Post-Bid Takeover Resistance: Antitakeover Provisions, Initial Offer Quality, and Target Board Motivation

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Abstract

Unlike Britain and many E.U. countries, it is the board of a U.S. takeover target firm that decides on post-bid resistance. In this context, we investigate the causal impact of existing antitakeover provisions (ATPs) and initial offer quality on the target-board's decision to resist post-bid. Exploiting instrumental variables, we find a positive relationship from existing ATPs to post-bid resistance, and no causal relationship from initial offer quality to post-bid resistance. We argue that this necessarily implies that the target-board's decision to resist is, on average, not motivated by good-faith bargaining in stockholder interest. Instead, it is indicative of entrenchment considerations.

Keywords: takeover resistance; antitakeover provisions; initial offer quality; good-faith bargaining; entrenchment

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1. Introduction

Takeover defenses take two forms. The first are 'structural' antitakeover provisions (hereafter "ATPs"). These are generic, legal and governance mechanisms adopted *ex ante*, without reference to a specific bid, to impede or deter any takeover bid for a firm, or to increase its bargaining power in the event of a bid: e.g., classified/staggered boards, supermajority amendments, fair price amendments, and poison pills (Ruback, 1987). The second are 'transactional' *post-bid* defenses. These are financial, operational, or other reactive actions taken post-bid by a target firm's board to resist a specific bid. Post-bid transactional resistance can range from recommending rejection of an initial offer (Levit, 2017) to proactively deploying, or threatening to deploy, a defense discriminating against at least an initial bidder (Berkovitch and Khanna, 1990). Such post-bid resistance is quite frequent – it occurs in 17.4 percent of our sample of 995 U.S. firms selected as takeover targets over our twenty-year sample period.

If a U.S. firm is a takeover target, it is entirely up to the board of that target firm to decide whether or not to offer post-bid resistance. This would not be the case in the U.K., or in the many E.U. countries that have adopted Article 9 of the *E.U. Takeover Directive*. This is because their 'Board neutrality' rule forces the board to remain relatively passive during a takeover bid, by prohibiting it from taking any action that could frustrate the bid, without due stockholder consideration and approval. Legal scholars have long debated the optimal level of managerial discretion that should exist in this regard. Easterbrook and Fischel (1981) argue for altogether removing managerial discretion by enacting a 'Board passivity' rule in the U.S.; Bebchuk (2002) makes a case for requiring stockholder approval of board intentions through a less restrictive 'no Board veto' rule; and Gilson and Schwartz (2021) recommend placing minimal restrictions on managerial discretion to resist takeover bids.

In the context of the above, an overarching objective of this paper is to address an important question that the literature has long struggled with: i.e., what is the dominant underlying motivation of the board of the target firm that drives its decision to resist? In particular, does the board's decision to offer post-bid resistance represent good-faith bargaining to get a better offer for stockholders (Fishman, 1988; Hirshleifer and Titman, 1990); or is it driven by entrenchment considerations, reflecting an inclination to block acceptance of any bid in order to preserve incumbency and concomitant private benefits of control (Baron, 1983)? Arguably, this underlying board motivation should govern the ATPs that it chooses to keep in the firm in equilibrium (prior to any bid), along with its choice of whether or not to resist a takeover bid (after a bid has actually been made), and how it conditions that decision depending on the quality of the initial offer.

We accordingly make three contributions in this paper. First, we investigate the causal impact of ATPs already in place in a target firm on the target-board's decision to resist post-bid. Second, we

examine the causal impact of initial offer quality on the post-bid resistance decision. Third, we analyze what our causal results necessarily imply about the dominant underlying motivation of the board in resisting a takeover post-bid – good-faith bargaining in stockholder interest, or self-interested entrenchment.

We first examine if and how existing ATPs causally affect the likelihood of the board engaging in post-bid transactional resistance. This paper is *not* about ATPs and the likelihood of a takeover – Karpoff, Schonlau, and Wehrly (2017) and Cuñat, Giné, and Guadalupe (2020) already show that ATPs causally reduce the likelihood of a takeover. Our analysis is about the hitherto unexplored causal relationship between ATPs – the generic *ex ante* takeover defenses that the target firm has chosen to keep in place – and post-bid transactional resistance – the bid-specific *ex post* takeover defense of the firm conditional on an actual bid. Relevant extant research in this context is Bates and Becher (2017), who find no association between ATPs and the decision to use post-bid resistance. However, they do not account for endogeneity, and consider just one ATP, the existence of a classified/staggered board.

Our primary measure for ATPs is the commonly used Gompers, Ishii, and Metrick (2003) "G-index". Karpoff et al. (2017) utilize two G-index based instrumental variables – one geography cohort based and one initial public offering cohort based – to show that ATPs significantly and negatively affect takeover likelihood, after accounting for endogeneity. These instrumental variables filter variation in firms' takeover defenses due to factors other than those non-arbitrarily driven by expected takeover likelihoods. We use instrumental variables similar to them, since these clearly correlate with the G-index and should be exogenous to a board's decision to offer post-bid resistance. We thereby estimate the impact of the instrumented G-index on the decision to offer post-bid resistance. In extended tests, we also use the Bebchuk, Cohen, and Ferrell (2009) "E-index", consisting, according to them, of just the six most potent variables (from an ATP perspective) out of the 24 variables in the G-index, and also the "O-index", which comprises the other eighteen variables out of the G-index variables. Given the findings of Karpoff et al. (2017), we also duly correct for takeover target selection in the presence of unobservable factors. This is to account, in the theoretical context of Fishman (1988), for the possibility that private information held by an initial bidder (before selecting a firm as a takeover target) could render ATPs less effective than they would otherwise be, arguably making it more likely for managers to need to use post-bid resistance to strengthen the firm's bargaining position.

We next examine if and how the quality of the initial offer causally affects the likelihood of the board engaging in post-bid transactional resistance. Earlier research on this relationship either does not account for endogeneity at all (Bates and Becher, 2017), or does so only peripherally (Jennings and Mazzeo, 1993). The proportionate difference between the initial offer price for, and the pre-run-up price of, the takeover target (the initial premium) is our standard measure of initial offer quality. Baker, Pan, and Wurgler (2012) show that the 52-week-high price serves as a reference point for an initial bidder in setting an initial offer price. We use the pre-run-up price to 52-week-high price as an instrumental variable for the initial premium, for drawing causal inferences concerning the influence of initial offer

quality on the board decision to offer post-bid resistance. The pre-run-up price to 52-week-high price should be not only negatively associated with the initial premium, but also exogenous to the decision to use post-bid resistance. This is because, independently, the preceding 52-week-high price is unlikely to reflect private information held by managers and the initial bidder about the value of selecting the firm as a takeover target. We test accordingly for the effect of the instrumented initial premium on the target board decision to use post-bid resistance.

We finally consider what our results imply about the motivations of the board in choosing to resist post-bid. These motivations can be nuanced and complex. However, in order to make tractable big picture inferences, we posit a binary scenario in which a board has either a dominant perspective of negotiating and acting in good-faith in the best interests of stockholders, or a dominant perspective of acting self-interestedly for promoting board or managerial entrenchment. Our aim is to see which of these is supported overall by our analyses and results.

Let us first consider the causal impact of ATPs on the board decision to resist post-bid. Here, we develop hypotheses about what to expect based on two further possibilities – either the board's policy at the time is to be proactive in influencing some or all ATPs *ex ante*, or its policy is to be passive with respect to the presence or absence of some or all ATPs. Arguably, the board's policy can be different for different ATPs, irrespective of its objectives. For example, the board could potentially have a policy of being relatively passive in relation to the presence or absence of what may be a more potent ATP (e.g., a classified/staggered board), but of actively influencing the presence or absence of what may be a less potent ATP (e.g., a fair price amendment).

(a) First, consider the case where the board is primarily motivated by good-faith bargaining in stockholder interest.

   i. If board policy is to proactively influence some or all ATPs *ex ante*, the reason why it will have more ATPs in place is that it intends to, and will actually, utilize these ATPs in its negotiations with any bidder to secure bid price improvement up to its maximum economically sustainable level. Hence, ceteris paribus, the board is less likely to need to use post-bid resistance to strengthen its bargaining position post-bid when it has more existing ATPs. This implies a negative causal relationship between existing ATPs and its decision to resist post-bid.

   ii. Even if board policy is *ex ante* passive with respect to the presence or absence of some or all ATPs, the greater the ATPs that happen to be already in place, the less likely will be the need for the board to use post-bid resistance to secure bid price improvement up to its maximum economically sustainable level. This again implies a negative causal relationship between ATPs already in place and the decision to resist post-bid.

(b) Second, consider the case where the board is primarily motivated by entrenchment considerations.

i. If board policy is to proactively influence some or all ATPs *ex ante*, the reason that it will have more ATPs already in place is because more ATPs generate greater entrenchment value through bid deterrence. However, if a bid does actually happen in spite of these ATPs, the board will be more likely to resist post-bid if it has greater entrenchment propensity, and that greater entrenchment propensity will manifest in having relatively more ATPs already in place *ex ante*. This would imply a positive causal relationship between existing ATPs and the decision to resist post-bid.

ii. If board policy is *ex ante* passive with respect to the presence or absence of some or all ATPs, any ATPs that happen to be already in place will be unrelated to the actual entrenchment propensity of the board. If a bid does actually happen in spite of whatever ATPs exist, the board's use of post-bid resistance to secure its entrenchment will depend on its entrenchment propensity, and hence be unrelated to existing ATPs. Hence, in this scenario, there would be no causal relationship between existing ATPs and the decision to resist post-bid.

