

# TIGERS AND BEARS: MECHANISM DESIGN IN CORPORATE GOVERNANCE

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## CONCLUSION AND ABSTRACT

Mechanism Design Theory as a subset of Law and Economics study has great potential in Corporate Governance. The application of this outcome-oriented system in business organizations lies in the firm acting as a mechanism itself, utilizing smaller mechanisms to reach the predetermined optimal outcome. Although it may seem daunting to incorporate a new line of thought into major organizational structures, Mechanism Design Theory in governance is not a new concept and has been implemented with great success numerous times on a national level. If the system has been used to guide nations out of uncertainty and into economic booms, then it stands to reason it can be applied to individual firms as well.

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## I. INTRODUCTION TO MECHANISM DESIGN IN LAW AND ECONOMICS

Mechanism Design is a field of economics, most specifically game theory, in which a mechanism designer determines the desired outcome and then works backward to determine the most efficient way to reach the desired outcome. A mechanism designer "models the interaction of the individuals ... where the institutions governing interaction are modeled as mechanisms. In a mechanism each individual has a message (or strategy) space and decisions result as a function of the messages chosen."<sup>1</sup> In summation, Mechanism Design Theory is modeling an economic

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<sup>1</sup>Matthew O. Jackson, MECHANISM THEORY 4 (2003).

institution within a set environment so the outcome of the actors within the institution most closely reflect the desired outcome of the mechanism designer. This outcome-oriented strategy is rife with potential, for it seeks to modify an actor within the system, not the economic environment in which the system exists.

This theory is perfect for those who do not have the power to impact a market but still desire to reach efficient outcomes in a more predictable manner. Core tenets of Mechanism Design include prudent planning, foresight, and a certain degree of malleability. While the environment is represented as something the designer cannot change, that does not mean it is unchanging. A dynamic economic environment is a trademark of modern economics, where financial contagion can cause market shocks in one region to be felt globally.<sup>2</sup> "Contagion refers to the spread of market disturbances—mostly on the downside—from one country to the other, a process observed through comovements in exchange rates, stock prices, sovereign spreads, and capital flows."<sup>3</sup> Omniscience is a trait reserved for the Sovereign, hence acknowledging asymmetric information, such as incorporating uncertainty variables, is necessary for a good mechanism designer, whose knowledge is limited. To further understand Mechanism Design Theory, it is important to acknowledge its historic development and its significance in the economic world.

In 2007, the Royal Swedish Academy of Sciences awarded the Nobel Prize in Economic Sciences to Leonid Hurwicz, Eric S. Maskin, and Roger B. Myerson "for having laid the foundations of mechanism design theory."<sup>4</sup> Mechanism Design Theory "allows economists and other social scientists to analyze the performance of institutions relative to the theoretical optimum. Mechanism design has produced a large number of important insights in a wide range of applied contexts, influencing economic policy as well as market institutions."<sup>5</sup> While this theme is on the insights relating to market institutions, specifically firms, this was not the initial focus of Mechanism Design Theory. At its earliest stages, Hurwicz's application of Mechanism Design Theory was to single-

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<sup>2</sup>See Rudiger Dornbusch, Yung Park & Stijn Claessens, *Contagion: Understanding How it Spreads*, in THE WORLD BANK RESEARCH OBSERVER 177, 179 (Oxford Univ. Press, 2000).

<sup>3</sup>*Id.*

<sup>4</sup>Press Release, The Royal Swedish Academy of Sciences, The Nobel Prize (October 15, 2007).

<sup>5</sup>The Prize Committee of the Royal Swedish Academy of Sciences, *Mechanism Design Theory* 19-20 (October 15, 2007), <https://www.nobelprize.org/uploads/2018/06/advanced-economicsciences2007.pdf>.

equilibrium game theory scenarios, and much of its subsequent developments also reflected this application.<sup>6</sup>

One such example of an early mechanism was developed by stamp-collectors for stamp auctions as early as 1893 and was codified by William Vickrey decades later.<sup>7</sup> This so-called "Vickrey Auction" is a sealed-bid auction in which all the bidders did not know each other's bids.<sup>8</sup> Since there was incomplete information during the bidding stage, this could lead to under or overbidding.<sup>9</sup> However, the Vickrey Auction, like any other mechanism, keeps the desired outcome in mind, and adjusts the mechanism; here, the highest bidder wins but pays the value of second-highest bidder's price.<sup>10</sup> "With these rules, a winning bidder can never affect the price it pays, so there is no incentive for any bidder to misrepresent his value."<sup>11</sup> While simple, the Vickrey Auction is considered "the first serious attempt by an economist to analyze the details of market rules and to design new rules to achieve superior performance."<sup>12</sup> The codifier of this mechanism, William Vickrey, also won a Nobel Prize for his contributions to economics.<sup>13</sup>

Over time, Mechanism Design has evolved from theoretical microeconomic mechanisms into an interdisciplinary field with countless applications, one of which is law. In 2007, the same year that Mechanism Design theorists won the Nobel Prize, the 25th International Seminar on the New Institutional Economics was centered around the theme of "Mechanism Design and the Law."<sup>14</sup> The editorial preface for the event stated:

Legal rules can be seen as shaping the set of actions that are at the disposal of the involved parties as well as

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<sup>6</sup>*Id.* at 2 ("Initially, much of the interest focused on the informational and computational costs of mechanisms, while abstracting from the problem of incentives.").

