

## THE LOGIC OF LEADERSHIP AND ORGANIZATIONAL HIERARCHIES

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Leadership presents a puzzle for traditional economic theories of organizations. The theory of the firm recognizes advantages to centralizing authority through the facilitation of rule-based and delegated decision-making. However, the benefits of centralized authority do not address the specific contributions leaders make when they exercise their decision rights. Put differently, if effective leadership within a hierarchy is simply a function of institutionally defining and constraining a given leader's authority, why does it matter which specific individual is at the top of the hierarchy? Nonetheless, the importance of leadership searches for private and public organizations, as well as the compensation for these roles, indicates that specific individuals matter for downstream contingencies. We develop a property rights/transaction costs theory of leadership, and use the economic logic of agency and coordination costs to test the effect of changes in Deans of Law and Business Schools, NFL coaches and Brazilian soccer managers. We find an impact of leadership changes both within and between organizations.

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## INTRODUCTION

The concept of leadership today presents a puzzle for economists similar to that addressed by Coase (1937): in a world of zero transaction costs, there would be no need for leadership within any organization. All changes would come about because of either technological change or changes in relative prices. An algorithm could make the decisions. However, in a world of positive transaction costs, centralized decision-making authority, i.e., a hierarchy significantly reduces transaction costs to decision-making within groups. Nonetheless, centralized decision-making alone does not lead to optimal or even second-best decision-making. If it did, there would be no need for the astronomical salaries of many CEOs, coaches, and other leaders. Similarly, if within political organizations, all you needed were to centralize authority, there would not be such competitive markets for the rewards that leaders reap. This means the choice of who exercises authority within a given organization's hierarchy matters. The state space of decision-making under uncertainty, or the scope of decisions a given leader can make (given the exogenous factors they face during the period in which they exercise their authority), is where a given individual exercises their decision rights in a way that more or less effectively achieves the organization's purpose. We define leadership as: 1) the ability to move downstream unanticipated decisions in your preferred direction; and 2) the ability to motivate beyond incentive compatible contracting. In general moving in the preferred direction of those exercising leadership will be consistent with the purpose of the organization.

The literature in the social sciences has not given much treatment of leadership as a function of choices made within the space created by an organization's institutions and norms. In particular, it is important to disentangle two separate (but often closely related in practice) questions: how much of what we call leadership is the benefits of centralization of authority, and how much is the benefits of individual choices made when exercising this authority? We argue that leadership's ubiquity indicates that it serves an important economic function, just as Coase argued the existence of the firm suggested a fundamental economizing function to that organizational structure.

We develop a transaction-cost theory of leadership. In a zero transaction-cost world, there would be no room for leadership. Put differently, it would not matter who was at the top of the hierarchy, provided the organization perfectly defined decision rights, and associated checks and balances. In this world, the individual or individuals exercising centralized decision rights would

make the right decision because they would know every possible decision *ex ante* and weighing them against one another in their entirety would be costless. We argue this counterfactual because of its similar absurdity to the example of the zero transaction-cost world posed by the Coase Theorem. In a world where organizations completely defined and enforced decision rights (property rights) to policies, there would be no need for leadership. This is a world where an *ex ante* algorithm could make all downstream decisions. However, as Douglass North (2005) noted, we live in a non-ergodic world; perfectly defining every aspect of downstream decision-making with respect to leadership is impossible. Because property rights to policy determination are not perfectly defined, leadership entails agency and coordination costs to secure (capture) *de facto* property rights to policies. The balance of these agency and coordination costs vary in a predictable way depending on the organization, with important implications for the space in which leadership operates in a given organization.

Organizations form for different reasons. This results in organizations whose purposes vary drastically from one another. How can purposes vary? While top business schools and sports teams seek to improve or maintain their ranking, the nature of what it takes to accomplish this varies significantly. We argue that some organizations, like business schools, have a purpose whose scope and scale is significantly larger than that of other organizations, like sports teams. Organizational hierarchy defines the decision rights allocated to each node in the hierarchy, but this hierarchy itself varies considerably because of the varying purpose of the organization. Organizations whose purpose is of greater scope or scale have a greater deconcentration of decision rights in both a *de jure* and *de facto* sense. This changes the nature of what is required to be a successful leader: as an organization's scale or scope of purpose increases, the challenge a leader faces increasingly involves economization over coordination costs as opposed to more exclusively agency costs.

We begin with a very short review of some of the relevant literature on leadership. Many studies of organizations have emphasized the importance of centralization of decision rights within a hierarchy, but most existing studies of leadership have conflated centralization of authority with exercise of that authority. Relatedly, most studies of leadership in sports contexts have painted at best an unclear role for leadership. In order to better clarify the economic role of leadership in light of these puzzles, we develop a property rights-based theory of leadership. We argue that an organization's purpose greatly determines the extent of centralization of authority

within a given organization's hierarchy, which in turn defines the balance of agency and coordination costs that a leader must overcome to achieve successfully an organization's purpose. Beyond our general interest in better defining why and how leadership matters, our theory results in a testable prediction that in organizations with greater scale or scope of purpose, the effects of leadership changes are likely to be lower in magnitude and variance, compared to organizations with less scope or scale of purpose. We examine a specific implication of our theory of coordination versus agency costs as defined by an organization's purpose: greater deconcentration of decision rights is likely to result in less variance and magnitude of change because of new leadership. We provide initial tests of the effect of changes in leadership within one organizational context, as well as between organizational contexts. In the case of Brazilian soccer leagues, we identify a significant effect of changes in leadership that we attribute to the role of the individual leader. Furthermore, our empirical analysis of the comparative effect of changes in leadership provides results consistent with our hypothesis regarding moderated forces of change in organizational contexts of larger scale and scope of purpose. More specifically, changes in NFL coaches resulted in greater variance and magnitude of changes in rankings as compared to business school deans and school rankings.

## **I. Literature Review**

The literature relevant to our analysis can be broadly lumped into two categories. Studies of organizations have long emphasized the importance of institutions and norms when it came to centralization of authority within a given hierarchy.<sup>1</sup> Rules, institutions, and norms greatly influence the extent and form of agency and coordination costs incurred within a given organization, an insight that our theory of leadership depends upon directly. As to leadership itself, we are by no means the first to approach the question, whether in the context of private or public organizations, or both. However, most of the extant literature on leadership either muddies the centralization of authority with the exercise of this authority, or presents case studies whose

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<sup>1</sup> A considerable literature in business management discusses the importance of corporate culture, which we call a norm. For an excellent analysis of the negative impact of corporate culture at GM versus Toyota, see Helper and Henderson (2014). Corporate culture can be examined through the lens of relational contracting, as Helper and Henderson do.

generalizability is often lacking. In the following subsections, we identify some of the major contributions in these two areas, as well as their underlying relevance to our analysis.

### **a. Transaction Costs and Organizational Definition**

The wealth of scholarship in institutions and organizations has provided us with a valuable toolkit by which to understand the space in which leadership operates. Organizations exist to economize on the transaction costs of the market. But the choice to form an organization begets a hierarchy (meaning some centralization of authority) in order to facilitate collective decision-making. The transaction costs unique to a given organization are a function of how the property rights within the firm are centralized. The transaction costs of collective decision-making include agency and coordination costs to varying degrees as a function of the extent of centralization of authority within the organization. The specific balance of agency and coordination costs is what a leader must confront in order to successfully achieve the organization's purpose. An organization's purpose itself greatly defines the specific balance of transaction costs that a given leader faces.

*Organizations exist to economize on transaction costs*

Much has been gained from understanding the organization of the firm using the toolkit of property rights and transaction costs. Coase (1937) spawned a cottage industry in the determinants of the firm/market boundary. The central theoretical insight that Coase put forward is that there are transaction costs of using the market and transaction costs of using the firm. The relative transaction costs determine the firm market boundary.<sup>2</sup> In this same tradition, our analysis of organizations, both public and private, provides the insight that the relative internal transaction costs to an organization determine the boundary between hierarchy and leadership. These internal transaction costs, the cost to secure and define your decision rights<sup>3</sup>, occur in the

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<sup>2</sup> Oliver Williamson (1983, 1985, 1996), among many others, explored not only the firm/market boundary but also the numerous varieties of contracting within and between firms. A plethora of other scholars developed the literature on transaction costs and their economizing role to explore the variety of contractual and organizational forms, e.g., spot contracting, long-term contracting, franchises, multinational firms, tenancy *inter alia*. Following in the footsteps of Coase (1937, 1960) and Williamson are Alston (1981), Alston and Higgs (1982), Alston and Gillespie (1989), Joskow (1985), Libecap (1989), Masten (1988), LaFontaine (1992), Gibbons and Roberts (2013), Ménard (2013), Ménard and Shirley (2005), among many others.

<sup>3</sup> Transaction costs in the view of Barzel (1989), Allen (1991, 2000), and others are the costs that you incur to secure your property rights.

space between the aspects of the organization's hierarchy (and associated authority) that can be defined in contract and policy, and the full action space that can never be fully specified ex-ante.

*An Organization Begets a Hierarchy to Reduce Costs of Collective Decision-making*

A necessary consequence of forming an organization is the need for collective decision-making within the organization, as opposed to the individual assent implied by contracting in the market. The need for collective decision-making means the existence of an organization nearly always carries with it a hierarchy, wherein authority is centralized to at least some degree.<sup>4</sup> Just as there is a firm/market boundary, there are hierarchical boundaries within almost all organizations.<sup>5</sup> Organizational theories have regarded the role of centralized authority as a necessary cost to yield the net benefits of rule-based hierarchical decision-making. This institutional function of centralized authority spans private and public organizations. Whether a church, a sports team, a city government, a university or a labor union, a clearly defined leadership structure is ubiquitous.<sup>6</sup> We view this hierarchy as ubiquitous in the structure of organizations because of how it economizes on the costs of collective decision-making.

