The Value-Sharing Diamond: A Synthetizing Framework to Describe the Allocation of Gains and Losses among Stakeholders

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ABSTRACT

Using data on 16 airlines over four decades, we examine the interplay of value creation and its appropriation by the firm's stakeholders. We introduce the value-sharing diamond—a synthesizing framework that describes the distribution of returns and risk among stakeholders—to interpret empirically observed patterns of value appropriation and link them to theoretical models. Applying the VCA model annually to the airline data, we find that economic gains are shared among multiple stakeholders, but economic losses are largely borne by capital. Interpreted using the diamond framework, these asymmetric patterns are neither fully consistent with a model of perfect competition with capital as the sole residual claimant, nor do they fully reflect a model of equal sharing among multiple residual claimants.

Keywords: VCA model; Stakeholders; Value creation; Value appropriation; Airline industry

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INTRODUCTION

Strategy scholars have long been interested in the question of how the value created in a firm is distributed among its stakeholders (e.g., Coff 1999; Bowman & Ambrosini 2000; Harrison, Bosse, & Phillips 2010; Chatain & Zemsky 2011; Lieberman, Garcia-Castro & Balasubramanian 2017; Lieberman, Balasubramanian & Garcia-Castro 2018; Barney 2018; Stoelhorst 2023). Most economics-based perspectives have considered shareholders as the residual claimants of the firm's economic profit, leading to a focus on shareholder returns, assessed using finance- or accounting-based performance measures. Increasingly, however, scholars and business leaders have emphasized the need to adopt a broader perspective and more carefully consider other stakeholders, including customers, employees, suppliers, and communities (Barney 2018, 2020; Business Roundtable 2022; McGahan 2021, 2023; Bridoux & Stoelhorst 2022b; Bacq & Aguilera 2022; Lieberman 2023).

Such recent work has expanded our understanding, but two critical gaps remain. First, we lack empirical studies; research on value creation and appropriation has been almost entirely theoretical. While such work provides a conceptual foundation, a deeper strategic consideration requires empirical insights into stakeholder gains and losses (beyond returns to shareholders, on which the evidence is vast).[1] This is important, as incorporating multiple stakeholders theoretically yields varied—and potentially indeterminate—patterns of returns. The empirical literature to date has been sparse and tends to focus on returns to individual stakeholder groups, such as employees (e.g., Ramirez & Tarzijan 2018) and consumers (Koopmans & Lieshout 2016). Although some recent studies analyze multiple stakeholders (e.g., Lieberman et al. 2017; Kern & Gospel 2020), we still lack basic empirical characterizations such as how gains to

[1] We use "returns" interchangeably with "gains" to denote value captured by stakeholders.

various stakeholders correlate with each other. Empirical progress has been impeded by a lack of measurement approaches that simultaneously incorporate multiple stakeholders (Barney 2020; Lieberman 2023), a problem that the VCA model (Lieberman et al. 2017, 2018) aims to address.

A second gap relates to the absence of an applied framework to help synthesize empirical patterns of value appropriation. Without such a synthesizing framework, it is hard to understand and interpret observed patterns of returns and potentially link them to theoretical models of value appropriation presented in the literature. Moreover, while prior research has extensively examined how economic gains are allocated among stakeholders, little attention has been paid to how risk is distributed. This oversight is significant, as similar realized returns across stakeholder groups may conceal substantial differences in their exposure to the risk associated with the firm's value creation strategy. Notably, the distribution of gains and losses is not always symmetric; some stakeholders may disproportionately bear losses while others capture a greater share of gains. For example, powerful stakeholders may demand residual claims to value gains while forcing weaker stakeholder groups to become residual claimants of value losses. As such, evaluating stakeholder returns without concurrently examining how risk is allocated offers an incomplete view of value appropriation and obscures which stakeholders function as residual claimants in the firm's value creation process.