<sup>7</sup>David Lucking-Reiley, *Vickrey Auctions in Practice: From Nineteenth-Century Philately to Twenty-First-Century E-Commerce*, 14 J. OF ECON. PERSP., no. 3, 186, 186-88 (2000).

<sup>8</sup>Lawrence M. Ausubel and Paul Milgrom, *The Lovely but Lonely Vickrey Auction*, in COMBINATORIAL AUCTIONS 1, 2 (Peter Cramton, Yoav Shoham, Richard Steinberg, eds., 2006).

<sup>9</sup>*Id.*

<sup>10</sup>*Id.*

<sup>11</sup>*Id.*

<sup>12</sup>Lawrence M. Ausubel and Paul Milgrom, *The Lovely but Lonely Vickrey Auction*, in COMBINATORIAL AUCTIONS 1, 2 (Peter Cramton, Yoav Shoham, Richard Steinberg, eds., 2006).

<sup>13</sup>The Nobel Prize, *William Vickrey Biographical* (1996), <https://www.nobelprize.org/prizes/economic-sciences/1996/vickrey/biographical/>.

<sup>14</sup>See The Royal Swedish Academy of Sciences, *supra* note 4; Christoph Engel & Urs Schweizer, *Mechanism Design and the Law*, 174 J. OF INSTITUTIONAL AND THEORETICAL ECON. 1, 1 (2008).

defining the consequences that follow from the actions effectively chosen by them. A mechanism - or, in the language of game theory, a game form - specifies the strategies available to the players as well as the outcome resulting from a chosen strategy profile. On this account, an obvious relation between legal rules and mechanisms arises, under which devising legal rules corresponds to mechanism design.<sup>15</sup>

Mechanism Design being utilized within the legal field is becoming more prominent, as Harvard Law professor of corporate law and finance Holger Spamann noted "[t]his application is natural because the legal system is the ultimate mechanism or collection of mechanisms: Legal design is mechanism design. Thinking rigorously and creatively about it is a healthy antidote to the caricature conservative reflex that what exists must (already) be efficient."<sup>16</sup> To date, Mechanism Design Theory has already permeated into Law and Economics literature in the fields of civil procedure, contracts, and mergers and acquisitions.<sup>17</sup>

As Mechanism Design Theory increases its presence in the field of Law and Economics, it is important to note the rise of Law and Economics literature in modern precedent. The Supreme Court has incorporated Law and Economics literature into a variety of commercial fields, including but not limited to: antitrust law, intellectual property, broadcast communications, interstate commerce, landlord-tenant law, advertising and marketing, product liability, and pharmaceuticals.<sup>18</sup> Delaware Courts have also applied Law and Economics literature to cases as well, even including those in the realm of business organizations and corporate

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<sup>15</sup>*Id.*

<sup>16</sup>Holger Spamann, *Can Simple Mechanism Design Results Be Used to Implement the Proportionality Standard in Discovery?* Comment, 172 J. OF INSTITUTIONAL AND THEORETICAL ECON. 2, 2 (2016).

<sup>17</sup>See generally *id.* (civil procedure); Robert E. Scott & George G. Triantis, *Symposium: Incomplete Contracts: Judicial Responses, Transactional Planning, and Litigation Strategies*, 56 CASE W. RES. L. REV., no. 1 (2005) (contracts); Steven J. Brams & Joshua Mitts, *Mechanism Design in M&A Auctions*, 38 *Del. J. Corp. L.*, no. 3 (2014) (mergers and acquisitions).

<sup>18</sup>*Leegin Creative Leather Products, Inc. v. PSKS, Inc.*, 551 U.S. 877, 889-92 (2007) (antitrust law); *Bilski v. Kappos*, 561 U.S. 593, 651 n.47 (2010) (Stevens, J., concurring) (intellectual property); *Turner Broadcasting Systems, Inc. v. F.C.C.*, 512 U.S. 622, 638 n.5 (1994) (broadcast communications); *U.S. v. Southwestern Cable Co.*, 392 U.S. 157, 177 n.45 (1968) (interstate commerce); *United Housing Foundation, Inc. v. Forman*, 421 U.S. 837, 863-64 n.3 (1975) (Brennan, J., dissenting) (landlord-tenant law); *California Dental Ass'n v. F.T.C.*, 526 U.S. 756, 794 (1999) (Breyer, J., concurring in part) (advertising and marketing); *Air and Liquid Systems Corp. v. DeVries*, 139 S.Ct. 986, 997 (2019) (Gorsuch, J., dissenting) (product liability); *Bruesewitz v. Wyeth LLC*, 562 U.S. 223, 239 n.64 (2011) (pharmaceuticals).

governance.<sup>19</sup> It will not be long until these two concepts overlap, as further justification for being involved in the Mechanism Design in the field of Law and Economics.