The need to coordinate group behavior inter-temporally requires collective decision-making, which makes the institutions governing the structure of group decision-making central to understanding outcomes. Any group has some type of decision rule, whether explicitly articulated as an institution, or as a norm. Furthermore, the need for rule-based collective decision-making begets large benefits from the development of a hierarchy of rules.<sup>7</sup> The benefits resultant from a hierarchy of rules, as well as the need for rule-based decision-making

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<sup>4</sup> Coase definition of "bureaucracy" as a cost of an organization's structure. Who else has talked about bureaucracy as a limiting factor on an organization's size?

<sup>5</sup> There is a huge literature on collective-action problems within groups, starting with Buchanan and Tullock (1962) and Olson (1965). Olson and Buchanan and Tullock considered collective-action problems in the context of public organizations, although much of their insights were generalizable to organizations more broadly, whether public or private. Ostrom (1990) is also seminal here and spawned both theoretical and empirical contributions (see Ostrom 2010 for many references). The literature in Public Administration pays a lot of attention to hierarchies and management with hierarchies, but as far as we know, it does not consider the role of leadership/management holding constant hierarchies. For some of the classic sources, see Thompson (1967), Mintzberg (1983), and O'Toole and Meier (1999).

<sup>6</sup> Protest movements stand out with some being purposefully leaderless. However, protest movements without leaders have shorter durations and appear less successful. (CITATION NEEDED)

<sup>7</sup> If every instance of a new collective decision also required a debate over the process by which the group would reach a decision, the costs of decision-making would increase significantly. Moreover, such a possibility would create strategic incentives on the part of individuals who stand to lose from any given decision. In other words, if the rules for making rules were continuously up for debate, it would invite opportunistic behavior and raise the costs of decision-making more generally (Hart 1995). Nevertheless, there are situations when the rules for making rules become a variable for individuals in a group. In the political science literature, this is known as the Riker Objection (Shepsle 2006).

more generally, come with an associated cost: an authority to resolve questions of interpretation and conflicts among rules. The benefits of tiered rule-based decision-making therefore require a hierarchy with some measure of centralized authority. Delegated decision-making allows for the vast majority of group members to have only periodic and attenuated influence into the decisions made surrounding the rules and actions of the group.<sup>8</sup>

Thomas Schelling's 1960 book *Strategy of Conflict* provided an important rationale for leadership through a careful analysis of how people achieve coordination in games that have multiple equilibria. At a time when game theorists struggled to find ways to identify a unique equilibrium for every game, Schelling showed that multiple equilibria are a pervasive and inevitable fact, and he developed instead a theory that analyzed how people coordinate in order to choose a specific equilibrium among the many possible. If a game has two or more equilibria and one of them is Pareto superior, there is no guarantee that rational, self-interested players will manage to coordinate onto that best outcome. Schelling showed how the context and details of the information and timing of individual's decisions, as well as beliefs and commitment problems, could lead to inferior outcomes. He noted, however, that any specificity in the context or history of the game that focused players' attention on a given equilibrium, could affect expectations in a self-fulfilling way. Such focal points can be any feature that makes one equilibrium more salient in the eyes of all players, such as driving on the right side of the road. One of the ubiquitous focal points turn out to be recognized leaders that perform the function of coordinating the players on to a more desirable outcome.<sup>9</sup>

In sum, rule-based decision-making greatly facilitates the ability of groups to increase their size or more cost-effectively achieve their objectives, but also requires the definition of the authority to adjudicate disputes arising from the application of these rules. Relatedly, requiring the input of all individuals affected by governance would significantly raise the costs of reaching

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<sup>8</sup> The attenuated influence greatly reduces the costs of administering the process of collective decision-making, although it comes at the cost of less direct representativeness (whether nominal or actual) in the process. Whether occurring via the consent-based processes associated with democratic public organizations (Thompson 2001), or the more centralized processes typically associated with private organizations (Wirtz 1952), delegated decision-making is a nearly ubiquitous institutional solution designed to facilitate collective decision-making in greater numbers.

<sup>9</sup> There is, of course, the problem that the parties must first coordinate on who is the recognized leader, but as noted by Myerson (2009: 1117) in a review of *Strategy of Conflict*, "this is the coordination problem to solve all other coordination problems." Medina (2007) in concluding remarks of his influential book on collective action noted: "I have studiously sidelined organizations and leadership. Concrete examples of collective action usually require both..." Medina (2007:253).

any decision, costs that increase as the size of a given organization increases.<sup>10</sup> This again leads to the centralization of decision-making authority as a scalar mechanism in group complexity or magnitude. Due to these two overarching tendencies, groups tend toward centralization of authority within a hierarchy of rules as a means of minimizing the costs associated with collective decision-making.

*The Costs of Collective Decision-making Vary Depending on the Specific Hierarchy*

Collective decision-making does not proceed identically. The specific type of transaction costs implicated in collective decision-making within the firm is different than that implicated in a federalist political system, for example. We explore these differences in hierarchical nodes and their leadership roles because we believe the organization-specific hierarchy defines the relevant balance of transaction costs faced by a leader. In the firm, different organizational units typically have their decision rights and representative decision maker defined via centralized policy. In public organizations, in contrast, delegated decision-making typically involves the election of a representative (or appointment of a delegated decision maker by an appointed representative). In either case, the delegation of decision-making to an agent necessarily involves the centralization of decision rights. One important way in which organizations vary, however, is the extent of centralization of authority. Private firms are typically much more centralized than public authorities like governments, although the latter can vary significantly as to the extent of centralization of authority, a well-developed distinction we exploit later in our analysis.<sup>11</sup> We argue that these relative differences in hierarchy greatly determine what is required for effective leadership.

To our knowledge, we are not aware of a literature that explains why in theory some organizations have a flatter hierarchy than other organizations.<sup>12</sup> Certainly, an organization's size has a lot to do with hierarchical ladders, but so does the purpose of the organization and the objectives of its purpose. The logic of the centralization of authority for group decision-making, and the costs this centralization attempts to minimize, is the central foundation of our theory: the specific form of hierarchy chosen has important implications for the space in a given

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<sup>10</sup> In almost all circumstances, unanimity rule is not the ideal rule (Buchanan and Tullock 1962). Juries may be a counterexample due to the underlying social preference for institutions that ensure a high probability of guilt before conviction.

<sup>11</sup> Tsebelis citation.

<sup>12</sup> We are in the process of a deeper literature review on hierarchies within organizations, so we welcome any suggestions for further reading.

organization in which leadership operates. There are many accounts of firms and other individual organizations, but few in a comparative context.

*The Study of Firms Leads to the Identification of Agency Costs*

Because of how comparatively centralized decision-making authority is within firms, analysis of private organizations using the tools of property rights and transaction costs has led to the identification of agency costs as an important determinant of contractual and organizational forms. A focus on property rights within the firm led to the notion of residual claimancy, where high-powered incentives are matched to the exercise of significant authority within the firm.<sup>13</sup> Importantly, residual claimancy of the rents or profits from the exercise of authority relies integrally on the centralization of property rights within the firm, or as we call them, decision rights.<sup>14</sup> The person with the most skin in the game will be on top of the hierarchy in general. However, the uneven division of rents across an organizational hierarchy is itself what creates agency costs. Residual claimancy means those who do not claim residual rents from their labor are less incentivized to exert optimal effort than those who do. The early literature on the firm therefore led to the very large literature on principal/agent incentive compatible contracting.<sup>15</sup> Within the firm, then, decision rights are centralized and coupled with the rents associated with these decisions makes agency costs a major determinant of the contractual and organizational forms we observe in such centralized contexts.

*Study of Public organizations Shows Importance of Coordination Costs.*

In contrast, the study of public organizations has led to the identification of coordination costs as the most important determinant for institutional and organizational outcomes. The storied need to constitutionally check and balance authority within a public organization has direct implications for the level of centralization of authority.<sup>16</sup> While still centralized to some

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<sup>13</sup> The literature closest to discussing the firm and hierarchy from a property-rights perspective started with Alchian and Demsetz (1972). Their explanation for a hierarchy depended on residual claimancy. Those who stand to win or lose by the actions of others will be in the best position to monitor labor

<sup>14</sup> Barzel (1989) developed the property-rights view of contracting, which is an umbrella over transaction costs. Cheung (1983), Alston and Gillespie (1989), and Allen (1991, 2000) further developed this approach. However, not all margins of contracts can be perfectly specified and enforced, so some margins are open access, over which people compete. We will use this insight later to analyze property rights over decisions.

<sup>15</sup> Grossman and Hart (1983), Milgrom (1988), Sappington (1991), Dixit (1997), Holmstrom (1999), Laffont and Martimort (2002), *inter alia*. Alston and Higgs (1982) followed in the Alchian/Demsetz tradition in explaining contracting on plantations. They argue who supplies what to the production function will have an incentive to monitor the return from their assets.

<sup>16</sup> CONSTITUTIONAL BALANCE OF POWERS CITATIONS

extent due to the organizational ubiquity we describe previously, political systems that check and balance the concentration of authority deliberately create more veto players for the creation and execution of public policy. A system with less centralized authority, or more veto players, is one that is seen as requiring comparatively more voluntary coordination among the different government powers, as opposed to a system where such authority is under more singular control.<sup>17</sup> Indeed, one prominent political scientist deemed policymaking a “coordinative” art.<sup>18</sup>

*Leadership Economizes on Specific Balance of Internal Transaction Costs*

Through exploration of the implications of centralizing decision rights within an organization, we develop the role of decision rights as property rights within a hierarchy.<sup>19</sup> Hierarchy typically conveys a certain amount of authority, e.g., presidents, mayors, deans, pastors, gang leaders, and even parents. This yields well-identified benefits associated with hierarchical decision-making: finality, incentive alignment, *inter alia*. The most generic consideration of group decision-making identifies the benefits of rule-based and delegated decision-making. The benefits of rules to define subsequent group decisions create a need for an authority to interpret and apply the rules in case of disputes. Relatedly, organizations above a certain size face prohibitive costs to universal decision-making, creating significant benefits to the institution of delegated decision-making. These approaches all focus on the benefits to centralization of authority, as opposed to the specific latitude those who wield this authority have to use it more or less effectively. We instead wish to better understand the role of the individual in exercising leadership separate from the centralization of authority within the organizational hierarchy that the individual commands.