We address this gap by developing a novel synthesizing framework that we call the "value-sharing diamond." This descriptive framework enables a better understanding of the match between empirically observed patterns of value appropriation and the patterns theoretically predicted by some commonly discussed models of stakeholder interactions (e.g., Friedman 1970; Freeman 1984; Coff 1999; Harrison et al. 2010; Bridoux & Stoelhorst 2014; Barney 2018; Stoelhorst 2023). The diamond framework characterizes each stakeholder within a two-dimensional space defined by the stakeholder's value appropriation and its assumption of risk. The latter is conceptualized as the extent to which the stakeholder's payoff is contingent on the firm's value creation outcomes—specifically, how much of the firm's upside and downside the stakeholder absorbs.[2] These dimensions can be linked to two theoretical concepts that have been emphasized in the stakeholder and resource-based theory (RBT) literature: the stakeholder's bargaining power (e.g., Coff 1999; Stoelhorst 2023) and its residual claimancy on the firm's economic profits (e.g., Barney 2018). Thus, the framework helps to *jointly* describe the allocation of *value* and *risk* among stakeholders, making it apparent that these can be asymmetrically allocated among stakeholders.

After introducing the value-sharing diamond framework, we implement it empirically by applying the VCA model (Lieberman et al. 2017, 2018) to annual data on 16 US airlines over nearly four decades from 1980 to 2019. The VCA model is a method that allows a simultaneous examination of dynamic value creation and its distribution to stakeholders in the value chain, albeit within some constraints and assumptions. Whereas prior VCA studies (Lieberman et al. 2017, 2018; Kern & Gospel 2020) have made their calculations across decades to capture trends, this study utilizes VCA estimates of year-to-year changes in value creation and stakeholder returns. By assessing the VCA estimates within the value-sharing diamond framework, we gain insights into patterns of value creation and appropriation in the US airline industry.

By helping to fill these two important gaps, our inquiry and findings contribute to the strategic management literature. First, we contribute theoretically by introducing our novel

[2] Different definitions of risk exist in the literature. Some scholars define risk as exposure to potential losses, while others define it as the variability of returns, which can be gains or losses. For a recent review of the usage of the two definitions, see Arteaga-Fonseca, Rutherford, Phillips, and Hill (2024). In our study, we adopt the latter perspective and conceptualize risk as the extent to which the stakeholder's returns are not fixed but fluctuate with the value creation outcome of the firm, which could imply gains and losses.

framework—the value-sharing diamond—to facilitate comparisons between empirical estimates of value appropriation and the theoretical models in the literature. The framework provides one way of quantifying the allocation of value and risk among stakeholders based on key dimensions drawn from RBT and stakeholder studies. The framework emphasizes that in addition to a "value pie" to be allocated among stakeholders, which has received much attention in the literature, there is also a "risk pie" to be allocated. Since the allocation of the first does not necessarily imply the allocation of the second, a tool that helps to visualize both can be valuable for scholars and practitioners. While our framework is merely descriptive and not explanatory (i.e., it can help a researcher visualize the value appropriation profiles but not uncover the reason why a stakeholder has a specific profile), in the discussion we provide possible directions for future researchers interested in uncovering underlying causal links.

Empirically, we contribute by extending work on the VCA model and examining co-movements of stakeholder returns and their connection with value creation. Our study documents how and why value creation may diverge from value captured by stakeholders in general and by shareholders in particular. In this regard, we go beyond previous studies, such as Lieberman et al. (2017) and Kern and Gospel (2020), by looking at correlational patterns emerging from a relatively large sample. The resulting findings provide novel empirical evidence on the co-movements of stakeholder returns and, more broadly, on the interplay of value creation and value appropriation. This evidence can help answer, albeit in one industry context, some fundamental questions, such as how gains to various stakeholders are correlated and whether this is contingent on value creation. Answers to these questions can help us better relate firm behavior to strategic management theory and potentially aid in refining theory further.

While the demonstration of these empirical patterns contributes to our understanding of value creation and appropriation, they are more insightful when seen through the value-sharing diamond. For instance, we find that in the context of the airline industry, economic *gains* have been shared among multiple stakeholders, but economic *losses* have been largely borne by shareholders. Within that framework this appears inconsistent with shareholders being the sole residual claimant operating in competitive markets with no adjustment costs (as assumed in neoclassical economics-based models). Nonetheless, shareholders remain the main residual claimants of airlines' value creation, sharing only a small portion of the risk with employees.