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

Next, let us consider initial offer quality. If the primary motivation of the board is good-faith bargaining in stockholder interest, a lower quality initial offer will provide greater potential for further price improvement from post-bid resistance. Hence, ceteris paribus, the lower the quality of the initial offer, the more likely would be the need for the board to use post-bid resistance. On the other hand, if the primary motivation of the board is entrenchment, it will prioritize entrenchment considerations irrespective of the quality of the initial offer. The board would therefore use post-bid resistance based on its entrenchment propensity regardless of, and unrelated to, initial offer quality. Accordingly, a negative relationship between an exogenous measure of initial offer quality and the decision to use post-bid resistance will represent support for the good-faith bargaining view of post-bid takeover resistance, whilst the absence of any relationship will represent support for the entrenchment motivation for post-bid takeover resistance. There would be no clear inference if initial offer quality relates positively to the decision to resist post-bid.

What we find from our empirical investigations is as follows. First, we find a strongly statistically significant and positive causal relationship from existing ATPs to post-bid resistance based on the 24 ATPs counted in the G-index, and based on the subset of eighteen ATPs in the O-index, and no significant causal relationship for the other six ATPs comprising the E-index. The magnitudes of the impact from the G-index and the O-index are economically very significant. For example, the effect of the instrumented G-index, after correcting for takeover target selection in the presence of unobservable factors, equates to a 4.3 percentage points increase in the likelihood of the use of post-bid resistance for

each additional ATP. Second, we find no statistically, or economically, significant causal effect of initial offer quality on the board decision to use post-bid resistance.

For existing ATPs, our results do *not* support good-faith bargaining in stockholder interest as the more likely motivation for post-bid resistance. This is because, for that theory to have been supported, post-bid resistance would have had to have been more likely for fewer existing ATPs, implying a negative causal relationship, irrespective of whether or not the board actively influences some or all ATPs *ex-ante*. On the other hand, our results are indicative of entrenchment as the motivation for post-bid resistance. With an entrenchment motivation, if the board actively influences some or all ATPs *ex ante*, more existing ATPs will mean more entrenchment propensity, and consequently more likelihood of it resisting post-bid – leading to a positive causal impact. This is what we find for the G-index and the O-index. If the board is *ex ante* passive with respect to the presence or absence of some or all ATPs, any ATPs that happen to be already in place will be unrelated to the board's entrenchment propensity, which arguably is what should drive post-bid resistance if the board's motivation is entrenchment related. This implies no relationship between this set of existing ATPs and post-bid resistance. This is what we have for the E-index. In this context, our E-index results suggest that boards tend to be relatively passive in relation to changing the *status quo* for what may be the most potent ATPs.

For initial offer quality, our results also do *not* support good-faith bargaining in stockholder interest as the motivation for post-bid resistance. This is because then post-bid resistance would have been more likely for a lower quality initial offer – leading to a negative causal relationship. Our results are instead again indicative of an entrenchment related motivation, since the board will then be inclined to resist post-bid based on its entrenchment propensity, irrespective of initial offer quality, implying no causal relationship between initial offer quality and post-bid resistance.

Hence, our results for both of these causal relationships necessarily imply that, in our twenty-year sample period, target-firm boards are overall, on average, not motivated by good-faith bargaining in the interests of stockholders in their post-bid resistance decisions. Instead, our results are indicative of an entrenchment related motivation.

Our overall conclusions, on each of the three questions we examine, remain very robust to an extensive battery of robustness checks. In particular, they are robust to the inclusion of a proxy for private information held by an initial bidder about the value implications of selecting a firm as a takeover target. They are also robust to multiple regression specifications, extending to linear-probability instrumental variables regressions, various types of probit instrumental variables regressions, and different construction lags on the instrumental variables for existing ATPs. The conclusions are also robust to multiple variable specifications, extending to a summation-based G-index, a threshold-based G-index, different subsets of existing ATPs, and different measures of initial offer quality. Finally, we further reinforce our conclusions by showing that an entrenchment-related

board motivation behind post-bid takeover resistance also follows from (non-causal) results on the effect of the decision to use post-bid resistance on key bid-outcome-related variables.

We organize the rest of the paper as follows. Section 2 highlights our contributions to the literature. Section 3 describes the sample, the variables, and the univariate results. Section 4 provides multivariate results on the causal impact of existing ATPs on the decision of the board to use post-bid resistance. Section 5 documents multivariate results on the causal impact of initial offer quality on the decision to use post-bid resistance. Section 6 provides (non-causal) evidence on the impact of the decision to use post-bid resistance on key bid-outcome-related variables. Finally, Section 7 concludes.

2. Contributions to the Literature

We make interrelated contributions to the literature on the market for corporate control, as framed by Jensen and Ruback (1983), by investigating the decision of the board of a target firm to use post-bid resistance. Earlier studies, briefly reviewed below, have also made inferences about the managerial motives behind the decision to use post-bid takeover resistance. What makes our study unique is that our analyses arguably lead to causal inferences, since we examine hypothesized drivers made plausibly exogenous to the decision to use post-bid resistance. Specifically, we empirically examine the causal impact of two important drivers of this decision: first, the ATPs already in place in a target firm; and second, the quality of the initial offer. Our overarching, and third, objective is to analyze what our causal results necessarily imply about the dominant underlying motivation of the board in resisting post-bid – good-faith bargaining in stockholder interest (Fishman, 1988; Hirshleifer and Titman, 1990), or self-interested managerial or board entrenchment (Baron, 1983). We discuss our contributions under these three headings.

2.1. Existing ATPs and the Post-Bid Resistance Decision

There is an extensive literature, from contexts other than that concerned directly with post-bid resistance, which addresses whether or not existing ATPs are beneficial for stockholders. Straska and Waller (2014) provide an excellent review of this literature. Several studies suggest that existing ATPs are beneficial for stockholders. In particular, Comment and Schwert (1995) and Bates, Becher, and Lemmon (2008) find that more existing ATPs are associated with a better quality outcome for stockholders following a takeover bid. However, they do not treat existing ATPs as a suspect endogenous variable, nor venture beyond measures that only account for a poison pill and a classified/staggered board, respectively. However, Cain, McKeon, and Solomon (2017) exploit the exogenous passage of antitakeover laws to provide causal evidence, and evidence that is also not confined to a measure that is limited in scope. They too find that greater protection from a hostile takeover leads to a better quality outcome for stockholders, if a bid does actually happen in spite of having more protection.

There are also multiple other studies that document evidence consistent with the contrary inference. In particular, Karpoff et al. (2017) use instrumental variables to infer causally that more existing ATPs are more likely to impede a firm's selection as a takeover target. Similarly, Cuñat et al. (2020) causally show, by exploiting regression discontinuity applied to stockholder voting, that revocation of an ATP makes a firm more susceptible to selection as a takeover target, and that it leads to a better quality outcome for stockholders.

However, while the above findings are all important contributions to the literature, the evidence in these studies does not directly touch on issues related to concurrences, or conflicts, of interest between stockholders on the one hand, and managers and the board on the other. To get at this core issue requires contexts directly related to a managerial or board decision conceivably affected by ATPs already in place. The decision by a board to resist a takeover post-bid is precisely such a decision, and that is what we investigate in this study.

In the context of managerial behavior impacted by ATPs already in place, relevant studies include: (a) Masulis, Wang, and Xie (2007), whose (non-causal) results indicate that "*managers at firms protected by more antitakeover provisions are … more likely to indulge in empire-building acquisitions that destroy shareholder value*"; (b) Harford, Humphery-Jenner, and Powell (2012), who, again non-causally, document ways in which, for acquiring firms, "*entrenched managers destroy value*"; and (c) Gormley and Matsa (2016), who exploit the exogenous passage of an antitakeover law to causally document that "*after managers are insulated by the adoption of an antitakeover law, they take value-destroying actions that reduce their firms' stock volatility and risk of distress*." In contrast, we examine how a decision of the board of a *target* firm – post-bid takeover resistance – is causally impacted by ATPs already in place. Our findings show that board motivation in the post-bid resistance decision is not likely to be in the best interests of stockholders.

The specific question of how ATPs already in place drive a board's decision to resist post-bid is a question that has received comparatively little prior attention in the literature. This is a question that should provide insights about the underlying motivations driving the target firm's board – stockholder price maximization versus managerial/board entrenchment. This is because, arguably, similar underlying motivations could govern both the ATPs that the board chooses to keep in the firm in equilibrium (prior to any bid), as well as its choice of whether or not to resist a takeover bid (after a bid has actually been made). Bates and Becher (2017) is the only relevant empirical study in this specific context.[1] They find no association between ATPs already in place and the decision to use post-bid resistance. However, they do not correct for endogeneity, and use a measure that considers only *one* existing ATP, that of a classified/staggered board.

[1] Schwert (2000) suggests that larger firm size serves as a natural takeover impediment. However, he finds that a larger takeover target is not a substitute for the board's decision to use post-bid resistance. We find that a larger takeover target is not also a substitute for the board having more ATPs already available to it.

This paper is the first to examine whether or not there is a causal association between ATPs already in place, before a firm's selection as a takeover target, and the board's decision to use post-bid resistance. We find that standard measures of existing ATPs are not sufficiently exogenous to the decision to use post-bid resistance. In contrast to Bates and Becher (2017), we therefore exploit plausibly exogenous sources of variation in the Gompers et al. (2003) G-index in our analyses. We accordingly estimate the effect of instrumenting for existing ATPs on the decision to use post-bid resistance. We do so also for the Bebchuk et al. (2009) E-index that only counts what may be the six most potent ATPs in the G-index, and for the O-index that counts the other eighteen ATPs in the G-index, separately estimating plausibly exogenous sources of variation in each of them. Given our use of plausibly exogenous drivers, this is the first study to document the causal impact of existing ATPs on the board decision to mount post-bid resistance.

2.2. Initial Offer Quality and the Post-Bid Resistance Decision

A lower quality initial offer should equate to managers having more potential for further price improvement through post-bid resistance. The potential for price improvement matters in the theoretical models of Fishman (1988), and Hirshleifer and Titman (1990), because stockholders are more willing to resist a lower quality initial offer for their firm. By examining initial offer quality, two empirical studies, in particular, find direct support for the good-faith bargaining in stockholder interest view for explaining managerial motives behind the decision to use post-bid takeover resistance, though neither of these studies controls (adequately) for endogeneity. Each study also applies a different measure of initial offer quality.