Those who exercise decision rights we term as leaders, although there is generally some uncertainty over who has the de facto property right to make every decision within an organization. There are transaction costs (competition) to capture property rights over decision-making. Leadership is the ability to capture decision rights to best achieve the purpose of the organization (more on this later).<sup>20</sup> Certainly, authors before us have spilled plenty of ink on

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<sup>17</sup> Tsebelis 1995.

<sup>18</sup> Riker 1986.

<sup>19</sup> This most closely will expand on the insights of Alchian and Demsetz. We differ in that Alchian and Demsetz discussed the issue of monitoring of labor but not overall decision-making by those in nodes of authority.

<sup>20</sup> In situations of principal agent relationships leadership is also the ability to motivate beyond incentive compatible contracting.

leadership as centralized authority, but we take a different tack. We wish to understand not only why there is centralization of leadership within an organization but also why it varies across organizations. As we explain in more detail below, the scope of purpose of an organization, i.e., how many goals it wishes to accomplish or the complexity of the purpose, will determine in part the centralization of leadership. An organization's purpose also determines the size of the organization (how many people are in the organization) which in turn influences spatial and hierarchical separation between the organization's members.

Put differently, a la Coase, the relative internal transaction costs determine the boundary where the benefits of hierarchy end and the benefits of leadership begin. The notion of incomplete contracting, scaled to the organizational level, and mapped across all the actions the organization's members could take to achieve the organization's purpose is what animates our characterization of this internal boundary. Because the contracts specifying the organization's members' rights and duties can never fully specify the actions a given member must undertake, the limit between formal contractual definition and the potential set of actions the organization's members could take in the aggregate is where leadership plays an economizing role.

## **b. Studies of Leaders and Leadership**

The scholarship on leaders and leadership is voluminous.<sup>21</sup> Among the foundational thinkers who considered the topic of leadership through a more systematic lens are Machiavelli (1950; originally 1532) and Weber (1968; originally given as a lecture in 1919), whose contributions are the touchstones for many who study leadership in government. Machiavelli, to some extent, and certainly Weber, were concerned with power and at times conflated authority with leadership and power. Weber classified leadership according to: traditional leadership, charismatic leadership, and legal authority.<sup>22</sup> Weber was interested in leadership change, traits of successful leaders, and hierarchical definition of authority, but did not create a firm theoretical basis for delineating the

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<sup>21</sup> For an excellent broad-ranging review of the literature on leadership, see Ahlquist and Levi (2011). Ahlquist and Levi also pose several of the questions on which we shed light: how do you distinguish the position of authority and the power therein conveyed from the individual exercising the authority? Many of the books on leadership fall into the category of individual biographies, e.g., Caro's (1981, 1990, 2002, 2012) four-volume set on Lyndon B. Johnson with the fifth volume in the works.

<sup>22</sup> Traditional leadership gave decision-making rights to an acknowledged person based on the past, e.g., first-born sons became king or chief. Charismatic leadership referred to the power of a person to persuade others to follow based on their "charisma." Legal authority referred to people occupying positions of authority based on some legitimate rules, e.g., an election (Weber 1968).

differences between these aspects of leadership the way we have. We are more interested in the exercise of leadership but believe we can reveal something systematic about this exercise through examining the succession of leaders. We wish to think of leadership not as the centralization of authority to make decisions per se but rather the extent to which leadership is successfully transformational (Burns 2004) in the exercise of centralized authority. Burns clearly distinguishes leadership from leaders, i.e., the person in power.<sup>23</sup>

The literature on leadership in business is huge but lacks generalizability, in part because of a lack of a systematic theoretical basis for understanding the organizational context in which a given leader operates.<sup>24</sup> This genre is less analytical in terms of understanding concentration of decision-making or the role of scale and scope of purpose of the organization.<sup>25</sup> The literature on generals and coaches falls most closely to Weber on charisma, among other traits that minimize agency costs.<sup>26</sup> For the most part, scholars in this strand of the literature discuss the traits of leaders as the core for their success.

We are clearly not the first to approach the question of leadership in the context of sports, although this is the first study of which we are aware that compares the role of leadership in sports to other leadership contexts. Coaches seem to perform many of the tasks associated with leadership. Most studies, however, have failed to find much of a role played by coaches on team outcomes.<sup>27</sup> These findings, in the context of sports teams, pose a puzzle given leadership's

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<sup>23</sup> For Burns, most leaders fall into two categories: transactional or transformational. A transactional leader is one who changes things on the margin given their power. If enough marginal changes accumulate, the change could be transformational. Transformational leadership fundamentally changes the trajectory of a country (Alston et al. 2018), or a firm, though Burns discusses mostly political leadership. Burns (1956, 1970) wrote two books on Franklin D. Roosevelt. Burns clearly believes that holding positions of power constant, individuals matter. Transformational leadership does not always succeed due to both skill and chance. We are motivated to better identify the role of the leader as opposed to the role of chance in determining marked changes in organizational outcomes.

<sup>24</sup> Most of the books are in the form of lessons that business leaders need to take to heart and apply to their form. Collins (1999, 2001, 2009, 2011), Collins and Porras (1994), and Collins and Lazier (1992) typify much of the literature.

<sup>25</sup> An exception is the work typified by Beatty and Zajac (1987) who analyze succession effects for CEO changes at 209 corporations. They find that announcements of CEO changes lowers stock prices.

<sup>26</sup> The central question this literature addresses is: how do those on top get those underneath to fight that much harder or play more intensely than the opposition? In addition, great coaches and generals also need imagination and strategy, but the authors of books in this area do not generalize. (CITATION NEEDED)

<sup>27</sup> Berry and Fowler (2019) review the extant literature and show that the general conclusion is that coaches, while necessary for a team, are largely interchangeable: "Much of the sports analytics literature on coaches is oriented around questions of leadership succession, inspired by the influential early work of Grusky (1960, 1963). Most of the studies in this tradition seek to assess whether a team's performance changes significantly following the replacement of a coach. The general conclusion, across a variety of contexts, is that coaching changes have either no effect on team performance, or a slight negative effect." (Berry and Fowler 2019: 2) Similarly, The Economist

ubiquitous role, and the high salaries that sports coaches command, especially in the United States. If coaches were indeed interchangeable, why expend such large costs in searching for and compensating coaches if their value is unclear? Our first empirical test provides a new perspective on this question through better identifying the role of leadership in the context of Brazilian soccer leagues, controlling for the numerous factors likely to determine team performance separate from the role of an individual coach.

## II. Our Theory

Broadly, we think that leadership's ubiquitous role in private and public organizations indicates changes in leadership should have an observable effect on outcomes, given the way we define leadership in this section. Leadership is a scarce factor of production that cannot be competed away, i.e. leaders who exercise leadership receive rents. More specifically, we define leadership as better achieving an organization's purpose through economizing over the transaction costs (agency and coordination) created by the specific organizational hierarchy that is itself defined by the organization's purpose. As the purpose of an organization varies, a leader faces a differing balance of agency and coordination costs.<sup>28</sup> Most of our discussion in this section refines the specific implications of our theory for our second empirical test, examining the effects of changes of leadership in different organizational contexts. Nonetheless, the logic we spell out here regarding imperfectly defined decision rights within an organizational hierarchy also suggests that changes in leadership should have an observable effect in almost any organizational context, a question we tackle in our first empirical test in section III.

In order to illustrate the role of leadership in organizational hierarchies, consider the stylized organization in Figure 1. The organization has a purpose and delegates to a leader,  $L$ , the task of pursuing that purpose.<sup>29</sup> The leader further delegates different tasks to several members of the organization. Authors in various fields have addressed this issue of delegation. Scholars of

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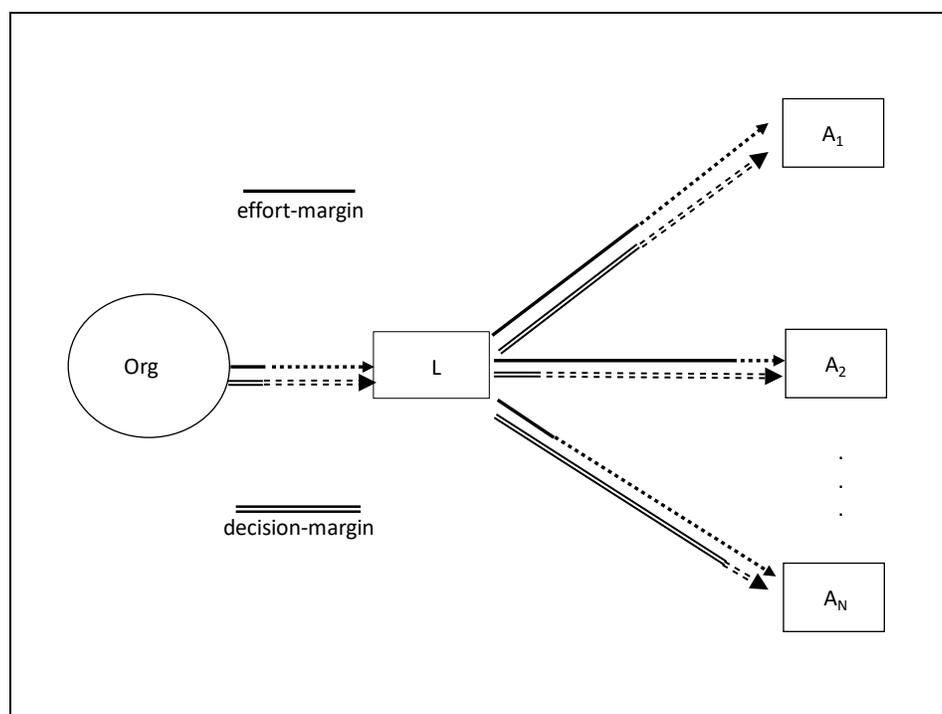
(2019) recently presented an analysis of the contributions of coaches and players in five big European soccer leagues (2004–2018) and conclude that “the likely cause of the decline of once-feted bosses . . . is not that they lost their touch, but that their early wins owed more to players and luck than to their own wizardry.”