ALTERNATIVE MODELS OF VALUE APPROPRIATION AND INTER-STAKEHOLDER INTERACTIONS

Before introducing our framework, we briefly discuss some common models of stakeholder interactions in the literature. The value created in the context of a firm flows to multiple stakeholders, which can be grouped into two broad categories (Lieberman 2023): those located within the firm's value chain (shareholders, employees, suppliers, and customers) and those outside (e.g., local communities and the broader society). Outside the value chain, value is distributed between the firm and its stakeholders through positive or negative externalities (e.g., the positive effect of increased employment on a local community, or the negative effect of industrial pollution). Within the value chain, value is defined by the sum of the surplus to the firm's customers and the firm's economic profit, where the latter equals the difference between the firm's revenues and the opportunity cost of the inputs used (e.g., Brandenburger & Stuart 1996; Barney 2018). Efficiency improvements in the firm create economic value to be distributed among stakeholders in the value chain (e.g., Lieberman et al. 2017, 2018), whereas losses in efficiency (e.g., due to poor strategic choices) destroy economic value, and such losses are absorbed by stakeholders.[3]

Numerous models of value appropriation have been proposed in the literature. In Table 1, we organize these into three broad categories: (1) models with shareholders as the sole residual claimants of economic profits, (2) bargaining power models, and (3) pie-sharing partnerships.

[Insert Table 1 about here]

Shareholders as sole residual claimants of economic profits. The most common economic theories of how value is appropriated by stakeholders inside the value chain view the firm as a nexus of contracts among input providers (e.g., Jensen & Meckling 1976). In the strictest interpretation, these models view shareholders as the sole residual claimants of the firm's economic profits, obtaining whatever value is left after all input stakeholders receive their payment based on the equilibrium market price in their respective input markets (Friedman 1970). The structure of the market of each stakeholder affects the equilibrium price that ultimately determines the value that each stakeholder appropriates. Although many different market structures are possible, for our purposes, we can classify them into three broad variants (row 1 of Table 1).

In the first stylized variant, the firm (and by extension its shareholders, which are its sole residual claimants) is a price-taker in all markets, and the value-creation efforts by the firm do not affect market prices (i.e., there are no spillovers among competing firms). In this context, all stakeholder groups except shareholders pay or receive the market price for their contributions, and shareholders receive all value created (gains in efficiency) and bear all value losses (drops in efficiency). The gains to shareholders in this case are due to firm-specific efficiency or Ricardian

[3] Theoretically, value can be created or destroyed also if efficiency is kept constant when the customer's willingness to pay or the opportunity cost of inputs changes. However, such changes are difficult to measure empirically. For example, these changes cannot be captured with the VCA model (see Lieberman et al. 2017, 2018). In the historical context of the airline industry, most value creation has come from improvements in efficiency rather than increases in customer "willingness-to-pay."

rents (e.g., Hopenhayn 1992; Peteraf 1993). This stylized model implies that value creation is positively correlated with shareholder returns (both in the case of value creation and value losses) but is not correlated with returns to other stakeholder groups. Similar correlations would emerge in a Bertrand competition model where firms compete on price: the firm with the lowest marginal cost sets the price slightly below the lowest marginal cost among competitors; any additional gains or losses in the firm's efficiency generate gains and losses to the firm's shareholders (e.g., Tirole 1988).

In the second stylized variant, the firm is a price-taker in all markets, but the value creation efforts by the firm spill over instantly to competitors (i.e., with no adjustment costs). This case corresponds to the theoretical definition of perfect competition. All stakeholder groups except shareholders pay or receive the market price for their contributions, shareholders bear all value losses, and consumers receive all value created. This structure implies that value creation is positively correlated with returns for consumers but not correlated with returns to other stakeholder groups, while value losses are positively correlated with losses to shareholders but not correlated with returns to other stakeholder groups.

In the third stylized variant, the firm has market power in some input or output markets. In this case, the firm has the power to set market prices and accrues some market power rents (e.g., through a monopoly, oligopoly, or monopsony). Shareholders split value creation and losses with stakeholders in markets where the firm has market power (e.g., with consumers in a Cournot duopoly). The division depends on market power (e.g., consumers get a larger share of value creation in markets with more elastic demand curves). This structure implies that value creation is positively correlated with returns for stakeholder groups where the firm has market power, both in the case of value creation and value losses.