Applications of Mechanism Design are not free of criticism, as Spamann noted "[i]n the real world, formal mechanism design may run into unforeseen problems that simpler models of existing institutions avoid," and "[t]his can lead to disaster if mechanism design is uncritically applied in the real world."<sup>20</sup> One critic mused that mathematical modeling "can help economists to clarify their thinking and reasoning[:]" however, "the ubiquity of mathematical theory in economics also has serious downsides: it creates a high barrier of entry for those who want to participate in the professional dialogue, and makes checking someone's work excessively laborious."<sup>21</sup> Another group of researchers found "a broader critique of the approaches used by market designers, pointing to the gap between translating theoretical assumptions to practical solutions."<sup>22</sup> Boiled down, the concerns relate to over-modeling, which can impact the real-world applications of a mechanism and dissuade those interested in the field from learning more.

These criticisms are not unreasonable, as many Mechanism Design works have such complex algorithms they seem to require a post-graduate mathematical degree to comprehend. That being said, Holger Spamann determined even if Mechanism Design Theory did not work as intended, it would still be useful as a tool to analyze and compare institutional policies.<sup>23</sup> Economic Nobel Prize Laureate Bengt Holmstrom noted "[t]he recent development of information economics, which explicitly recognizes that agents have limited and different information, is a welcome invention, which promises to be helpful in understanding the intricacies of organizational design."<sup>24</sup>

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<sup>19</sup>See *Nakahara v. NS 1991 American Trust*, 718 A.2d 518, 524 n.41 (Del. Ch. 1998) (finding Law and Economics refers to a courts' forward-looking tendencies through the lens of incentive-compatible legal rules); See also *R&R Capital, LLC v. Buck & Doe Run Valley Farms, LLC*, No. 3803-CC, 2008 WL 3846318, at \*4 n.21 (Del. Ch. 2008) (postulating why LLCs are increasingly popular from a Law and Economics perspective).

<sup>20</sup>Spamann, *supra* note 16, at 2.

<sup>21</sup>Alan Jay Levinovitz, *The new astrology: By fetishizing mathematical models, economists turned economics into a highly paid pseudoscience*, AEON (April 2, 2016), <https://aeon.co/essays/how-economists-rode-maths-to-become-our-era-s-astrologers>.

<sup>22</sup>Jessie Finocchiaro, et al., *Bridging Machine Learning and Mechanism Design towards Algorithmic Fairness*, ARXIV (Oct. 12, 2020), <https://arxiv.org/pdf/2010.05434v1.pdf>.

<sup>23</sup>Spamann, *supra* note 16, at 2 ("Even if [Mechanism Design Theory was] practically useless, however, mechanism design would still be helpful for theorists trying to understand which difficulties existing institutions avoid.").

<sup>24</sup>Bengt Holmstrom, *Moral Hazard in Teams*, 13 THE BELL J. OF ECON. 324, 324 (1982).

Furthermore, not all mechanisms require complex algorithms and formulas; two examples are utilizing the second-highest bid price in a Vickrey Auction and not naming the bidders in an auction to avoid collusion.<sup>25</sup> These are examples of commercial mechanisms that do not require mathematical computations. For the purposes of Mechanism Design in Corporate Governance, the complicated macroeconomic theory need not be utilized in such an abstract form. In actuality, the application of Mechanism Design Theory to individual firms lies somewhere between the well-documented microeconomics sphere and the relatively uncharted waters of macroeconomic application.<sup>26</sup> One such simple mechanism will be propounded below.

## II. MECHANISM DESIGN IN GOVERNANCE: THE TIGER MODEL

Mechanism Design Theory, while codified in its simplest form in 1960,<sup>27</sup> is at its core an outcome-oriented strategy that requires careful planning and foresight, which is not a new concept in governance. The Director of the Max Planck Institute for Research on Collective Goods, Werner Güth, simplified Mechanism Design in governance, finding "[m]echanism design is the game theoretic jargon for institutional design and the even older tradition (in German) of 'Ordnungspolitik' (institutional design policy). When implementing institutions or mechanisms (or simply rules of conduct) such regulation should usually be codified by complementing the law appropriately."<sup>28</sup> While acting in the role of Germany's Minister of Finance, Wolfgang Schäuble in his welcome note to The Institute of New Economic Thinking defined Ordnungspolitik as focusing "on the necessity of pursuing economic and fiscal policies that are consistent with the principles of markets and competition..." and found the "approach can make crucial contributions to the concrete design of policies and especially institutions."<sup>29</sup>

To understand the applicable theoretical elements to Mechanism Design Theory in the sphere of Corporate Governance, it will be beneficial

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<sup>25</sup>See generally Lucking-Reiley, *supra* note 7.

<sup>26</sup>In this piece, 'microeconomic' refers to the smaller, more algorithmic components of a firm's operation, whereas 'macroeconomic' refers to the bigger-picture, more theoretical aspects of the firm.

<sup>27</sup>The Prize Committee of the Royal Swedish Academy of Sciences, *supra* note 4, at 2.