<sup>28</sup> The traits of leadership that best solve an agency problem are not the same traits most needed to solve a coordination problem. We return to this briefly in the penultimate section.

<sup>29</sup> Although the diagram shows the well-understood agency costs that an organization creates when it chooses a leader, our analysis does not approach these costs. A minimum assumption our theory requires is that a given organization's choice of leader is sufficiently successful in picking an individual who wants to achieve the organization's purpose.

transaction-cost economics analyzed the question of where the boundary lies between the organization and markets. For example, transaction costs explain why the specific organization with  $N$  members and functions arose. Similarly, principal-agent theory has focused on the impact on organizational structure of asymmetric information that arises from delegation. In Figure 1, the leader is an agent of the organization and at the same time a principal of the other members. The gist of most of the principal-agent literature is for principals to design incentives to elicit effort from the agent toward the principal's objectives. The moral hazard and adverse selection that arise from the imperfect observability of the agents' efforts mean that a first-best level of effort is not possible, and the agent appropriates an informational rent.<sup>30</sup>

**Figure 1. Leadership in organizations.**



Our interest, however, is not on the boundary of the organization or on the effort-margin, but on what we call the decision-margin (though of course these dimensions interact and are simultaneously determined). The decision-margin refers to the issue of tasks delegated from the organization to leaders, and from these down the line. It is not possible to foresee all the

<sup>30</sup> All the action in this literature is on the effort-margin. Examples include a landowner delegating farming to a peasant, and the type of contract – wage, sharecrop, fixed rent, or other – determines the peasant's allocation of effort; or a regulator delegates the provision of a public service to a utility, and the concession contract – price-cap, cost of service, or other – determines the utility's incentive to reduce its costs.

decisions that the person in charge of each node in its structure must make, and hence you cannot contract ex ante for all the contingencies. The solid portion of the single-line arrow represents the incentive compatible contracting over effort and the dotted part of the arrow represent potential rents for the exercise of leadership, if she is able to supply motivation and effort beyond contractual terms.

The solid portion of the double-line arrows represents the responses and decisions that can be predicted and contracted. For these decisions, it does not matter who is in charge of implementing them, as they are predetermined. We represent the unanticipated contingencies that cannot be codified with the dashed portion of the arrows. In these situations, there is scope for the person in charge to influence how the organization will respond. We call this discretion and capture of decision rights, *leadership*.

In Figure 1, the extent of leadership held by  $L$  is determined both in her role as an agent of the organization, and in her role as a principal to the other members. The greater the ratio of dashed to solid double-line arrow in the role as an agent, the greater the extent of potential leadership, as this indicates the right to make a greater range of decisions. In the role as principal to the other members, however, the exercise of leadership is different and the focus of our analysis. The solid portions of the arrows can be contracted ex ante in the rules and leave no room for leadership (as we define it). The dashed portions of the arrows indicate: the unforeseen contingencies that have not been specified in the contract or rules; as well as the inability to establish the perfect incentive compatible contract that will induce effort greater than one's opponents (in a zero sum game) or competitors in the market. This allows the members at those nodes to make decisions over unforeseen contingencies, which would appear to indicate a reduction in the extent of leadership exercised by  $L$ . But, perhaps counterintuitively, it is this conjugation of multiple members of the organization enabled to make uncoordinated decisions that creates a situation where a leader can potentially make the most difference. Successful leadership entails more precisely coordinating the actions of the members of the organization to achieve the outcomes that best fulfil the purpose of the organization. In the following subsections, we spell out the theory illustrated in the diagram in detail. We conclude this section by identifying the initial testable implications of our theory.

### a. Leadership as Minimizing Agency and Coordination Costs to Achieve Organization's Purpose

When we say leader, we mean an individual (or individuals) who is at the top of a given organization, or unit of organizational hierarchy. A manager can exercise some measure of leadership just as can a president or a CEO. In organizations, leadership is nested with ultimate authority (and responsibility) in the hands of the leader at the top of the hierarchy in the organization: “the buck stops here,” though for practical purposes the buck may well stop at lower levels in the hierarchy. The CEO or president is the most salient leader, but at every layer of an organization's hierarchy at which decision rights are (partially) centralized, the lack of perfect definition of these rights creates the possibility for the exercise of leadership. A leader retains final decision rights over the actions undertaken by the organization in pursuit of achieving its purpose.<sup>31</sup>

Organizations have widely different purposes. Firms maximize profits.<sup>32</sup> Sports teams seek to maximize wins, as well as profits. Some organizations have more nuanced purposes, e.g., universities or governments. Leadership, in terms of de jure hierarchical control, is endogenous to organizational form. In some organizations where the residual claimancy is clear, leadership will be vertical with few veto players. In other organizations with less clear residual claimancy to the objectives (governmental policies), leadership will be flatter with actors competing to determine policy via decision rights. Due to the organizational benefits of hierarchy, there will be some measure of centralization of authority: chairs of committees, or majority or minority leaders in Congress, for example. Autocracies centralize leadership to a high degree, though even dictators need to sleep at night. As such, there will still be veto players, or those with significant ability to influence the success or failure of a given leader's decisions and their subsequent implementation.

Within any hierarchy, there are returns or rents to individual skills of leadership, which explains the high salaries of CEOs and football coaches, *inter alia*.<sup>33</sup> The leadership skills needed vary, depending on the objectives required to best achieve the purpose of the

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<sup>31</sup> For now, we are abstracting from the issue of whether the leader's objectives align perfectly with the purpose of the organization. Dealing with agency costs on the part of the leader herself is a function of leadership selection, punishment, and retention, which is a largely different question than the one we analyze.

<sup>32</sup> Firms also have other components in their purpose, especially varying across profit and non-profit.

<sup>33</sup> The skill set of leaders is what James MacGregor Burns (2004) refers to as Traits.

organization. The simpler the purpose, the more the issue becomes one of solving a principal-agent problem. As the objectives of an organization become more complex, the more de facto residual claimancy will depend upon the voluntary support of powerful members of the organization. There will be a competition to determine whose position will sway others at the table. Think King Arthur and the roundtable versus a head coach of a college basketball team. Leadership necessarily involves more coordination in roundtable contexts.

For our purposes, an organization has a larger scope of purpose when it seeks to have a greater number of outcomes, or seeks to influence a given number of individuals in a larger number of ways. Similarly, we say an organization has a larger scale of purpose when it tries to influence a larger number of individuals with the organization's activities, e.g., a family firm in a small town versus a multinational firm like Toyota.<sup>34</sup> Holding constant the scope of organizational purpose, as an organization's purpose increases in scale, governance becomes more costly, which in general will lead to less concentration (or more delegation) in decision rights. Holding constant the scale of an organization's purpose, an increase in the scope of the organization's purpose makes governance more costly and leads to less concentration of decision rights. In either case, governance becomes more difficult because of the increase in agency and coordination costs associated with the organizational hierarchy, and a greater number of members of the organization.

When fit between objective functions of the organization's members is tight, e.g., a football team, the problem becomes one of maximizing output under those objective functions. This is the classic problem of minimizing agency costs. When one individual's output does not solely benefit them, this creates a wedge between incentives to engage in costly effort and incentives to shirk or satisfy their own objectives, e.g., a nice office. When fit between objective functions of the organization's members is instead weak, the problem becomes one of coordinating output under a diversity of objective functions in a way that sufficiently satisfies each individual's objective function. Yet, the leader strives to maximize the organization's purpose as a complex balance of diverse objective functions, e.g., committee members may differ dramatically how to best regulate banking. The chair of the committee has some agenda

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<sup>34</sup> In our theory, having more members is a consequence of choice of purpose. Greater scale does not equal greater members directly – by and large, the greater the number of individuals that an organization seeks to reach with its output, the greater the number of members required to successfully achieve this greater influence.

control at her disposal to exercise leadership in a coordinative/cooperative fashion such that all members benefit but the chair benefits the most given the constraints of veto by others on the committee. While agency costs are still present to a significant extent in this latter context, coordination costs increase in relative importance as compared to other contexts where agency costs rule the day.

### **b. Organizational Purposes as Made Up of One or More Objectives**

A leader is more effective when they are more successful at achieving an organization's purpose. The greater the scope of an organization's purpose, the greater the number of objectives to achieve that purpose, e.g., a university's educational mission is complex. This implies a large organization with a large hierarchy, both of which increase the decentralization of de facto control over the objectives required to achieve an organization's purpose. For example, universities' purpose consists of educating students, promoting research, and engaging in outreach. There are numerous actors: staff, deans, students, faculty (with and without tenure), provosts, and presidents. However, not all increases in organizational size result from scope of purpose; an organization can also seek to influence a greater or fewer number of individuals with its output. A single restaurant seeks to provide food to its customers just as does a national restaurant chain, but the latter organization clearly has a much larger size resultant from the scale of its purpose.

Increased scope and/or scale of organizational purpose increases outputs. Increased outputs increases an organization's size in most instances. Increased size by definition increases number of individuals involved (and associated levels of organizational hierarchy). The increased numerical and hierarchical margins lead to increases in undefined decision rights, which results in greater decentralization in de facto control. Greater decentralization in de facto control suggests a larger number of veto players in practice, which means coordination becomes more important.<sup>35</sup> We thus argue that deconcentration of decision rights increases as the scale or scope of an organization's purpose increases.

At its simplest, relying on another individual to achieve an objective of the organization creates transaction costs and principal-agent costs. Agency and coordination costs create a

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<sup>35</sup> By veto players, we mean members of an organization who have a say in the decision-making process even though they may not be able to exercise a complete veto. For example, a president in the U.S. may veto legislation, but Congress can overrule his veto through a two-thirds majority vote.

margin of de facto control for the agent; areas of divergence of objectives between the principal and the agent. To some extent, it costs too much for the principal to oversee all margins of the agents' behavior: "it costs too much to put the matter right" (Coase 1960: 39). The decentralization of de facto control defined by the margins left to the agents may reflect de jure organizational policies that in turn suggests a greater number of institutionally defined veto players, especially to the extent de facto control solidifies over time.