Bargaining power models. The strategy literature, particularly the literature on the RBT and stakeholder theory, departs from the assumptions of the standard economic theory model. Barney (2018) establishes that the RBT is logically inconsistent with a shareholder supremacy model of profit appropriation in which shareholders are the sole residual claimants of the firm's economic profits. Indeed, while some resource providers may be compensated with fixed claims, those providing resources capable of generating economic profit must be rewarded, at least partially, with residual claims. This is because the latter type of resources involves co-specialized investments; therefore, their provision cannot be governed by complete contracts. Thus, Barney (2018) highlights that accepting that economic profits stem from the firms' resources implies accepting that the stakeholders (other than shareholders) providing those resources are residual claimants of the firm's economic profit.

Hence, according to the RBT, multiple stakeholders should be exposed to the firm's upsides. Along these lines, scholars have emphasized that the allocation of residual claimancy of the firm's economic profits to stakeholders other than shareholders has key strategic implications. In particular, the award of residual claimancy on the firm's upsides is key to retain and attract stakeholders that allow the firm to continue creating value and sustain its competitive advantage (e.g., Bosse, Phillips, & Harrison 2009; Harrison, Bosse, & Phillips 2010; Porter & Kramer 2011; Bridoux & Stoelhorst 2014; Tantalo & Priem 2016; Boaventura, Bosse, de Mascena, & Sarturi 2020; Jourdan, Kivleniece, & McGahan 2022; Martin & Phillips 2022).

Another key tenet in the strategy literature is that the appropriation of value by stakeholders is determined through bargaining. Various models of stakeholder value appropriation acknowledge the existence of stakeholder bargaining power and conceptualize the firm as a "marketplace" where stakeholders bargain with each other to appropriate value (e.g., Coff 1999, 2010; Di Gregorio

2013; Bridoux & Stoelhorst 2014; Mitchell et al. 2016; Barney 2018; Stoelhorst 2023).

Klein et al. (2019) highlight that some stakeholders have a greater influence on the firm's governance, including the allocation of value, because they contribute resources that are central to the firm's value creation. These stakeholders are known as "enfranchised stakeholders." Furthermore, studies (e.g., Coff 1999) have noted that in the presence of such inter-stakeholder bargaining, while firms may create value, value creation may not always be reflected in shareholder returns. For instance, employees or powerful suppliers may be able to capture a large share of the value created in the firm. In such cases, we may observe that the firm's financial performance–which measures the shareholders' returns–does not improve even though it is successful at creating value for other stakeholders. Conversely, a firm (and its shareholders) may be able to use its bargaining position to extract value from its consumers and suppliers without creating any value.

Stoelhorst (2023) clarifies that bargaining takes two distinct forms: "competitive bargaining," determined by market competition and equilibrium prices, and "pure bargaining," in which market forces can only determine an interval of possible value allocations, and the final allocation is determined through other non-market forces. The latter include bargaining skills but also sociopolitical processes, including informal institutions and formal institutions. For instance, cultural norms may require "fair" redistribution of gains among stakeholders (Agle, Mitchell, & Sonnenfeld 1999; Bosse et al. 2009; Bridoux & Stoelhorst 2014). The national or industry-specific institutional context can also shape the extent to which gains and losses are shared among stakeholders, and some of the cultural norms governing the redistribution of gains can be formalized into laws and regulations (Ramirez & Tarzijan 2018; Kern & Gospel 2020). In this context, the firm is conceptualized as a governance structure to facilitate cooperation among stakeholders and help resolve this bargaining (Bridoux & Stoelhorst 2022a; Stoelhorst 2023; Stoelhorst & Vishwanathan 2024).

These models are labeled "bargaining power models" in Table 1. Overall, they encompass a broader class of models than those of the standard economic theory and allow for more flexible processes of bargaining and competition, with multiple residual claimants of the firm's economic profit. Typically, these models envision a two-step process of value creation followed by value appropriation (e.g., MacDonald & Ryall 2004). The allocation of value created to different stakeholder groups is based on an interplay of "competitive bargaining" and "pure bargaining" (Stoelhorst 2023), and stakeholders with higher bargaining power will appropriate a larger share of the value created (e.g., Barney 2018; Coff 1999; Stoelhorst 2023). Notably, the allocation of value losses (i.e., efficiency losses) is typically not explicitly addressed in these models. These models imply that the correlations among values appropriated by different stakeholders, and the extent to which they vary with the extent of value creation, depend on the specific context.