<sup>28</sup>Werner Güth, *Mechanism Design and the Law*, THE OXFORD HANDBOOK OF LAW AND ECONOMICS: VOLUME 1: METHODOLOGY AND CONCEPTS 483 (2017).

<sup>29</sup>Steve Clemons, *New Economic Thinking vs. Ordnungspolitik*, THE ATLANTIC (April 13, 2012),

<https://www.theatlantic.com/business/archive/2012/04/new-economic-thinking-vs-ordnungspolitik/255841/>.

to understand Mechanism Design Theory as applied to governance in general. While there are ample governments for which to study the implementation of institutional design policy—Mechanism Design Theory in governance—few if any are as recent, and arguably fascinating, as the Tigers.

In the years following World War II, East Asia saw the creation of many new countries and restructured governments, of which four became known as the "East Asian Tigers:" South Korea, Singapore, Hong Kong, and Taiwan (Republic of China).<sup>30</sup> As Colonial powers disintegrated and maps were redrawn, the new, or newly empowered, governments had great uncertainty in their development.<sup>31</sup> Along with other regional nations (including the Indonesia, Myanmar, the Democratic People's Republic of Korea, the People's Republic of China, and Malaysia) the Tigers had to choose the course of development their economies would take, and they possessed the autonomy to do so. In the post war era, it became clear to the South Asian States that they must modernize their economic systems.<sup>32</sup>

Numerous authors and institutions have pointed out specific features of the Tigers' success. The World Bank created a report on the "East Asian Miracle" (referring to the Tigers), finding "[t]heir public policies promoted rapid capital accumulation by making banks more reliable and encouraging high levels of domestic savings."<sup>33</sup> In the same report, the World Bank found the Tigers "targeted key industries for rapid development. In key areas, resource allocation was strictly managed. Trade in manufactured exports was promoted by government-established marketing institutions."<sup>34</sup> Many Southeast Asian States also formed regional organizations, such as the Association of Southeast Asian Nations (ASEAN), and developed common strategies to fight off problems, like communism.<sup>35</sup> In essence, their general strategy was one of profit maximization within the larger economic environment and foresight of potential pitfalls while maintaining prudent investment strategies. Despite

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<sup>30</sup>Japan, though not formally a Tiger, is also considered in many conversations about the Tigers' growth, and for the purpose of the article will be considered a fifth member.

<sup>31</sup>NORMAN G. OWEN, *THE EMERGENCE OF MODERN SOUTHEAST ASIA: A NEW HISTORY*, 379-80 (2005).

<sup>32</sup>*Id.* at 379.

<sup>33</sup>Nancy M. Birdsall, et al., *The East Asian miracle: economic growth and public policy; Main report (English)*, THE WORLD BANK (1993), <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/975081468244550798/main-report>.

<sup>34</sup>*Id.*

<sup>35</sup>BERNARD ECCLESTON, MICHAEL DAWSON, & DEBORAH J. McNAMARA, *THE ASIA-PACIFIC PROFILE* 311 (1998).

commonalities, their approaches to economic governance were quite different.

The Tigers, while seemingly a unit, developed quite separately. The Southeast Asian States sought strategies of limited alignment for economic and security purposes, which led to different tracks.<sup>36</sup> The Tigers' economies greatly differed in structure and political system, and have applied equally different policies to promote their economic growth.<sup>37</sup> David Dollar, an economist working in the Asia Region of the World Bank, found that "[t]here is no specific East Asian formula for economic success; these countries developed strategies that conform to their local conditions and needs."<sup>38</sup> While there was some common strategy, the malleability of application to each State taking into account their environment specific considerations should be promising for those who are hesitant to apply Mechanism Design Theory to varied industries.

Japan was a focal point for early economic planning strategies leading to economic success, and there have been noted five causes for Japan's success: "the high level of education, an expert managerial pool, the technological gap that existed with the West, ... the high savings level coupled with the high level of investment, and the government's supportive role."<sup>39</sup> A historian at the University of Hong Kong, Norman Owen, noted that many of the Tigers looked to Japan when developing their own post-war modernization strategies.<sup>40</sup>

The eye of the Tigers was also on Singapore, who created a new economic strategy (export-oriented industrialization) to turn from a small domestic market to an economic powerhouse.<sup>41</sup> Owen explained "[Singapore's] only hope was to attempt to develop industries that could compete globally on their own merits—quality and price—without the benefit of any tariff preference. This strategy turned out to be wildly successful there and in Hong Kong, Taiwan, and South Korea . . . as well."<sup>42</sup> While the World Bank praised this strategy in particular, it is important to note that Singapore also had the highest rate of savings anywhere in the world. In essence, the Tigers' careful centralized planning with a close eye on the trajectory of their internal economies, all while

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<sup>36</sup>See generally JOHN D. GIORCIARI, *THE LIMITS OF ALIGNMENT: SOUTHEAST ASIA AND THE GREAT POWERS SINCE 1975* (2010).

<sup>37</sup>Pam Woodall, *Tigers Adrift*, *THE ECONOMIST* (Mar. 3, 1998), <https://www.economist.com/special-report/1998/03/05/tigers-adrift>.