Increased scope and scale of organizational purpose suggests contexts that display greater deconcentration of decision rights. Whether strict veto players, or individuals whose assent greatly reduces the costs of changing and implementing policy, an increase in their presence creates coordination costs. In contrast, an organization with a narrow purpose in terms of scope or scale, perhaps composed of a single objective, is one where leadership instead more squarely confronts the problem of minimizing agency costs.

### **c. An Organization with Greater or Fewer Objectives to Its Purpose**

An organization's purpose can greatly determine the context in which leadership operates, and accordingly, the type of leadership required in order to be effective. One important margin by which variance in organizational purpose can affect the role for leadership is the implications the purpose has for the objective functions of individual members of the organization.

An organization can vary as to the extent to which the members of the organization's objective functions vary from one another. *Ceteris paribus*, a business or law school would like to maximize its ranking, but this ranking is a composite of the faculty's research output, the quality of students attracted as a function of faculty, and curricular quality, *inter alia*. The extent to which any faculty member cares about a specific course or research objective varies significantly. In contrast, a sports team's ranking is a function of how many games it wins. Even if a coach and a superstar player do not see eye to eye about important choices in team strategy or composition, they both care deeply about winning each game. This is an example of how a sports team is composed of individuals whose objective functions vary less than a number of other organizational contexts. Each output of a member of a sports team aligns well with the singular purpose of winning games. In contrast, the output of members of a law school or business school is not easily tied to a singular objective, even if all members agree that increasing school ranking is important. The context of business and law schools is thus one

where a greater number of objectives associated with the organization's purpose creates a greater decentralization of de facto and de jure policy control. As compared to organizations with narrower purposes (like sports teams), leaders of organizations with broader purposes (like law schools and business schools) face a greater number of effective veto players in pursuit of their realization of the organization's purpose. The quintessential example of an organization with a high degree of variance as to members' objective functions is that of public organizations, regardless of whether one considers ordinary citizens or politicians to be members.

The extent to which an organization best achieves its purpose through an organizational hierarchy composed of subunits devoted to the pursuit of numerous objectives directly determines the nature of leadership that is most likely to best achieve the organization's purpose, e.g., GDP per capita, lower income inequality, profits, winning a game, a battle, or rising in university rankings. The broader the scope of the purpose an organization seeks, the greater the need for specialization within the organization's hierarchy to pursue the different objectives required to achieve this purpose. Similarly, the larger the organization, the greater the delegation of day-to-day decision control to subunits. In each case, leadership faces a higher number of veto players in terms of those whose assent to policy decisions is necessary.

Put differently, greater scope of organizational purpose (and greater organizational size) results in more decentralized residual claimancy to de facto property rights to control over organizational outputs. When residual claimancy is more decentralized, leadership involves coordinating output among units that have more autonomy as to the acceptance and implementation of policy. In these contexts, minimization of coordination costs becomes more important for successful leadership, which may thus entail persuasion, agenda control, or other traits of leadership.<sup>36</sup> Alternatively, when residual claimancy is comparatively concentrated, leadership involves inducing the greatest effort toward a narrow organizational purpose, i.e., minimizing agency costs, which may entail leadership traits of passion, charisma, or fear.

#### **d. Policy Change and Implementation with More or Less Veto Players**

An important effect of the scope of organizational purpose on leadership is the extent to which a given leader faces veto players (or other members of the organization with some measure of decision rights, or practical influence over the success or failure of a given decision) in realizing

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<sup>36</sup> We will have a discussion of traits later on in section IV.

policy change and implementation. This has two testable implications: (1) in organizational contexts with a greater number of veto players, the organization is likely to be less sensitive to changes in leadership; and (2) the characteristics or traits required for successful leadership are different depending on whether the organizational context involves leadership resolving coordination or principal-agent problems.

Political systems with more veto players require a greater level of consensus outcomes, even if not unanimity, and accordingly display less rapid and extreme policy changes (Tsebelis 1995; Acemoglu et al. 2003). Coordination-intensive leadership contexts should display less variance when it comes to changes in leadership. For example, our logic predicts that the average change in a coach on a sports team is more likely to shift outcomes in either direction to a greater magnitude than a change in business or law school leadership.

#### **e. Statement of Theory and Testable Implications**

Holding hierarchy equal, more members of the organization means greater dispersion of actual decision-making due to coordination costs. Holding membership constant, more layers of hierarchy creates more agency costs between numerous principals and the final agent (as well as more coordination costs). Both of these factors, hierarchy and members, are likely to increase as the scope or scale of an organization's purpose increases. We define agency costs as arising due to asymmetric information (moral hazard and adverse selection) and imperfect incentive alignment. By coordination costs, we mean the costs of gathering the information necessary to take an economic action requiring the voluntary action of others (not related to effort and ability, but to searching, evaluating, bargaining, matching, clearing, accrediting, and so forth). Agency and coordination costs unique to a given organization's purpose act as important constraints on leadership (de facto and de jure organizational structure matter for leadership). As agency and/or coordination costs increase, this increases the deconcentration of decision rights.

We hypothesize that the lower the scope and/or magnitude of an organization's purpose, the greater the variance in organizational outcomes that will be observed when leadership changes. In our initial tests, this results in discrete predictions for both sports teams and professional graduate schools. In the case of changes in coaches for sports teams, we expect more negative and positive changes in ranking; greater magnitude of change where it occurs; swifter rate of change where it occurs; and fewer null results. In contrast, for business schools

and law schools, we expect fewer positive and negative changes in ranking; lower magnitude of change; slower rate of change where it occurs; and more null results.

It is important to be clear what we are testing: on average, will changes in leadership (authority) have a greater variance in some organizations versus other organizations because the scope of purpose varies? In any organization, an individual leader could be transformational.<sup>37</sup> Because of this, we first consider whether we can better identify the effect of changes of leadership generally, before examining the specific comparative implications our theory has for changes of leadership in different organizational contexts.

### **III. Empirical Tests: Changes in Leadership within and between Sectors**

In the following subsections, we provide two distinct tests of the effects of changes in leadership. The first compares the effect of changes of leadership *within a single organizational context*: Brazilian soccer leagues. We develop a novel methodology to isolate the effect of leadership as compared to the numerous other factors likely to affect team performance at any given time. In contrast, the second test compares the effect of changes of leadership *between organizational contexts*: business and law schools as compared to NFL teams. In sum, we find both a discrete effect of changes of leadership for Brazilian soccer teams, as well as initial evidence supportive of our hypothesis that as an organization's purpose increases in scale and scope the effect of leadership changes moderates. Leadership matters, but the extent to which it matters depends on an organization's purpose.

#### **a. Brazilian Soccer Leagues: Identifying the Role of the Individual through Changes in Leadership**

Despite the wealth of detailed data, it is not straightforward how to measure the effect of coaches on team performance, and most of these analyses fail to separate the contribution of coaches from a series of interrelated and confounding factors, such as player quality or luck.<sup>38</sup> For studies

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<sup>37</sup> In future work, we plan to use analytical narratives of outlying cases to understand better the role of particular individuals in organizations. Our work will differ from the standard biographies of leaders because we will draw from a fuller sample of leaders and look at those leaders whose outcomes stand out as stellar, suggesting the role of the individual mattered. Doing so first requires a baseline expectation for the extent of change that is possible, though, which is a central motivation of our analysis here.

<sup>38</sup> See Berry and Fowler (2019) for a discussion of these statistical issues. These authors then go on to suggest a novel method for measuring coach impact that gets around many of these issues. By applying this method to data

that rely on instances of coach replacements to measure their impact, the main difficulty is accounting for the issue of mean reversion. This is the statistical phenomenon that a team that is going through a bad streak, which often tends to prompt a change of the coach, has a greater probability of eventually improving than it does of doing even worse, and vice versa for a winning streak. Thus, simply showing that a new coach brought about an improvement in team performance is not proof that it was the result of the change in leadership.

One of the difficulties of using instances of coach replacement to measure coach impact is that these tend to be relatively rare events and they tend to take place primarily between seasons. As a result besides the coach changing, many other variables change simultaneously (players, adversaries, sponsors, the economy, or the general mood), making it hard to attribute any change in performance solely to the new coach. In order to get around this problem, in this section we use data from Brazilian football Series A Championship to analyze the impact of coach changes on the teams' championship standings. Brazilian soccer teams have an exceptionally high rate of manager turnover. In 2018, only 4 of the 20 major league teams did not change managers within the season, while 6 teams had 3 different managers and 4 teams had 4.<sup>39</sup> The average tenure of a manager in an elite Brazilian team is 6.4 months, whereas in the English Premier League it is 2.68 years.<sup>40</sup>

These characteristics of Brazilian soccer provide enough variability for us to focus only on within-season coach changes, thus controlling for between-season confounding factors. In addition, we perform a placebo test that helps us identify whether any impact we find is due to the coach or to mean reversion. Our data is for the 2016, 2017, and 2018 seasons of the Brazilian Series A Championship, in which 20 teams play each other twice throughout the season (home and away), with a win worth 3 points, a tie 1 point, and a loss zero points. The team with most points at the end of the season is the champion, the top four qualify for next year's South American Libertadores Championship, while the bottom four get relegated to the Series B and are replaced by the top four teams from that league.

The unit of observation is team  $i$  in round  $t$  of championship year  $j$ , comprising 2,280 observations (20 teams per year, 38 round per year, 3 years). The dependent variable is a

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from a series of different sports leagues in the US, they find that “coaches explain about 20–30 percent of the variation in a team's success” (p. 1).

<sup>39</sup> <http://interativos.globoesporte.globo.com/futebol/especial/rotatividade-dos-tecnicos>.

<sup>40</sup> Data from English football from League Manager Association (2017).

measure of local improvement in the team's championship points standing. It compares how much a team improved in the past five rounds to how much it improved in the following five rounds:

$$Team\ performance = \frac{p_{+5} - p_0}{p_0 - p_{-5}} \quad (1)$$

where:

team performance = ratio of point improvement from 5 rounds back to 5 rounds forward;

$p_0$  = total points after current round;

$p_{-5}$  = total points five rounds back;

$p_{+5}$  = total points five rounds forward

When this ratio is above 1, the team is going through a period of improved performance in a 10-round window. By focusing on a short-term metric of performance, instead of a season-long measure, we reduce the probability of our results being due to mean reversion.