First, Jennings and Mazzeo (1993) find that the decision to use post-bid resistance is more likely in response to a lower initial premium. Although they treat the initial premium as an endogenous variable, in a system of simultaneous equations, they rely solely on this estimation process accounting for any correlation between the error terms, thereby not properly controlling for endogeneity. Second, Bates and Becher (2017) find that the decision to use post-bid resistance is associated with a relatively lower unexplained component of initial premium. However, they do not control, at all, for endogeneity. In fact, we find persistence in the association documented by them, after accounting for the initial premium, which indicates that initial bidders tend to offer higher than normal initial premiums to preempt more costly post-bid resistance.

In contrast, we exploit a plausibly exogenous source of variation in the initial premium to examine the effect of instrumenting for the initial premium on the decision to use post-bid resistance. This is again the first study to investigate the properly causal impact of initial offer quality on the board decision to mount post-bid resistance.

2.3. Target Board Motivation for Post-Bid Resistance

Theoretical modeling of post-bid resistance by Berkovitch and Khanna (1990) and Levit (2017) provides insights on the significant role of managerial motivation in the decision to resist. Berkovitch and Khanna (1990) show that managerial discretion extending to even the use of extreme forms of resistance, discriminating against an initial bidder, can be beneficial for stockholders.[2] Specifically, they demonstrate that managers by deploying, or threatening to deploy, such resistance can create an advantage for a potential rival bidder, and therefore bargain more effectively for a higher quality offer from a disadvantaged bidder.[3] However, they also emphasize that the use of such resistance can be open to abuse by entrenched managers. Levit (2017) shows that managerial discretion to merely recommend rejection of a takeover bid can be similarly beneficial for stockholders, but again open to abuse by entrenched managers. This because, either way, managers hold private information about the value of the target firm, which makes them better informed than stockholders. On the other hand, entrenchment is the key focus in the theoretical work of Baron (1983). This is because managers are willing to recommend resistance against even a higher quality initial offer for the firm, in order to defend their incumbency and concomitant private benefits of control.

Several empirical studies address, albeit not causally and not always directly, whether post-bid resistance is driven by boards acting in the best interests of stockholders, or in self-interested furtherance of managerial and board entrenchment interests. Evidence supporting entrenchment-based motivation includes Walkling and Long (1984) and Cotter and Zenner (1994), who find that the decision to use post-bid resistance is more likely when managerial wealth is more aligned to the retention of incumbency than to the maximization of stockholder wealth. Harford (2003) also finds that the decision to use post-bid resistance is more likely when managers have a greater expectation of a completed bid being at the expense of their incumbency. Hartzell, Ofek, and Yermack (2004) find evidence to suggest that some managers sacrifice their incumbency and concomitant private benefits of control by negotiating sizeable cash payments for themselves, in return for agreeing to a completed takeover. They also find evidence to suggest that this behavior comes at the expense of a lower quality offer for the target firm's stockholders. On the other hand, Jennings and Mazzeo (1993), Franks and Mayer (1996), Schwert (2000), and Bates and Becher (2017) attach weight to evidence related to revised and rival offers, and suggest that the decision to use post-bid resistance is associated with bargaining for price improvement in stockholder interest.[4] However, none of the findings in any of the above studies amount

[2] Examples of discriminatory post-bid resistance are standstill agreements, litigation, and asset restructuring. Non-discriminatory post-bid resistance examples are targeted repurchases and liability restructuring (Ruback, 1987).

[3] Berkovitch and Khanna (1990) broaden similar theoretical findings by Shleifer and Vishny (1986). In contrast, Stulz (1988) models and finds benefits from the use of extreme forms of resistance disadvantaging not only an initial bidder, but also a potential rival.

[4] Carline, Linn, and Yadav (2021) investigate in this context an institutional setting that does not allow ATPs – the U.K. – to focus on the nature of takeover resistance: specifically, the differences in target behavior and associated motivations in cases of severely obstructive bid resistance relative to mild bid resistance.

to causal relationships. Moreover, their findings mostly derive from relationships that rely either on drivers based on projections extending beyond the post-bid resistance decision, or on effects – and not therefore drivers – of this decision.

Whether managers choose to resist a takeover bid in good-faith in the best interests of stockholders, or whether their motivation is a desire to protect their own interests by remaining entrenched, is an important empirical question. We address this question in this paper. Our empirical analysis uses instrumental variables to filter variation in our hypothesized drivers of this decision – existing ATPs and the initial premium – due to factors other than those systematically driven by expected takeover likelihoods, and by private information held by managers and the initial bidder about the value of selecting the firm as a takeover target. The motivation of a board in choosing to resist post-bid then necessarily follows from our two causal results on the impact of existing ATPs, and of initial offer quality, on post-bid resistance.

We base our inferences relating to the motivation of a board in using post-bid resistance on the arguments and discussion in this regard in Section 1. Figures 1 and 2 provide, for existing ATPs and for initial offer quality respectively, schematic representations of these arguments, and the inferences that necessarily follow from them. Given our use of plausibly exogenous drivers, our study is perhaps the first to be based on direct and causal evidence when addressing the issue of the motivation underlying the board decision to use post-bid takeover 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. 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 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 instrumental variables for the G-index at least three years before ascertaining takeover target selection for a firm in a given 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.[5]

We utilize the Securities Data Company (SDC) database for ascertaining takeover target selection for a firm in a given year. We require a bid to be an attempt to acquire common stock in excess of fifty percent and disclose an offer price. Despite the criteria, some firms are selected as a takeover target multiple times in reasonably quick succession. We therefore merge into a single bid multiple attempts to acquire a firm when the separation is no more than one year, but then do not count bids beginning before our sample period.[6] 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 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 for a board decision to use *any* form of post-bid resistance. Resistance ranges from merely recommending rejection of the initial offer to, at the extreme, deploying, or threatening to deploy, a defense discriminating against at least the initial bidder. However, we also search for the decision to adopt any post-bid ATP, the most common type of which is an 'out of the shadows' or 'morning after' poison pill (Heron and Lie, 2006). In addition, our searchable timeframe incorporates a run-up period of forty-two trading days and extends to the very end of a bid, in the context of having merged some multiple attempts to acquire a firm.

Columns (1), (2), and (3) in Table 2 present, respectively: (a) frequency distributions for all observations, (b) observations for which the firm is selected as a takeover target, and (c) 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) in Table 2 shows that firms selected as takeover targets are 4.7 percent of the overall observations across the sample period. Column (5) in Table 2 shows that overall 17.4 percent, i.e. 173, of the takeover targets use post-bid resistance. The overall rate in Column (4) is compatible with the rate of takeover target selection documented by Karpoff et al. (2017) for a comparable sample. However, the overall rate in Column (5) is much higher than the rate of the use of post-bid resistance 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 mainly attributable to their sample not being restricted to takeover targets with coverage in the RiskMetrics dataset because

[5] 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.

[6] The criteria still leave a few firms selected as a takeover target multiple times. We count each time to present the results in the paper and Internet Appendix. Nonetheless, dropping all observations for the firms after the first time does not materially alter our results.

the component G-index data is generally for larger firms. Indeed, Schwert (2000) and Bates and Becher (2017) themselves find that a larger takeover target is more likely to use post-bid resistance. Another likely contributing factor 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 rate of use of post-bid resistance that is higher than in our data, albeit for a non-comparable timeframe. In Columns (4) and (5), years with a higher rate of takeover target selection, particularly the takeover waves of 1997-2000 and 2005-2007, tend to be years with a lower rate of the use of post-bid resistance.

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. The variables are described in Table 1, as are the instrumental variables for the firm and bid features of main interest to our analysis, namely the G-index and initial premium, respectively. The instrumental variables for the G-index, following Karpoff et al. (2017), are the IPO-cohort based IPO-peers G-index and the geography-cohort based HQ-peers G-index. The instrumental variable for the initial premium, following Baker et al. (2012), is the pre-run-up price to the 52-week-high price. These instrumental variables are for correcting econometrically for endogeneity. We discussed them briefly in Section 1 and will be discussing them in more detail below, with Table 1 providing formal detailed definitions.

The G-index and the initial premium are our hypothesized drivers of the decision to use post-bid resistance. Table 3 presents descriptive statistics for these hypothesized drivers, and for other firm and bid features as additional explanatory variables, after grouping takeover targets based on whether or not their boards decided to use post-bid resistance. Columns (1)-(3) and Columns (4)-(6) present the mean values, standard deviation, and number of observations for each of these variables for the two groups. Column (1) additionally flags the statistical significance of differences in the mean values for takeover targets that do and do not 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 after adding one for each counted ATP, equates to the board having a more effective set of mechanisms for achieving its objectives, be these to do with bargaining for price improvement in stockholder interest or with securing its entrenchment. If bargaining for price improvement in stockholder interest were the board's motive driving the decision to use post-bid takeover resistance, 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 the board's motive were entrenchment-related, we would expect to find a G-index that is larger or no smaller 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 consistent with entrenchment being the motive for post-bid takeover 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 or not the G-index causally drives post-bid resistance.

As a partial assessment of causality, we examine differences in the means for the instrumental variables for the G-index, namely IPO-peers G-index and HQ-peers G-index.[7] For our causal inferences to be beyond reasonable doubt, each instrumental variable should be a source of variation in the G-index that is plausibly exogenous to takeover target selection for a firm in a given year. These instrumental variables are similar to those of Karpoff et al. (2017), and they theoretically duly scrutinize these conditions. Their rationale is as follows. Each instrumental variable is restricted to a group of peers for the firm. Endogeneity induced from industry takeover waves is removed by only including peers from sectors not shared with the firm. Any remaining endogeneity is removed by summing the adoption rates for the individual ATPs counted in the G-index for a group of peers at a point in time many years before ascertaining takeover target selection for the firm in a given year, and by ensuring that each group of peers has a specific connection to the firm related to the past adoption of ATPs. For the IPO-peers G-index, the connection relates to time in that the firm and its peers experienced the same legal environment for the adoption of ATPs because of sharing the same year of the initial public offering (IPO). For HQ-peers G-index, the connection relates to geography in that the firm and its peers are likely to have received similar legal advice on the adoption of ATPs because of sharing the same state headquarters (HQ).