<sup>38</sup>Howard Shapiro, *CLE Conference - The Tides of Trade: The Four Tigers*, 2 *Int'l Legal Persp.*, no. 1, 87, 88 (1990).

<sup>39</sup>*Id.*

<sup>40</sup>Owen, *supra* note 31, at 383.

<sup>41</sup>*Id.*

<sup>42</sup>*Id.*

working in global markets in a capitalistic and pro-business way, would allow for outstanding economic growth cycles for decades.

The Tigers' growth was not immortal and the miracle would eventually come to an end in the Asian Financial Crisis in the 1990s.<sup>43</sup> Rapid growth also concealed structural weaknesses such as inadequate bank regulation, a lack of transparency in business and endemic cronyism, which made a dangerous mixture with the excessive borrowing. And so many years of unmitigated success inevitably encouraged complacency, so that governments were slow to act when the first signs of trouble emerged.<sup>44</sup>

The Tigers can also serve as a cautionary tale, as it speaks to the notion that fiscal responsibility should not only apply when escaping bear markets; irresponsibility in the midst of strong growth cycles can be just as deadly to economic actors, from sole proprietorships to entire nations. In the words of Andrew Carnegie: Surplus wealth is a sacred trust which its possessor is bound to administer in his lifetime for the good of the community.<sup>45</sup> Despite the Tigers' mismanagement and "[e]ven after the Asian Financial Crisis, [they] had a GDP growing at an annual rate of 7.5% for over [a] decade, which [was] over 250% faster than the rest of the world."<sup>46</sup> Therefore, positive impacts of the Tigers' Mechanism Design-esque approach were felt even after loosening their carefully-planned economic strategies.

The Tigers are a meaningful example because of their origins; in a short period of time, they created powerful economies able to withstand major financial crises from the ground up. As useful of an example as the Tigers are, so are their less successful neighbors, who were given the same opportunity to create any type of economic environment they could imagine, and chose poorly. While there is almost never a single controlling reason an entity fails financially, key reasons for these failures include: systems which allow for corruption, markets relying on speculation, and unstable credit.<sup>47</sup> Even among the Tigers, South Korea was hit especially hard during the financial crisis, largely for some of the reasons listed above.<sup>48</sup> Stable investment strategies and sources of credit, strong long-term planning capabilities, and a certain degree of risk aversion and

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<sup>43</sup>*Troubled Tigers*, THE ECONOMIST (Jan. 29, 2009), <https://www.economist.com/briefing/2009/01/29/troubled-tigers>. [hereinafter as "*Troubled Tigers*"].

<sup>44</sup>Woodall, *supra* note 36.

<sup>45</sup>ANDREW CARNEGIE, WEALTH (1889).

<sup>46</sup>*Troubled Tigers*, *supra* note 41.

<sup>47</sup>Woodall, *supra* note 36.

<sup>48</sup>*Troubled Tigers*, *supra* note 41.

circumspect are ingredients of the success of these economic superpowers. Consequently, they are also all components of Mechanism Design as applied to Corporate Governance; planning and prudence are essential qualities of a strong mechanism designer, and strong mechanism designers create more stable economic entities.

### III. APPLICATIONS OF MECHANISM DESIGN IN CORPORATE GOVERNANCE

For the sphere of Corporate Governance, Mechanism Design Theory should be employed in the combination of microeconomic and macroeconomic applications of Mechanism Design. Microeconomic application of Mechanism Design Theory will vest in the individual, small-scale mechanisms the firm will utilize in achieving its goals. The decision of which combination of mechanisms to implement is completely up to the firm. In a macroeconomic sense, the firm will operate as a mechanism itself. Delaware Courts have found:

Delaware corporate law starts from the bedrock principle that '[t]he business and affairs of every corporation ... shall be managed by or under the direction of a board of directors.' When exercising their statutory responsibility, the standard of conduct requires that directors seek 'to promote the value of the corporation for the benefit of its stockholders.'<sup>49</sup>

It is the board's statutory responsibility to ensure the best outcome, and the fixed hierarchy of control almost encourages the implementation of Mechanism Design Theory in Corporate Governance, as the framework is already in place. In essence, the model of governance can be replicated from Ordnungspolitik or the Tiger Model.

The definition of Corporate Governance is "the broad spectrum of how [decisionmakers] control levels of organization in a firm to achieve firm goals."<sup>50</sup> Similar to how Mechanism Design Theory lends itself naturally to Law and Economics, it also seems tailored to this understanding of Corporate Governance. The goal-oriented structures are at the center of all firms, whether nonprofits, corporations, or sole proprietorships.

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<sup>49</sup>In re Tradco Inc. S'holder Litig., 73 A.3d 17, 47 (Del. C. 2013) (citing 8 Del. C. § 141(a)).

<sup>50</sup>ROGER SHERMAN, MARKET REGULATION 119 (2008).