The explanatory variable of interest is a dummy variable that equals 1 for a given team/round/year when a change of manager has taken place. The idea is to see if this event leads to an increase in performance as measured by the ratio described above. To test the duration of this improvement in performance, two other dummy variables are also used, set at 1 for 3 and 5 rounds after a change in manager.

In order to separate the contribution of the coach from that of players, we control for player quality by using data from a Brazilian fantasy soccer league called *Cartola FC*.<sup>41</sup> In this game, tens of thousands of people in Brazil play by picking their own teams from the roster of all players in the championship. For each round, the game's platform compiles a large set of statistics from the actual games (goals scored, assistances, fouls committed, yellow and red cards, among other statistics). The data give each soccer player and coach a score for that round. The *Cartola FC* players track how well their individual team does throughout the championship. They can buy and sell players each round (not real money) as there is a market in which better-performing players become more expensive. We use the average player price and coach price for each team in the first round of the championship as a control for player and coach quality. We compile this price by the platform before the first games, using expert advice and gamers' inputs through Twitter. We use this price instead of the changing prices throughout the season because those subsequent prices are influenced by game results and are thus endogenous, that is, we

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<sup>41</sup> <https://globoesporte.globo.com/cartola-fc/>.

cannot separate if the team won because the players and coach are high quality from the extent to which the measure of that quality changed because the team won.

In addition, for each team/round/year observation, we control for the current number of points in the season, the round number (38 rounds per season), whether it is a home or an away game, plus season dummies (2016 is the base year). The data is organized as a panel with  $N=26$  and  $T=29$ , across three different seasons, and is estimated using club-fixed effects.<sup>42</sup>

We show the results in Table 1. In column [1], we first try a more straightforward approach at measuring coach impact on team performance by regressing the final number of championship points in each season against the preseason measures of player quality and coach quality. Both players and coaches are found to have a positive impact on the teams' final standings, with players having a bigger impact than coaches, and both together explaining 28% of the variability in team points. Placing all variables at their mean, a team would be expected to end the season with 52.2 points. If instead of the average coach we use the best coach in the sample, this would increase to 58.2 points, which can make a big difference in terms of rankings. Using the best players and the average coach, the expected number of final points would be 61, an even bigger difference. These results provide an indication that coaches' leadership does matter. The results are, however, not highly robust. Using a panel estimation structure or controlling for season dummies makes the coach-quality estimate statistically insignificant, though player quality continues to matter. Although there is some evidence of coach impact, the results are not sufficiently strong to outweigh the extensive literature that finds no such effects.

We therefore focus on a different approach that makes use of the extensive within-season coach turnover in Brazil. The results are presented in columns [2]–[4], which test for a different length of coach-change impact: 1, 3, and 5 rounds. The dependent variable is now the 10-round measure of improvement described in equation (1).

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<sup>42</sup> There are 20 teams per season, but four teams change each year. There are 38 rounds per season, but the construction of the dependent variable requires lagging 5 rounds and forwarding 5 rounds, which requires dropping some observations per season.

**Table 1. The impact of coaches on team performance**

	[1] Dep. var.: Final points	[2]	[3]	[4]	[5]	[6]	[7]	[8]
		Dep. variable: Team performance in 10-round window*						
Change in coach t		0.969*** (6.29)						
Change in coach t+3			0.516*** (5.94)					0.526*** (6.11)
Change in coach t+5				0.221*** (2.91)				
Placebo change in coach t					-0.702*** (-4.29)			
Placebo change in coach t+3						-0.554*** (-6.23)		
Placebo change in coach t+5							-0.087 (-1.14)	
Player quality pre-season	1.257* (1.92)	-0.034 (-1.28)	-0.032 (-1.20)	-0.032 (-1.21)	-0.035 (-1.31)	-0.032 (-1.20)	-0.034 (-1.26)	0.047*** (2.73)
Coach quality pre-season	0.932* (1.92)	-0.017 (-1.12)	-0.018 (-1.21)	-0.017 (-1.11)	-0.016 (-1.03)	-0.020 (-1.35)	-0.016 (-1.08)	-0.001 (-0.04)
Championship points at round t		-0.074*** (-12.59)	-0.072*** (-11.97)	-0.074*** (-12.13)	-0.074*** (-12.45)	-0.071*** (-11.98)	-0.077*** (-12.74)	-0.053*** (-10.74)
Championship round		0.105*** (11.88)	0.101*** (11.31)	0.104*** (11.43)	0.105*** (11.72)	0.101*** (11.33)	0.108*** (12.07)	0.075*** (9.92)
Home game		-0.187*** (-3.33)	-0.197*** (-3.50)	-0.194*** (-3.42)	-0.175*** (-3.08)	-0.193*** (-3.43)	-0.193*** (-3.39)	-0.205*** (-3.62)
Season 2017		0.194* (1.73)	0.167 (1.49)	0.182 (1.60)	0.203* (1.80)	0.200* (1.78)	0.201* (1.77)	-0.055 (-0.66)
Season 2018		0.165 (1.24)	0.143 (1.07)	0.161 (1.20)	0.175 (1.31)	0.163 (1.23)	1.74 (1.30)	-0.174* (-1.81)
Constant	32.389*** (7.28)	1.637*** (8.17)	1.621*** (8.08)	1.628*** (8.04)	1.683*** (8.34)	1.750*** (8.70)	1.674*** (8.24)	0.932*** (6.73)
Observations	60	1740	1740	1740	1740	1740	1740	1740
Effects	No	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Random
within R <sup>2</sup>		0.122	0.120	0.106	0.111	0.121	0.102	0.109
between R <sup>2</sup>		0.559	0.559	0.560	0.568	0.568	0.567	0.504
overall R <sup>2</sup>	0.28	0.093	0.093	0.081	0.086	0.096	0.078	0.111
Prob.>F or ( $\chi^2$ )	0.0000	0.0008	0.0014	0.0015	0.0023	0.0036	0.0013	0.0000

\*Ratio of change in current championship points 5 rounds forward over change in points 5 rounds back. Season dummies relative to the 2016 season. t-stats in parentheses. Column [1] minimum least-square estimation. Columns [2]–[7] panel estimation with club-fixed effects. Column [8] random effects. Championship consists of 20 teams per year, 38 rounds (every pair plays a home and an away game). This sample covers three seasons, 2016–2018, in which 29 different teams participated, as the last four teams get relegated to a lower division and substituted by the four top spots of that league.

The positive and statistically significant coefficients for the coach-change dummies in columns [2]–[4] indicate that, on average, teams do improve their performance, measured from five rounds back to five rounds forward, when coaches are changed. The coefficients indicate how much the ratio in equation (1) changes in round  $t$  (or in the three/five subsequent rounds) when there is a change in coach in that round. The average value of the dependent variable is

1.30 (standard deviation = 1.25), so the magnitudes of the coach-change impacts found in Table 1 are large. Comparison of the estimates in columns [2], [3], and [4] show additionally that the impact decreases over time. We expected this, given the nature of the dependent variable, as the improvements brought about by the change in coach make it subsequently harder to obtain subsequent improvements. Below, we consider whether this is simply reversion to the mean or whether it actually captures the effect of coach leadership.

The control variables are all statistically significant (except for some season dummies), though understanding their sign requires attention to the nature of the dependent variable, which is not final season points but rather improvements in a moving 10-round window. The variable that proxies for team quality at the start of the season is not statistically significant. This counterintuitive result is likely due to this variable not changing for a team within a season, so it is highly correlated with the team-fixed effects. When the estimation is done using random effects (see column [8]), team quality is found to have the expected positive and significant effect with no qualitative changes in the other results. Coach quality is not statistically significant under fixed or random effects. Although coaches were found to have an effect on the final season standing in column [1], they do not have an impact on the round-to-round fluctuations in team performance except when they are replaced, as captured by coach-change dummies.

The greater the number of points accumulated by any round in the season, the less likely the team is to see further improvements. This is the mean reversion at work. A team that has collected many points in the last five rounds will have a hard time improving further in the subsequent five rounds. The coefficient for home games is also negative. This seems counterintuitive, but happens because of the home game advantage (fewer than 20% of the visiting teams managed a victory). Because a home game most likely results in an increase in points,  $p_0$  in equation (1) tends to increase the denominator and decrease the numerator when it is a home game, leading to a lower index. The round dummy is positive, though it is not clear why the average level of improvement would increase *ceteris paribus* as the season progresses. Finally, the season dummies indicate only slight fluctuations across seasons.

These results suggest that leadership does make a difference in Brazilian soccer. However, there remains the concern that what we are measuring is not actually the effect of the coach, but rather that teams tend to change managers when the team is doing poorly. Since poor streaks tend to be followed by better streaks, due to mean reversion, the effect that we are

capturing may not be due to the coach, but simply a statistical effect. Columns [5]–[7] provide a test to disentangle these effects. In these runs, instead of using the actual coach-change dummies, we used placebo dummies at the point in each season when each team was having its worst performance. This is the point at which mean reversion would be strongest, so if we place a placebo coach change at this point, we would expect it to have a positive effect if mean reversion is the predominate cause of our previous results.

The results for the placebo-coach dummies are the opposite of those for the real coaches. In both columns [5] and [6], the estimated coefficients are negative and statistically significant, and that for column [7] is statistically equal to zero. These results indicate that, on average, when a team is doing poorly, it continues to do poorly, at least for the next three/five game window. Mean reversion does take place, as the coefficients in columns [5]–[7] increase from -0.7 to -0.5 to no effect, but these are still very different from the positive effects found when coaches were effectively changed. As it turns out, coach changes are not solely triggered by team performance, but probably also by a large variety of other circumstances, such as contractual clauses, team politics, the market for substitute coaches, fan pressure, press coverage, expectations, among others. All these circumstances impose costs and benefits to within-season coach changes that help to explain why, if we find that coach changes improve performance, they are not even more frequent. New leadership can improve matters, but there are transaction costs that make it hard to change leaders too frequently.