We therefore expect IPO-peers G-index and HQ-peers G-index to be positively associated with the G-index. As a testament to the distinctness of the instrumental variables, we observe that the positive correlation between IPO-peers G-index and HQ-peers G-index, for observations corresponding to the firms being selected as a takeover target, is only 12.3 percent. IPO-peers G-index and HQ-peers 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 is consistent with the positive association between the G-index and the decision to use post-bid resistance being causal.

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.

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

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 mainly attributable to his sample, like the sample of Bates and Becher (2017), containing a larger 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 initial offer quality. Arguably, a higher quality initial offer, which for the initial premium equates to a larger proportionate difference between the initial offer price and the pre-run-up price of the takeover target, equates to managers having less bargaining potential for price improvement. If bargaining for price improvement in stockholder interest (entrenchment) is the board's motive driving the decision to use post-bid takeover resistance, we would expect to find a lower (no lower) initial premium, on average, for takeover targets that use post-bid resistance, relative to those that do not. The initial 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 suggests that bargaining for price improvement in stockholder interest is behind the decision to use post-bid takeover resistance. While this is consistent with the conclusion of Jennings and Mazzeo (1993), it could well be documenting just a mere association rather than a causal link from the initial premium to the decision to use post-bid resistance.

As a partial assessment of causality, we again examine the difference in the means for the instrumental variable for the initial premium, namely pre-run-up price to 52-week-high price. For our causal inference to be beyond reasonable doubt, the instrumental variable should be a source of variation in the initial premium that is plausibly exogenous to the decision to use post-bid resistance. This instrumental variable is based on Baker et al. (2012), who theoretically scrutinize the relevance condition. Their rationale is that because the instrumental variable 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 reference point for the initial bidder in setting the initial offer price. We therefore expect pre-run-up price to 52-week-high price to be negatively associated with the initial premium.

Baker et al. (2012) go on to rationalize that the pre-run-up price to 52-week-high price is exploitable for examining whether or not there is a negative association between the initial premium and the announcement return to the initial bidder – as a way of causally 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 because the preceding fifty-two week high price is unlikely to reflect private information held by managers and the initial bidder about the value of selecting the firm as a takeover target. 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 that the negative association between the initial premium and the decision to use post-bid resistance is unlikely to be causal.

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 inferences of Malmendier, Opp, and Saidi (2016), who infer that the intended method of payment tends to use more cash when the initial bidder wants to send a more coercive signal that the takeover target is undervalued.

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

We next draw on a series of regressions to examine the effect of the G-index on the decision to use post-bid resistance. We start by only accounting for the effect of our other hypothesized driver of the decision to use post-bid resistance – the initial premium – as well as for the effects of the other firm and bid features, and for industry and year effects. We then additionally account for private information held by the initial bidder about the value of selecting the firm as a takeover target, via correcting for takeover target selection in the presence of unobservable factors. We finish this section with a battery of additional robustness checks.

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 produce near identical results from (probit) regressions specifically intended for a limited dependent variable. The parallel results for Tables 4 and 5 are presented in Tables IA1 and IA2, respectively, in the Internet Appendix.

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 – for G-index, IPO-peers G-index and HQ-peers G-index – that were collectively suggestive of a positive causal association between the G-index and the decision to use post-bid resistance. Collinearity between the G-index and the initial premium and other firm and bid features could account for the difference. However, regardless of how significant a role collinearity plays, and despite what was 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 decision to use post-bid resistance. In particular, without exploiting the instrumental variables that provided the most reliable evidence from the univariate results, reverse causality could engender an unreliable

association between the G-index and the decision to use post-bid resistance because a firm could have adopted (revoked) an ATP to signal more (less) coerciveness in expectation of being selected as a takeover target.

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.[8] We jointly exploit the instrumental variables because IPO-peers G-index and HQ peers G-index are distinct, plausibly exogenous sources of variation in the G-index. The first stage results for instrumenting the G-index and second stage results for the effect of instrumenting for the G-index 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 a 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 IPO-peers G-index and HQ-peers G-index is from the first stage test of the null hypothesis that the instrumental variables alone have no joint effect on the G-index that is statistically significant at conventional levels. The value of 38.4 exceeds the recommended minimum value of 10.0 (see, for example, Angrist and Pischke, 2009, p. 213) and is statistically significant at the one percent level. We therefore have confidence in rejecting the null hypothesis, knowing also that the coefficients on IPO-peers G-index and HQ-peers G-index are positive and statistically significant to at least the five percent level. The R^2-statistic for IPO-peers G-index and HQ-peers G-index is the first stage measure of the overall variation in the G-index explained by the joint variation in the instrumental variables alone. Despite there being no recommended minimum value, the value of 7.8 percent seems reasonable in light of the rationale for the instrumental variables having theoretical validity as sources of variation in the G-index. The results therefore suggest that the instrumental variables also have statistical validity as sources of variation in the G-index.

Since we jointly exploit the instrumental variables, the Chi^2-statistic for no over-identification is from the second stage test of the null hypothesis that at least one of the instrumental variables is likely to be exogenous to the decision to use post-bid resistance. The value of 0.1 is not statistically significant at conventional levels. We therefore have confidence in accepting the null hypothesis, which gives us reassurance that the instrumental variables have not only theoretical validity but also statistical validity as exogenous sources of variation in the G-index. 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

[8] 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.

statistically significant at the one percent level, which therefore gives us confidence in rejecting the null hypothesis.

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 at the helm of a larger takeover target does not substitute for a greater set of ATPs already in place. The positive collinearity runs contrary to Schwert (2000), who posits that a larger takeover target equates to managers 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.

Angrist and Pischke (2009, p. 213) emphasize that it would be dubious for a causal association not to be traceable in the reduced form, in the sense of it not being possible to detect a matching indirect effect of the instrumental variable on the outcome variable. 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-peers G-index and HQ-peers G-index are positive, close in magnitude, and statistically significant at the one percent level for the first instrumental variable. All things considered, we conclude therefore that there is a positive causal association between the G-index and the decision to use post-bid resistance.

4.2. Effect of Private Information Held by the Initial Bidder

So far, we infer a positive causal relationship running from ATPs already in place before a firm's selection as a takeover target to the decision to use post-bid resistance. The positive causal association is contrary not only to the bargaining for price improvement in stockholder interest view for specifically explaining the motive behind the decision to use post-bid takeover resistance, but also to an often espoused positive association 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, 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 modeling 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 causal association between the G-index and the decision to use post-bid resistance manifests from the omission of any 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 in a given year. The explanatory variables are the firm features, and industry and year controls. However, Karpoff et al. (2017) suggest that reverse causality muddles the true association between the G-index and 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. We then add the IMR to the same 2SLS regression, which requires a correction to the standard errors. The procedure is emphasized by Wooldridge (2010, pp. 809-813) as a correct way to treat a suspect endogenous variable warranting inclusion in not only the outcome stage but also the selection stage of a model.

However, to be beyond reasonable doubt that the IMR is exogenous, we exploit a source of variation in takeover target selection that is plausibly 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 many years before firms in our sample make the decision to use post-bid resistance.

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, indeed, positive and statistically significant (at the one percent level).[9] In contrast, the average marginal effects of IPO-peers G-index and HQ-peers G-index are negative and statistically significant (to at least the five percent level).[10] 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

[9] Many firms in our sample are incorporated in Delaware. Nonetheless, jointly accounting for this fact does not materially alter our results, and the average marginal effect of Delaware incorporation is itself not statistically significant at conventional levels.

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

(smaller) G-index, which is possibly because of the adoption (revocation) of an ATP to signal more (less) coerciveness in expectation of selection as a takeover target.[11] 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 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 causal association between the G-index and the decision to use post-bid resistance, although with a slight reduction in its effect. The same is true of the reduced form results presented in Column (4) of Table 5.

4.3. Additional Robustness Checks

After correcting for takeover target selection in the presence of unobservable factors, we continue to infer that a greater set of ATPs already in place before a firm's selection as a takeover target gives more causal impetus to the decision to use post-bid resistance. The positive causal association is consistent not only with the entrenchment motivation for specifically explaining the decision to use post-bid takeover resistance, but also with an often espoused positive association between ATPs already in place and entrenchment in other contexts (see, in particular, Masulis et al., 2007; Harford et al., 2012; Gormley and Matsa, 2016; Karpoff et al., 2017; and Cuñat et al., 2020). However, in this sub-section, we undertake additional robustness checks to examine whether or not the positive causal association holds when the instrumental variables for the G-index are constructed even further back in time, and for the effects of instrumenting for subsets of ATPs already in place.

In our earlier analysis, we construct the instrumental variables for the G-index three years before ascertaining takeover target selection for a firm in a given 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 instrumental variables with equivalent variables constructed from the earliest available component G-index data, which is at the beginning of the RiskMetrics dataset for most firms. We do not expect the fixed instrumental variables, namely IPO-peers G-index (fixed) and HQ-peers G-index (fixed), to not meet the first stage relevance condition because ATPs are generally fairly sticky through time and firms seldom relocate headquarters (in the context of the HQ-peers G-index). Since we exploit new instrumental variables 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 IA3 in the Internet Appendix. The first stage, second stage, and reduced form results are presented in Columns (2), (3), and (4), respectively, of Table IA3. Despite

[11] Data collected by Smith (2019), as recent as after the passage of the Sarbanes Oxley Act of 2002, shows that the adoption and revocation of an ATP are both rather frequent, but that revocation is more frequent. Despite the general stickiness of ATPs through time, data collected by Cuñat et al. (2020) for a timeframe covering most of our sample period also shows that revocation is frequent.

these changes, our main results continue to indicate that there is a positive causal association between ATPs already in place and the decision to use post-bid resistance.