Nobel Laureate economist Bengt Holmstrom noted "Orthodox economic theory has little to offer in terms of understanding how nonmarket organizations, like firms, form and function. This is so because traditional theory pays little or no attention to the role of information, which evidently lies at the heart of organizations."<sup>51</sup> This was a significant development to Law and Economics applications of Mechanism Design in business organizations. The Director of Outreach for Financial and Economic Policy at the Mercatus Center, Dino Falaschetti, noted "[t]his insight let Holmstrom (1982) extend the [components of Mechanism Design Theory] to the realm of Corporate Governance by formally showing how state-contingent remuneration contracts can elicit optimal effort from employees."<sup>52</sup> From this, Dr. Falaschetti drew the following conclusions:

- (i) [T]hese small-scale mechanisms share common characteristics with monitoring as a form of governance in business associations, (ii) information requirements and distributional conflict for such mechanisms become untenable as business associations scale to the corporate form, and (iii) corporate governance may thus rely more heavily on a type of assurance contract that, given its relatively weak reliance on monitoring and potentially stronger resistance to distributional interests....<sup>53</sup>

Although Dr. Falaschetti was postulating how we can take Mechanism Design lessons from Corporate Governance,<sup>54</sup> this paper seeks to reverse-engineer the process.

It is important to note that Mechanism Design Theory, while a seemingly rigid approach, can positively impact the way firms operate. NYU professor of politics Steven Brams and Columbia law professor of corporate and business law Joshua Mitts found that "algorithmic procedures can 'eliminate the incentive to engage in costly strategic bargaining, reduce transaction costs, and thereby facilitate efficient trade.'"<sup>55</sup> Additionally, "mechanism design theory tells us when markets or market-based institutions are likely to yield desirable outcomes . . . and when other institutions will be better at achieving the desired goals [and]

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<sup>51</sup>Holmstrom, *supra* note 24, at 324.

<sup>52</sup>Dino Falaschetti, *Global Environmental Governance: Mechanism Design Lessons from Corporate Governance*, THE PROP. AND ENV'T RSCH. CENTER, Jan. 2013, at 5.

<sup>53</sup>*Id.* at 1.

<sup>54</sup>See generally *id.*

<sup>55</sup>Brams & Mitts, *supra* note 17, at 729.

mechanism design theory gives us guidance to design such alternative institutions when markets fail."<sup>56</sup> To date, most Mechanism Design literature on business organizations has been on the implementation of small-scale mechanisms to correct externality issues. Beyond corrective mechanisms, this paper asserts that all planning and analysis may be done through the scope of Mechanism Design Theory.

#### IV. RUDIMENTARY CORPORATE GOVERNANCE MECHANISM

The following mechanism was created by the author to demonstrate the adaptability and applicability of microeconomic Mechanism Design Theory to Corporate Governance. This mechanism is designed to apply a firm's risk aversion levels to an environment which takes into account asymmetric information and great uncertainty. Quantifying levels of risk aversion under uncertain conditions are important within a firm, as it is found that those with 'white-collar' positions, such as business, are more prone to risk seeking behavior.<sup>57</sup> One study found those "who mostly deal with health/safety-related risks on a day-to-day basis (high-risk occupations) were predominantly risk-averse (avoiding risky options), while participants who mostly deal with financial/social risks (white-collar occupations) were prone to risk-seeking behavior (avoiding certain options)."<sup>58</sup> This is especially relevant in a SARS-CoV-2 world, where great uncertainty and asymmetric information could be considered the norm.<sup>59</sup>

By creating a formula which is simple and applicable to all industries, this mechanism reflects the criticism of over-modeling and too great a reverence for algorithms in modern economics.<sup>60</sup> The mechanism will be divided into three distinct steps, (1) subtracting the maximum and minimum potential costs from the maximized revenue of the firm to determine a desired outcome range, i.e.  $\pi^* - TC\{X, Y\} = D^*(r)$ ; (2) determining the level of risk the firm wishes to absorb based on the range in the first step, then selecting a desired spending level, i.e. selecting

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<sup>56</sup>Patrick Legros & Estelle Cantillon, *The Nobel Prize: What is mechanism design and why does it matter for policy-making?*, Vox EU (Oct. 18, 2007), <https://voxeu.org/article/nobel-prize-what-mechanism-design-and-why-does-it-matter>.

<sup>57</sup>See Tetiana Hill, et al., *Choice Under Risk: How Occupation Influences Preferences*, FRONTIERS IN PSYCHOLOGY (Aug. 30, 2019), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6730483/>.

<sup>58</sup>*Id.*

<sup>59</sup>See generally Emel Akan, *Pace of Economic Growth Likely to Slow Down Amid Uncertainty*, THE EPOCH TIMES (Nov. 5, 2020), [https://www.theepochtimes.com/pace-of-economic-growth-likely-to-slow-down-amid-uncertainty\\_3565355.html](https://www.theepochtimes.com/pace-of-economic-growth-likely-to-slow-down-amid-uncertainty_3565355.html).

<sup>60</sup>See generally Levinovitz, *supra* note 21.

a  $D^*$ , where  $X \leq D^* \leq Y$ ; and (3) subtracting the desired spending level from the maximized revenue to determine the predictive revenue from the firm, i.e.  $\pi^* - D^* = R^*$ .