#### **b. Professional Schools and Sports Leagues: Identifying Variance in Leadership Roles Depending on an Organization's Purpose**

Our second set of tests relies on changes in rankings of business and law schools compared to changes in rankings for NFL teams. Just as NFL teams seek to improve their rankings by winning as much as possible, business and law schools seek to maximize their rankings as a function of the teaching, research, and service output of the school's members. We examine the effect of a change in leadership on the ranking of a given business, law school or NFL team. Our initial results, while only raw correlations, are directionally consistent with our theory's predictions that changes in NFL coaches are likely to result in greater magnitude of change in the team's ranking than a change in leadership for the ranking of a business or law school.

*Businessweek* magazine has ranked business schools biannually from 1988 to 2016, and yearly since 2017. We used the top 35 schools in 2017, which resulted in a data set of 426

observations. For law schools, we used the U.S. News & World Report ranking. This is a yearly ranking from 1987 to 2019. We used the top 25 schools in 2017, and when available extended it to the top 35 schools.<sup>43</sup> For the NFL coaches, we used the standings for the 1990 to 2018 seasons. The data is yearly, and we use all teams in the NFL. The data set consists of 898 observations.<sup>44</sup>

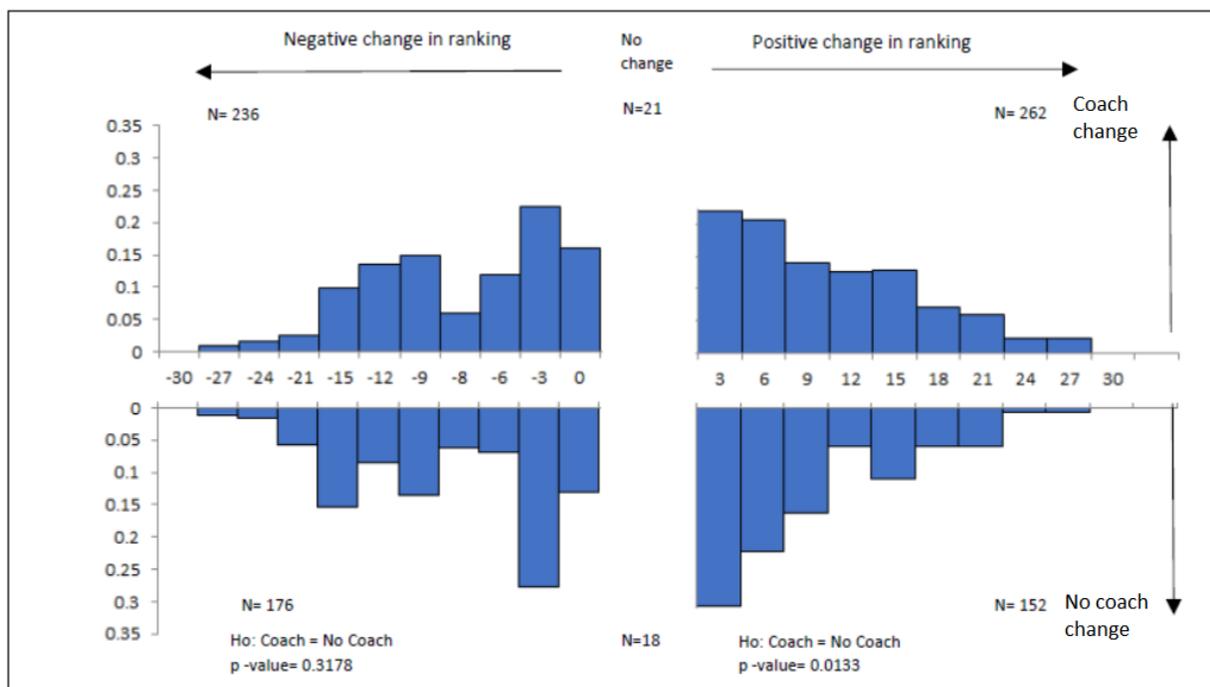
Figures 2, 3, and 4 plot the data for each of the contexts in a way that allows us to compare those schools/teams that moved up or down in the rankings when there was and when there was not a change in coach/dean. This does not allow us to make any statements about causation of leaders on performance, but it shows some associations that are consistent with our theory. Each figure has four quadrants plus two middle regions. The quadrants separate the data vertically according to whether there was a leadership change in that year, and horizontally by whether the change in rank was positive or negative. The middle section contains the observations where we observe no change in rank. We consider the treatment effect of a change in coach as a 3-year window because 3.32 was the average tenure of coaches. For Deans our treatment was 7 years which was the approximate length of their average completed terms. The histograms show how many observations in each quadrant are in each range of rank change, 0-3, 3-6, 6-9, and so on. Our main interest is to see whether there is any difference in each figure between the top half (coach/dean change) and the bottom half (no coach/dean change), and especially whether that difference varies across the graphs of the NFL teams compared to the business and law schools.

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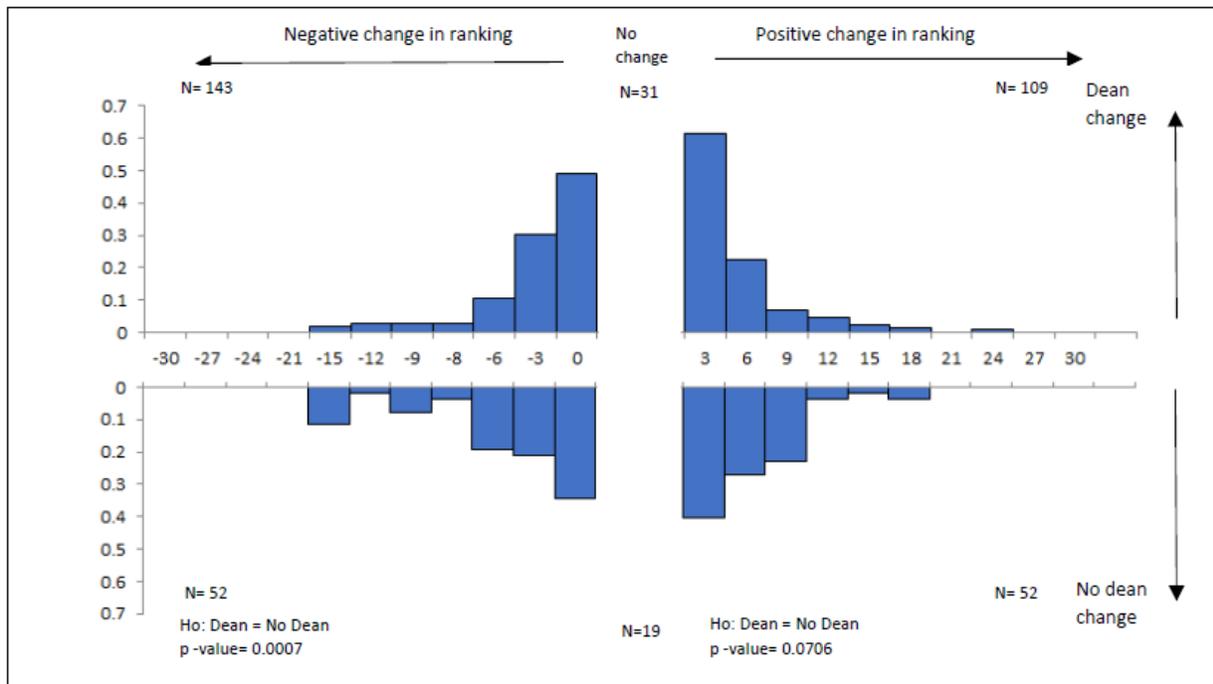
<sup>43</sup> Data can be found in the following websites: <https://7sage.com/top-law-school-rankings/> and [http://law.stanford.edu/wp-content/uploads/2015/03/lomio\\_etal-rp20.pdf](http://law.stanford.edu/wp-content/uploads/2015/03/lomio_etal-rp20.pdf).

<sup>44</sup> The data can be found at <https://www.nfl.com/standings>.

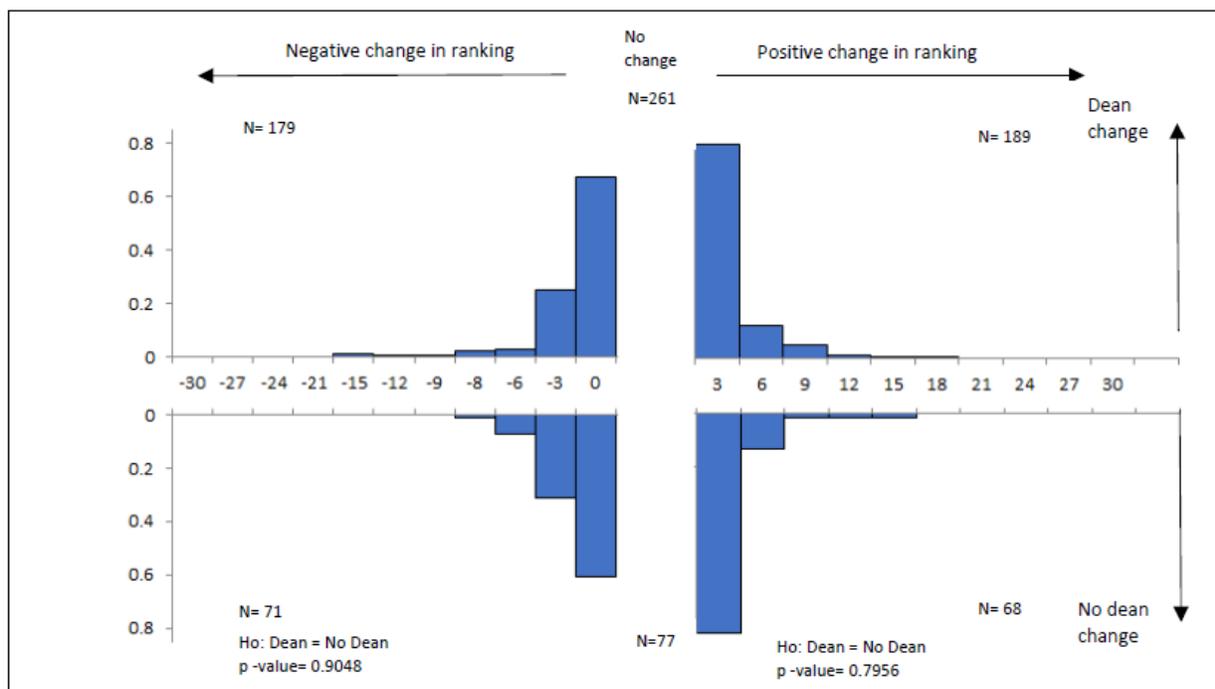
**Figure 2. NFL football, 1990–2018: Coach changes and ranking.**



**Figure 3. US business schools, 1988–2017: Changes in dean and ranking.**



**Figure 4. US law schools, 1987–2018: Changes in dean and ranking.**



The first thing to note is that there are proportionally more coach changes than there are dean changes. There was a change in coach in 25% of the coach-year observations, but only a change of dean in 12% of the dean-year observation for law schools and 13% for business schools. Because schools are different from NFL teams in many ways that we do not control here, the significantly greater frequency of changes of coaches than deans might have many causes. The observed difference is, however, compatible with the expectation of our theory that a change in leadership has a greater impact in organizations with a narrower purpose. Coaches switching at twice the rate than deans, suggests that leadership changes in the NFL team context have a more rapid impact than it does in a business or law school.