Gompers et al. (2003) conceive the G-index by assuming that the counted ATPs sum up, in units of one, to create an overall set of ATPs already in place. We therefore 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 in a given 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 go back to exploiting the rolling instrumental variables, which means that the probit regression for exploiting the IMR is as back 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. Since estimation of the two equation probit regression is via a system of simultaneous equations and therefore automatically accounts for any correlation between the error terms, an advantage over the 2SLS regression is that the estimation process is somewhat less reliant on the validity of the instrumental variables. Columns (1) and (2) in Table IA4 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. The equations are therefore akin to the first and second stages of the 2SLS regression. 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 causal association between ATPs already in place and the decision to use post-bid resistance.

Bebchuk et al. (2009) make a case for an E-index – with just six out of the 24 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. Their case relies on legal argument, as well as on evidence that only a higher E-index, not a higher index comprised of the other eighteen ATPs in the G-index, is harmful to stockholder value and returns, in the broadest possible sense. 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 therefore 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 go back to the summation based G-index, and replace it and the rolling instrumental variables with an index, namely O-index, and instrumental variables, namely IPO-peers O-index/ HQ-peers O-index, identically constructed, except for no longer counting ATPs set apart for the E-index. Since we exploit new instrumental variables for ATPs already in place, preceding the 2SLS regression is a new probit regression for exploiting the IMR, the results from which are presented in Column (1) of Table IA5 in the Internet Appendix. Columns (2), (3), and (4) in Table IA5 present in full the first stage,

second stage, and reduced form results, respectively. Column (2) in Table 6 presents abridged second stage results. Despite these changes, our main results continue to indicate that there is a positive causal association between ATPs already in place and the decision to use post-bid resistance.

We do the same for the E-index. The results, presented in full in Table IA6 in the Internet Appendix, and the second stage presented in abridged form in Column (3) of Table 6, indicate that there is no statistically significant causal association between what may be the most potent ATPs already in place and the decision to use post-bid resistance. Returning to our arguments, in Section 1, in relation to differentiating between good-faith bargaining and entrenchment related target-firm board motivations, we had considered two possibilities in each case: either the board's policy at the time of the initial takeover bid is to be proactive in influencing some or all ATPs *ex ante*, or it prefers to act passively conditional on whatever ATPs are already in place. Arguably, the policy of the board can be different for different ATPs, even if it has entrenchment propensity, as our results continue to suggest. If the board actively influences some or all ATPs *ex ante*, more existing ATPs will manifest from it having a relatively greater entrenchment propensity, meaning more likelihood of it resisting post-bid and, hence, a positive causal impact from existing ATPs, as we have for the G-index and the O-index. However, if the board does not actively influence some or all ATPs *ex ante*, its entrenchment propensity will lead to it resisting irrespective of whatever ATPs happen to already be in place, implying no causal relationship between existing ATPs and post-bid resistance, as we have for the E-index. In this context, our results for the E-index, whilst still consistent with entrenchment-related board motivation for the decision to use post-bid takeover resistance, also suggest that boards tend to be relatively passive in relation to changing the *status quo* for what may be the most potent ATPs.

To gain an idea about the relative influence that the board is likely to have over the different ATPs included in the O-index and the E-index, respectively, we examine mean percentages of firms that adopt at least one ATP counted in these sub-indices of the G-index, between consecutive updates to the RiskMetrics dataset for the component G-index data. We do so separately for firms selected and not selected as a takeover target. Table 7 presents the results. For firms selected as a takeover target, the mean percentage that adopt at least one ATP counted in the O-index is 24.9 percent, as compared to 18.2 percent for the E-index. The difference is statistically significant at the one percent level, which supports the suggestion that boards have a tendency to be relatively passive in relation to changing the *status quo* for what may be the most potent ATPs. This is also the case for firms not selected as a takeover target. Additionally, however, the results reveal that statistically larger mean percentages of firms selected as a takeover target adopt at least one ATP counted in the G-index, O-index, and the E-index, as compared to the other firms (not selected as a takeover target), which supports our rejection, earlier on, of the null hypothesis from tests of exogeneity in ATPs already in place.

5. Multivariate Results for Initial Premium and the Post-Bid Resistance Decision

Besides a cash offer, the initial premium is the only other explanatory variable from the univariate analysis that for the multivariate analysis is consistently associated with the decision to use post-bid resistance. The coefficient on, or the average marginal effect of, the initial premium is negative and statistically significant at the one percent level, which is therefore consistent with the corresponding univariate result for the effect of the initial premium on the decision to use post-bid resistance. However, the univariate result for the instrumental variable for the initial premium, pre-run-up price to 52-week-high price, suggested that the true association between the initial premium and the decision to use post-bid resistance is likely to be different.

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 preempt more costly post-bid competition by setting a higher initial premium. In contrast, an implication of the structural work of Dimopoulos and Sacchetto (2014) is that the initial bidder is likely to preempt more costly post-bid resistance, by setting a higher than normal initial premium, regardless of the private information that it holds before selecting the firm as a takeover target, and the consequences for post-bid competition. These implications amount therefore to compelling reasons to suspect that reverse causality is likely to muddle the true association between the initial premium and the decision to use post-bid resistance.

We therefore expand the 2SLS regression back in Table 5 to examine the effects of jointly instrumenting for the G-index and initial premium on the decision to use post-bid resistance. We also examine the implications for the unexplained component of initial premium.

5.1. Effect of Instrumenting for the Initial Premium

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 premium, and second stage for the effects of jointly instrumenting for the G-index and initial premium, respectively. The coefficient on the initial premium is not statistically significant at conventional levels.

The comprehensive set of diagnostic test results related to the effects of jointly instrumenting for the G-index and initial 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 instrumental variable alone has no statistically significant effect on the initial premium at conventional levels. The value of 28.1 exceeds the recommended minimum value of 10.0 and is statistically significant at the one percent level. We therefore have 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 premium explained by the variation in the instrumental variable alone. The value of 9.7 percent seems reasonable in light

of the rationale for the instrumental variable having theoretical validity as a source of variation in the initial premium. The results therefore suggest that the instrumental variable also has statistical validity as a source of variation in the initial premium.

Since we jointly exploit the instrumental variables for the G-index and initial 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 instrumental variables 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, knowing also that the result is just as strong as when only instrumenting for the G-index back in Table 5, and that there is no material collinearity between IPO-peers G-index/ HQ-peers G-index and pre-run-up price to 52-week-high price (maximum correlation coefficient between the instrumental variables = 14.8 percent). 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 premium. The remaining result is the Chi^2-statistic from the second stage test of the null hypothesis that the G-index and initial premium are likely to be jointly, sufficiently exogenous to the decision to use post-bid resistance as to not require instrumenting. The value of 7.7 is statistically significant at the five percent level. We therefore have confidence in rejecting the null hypothesis, knowing also that the result is stronger than when only instrumenting for the G-index back in Table 5, and that we will be evaluating the initial premium alone when examining the implications for the unexplained component of initial premium.

The first stage coefficients on IPO-peers G-index/ HQ-peers G-index for instrumenting the initial premium are not statistically significant at conventional levels. These reduced form results for the effect of instrumenting for the G-index suggest that there is no association between ATPs already in place before a firm's selection as a takeover target and the initial premium, which is further contrary to an often espoused positive association between ATPs already in place and bargaining in stockholder interest. In particular, 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 actually happen in spite of 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 premium is also not statistically significant at conventional levels, which suggests that there is no tendency for the initial bidder to set the initial premium by taking into consideration the private information that it holds, and the consequences for post-bid competition. This result does not provide support therefore for the implication that arises from the theory of Fishman (1988), and instead supports the structural inferences of Dimopoulos and Sacchetto (2014), who infer that preemption of competition from a potential rival bidder accounts for only a fraction of the bid premium.

Column (4) in Table 8 presents the reduced form results for the effects of jointly instrumenting for the G-index and initial premium. The coefficient on pre-run-up price to 52-week-high price shows no indication that the instrumental variable for the initial premium is statistically significant at conventional levels. All things considered, we infer therefore that there is no causal association between the initial premium and the decision to use post-bid resistance.

In contrast, Jennings and Mazzeo (1993) conclude, from estimating a system of simultaneous equations, that there is a negative causal association between the initial premium and the decision to use post-bid resistance. However, we exploit an exogenous source of variation in the initial premium to examine the effect of instrumenting for the initial premium, whereas they rely entirely on the property that their estimation process automatically accounts for any correlation between the error terms, in relation to treating the initial premium as a suspect endogenous variable. In addition, our sample period begins from the 1990s, whereas their sample covers a preceding period. Moeller (2005) finds evidence to suggest that a reversal occurred during the 1990s in the association between managerial control and the bid premium, which he attributes to ATPs only by then being already widely in place.

5.2. Effect of the Unexplained Component of Initial Premium

So far, our evidence is that more bargaining potential for price improvement because of a lower quality initial offer does not provide any causal impetus for the decision to use post-bid resistance. No such causal association runs contrary to the bargaining for price improvement view for explaining the motive behind the board decision to use post-bid takeover resistance. However, Bates and Becher (2017), in finding no correlation between the initial premium and the decision to use post-bid resistance, suggest that the unexplained component of initial premium is a more reliable measure of initial offer quality. We examine therefore the implications of what no causal association from initial offer quality to post-bid resistance means for the unexplained component of initial premium.