The desired outcome in business is profit maximization; however, to get the best outcome, maximized revenue should be a constant within the mechanism, as all potential losses can be represented in the total cost function. To understand the Corporate Governance mechanism, one should begin with the basic revenue function:  $R - TC = \pi$  (revenue - total cost = profit). Once understood, substitutions are made. The revenue component here is  $\pi^*$  ("maximized revenue"), profit is replaced by " $D^*(r)$ " ("desired outcome range"), and total cost is replaced by  $TC\{X, Y\}$  ("maximum and minimum potential costs"). The resulting mechanism is  $\pi^* - TC\{X, Y\} = D^*(r)$ . It follows that if  $\pi^*$  is the constant and  $D^*(r)$  is the result, then the  $TC\{X, Y\}$  function is where the bulk of step one in the mechanism exists.

The  $D^*$  will differ based on a firm's goal and structure. While publicly traded corporations are statutorily required to work for the benefit of the shareholders,<sup>61</sup> benefit corporations and low-profit limited liability companies seek to further advance their philanthropic goals.<sup>62</sup> Regardless of the structure, the  $D^*(r)$  is not exclusively  $R$ , but rather an amalgamation of the goals of the firm. This could manifest as changing scope (upsizing or downsizing), investments in supply chain developments, purchase of mergers and acquisition, et cetera. The first step of the mechanism is to carefully plan out the spending and investment strategy of the firm before engaging in the rest of the formula. Once the value of  $\pi^*$  can be ascertained, the firm must then move on to the  $TC$  function.

The total cost function is traditionally viewed as  $TC = VC + FC$  (total cost = variable costs + fixed costs), but the costs within formula are wildly different across industries, and even across differing scopes of businesses within the same industry. As varied as they are, there is an integral component that the formula is missing which can be applied to all firms: "survivability." While this paper is being compiled in the midst of a global

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<sup>61</sup>Model Bus. Corp. Act § 8.30(a) ("Each member of the board of directors, when discharging the duties of a director, shall act: (1) in good faith, and (2) in a manner the director reasonably believes to be in the best interests of the corporation.").

<sup>62</sup>MARC J. LANE, BRANDON BODOR, & MAVARA AGHA, GOVERNOR'S TASK FORCE ON SOCIAL INNOVATION, ENTREPRENEURSHIP, AND ENTERPRISE: PRELIMINARY REPORT 5 (2013) ("The low-profit limited liability company, or "L3C," is a new hybrid business form that combines aspects of the traditional forprofit LLC and socially beneficial aspects of nonprofit organizations."); 8 Del. C. § 362(a)("[A] public benefit corporation shall be managed in a manner that balances the stockholders' pecuniary interests, the best interests of those materially affected by the corporation's conduct, and the public benefit or public benefits identified in its certificate of incorporation.").

pandemic which is shaking institutions of all sizes, it has become evident the survivability of firms must be calculated within the TC function. Essentially, these factors reflect how much of the maximized revenue could be lost due to unforeseen circumstances. Despite the differences of the TC function as applied across firms, there are some universal variables to be taken into consideration:

- A. Elasticity<sup>63</sup>
- B. Scale of Potential Tort Action<sup>64</sup>
- C. Result of Facility Closures
- D. Effects of Bankruptcy and Held Debt
- E. Reliance on Human Capital<sup>65</sup>
- F. Desire to Continue Operation<sup>66</sup>
- G. Firm or Industry Specific Considerations<sup>67</sup>

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<sup>63</sup>Elasticity in this context will be defined as 'the resistance to price fluctuations and market shocks.' The greater the elasticity, the greater a firm's ability to resist the negative aspects of a bear market, and vice versa. Another new component to some states' handling of SARS-CoV-2 was the designation of "Essential" to some businesses. This could be viewed as a furtherance of the elasticity principle, but through a bureaucratic and not a financial lens.

<sup>64</sup>See generally *How Data Analytics Can Help Identify Trends in Mass Tort Claims*, VERSUS (Dec. 18, 2018), <https://verusllc.com/how-data-can-help-identify-trends-in-mass-tort-claims/>.

<sup>65</sup>Wang Yan, et al., *How the coronavirus outbreak is affecting human capital development*, CHINA GLOBAL TELEVISION NETWORK (Mar. 10, 2020, 2:42 PM), <https://news.cgtn.com/news/2020-03-02/How-the-coronavirus-outbreak-is-affecting-human-capital-development-OvK4p4vwXe/index.html> ("As governments prioritize life and health over economic growth by quarantine and closures interventions, many social and economic activities were suspended and the labor market has frozen to varying degrees."); Tom Ozimek, *Job Growth Expected to Slow Sharply Over Next Decade: Labor Department*, THE EPOCH TIMES (Sept. 2, 2020), [https://www.theepochtimes.com/job-growth-expected-to-slow-sharply-over-the-next-decade-labor-department\\_3485217.html](https://www.theepochtimes.com/job-growth-expected-to-slow-sharply-over-the-next-decade-labor-department_3485217.html) ("The Labor Department noted that while technological advancements are expected to drive rapid employment growth in some sectors, including professional, business, and scientific services, they will fuel job cuts in other sectors, like manufacturing.").