Pie-sharing partnerships. A final, theoretically relevant set of models are labeled "pie-sharing partnerships" in Table 1. In these models, multiple, possibly all, stakeholders are residual claimants, and value created and lost are distributed to residual claimant stakeholder groups based on their share in and contribution to the partnership (e.g., Weitzman 1986; Hennart 1988; Blinder 2011). As an example, "general partnership" businesses in the United States, where partners are responsible for the business and are subject to unlimited liability for any debts, include many of these features.[4] Such partnerships imply that the value appropriated by different stakeholder groups is positively correlated with each other and with the total value creation: either all residual

[4] https://corporatefinanceinstitute.com/resources/valuation/general-partnership/; retrieved Feb 24, 2025.

claimant groups receive positive value, or all accrue value losses, with the division governed by each group's share in the partnership.

In sum, the literature describes several models of stakeholder value appropriation that imply different correlations among stakeholders' gains and losses. Moreover, some models imply asymmetric value appropriation patterns between the case of value creation and value losses. Yet, most of this literature is theoretical. While there are some valuable empirical contributions on stakeholder value appropriation, they are focused on specific stakeholder groups (e.g., Koopmans & Lieshout 2016; Ramirez & Tarzijan 2018), and therefore we lack empirical descriptions of the overall value appropriation patterns by multiple stakeholders. Understanding which model of stakeholder value appropriation best fits the data is an empirical question that can only be answered by examining a sample of stakeholder returns and considering all stakeholders in the value chain.

Crucially, in this regard, examining how value appropriation patterns relate to the extent of value creation is important because it provides an answer to another fundamental question regarding the allocation of risk among stakeholders. Models of stakeholder value appropriation often conceptualize the value created by the firm as a "pie" to be split among stakeholders. If value appropriation patterns are symmetric in the case of gains and losses, the allocation of value then also determines the allocation of risk among stakeholders (conceptualized as the extent to which a stakeholder's returns vary with the firm's value creation outcome as opposed to being fixed). For example, in an equal partnership between two stakeholders, each would appropriate 50% of the gains and 50% of the losses and therefore bear an equal share of the firm's risk. If gains and losses are allocated asymmetrically among stakeholders, the allocation of value and risk may differ among stakeholders. Some stakeholders may attempt to hedge against risk by reducing their exposure to the firm's losses and making others bear them. Notably, some theoretical predictions in the context of gains may be reversed in the presence of losses. For example, we could expect that stakeholders with more bargaining power would use their power to become residual claimants of the firm's gains and thus predict a positive correlation between bargaining power and residual claimancy. Yet, in the case of losses, bargaining power may allow a stakeholder to allocate losses to weaker stakeholders, thus forcing them to become residual claimants. This would imply a negative correlation between bargaining power and residual claimancy. Contractual relations may also lead to such asymmetries; for example, many companies offer profit-sharing programs that reward employees when accounting profits are positive but revert to a fixed wage when profits are negative.

Overall, firms' strategies, almost by definition, involve uncertainties, and while successful strategies generate economic gains, unsuccessful ones generate economic losses. Losses can also arise, at least in the short run, when a firm is buffeted by macroeconomic fluctuations and industry downturns. Observing to what extent the allocation of the "value pie" among stakeholders varies with the extent of value creation can provide important information regarding the allocation of the "risk pie" among stakeholders.

A SYNTHESIZING FRAMEWORK: THE VALUE-SHARING DIAMOND

The above discussion suggests that, in any empirical context, it is important to ask to what extent a stakeholder's value appropriation depends on the extent of value creation in the firm. Given that the allocation of gains and losses is likely to be asymmetric among stakeholders in many situations, a framework that explicitly considers these asymmetries can be helpful to summarize and compare observed empirical patterns with theoretical models of appropriation. To characterize the allocations of value and risk among stakeholders can be similarly insightful.

We develop our framework in this section. We do so in two steps. First, we consider four limiting cases of allocations of gains and losses. Second, we derive the theoretical dimensions of our framework by comparing these four limiting cases. We conclude by relating the models illustrated in Table 1 to this framework.