For our analysis, the unexplained component of initial premium is the residual from an OLS regression identical to that used when instrumenting the initial premium back in Column (2) of Table 8.[12] We then replace the initial premium with the unexplained component of initial premium in the same 2SLS regression, except for being back to 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 of initial premium is negative and statistically significant (at the one percent level), which is consistent with the results of Bates and Becher (2017). However, their argument is that

[12] Bates and Becher (2017) drop bids with post-bid competition from a rival bidder, and uncompleted bids, to predict a close to immediately acceptable bid premium, in or out of sample, for subtracting from the initial premium. We instead retain such bids to ensure identicalness to when we instrument the initial 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 premium. Nonetheless, implementing their procedure does not materially alter our results. They include a predictor variable in their regression that is similar to the instrumental variable for the initial premium in our regression. However, they do not correct, as we do, for takeover target selection in the presence of unobservable factors.

the (*mere*) association between the unexplained component of initial premium and the decision to use post-bid resistance provides support for the good-faith bargaining in stockholder interest view of post-bid takeover resistance. In contrast, the main issue for our analysis then becomes to what extent this negative association manifests in reverse causality muddling the true causal relationship between the initial premium and the decision to use post-bid resistance.

To address this issue, we add the initial premium to the same 2SLS regression and exploit the Durbin-Wu-Hausman procedure to evaluate whether or not the initial premium, alone, is likely to be sufficiently exogenous to the decision to use post-bid resistance. Columns (3) and (4) in Table 9 present the first and second stage results, respectively. The second stage coefficient on the initial premium is not statistically significant at conventional levels, and equivalent to the effect of instrumenting for the initial premium back in Table 8 because of already accounting for the unexplained component of initial premium. However, the second stage coefficient on the unexplained component of initial premium is still negative and statistically significant (at the five percent level), which indicates therefore that the initial 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 premium and the initial premium (correlation coefficient = 93.2 percent), and by the fact that the unexplained component of initial premium is orthogonal to the IMR. As such, this suggests that there is a tendency for the initial bidder to preempt more costly post-bid resistance by setting a higher than normal initial premium regardless of their private information, and the consequences for post-bid competition. The results provide support therefore for the implication that arises from the structural work of Dimopoulos and Sacchetto (2014), who infer that resistance, rather than preemption of competition from a potential rival bidder, accounts for most of the bid premium, irrespective of the decision to use post-bid resistance.

We also find no evidence that our hypothesized drivers of the post-bid resistance decision – existing ATPs and the initial premium – are associated with one another, either when measured by mere correlation (in their raw forms) or when measured by causal association in reduced form (once the raw variables are substituted with their instruments). This does not though rule out these drivers interacting in their effect on the post-bid resistance decision. In particular, the effect of the instrumented initial premium may differ at different values of the instrumented G-index. However, after incorporating this interaction into our 2SLS regression, we find no evidence to support this possibility.

Overall, our results continue therefore to indicate that there is no causal association between the initial premium and the decision to use post-bid resistance. At the same time, our results continue to indicate that there is a positive causal effect of the G-index on the decision to use post-bid resistance.

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

Our analyses of the decision to use post-bid takeover resistance use hypothesized drivers of this decision. Given that we make these hypothesized drivers plausibly exogenous to the decision to use post-bid resistance, we conclude that more ATPs already in place before a firm's selection as a takeover target give *more* causal impetus to the decision to use post-bid resistance, and that more potential for price improvement because of a lower quality initial offer does *not* causally impact (measurably) the decision to use post-bid resistance. In view of the arguments in Section 1 – duly summarized schematically in Figures 1 and 2 – we further conclude therefore that the board decision to use post-bid takeover resistance is *not* driven overall, on average, by good-faith bargaining in the best interests of stockholders, but is instead indicative of an entrenchment related motivation.

In contrast, Franks and Mayer (1996), Schwert (2000), and Bates and Becher (2017) document support for the bargaining for price improvement view, except that none of their direct inferences are based on any causal relationships. They mostly infer managerial motives behind post-bid takeover resistance from analyzing the effects of the decision to use post-bid resistance. In view of this, and despite the indirectness 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, albeit non-causally, the effect of the decision to use post-bid resistance on key bid-outcome-related variables. Table 10 describes the four variables that we focus on: (a) use of a target termination fee; (b) final premium; (c) bid completion; and (d) overall return to target stockholders. These variables are widely used in the literature on the market for corporate control.

We first present the descriptive statistics, with means for takeover targets that do and do not use post-bid resistance in Columns (1) and (4), respectively, and with statistical significance of differences in the means in Column (1) of Table 10. The use of a target termination fee averages 50.3 percent for takeover targets that use post-bid resistance, and 87.6 percent for those that do not. The difference in the means is negative and statistically significant at the one percent level, which is consistent with the results of Bates and Lemmon (2003) and Officer (2003), who infer from extensive analyses that the use of a target termination fee is to serve as a signal of commitment in exchange for a better quality outcome for stockholders. Given the association with bargaining for price improvement, and given that our measure of the use of a target termination fee accounts for multiple offers separated by up to one year, this result suggests that the effect of the post-bid resistance decision on the use of a target termination fee is *not* likely to have been in the best interests of stockholders.

The final premium averages 46.7 percent for takeover targets that use post-bid resistance, and 42.9 percent for those that do not do so. Despite considerable weight attached to evidence related to revised and rival offers as suggesting that the decision to use post-bid resistance is associated with bargaining for price improvement in stockholder interest (in particular, as in Jennings and Mazzeo, 1993; Franks and Mayer, 1996; Schwert, 2000; and Bates and Becher, 2017), and despite the fact that our measure of the final premium accounts for multiple offers separated by up to one year, the difference

in the means is not statistically significant at conventional levels. The final premium appears to be unaffected by whether or not there was any post-bid resistance. Conversely, the final premium is seldom higher than the initial premium for takeover targets that do not use post-bid resistance, a result that is consistent with bargaining for price improvement in the lead up to a bid, rather than post-bid, for takeover targets that do not use post-bid resistance (see, Boone and Mulherin, 2007; Aktas, de Bodt, and Roll, 2010; and Liu and Officer, 2021). Again, it appears unlikely that post-bid resistance represents good-faith bargaining for stockholders.

Bid completion averages 64.2 percent for takeover targets that use post-bid resistance, and 94.6 percent for those that do not do so. The difference in the means is negative and statistically significant at the one percent level, which is consistent with the results of Walkling (1985). Given the considerable weight attached to extant evidence related to revised and rival offers as suggesting that the decision to use post-bid resistance is associated with bargaining for price improvement in stockholder interest, and given that our measure of bid completion accounts for multiple offers separated by up to one year, this result again suggests that the effect of the decision to use post-bid resistance on bid completion is *not* likely to have been in the best interests of stockholders.

The overall return averages 18.1 percent for takeover targets that use post-bid resistance, and 27.0 percent for those that do not do so. The difference in the means is negative and statistically significant at the one percent level, which suggests that the decision to use post-bid resistance has an adverse effect on the overall return to stockholders, and is not likely therefore to have been in their best interests. This result is in contrast to 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 decision to use post-bid resistance. 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.

Finally, we draw on regressions to examine the effects of the decision to use post-bid resistance. The dependent variables are now our four bid-outcome-related variables. Our decision-to-use-post-bid-resistance variable changes therefore from having been the (limited) dependent variable in our earlier core analysis to being now the main (dummy) explanatory variable in this part of our analysis. The other explanatory variables are the features of the firm and the bid, the IMR, and the industry and year controls, all as per the 2SLS regression back in Table 8. However, we account for the reduced form effects of jointly instrumenting for the G-index and initial premium because, whilst respecting the evidence from our earlier core analysis indicating that neither variable is sufficiently exogenous to the decision to use post-bid resistance, our main interest in this section is in the effect of the decision to use

post-bid resistance.[13] In addition, we account for whether or not a takeover bid begins as a tender offer, which is a standard control when examining effects of the decision to use post-bid resistance, regardless of how a bid is initially structured. While a tender offer and the decision to use post-bid resistance are positively correlated (consistent with the results of Schwert, 2000), the correlation is not to any material extent (correlation coefficient = 8.0 percent).

The results from a probit regression for the use of a target termination fee, an OLS regression for the final premium, a probit regression for bid completion, and an OLS regression for the overall return are presented in Columns (1)-(4), respectively, of Table 11. In each case, after including all of the control variables in the regressions, the (probit regression) average marginal effects of, and the (OLS) regression coefficients on, the decision to use post-bid resistance are completely consistent with the univariate results documented above. For each of the four bid-outcome-related variables that we examine in this section, the effects of post-bid resistance do not come out as being in the best interests of stockholders and, hence, are not consistent with the bargaining-for-price-improvement view of why the board offers post-bid resistance. Instead, these results are further indicative of an entrenchment motivation for post-bid resistance. Taken together, our analysis here and our earlier core analysis, suggest that revised and rival offers, long associated with bargaining for price improvement in stockholder interest, are a by-product and not a primary driver of the decision to use post-bid resistance.

As emphasized earlier, this section examines the question of board motivation behind post-bid resistance only non-causally through its effect on key bid-outcome-related variables, and primarily in the context of certain earlier studies that conclude in favor of bargaining for price improvement in stockholder interest as the motivation for post-bid takeover resistance. The results in this section are wholly consistent with our main results, documented in Sections 4 and 5, that show a positive and significant causal impact from existing ATPs to the board decision to resist post-bid, and the absence of any causal impact of initial offer quality on that decision. As schematically represented in Figures 1 and 2, and as extensively discussed earlier on, this necessarily implies that post-bid takeover resistance is *not* driven by good-faith bargaining in stockholder interest, and indicates instead an entrenchment motivation.

7. Conclusions

In the U.S., if a firm is a takeover target, it is entirely up to the board of that firm to decide whether or not to offer post-bid resistance. In this context, we focus on two causal drivers of the decision to use post-bid resistance: (a) ATPs already in place before a firm becomes a takeover target; and, (b) the quality of the initial offer. Since neither of our drivers are, as they stand, sufficiently exogenous to

[13] In any case, the average marginal effects of, and the regression coefficients on, the IPO-peers G-index and HQ-peers G-index are not statistically significant at conventional levels. Likewise, the average marginal effects of, and the coefficients on, the IMR are statistically significant, at conventional levels, only in relation to (negatively) affecting the use of a target termination fee.

the decision to use post-bid resistance, we exploit plausibly exogenous sources of variation in ATPs already in place and initial offer quality to examine the effects of instrumenting, suitably, for these drivers. We follow (a) Karpoff et al. (2017) in our choice of instruments for ATPs already in place, and (b) Baker et al. (2012) in our choice of instrument for initial offer quality. We accordingly believe that the relationships that we identify as driving (or not driving) post-bid resistance indicate the existence (or absence) of causal relationships. Finally, and importantly, based on these relationships, our results enable an unequivocally clear inference to be made about the dominant underlying motivation behind the decisions of target firm boards on whether or not to offer post-bid takeover resistance.