The second test involves comparing the distributions of rank changes in the upper and lower quadrants for each side of the graphs. We show the p-values for a difference-in-means test for positive and negative changes in rankings. The idea is to determine whether those observations where teams/schools changed coaches (upper distribution) are different from those where no change occurred. We find the biggest difference in NFL teams that improved in the ranking. Coach changes associated with positive moves in the rankings show a statistically significant greater improvement in the rank than those where no coach was changed.

For business schools (Figure 3), we find a statistically significant difference for negative changes and positive changes. The direction of the difference is such that changing a dean is associated with improvements in rank and not changing a dean is associated with a fall in rank. This suggests that dean changes for business schools do matter. Comparing the spread of the histograms for coaches and for business school deans, however, shows that coaches have a much greater proportion of the mass of each distribution towards the tails where there are greater jumps or falls in the ranking. This indicates that, though there is evidence of an impact of leaders in both contexts, it is bigger for coaches.

The data for law school deans in Figure 4 does not show any difference in performance in observations with or without dean changes. The figure shows that for law schools the rankings are remarkably stable with very little oscillation over time. Much of the mass of the observations is in the middle section where the schools do not change rank. Furthermore, the observations in the four quadrants are concentrated close to the center, indicating that even when changes do happen, they are small changes in rank. We are currently considering explanations for this anomalous effect.

The tests do not allow us to determine causality. It may be that coach changes tend to cause improved performance, but it may also be that teams that are doing badly tend to both change coaches and to experience mean reversal for purely statistical reasons. In any case, we found a stronger association between coach changes and performance in NFL teams than in professional schools, which fits our expectations from our theory. We plan to use a placebo method similar to the one we used for the Brazilian soccer data in the previous section to strengthen the power of these tests.

#### **IV. EXTENSIONS**

We are in the process of compiling data on Mexican soccer teams to see if our results on Brazilian soccer are robust. We are also exploring whether we can compile data from U.S. fantasy football leagues to better test the role of coaches in the NFL. We also intend to draw upon techniques from event analysis studies to provide more rigor to our initial raw correlations presented in the second test. We are well aware of the problematic nature of too strong of a causal inference based upon a change in leadership, which is a primary motivation behind our first test identifying the effect of changes in leadership. For our second test, we need better

controls for prior and subsequent trends in organizational performance before we can more rigorously argue that the causal mechanism we lay out is truly driving observed changes in rankings for NFL teams and graduate professional schools.

Furthermore, there is general value in understanding how leadership changes are likely to influence an organization in a comparative sense. Some sports research argues the impact on rankings from managers of soccer club managers is modest and less than many observers expected, given their high salaries.<sup>45</sup> Our results provide some indication that the effects of leadership changes may be more than the literature attribute to such changes. We are in the process of expanding our analysis to implications for changes in corporate leadership. In particular, can we measure the magnitude and scope of what a given company sets out to do, and predict variance or magnitude of changes in returns, because of changes in leadership? Markets do not always react identically to changes in corporate leadership. To what extent do change in CEOs drive market valuations?

In the discussion above, we only derived the importance of a leader in a given hierarchy. But, clearly specific individuals matter for success. Most biographies stress the importance of traits for the success of their subject. We agree, but need to map which traits matter the most based on the purpose of the organization. For leaders in public organization, e.g., heads of state, biographers frequently stress the role of moral authority (George Washington; Ellis 2015), coordination of the dominant network (Lyndon B. Johnson; Caro 1981, 1990, 2002, 2012), imagination (Alexander Hamilton; Chernow 2004), rhetoric (Franklin D. Roosevelt; Burns 1956, 1970), and adaptability (Deng Xiaoping; Vogel 2011). For business organizations, the traits of entrepreneurship, coordination, risk taking, and persistence stand out. Biographers of generals frequently mention courage, imagination, and adaptability. Coaches seem most akin to generals. How do we bring data to bear on the mapping of traits to excelling in achieving the purpose of an organization? Analytical narratives of outliers seem the most promising route.<sup>46</sup>

## CONCLUSION

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<sup>45</sup> According to *The Economist* (2019), a manager's impact is modest, but less than what most people presumed. The key to their study was the use of data from a video game called FIFA, which they used to rate players and estimate, which teams should have won, given their players. The difference between actual and expected they ascribed to manage.

<sup>46</sup> We most welcome comments on how to best test the role of individuals.

The study of leadership goes back to at least Aristotle and Plato. The role of individuals in shaping organizational outcomes across societies and historical periods is one as old as recorded history. Indeed, many of the instances of success that we see – coaches, prime ministers, generals, CEOs, and so forth – involved an intrinsic role for leadership that is not simply a case of great individuals making history. Leading scholars, e.g., Weber and Burns, understood this, but many works attribute too much to the individual, without understanding the organization and hierarchy in which actions take place. We need a way to distinguish between the well-understood benefits of hierarchical decision-making and the more or less effective choices made when exercising the decision rights defined by a particular organizational hierarchy.

Our analysis provides a rigorous examination of the interplay between organization and leadership. Our theory begins by recognizing that scholars of institutions and organizations have long considered the importance of hierarchy in the ability of groups to decide collectively upon a course of action. Delegated decision-making and rules about making rules both require some measure of centralization of authority in the hierarchy of public and private organizations. Authority enables organizations to increase in size and function at higher levels, which means that many institutional design questions in organizational behavior surround the appropriate allocation of decision rights to each node in a given organizational hierarchy, and how to appropriately check and balance the power of these decision rights. However, an organization that perfectly defines and enforces decision rights and constraints would have no need to be concerned with the specific individual that makes decisions within the constraints defined by the formal organizational structure. Indeed, in principle, an algorithm could do the job. Nonetheless, the importance of executive searches and elections indicates that leaders play a critical role in determining outcomes for a given organization.

This same importance poses an equally critical theoretical question: what role does a leader provide in terms of their exercise of decision rights defined by a given organization's hierarchy? Relatedly, how can interested scholars identify the effects of leadership, when outcomes are simultaneously determined by: mean reversion; the organization's hierarchy; and the specific members of the organization at a given time? We first test the effect of changes in leadership controlling for these confounding variables, and show that soccer coaches in Brazil have an underappreciated effect on team performance once we control for other relevant factors.

Our logic further defines our view of leadership as on a continuum in a comparative organizational sense. At one end of the continuum, we have a person in authority, a leader, with well-defined and enforced decision-making rights, along with rights of residual claimancy. The leader is the de jure residual claimant to policies/profits, but there are transaction costs with motivating agents to work in the interest of the principal (leader). The leader's problem in these situations is to motivate those underneath her. The motivation will entail the well-known agency costs associated with organizations. In economics, there are scores of articles addressing the issue through incentive compatible contracting and incomplete contracting. At the other end of the spectrum are organizations in which the leader holds some decision-making rights, but decisions are by no means unilateral. These are organizations whose purpose creates more hierarchy and greater size and scope, increases agency and transaction costs. In these situations, more deconcentrated decision rights result in a greater dispersion of residual claimancy to decisions. Leaders at this end of the continuum need to persuade and coordinate others over policy. The type of leadership traits needed along this continuum varies with the degree of de jure and de facto residual claimancy that the leader possesses.

While existing theories and descriptions of leadership pose the issue as a principal-agent problem, in cases where rights to decision-making within the organization are more deconcentrated, and are relatively less well defined and enforced, the problem is instead one of coordination.<sup>47</sup> In other words, in many situations, residual claimancy to policy choices within organizations creates a role for leadership that is more akin to minimizing coordination costs than it is minimizing agency costs. Which types of organizational structures determine how much of each aspect of leadership is required for success? In cases with less concentrated decision rights, a leader is someone who can overcome the coordination problems associated with de facto authority diffused among a number of individuals with different objectives. Examples are numerous, but we test for the role of individual business and law school deans in our second empirical test. In other cases, with a narrow and tightly defined structure of accountability, a leader is instead someone who can resolve the principal-agent problems associated with group leadership on behalf of a different individual or group. Examples here include military generals and sports coaches, and we examine our theory through a number of examples from the latter category in our empirical tests.

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<sup>47</sup> Riker (1986) understood this when he referred to leadership as involving the art of policymaking.

Our examination of the complex relationship between hierarchical decision-making and the exercise of leadership follows in the long-standing scholarly interest in questions of organizational structure and behavior. We argue here that leadership defines an underappreciated internal boundary of the firm, and this boundary varies in predictable ways depending on the scope and scale of an organization's purpose. More specifically, as the scale and/or scope of purpose increases, this results in less concentration of decision rights within the organizational hierarchy, which in turn implies less variance as a result of leadership changes. In our second test, we provide initial results consistent with this hypothesis, showing considerably less variation in outcomes when leadership changes in professional graduate schools as compared to NFL teams.

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