<sup>66</sup>If there is an intended short-term arrangement, such as a joint ventureship, or a "side gig" that is not a necessary source of income, this uncertainty variable is of much less consequence.

<sup>67</sup>See Brian Straight, *The impact of COVID-19 on the food and beverage supply chain could be long lasting*, FREIGHT WAVES (Nov. 11, 2020), <https://www.freightwaves.com/news/assessing-the-impact-of-covid-19-on-the-food-and-beverage-supply-chain>; Craig Wigginton, *COVID-19: Impact on media and entertainment companies*, DELOITTE (April 3, 2020), <https://www2.deloitte.com/global/en/pages/about-deloitte/articles/covid-19/covid-19-impact-on-media-and-entertainment-companies.html>; Niall McCarthy, *COVID-19's Impact On Tourism: Which Countries Are The Most Vulnerable?* [Infographic], FORBES (May 5, 2020, 6:30 AM), <https://www.forbes.com/sites/niallmccarthy/2020/05/05/covid-19s-impact-on-tourism-which-countries-are-the-most-vulnerable-infographic/?sh=6a14fc71906a>.

Taking the variables (A-G) into account, the financial and actuarial components of a firm may represent the uncertainty in whichever format they deem appropriate, i.e. relative standard error, confidence limits, et cetera. Even without a finance team, small firms can likely ballpark what the costs are, as well as the range of potential costs. As SARS-CoV-2 has demonstrated, we can never fully predict what barriers market actors may create and to which businesses, such as the effects of forced gubernatorial business shutdowns.<sup>68</sup> Inversely, there are factors that can limit the chances of suffering extreme loss, such as the probability of government aid, and the relative value of the aid to the potential loss.<sup>69</sup> However, probability may not play as important part of determining these costs within this mechanism.

Instead, it may be better to represent uncertainty as the potential costs, such as the universal variables, listed on a spectrum. This modification to the TC function could be viewed as the traditional TC function (VC+FC) added to the uncertainty equation, which is represented as  $[(VC+FC)+\{x,y\}]$ , where x is the minimum expected loss and y is the greatest expected loss of the uncertainty variables. The TC function is then expressed as  $TC\{X,Y\}$ , which is the result of  $[(VC+FC)+\{x,y\}]$ , with (VC+FC) added to the lower case counterparts of X and Y. The resulting outcome will not be fixed, but will reflect the range of outcomes introduced by the total cost function. From this range, the firm will then select its desired risk level and compute their desired spending level ( $D^*$ ) based solely on the level of risk they are willing and able to absorb. The greater the risk aversion, the lower the value on the  $D^*(r)$  scale they are willing to select as their  $D^*$ . This step provides an opportunity for a firm to deeply consider why they are choosing their preferred level of risk aversion. As  $D^*$  is the desired spending level, it is then subtracted from  $\pi^*$  to determine the predictive revenue ( $\pi^*-D^*=R^*$ ).

As an example, suppose firm DJCL has a maximized revenue of \$100,000 and needs \$50,000 to purchase new office space for the coming year. As such, they would need their TC to be less than or equal to \$50,000, and set their costs accordingly. Utilizing universal variables A-G, they determined the range of unexpected costs between \$1,000 and \$15,000.

<sup>68</sup>Angela Couloumbis and Ed Mahon, *Gov. Tom Wolf's former business keeps operating during coronavirus shutdown despite losing state waiver*, THE MORNING CALL (Mar. 30, 2020, 12:36 PM), <https://www.mcall.com/news/pennsylvania/mc-nws-coronavirus-tom-wolf-business-waiver-20200330-kyraxal63nax3dxuqngnx7p5py-story.html> (finding which businesses may be affected by government shutdowns are an unknown variable).

<sup>69</sup>THE WHITE HOUSE, CDC, & FEMA, SUPPORTING SMALL BUSINESSES, <https://www.coronavirus.gov/smallbusiness/> (listing federal resources available to small businesses under President Donald J. Trump).

This leaves their adjusted total cost range between \$51,000 and \$65,000. Being more risk averse in the SARS-CoV-2 world, they determine their adjusted and final  $D^*$  is \$60,000. They subtract their desired spending level from maximized revenue, and are left with a predictive revenue of \$40,000. With this information, they decide to allocate only \$30,000 of their budget to the office space instead, and hence reinvest the remaining \$10,000 after this year as they see fit. From there, DJCL could also choose to hold off on new office space until the  $D^*$  variable for the next year could be \$50,000 (including the rollover savings from the previous year).

While this mechanism in particular is focused on survivability in uncertainty and risk aversion, every other aspect of Corporate Governance can utilize the same key features, such as prudence, foresight, circumspect, and malleability. Although the modern world may be uncertain and unstable, business planning does not have to be; the Tigers demonstrated there is power in careful, centralized planning. If firms can learn from the lessons of the past, both in success and failure, they can persevere. The tools of Mechanism Design Theory allow companies of all scales and types the opportunity to survive the bear and thrive with the bull.