To summarize, we make three contributions. First, we investigate the causal impact of ATPs already in place in a target firm on the board's decision to resist post-bid. Second, we examine the causal impact of initial offer quality on the post-bid resistance decision. Third, we address a relatively broader question: does the board's decision to offer post-bid resistance represent good-faith bargaining in stockholder interest to get a better offer for stockholders; or is it motivated by managerial entrenchment considerations, with the managers being inclined to block acceptance of any bid in order to preserve their incumbency and private benefits of control?

We argue that a negative relationship between an exogenous measure of ATPs already in place and the decision to use post-bid resistance would imply that target firm management offers post-bid takeover resistance in good-faith to bargain for the best possible deal for their stockholders. On the other hand, a positive relationship, or the absence of any significant relationship, would imply that the motivation of target firm management in their decision to offer post-bid takeover resistance is entrenchment related. At the same time, a negative relationship between an exogenous measure of initial offer quality and the decision to use post-bid resistance would represent support for the good-faith bargaining view of post-bid takeover resistance, whilst the absence of any statistically significant relationship would represent support for the entrenchment motivation for post-bid takeover resistance.

What we find is a statistically and economically significant positive causal relationship from ATPs already in place to post-bid resistance, and no significant causal relationship between initial offer quality and post-bid resistance. Our results from these causal analyses necessarily imply that the decision to use post-bid takeover resistance by target firm boards is *not* motivated, on average, by good-faith bargaining in stockholder interest, but is indicative instead of an entrenchment motivation.

We correct for takeover target selection in the presence of unobservable factors, and, hence, our inferences are robust to the inclusion of a proxy for private information held by the initial bidder about the value implications of selecting the firm as a takeover target. Our inferences are also robust to different construction lags on the instrumental variables for ATPs already in place, and to different measures of existing ATPs and initial offer quality. Finally, we also find reinforcing support for the conclusion that post-bid takeover resistance is not motivated by the best interests of stockholders by examining, albeit not causally but just through associations, the effects of the decision to use post-bid resistance on four key bid-outcome-related variables.

Several avenues for future research emerge from this study. First, while we add, through direct and causal evidence, to the long-standing debate around managerial and board motives for resisting the market for corporate control, and in particular for the decision to use post-bid takeover resistance, all of our results reflect the *overall average* picture. We need future research on the cross-sectional differences in board motivations in the context of the issues that we address. Second, given that our results suggest that boards tend to be relatively passive in relation to changing the *status quo* for what may be the most potent ATPs, this study highlights the need for significantly more research into the perspective of boards in regard to influencing ATPs in place, proactively or otherwise, to meet their corporate control objectives. Third, our study also points to a need for greater understanding about the nature of the bargaining process in the lead up to a takeover bid actually being made, particularly for target firms whose boards do not use post-bid resistance. Finally, and most importantly, this study has significant implications for a key policy level difference between the U.S. and the U.K. (along with many countries in the E.U.) – the difference in the level of discretion allowable to target firm boards to resist a takeover bid, within the respective legal and governance frameworks. We leave a deeper examination of these issues for future research.

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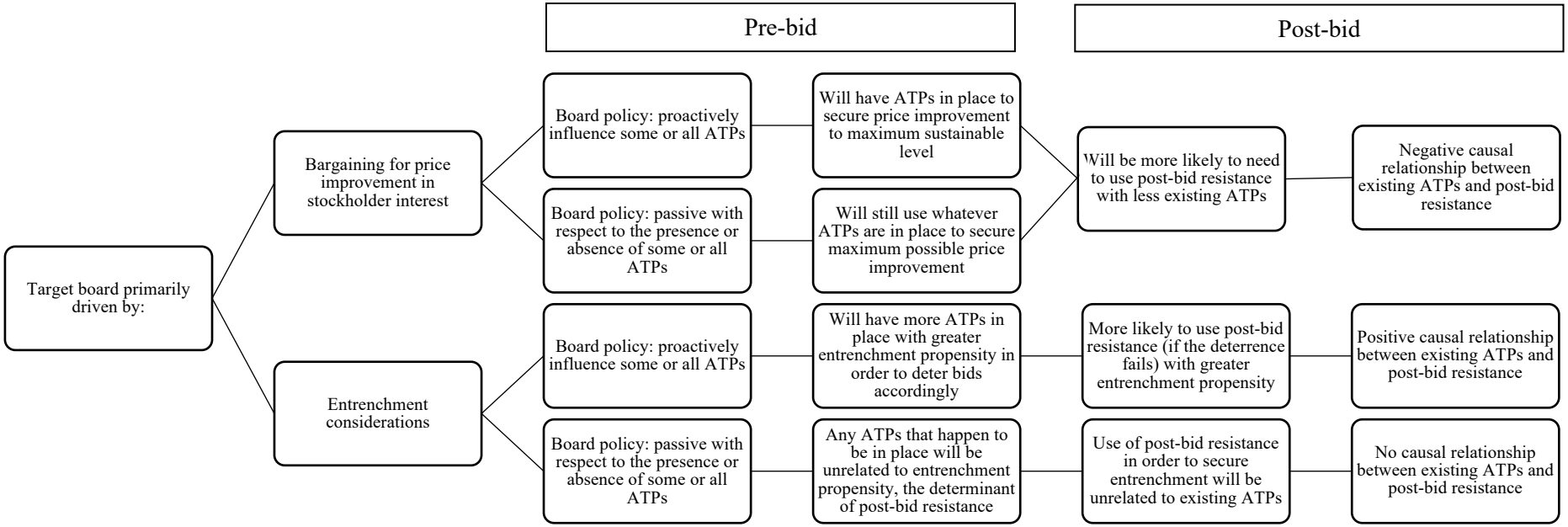
Figures

Figure 1

Existing antitakeover provisions and post-bid resistance

This figure provides a schematic representation of the arguments and inferences related to the impact of existing antitakeover provisions (ATPs) on the target board decision to offer post-bid resistance. For exposition purposes, we present a binary scenario in which the board has either a dominant perspective of negotiating and acting in good-faith in the best interests of stockholders, or a dominant perspective of acting self-interestedly for promoting board or managerial entrenchment. We then present likely scenarios in the pre-bid and post-bid phases leading to our predictions on the relationship between existing ATPs and the decision to offer post-bid resistance.



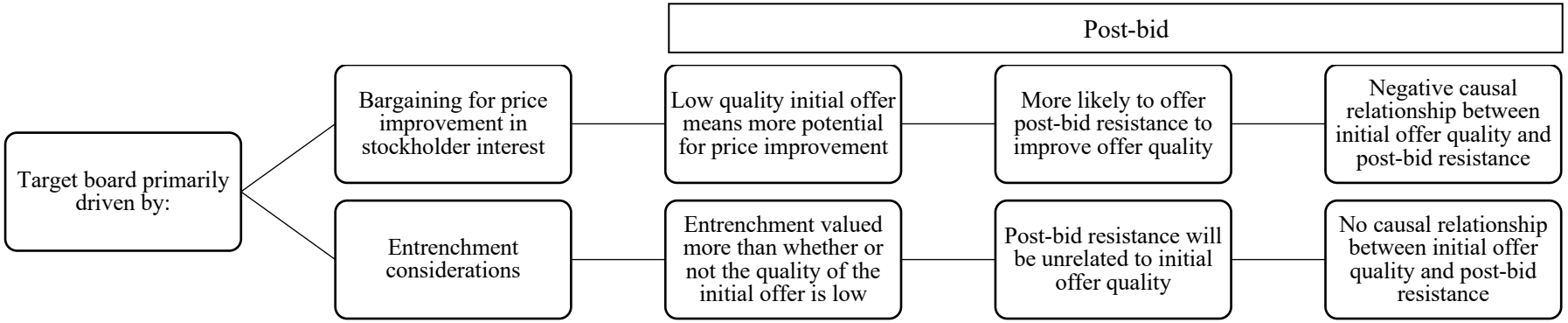
Bottom-line

1. Negative causal relationship from existing ATPs to post-bid resistance: supports good-faith bargaining in stockholder interest.
2. Positive, or no, causal relationship from existing ATPs to post-bid resistance: supports entrenchment related motivations.

Figure 2

Initial offer quality and post-bid resistance

This figure provides a schematic representation of the arguments and inferences related to the impact of initial offer quality on the target board decision to offer post-bid resistance. For exposition purposes, we present a binary scenario in which the board has either a dominant perspective of negotiating and acting in good-faith in the best interests of stockholders, or a dominant perspective of acting self-interestedly for promoting board or managerial entrenchment. We then present likely scenarios in the event of high and low quality offers leading to our predictions on the relationship between initial offer quality and the decision to offer post-bid resistance.



Bottom-line

1. Negative causal relationship from initial offer quality to post-bid resistance: supports good-faith bargaining in stockholder interest.
2. No causal relationship from initial offer quality to post-bid resistance: supports entrenchment related motivations.

Tables

Table 1

Variable descriptions

This table describes the explanatory variables.

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 in a given 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-peers G-index	The first instrumental variable for the G-index constructed three years before ascertaining takeover target selection for a firm in a given year, but restricted to a group of peers for the firm. IPO-peers G-index sums the adoption rates for the individual antitakeover provisions (ATPs) counted in the G-index for a group of peers from sectors not shared with the firm, based on historic two digit standard industrial classification codes from the Center for Research in Security Prices and Compustat Merged (CCM) database, and with a specific connection to the firm related to the past adoption of ATPs. The connection is related to time in that the firm and peers experienced the same legal environment for the adoption of ATPs because of sharing the same year of initial public offering (IPO), which is taken to be the year of inclusion in the CCM database or 1950 when included earlier.
HQ-peers G-index	The second instrumental variable for the G-index constructed three years before ascertaining takeover target selection for a firm in a given year, but restricted to a group of peers for the firm. HQ-peers G-index sums the adoption rates for the individual antitakeover provisions (ATPs) counted in the G-index for a group of peers from sectors not shared with the firm, based on historic two digit standard industrial classification codes from the Center for Research in Security Prices and Compustat Merged (CCM) database, and with a specific connection to the firm related to the past adoption of ATPs. The connection is related to geography in that the firm and peers are likely to have received similar legal advice on the adoption of ATPs because of sharing the same state locale of headquarters (HQ), which is taken to be a state locale with a radius of one-hundred miles based on zone improvement plan 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 in a given year. The book value and inflation data are from the Center for Research in Security Prices and Compustat Merged 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 in a given year. The book values are from the Center for Research in Security Prices and Compustat Merged 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 in a given year. The market and book values are from the Center for Research in Security Prices and Compustat Merged 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 in a given year. The book values are from the Center for Research in Security Prices and Compustat Merged database.

Table 1 (continued)

Variable	Description
Firm features	
Liquidity	The working capital as a proportion of the book value of total assets one year before ascertaining takeover target selection for a firm in a given year. The book values are from the Center for Research in Security Prices and Compustat Merged database.
Sales growth	The proportionate difference between sales one and two years before ascertaining takeover target selection for a firm in a given year. The sales are from the Center for Research in Security Prices and Compustat Merged 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 in a given year. The operating income and book value are from the Center for Research in Security Prices and Compustat Merged database.
Stock return	The value weighted market adjusted return one year before ascertaining takeover target selection for a firm in a given year. The returns are from the Center for Research in Security Prices and Compustat Merged database.
Industry concentration	The Herfindahl-Hirschman measure of industry concentration one year before ascertaining takeover target selection for a firm in a given year. Industry concentration sums the squared proportionate sales for the sector in which the firm primarily operates based on historic two digit standard industrial classification codes. The sales and codes are from the Center for Research in Security Prices and Compustat Merged database.
Bid features	
Initial premium	The proportionate difference between the initial offer price and the pre-run-up price of the takeover target. The initial offer price is from the Securities Data Company database, and the pre-run-up price is the stock price of the takeover target forty-two trading days before bid announcement from the Center for Research in Security Prices and Compustat Merged database. The initial premium is winsorized at the fifth and ninety-fifth percentiles.
Pre-bid price to 52-week-high price	The instrumental variable 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 forty-two trading days before bid announcement. The prices are from the Center for Research in Security Prices and Compustat Merged 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 bidder based on flags from the Securities Data Company 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 in a given year. A bid is required to be an attempt to acquire common stock in excess of 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 the decision to use any form of post-bid resistance, which ranges from merely recommending rejection of the initial offer to at the extreme deploying, or threatening to deploy, a defense discriminating against at least the initial bidder. Also counted is the decision to adopt any post-bid antitakeover provision, the most common type of which is a 'morning after' poison pill. The searchable timeframe incorporates a run-up period of forty-two trading days and extends to the very end of a bid in the sense of having merged some 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-peers G-index/ HQ-peers 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-peers G-index	9.115***	1.100	172	8.787	1.079	820
HQ-peers 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-bid 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 results for G-index and the decision to use post-bid resistance: effect of instrumenting for G-index

Column (1) presents OLS regression results for the effect of the non-instrumented G-index on the decision to use post-bid resistance. Columns (2), (3), and (4) present, respectively, the first stage, the second stage, and the reduced form 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. The instrumental variables are IPO-peers G-index/ HQ-peers G-index. Table 1 describes the explanatory variables. Table 2 describes the sample. Post-bid resistance equals one (zero) for takeover targets that use (do not use) post-bid resistance. Industry dummies based on historic two digit SIC codes, and year dummies, are also included. 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-peers G-index		0.5954***		0.0339***
		(0.0742)		(0.0116)
HQ-peers 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)
F-statistic overall	4.7***			5.1***
R^2-statistic overall	4.1%			5.0%
Chi^2-statistic overall		58.3***		
F-statistic IPO-peers G-index/ HQ-peers G-index		38.4***		
R^2-statistic IPO-peers G-index/ HQ-peers 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 results 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 in a given year. The explanatory variables include the instrumental variables for the G-index (IPO-peers G-index/ HQ-peers 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 SIC codes. 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-peers G-index	-0.0033**	0.5638***		0.0276**
	(0.0014)	(0.0751)		(0.0119)
HQ-peers 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)

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)**
Industry concentration	-0.0588***	-1.8936*	-0.1661	-0.2588
	(0.0192)	(1.1389)	(0.1736)	(0.1602)
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 peers G-index/ HQ peers G-index			31.7***	
R^2-statistic IPO-peers G-index/ HQ-peers 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 results for G-index and the decision to use post-bid resistance: effect of instrumenting for G-index in dummy and partial forms

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 IA4 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 in a given 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-peers G-index/ HQ-peers 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 IA5 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-peers O-index/ HQ-peers 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 IA5. 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 IA6 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-peers E-index/ HQ-peers 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. The explanatory variables also include the inverse Mills ratio from the probit regression for takeover target selection in Column (1) of Table IA6. 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 peers O-index/ HQ peers O-index		42.4***	
F-statistic IPO peers E-index/ HQ peers E-index			10.8***
R^2-statistic IPO-peers O-index/ HQ-peers O-index		8.2%	
R^2-statistic IPO-peers E-index/ HQ-peers 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 at least one antitakeover provision counted in G-index in complete and partial forms

This table presents mean percentages of firms that adopt at least 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 at least one ATP counted in the G-index	36.8***	2,225	28.5	4,060
That adopt at least one ATP counted in the O-index	24.9***, ^^^	2,225	19.3^^^	4,060
That adopt at least one ATP counted in the E-index	18.2***	2,225	13.6	4,060

Table 8

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

Columns (1)-(4) present the results from a two stage least squares regression for the effects of jointly 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 jointly instrumenting for the G-index and initial premium. Column (4) presents the reduced form results for the effects of jointly 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-peers G-index/ HQ-peers 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 and year dummies are also included. Industry dummies are based on historic two digit SIC codes. 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-peers G-index	0.5495***	0.0086		0.0293**
	(0.0758)	(0.0086)		(0.0120)
HQ-peers G-index	0.2217**	0.0018		0.0137
	(0.1113)	(0.0103)		(0.0142)
Initial premium			0.1492	
			(0.1443)	
Pre-bid 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 peers G-index/ HQ peers G-index		22.1***		
R^2-statistic IPO-peers G-index/ HQ-peers G-index		6.5%		
F-statistic pre-bid price to 52-week-high price		28.1***		
R^2-statistic pre-bid 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 results for initial premium and the decision to use post-bid resistance: effect of unexplained component of initial 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-peers G-index/ HQ-peers 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 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 and year dummies are also included. Industry dummies are based on historic two digit SIC codes. 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-peers G-index	0.5633***		0.5590***	
	(0.0750)		(0.0751)	
HQ-peers 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)

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)**
Industry concentration	-1.9031*	-0.1536	-1.9892*	-0.1394
	(1.1365)	(0.1739)	(1.1432)	(0.1760)
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 peers G-index/ HQ peers G-index		31.7***		30.8***
R^2-statistic IPO-peers G-index/ HQ-peers 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

Univariate results for effects of the decision to use post-bid resistance

This table presents descriptive statistics for the dependent variables for effects of the decision to use post-bid resistance. Columns (1)-(3) and Columns (4)-(5) present mean, standard deviation, and observations for the dependent variables for takeover targets that do and do not use post-bid resistance, respectively. The sample is described in Table 2. Target termination fee equals one (zero) for takeover targets that agree (do not agree) to pay a termination fee at any time during a bid based on flags from the Securities Data Company (SDC) database. Final premium equals the proportionate difference between the final offer price and the pre-run-up price of the takeover target. The final offer price is from the SDC database, and the pre-run-up price is the stock price of the takeover target forty-two trading days before bid announcement from the Center for Research in Security Prices and Compustat Merged (CCM) database. Final premium is winsorized at the fifth and ninety-fifth percentiles. Bid completion equals one (zero) for takeover targets for which a bid is (is not) completed based on flags from the SDC database. Overall return equals the value weighted market adjusted return to the takeover target from forty-two trading days before bid announcement to bid completion or one year after an uncompleted bid. The returns are from the CCM database. ***, **, * 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**
Dependent variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Outcomes						
Target termination fee = 1	0.503***		173	0.876		822
Final premium	0.467	0.315	173	0.429	0.299	822
Bid completion = 1	0.642***		173	0.946		822
Overall return	0.181***	0.549	170	0.270	0.319	815

Table 11: Multivariate results for effects of the decision to use post-bid resistance

Columns (1) and (3) present the results from a probit regression for the effect of the decision to use post-bid resistance on the use of a target termination fee and bid completion respectively. Columns (2) and (4) present the results from ordinary least square (OLS) regression for the effect of the decision to use post-bid resistance on the final premium and overall return to the takeover target respectively. The sample is described in Table 2. The dependent variables are described in Table 10. Post-bid resistance equals one (zero) for takeover targets that use (do not use) post-bid resistance. The explanatory variables also include the instrumental variables for the G-index (IPO-peers G-index/ HQ-peers G-index) and initial premium (pre-run-up price to 52-week-high price), and 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. 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**
	Tgt 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-peers G-index	-0.0090	0.0056	0.0023	0.0048
	(0.0120)	(0.0086)	(0.0088)	(0.0107)
HQ-peers G-index	0.0076	0.0096	-0.0068	-0.0124
	(0.0128)	(0.0108)	(0.0103)	(0.0120)
Pre-bid 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