Framework derivation

Firms' strategies involve risk and may generate gains as well as losses, defined, respectively, as the additional value created (e.g., due to efficiency improvements) and destroyed (e.g., due to efficiency losses) relative to the previous period.[5] Let's consider a focal stakeholder that appropriates share s_p of the additional value created by the firm (in case of positive value creation) and bears a share s_n of value destroyed by the firm (in case of negative value creation) after all the fixed claims of the firm have been paid out. Each such combination (s_p, s_n) can be represented as a point in the square in Figure 1, which represents possible allocations of gains (x-axis) and losses (y-axis) to the focal stakeholder. Based on this, we can define four important pairs {(0,0), (1,0), (0,1), (1,1)} that we label "theoretical corner cases." The pair (0,0) denotes the case of a perfectly *fixed claimant* that does not receive any share of the additional value created or lost. In this case, the stakeholder is not a residual claimant of the firm and receives a fixed payment (value transfer) irrespective of the value creation of the firm (this is likely to be the case, for instance, for debt providers). The opposite pair is (1,1), which corresponds to the case of a *full residual claimant* that has complete ownership of value creation, obtaining all gains and bearing all the losses. Note that since value includes both consumer surplus and the firm's economic profit, the *full residual claimant* has complete residual claimancy on the total amount of incremental value created by the firm during the period under examination, not only on the

[5] Hence, in line with Lieberman et al. (2017, 2018), we define value creation in a dynamic sense, considering changes relative to the previous period.

firm's economic profits (e.g., as shareholders in the standard neoclassical economic models).[6] The pair (1,0) reflects a case of complete value extraction, akin to an *exploitative dictator*, in which the focal stakeholder has enough bargaining power that allows it to appropriate all the gains and make other stakeholders bear all the losses. The opposite pair is (0,1), which, like a *powerless pawn*, has no bargaining power: this stakeholder cannot appropriate any of the gains and simply bears all the losses. Besides these corner cases, another theoretically important case is one of equal sharing among multiple residual claimants, which in a two-stakeholder case would correspond to (0.5, 0.5). Taken together, these five points establish theoretically important "landmarks" in the landscape, against which we can compare empirical estimates.

[Insert Figure 1 about here]

Figure 1 also has implications regarding the distribution of risk. Consider the corner points that are diagonally across from each other in the square. What distinguishes the *fixed claimant* from the *full residual claimant* is the exposure to the upsides and downsides of the firm: while the *fixed claimant* receives a fixed value transfer regardless of the value creation, the *full residual claimant* receives value transfers that are entirely contingent on the firm's value creation outcomes and therefore bears the firm's risk entirely. Hence, what differentiates the stakeholder's alternative positions along this diagonal is the exposure to the firm's risk. Along the other diagonal, what distinguishes the *exploitative dictator* from the *powerless pawn* is their ability to appropriate gains and make other stakeholders bear the losses. Thus, this second diagonal reflects the stakeholder's bargaining power vis-à-vis the other stakeholders.

[6] Note that in the standard neoclassical economic models, residual claimancy is defined on the firm's economic profits, which exclude consumer surplus (Friedman 1970; Barney 2018). With this definition, consumers can never be residual claimants. Given our focus on the whole value chain, we extend the definition of residual claimancy to include the total value created, which includes consumers. For example, consumers receiving constant surplus, e.g., in a regulated industry with fixed prices, would be fixed claimants. Conversely, consumers have residual claims when firms change prices and consumer surplus varies with the firm's value creation.

We make these two elements—the allocation of *value* and the allocation of *risk*—as the key dimensions of our framework and re-render Figure 1 accordingly. Specifically, we derive our diamond by rotating the square in Figure 1 anticlockwise by 45° and recentering it around the (0.5, 0.5) point, which is the "equal sharing" point for the two-stakeholder case. The value-sharing diamond is represented in Figure 2. The significance of the rotation is that it makes the axes directly relatable to the dimensions of risk and return. As a stakeholder moves upward on the vertical (risk) axis, the stakeholder is entitled to a greater share of *both* gains and losses. Thus, this dimension measures the extent to which the stakeholder is a residual claimant on the firm's value creation and, therefore, the extent to which its value appropriation varies with the firm's value creation outcome as opposed to being fixed. As the stakeholder moves along the horizontal axis, from the *powerless pawn* to the *exploitative dictator* position, the allocation of value to the stakeholder increases as the stakeholder appropriates a greater share of the gains and makes other stakeholders absorb a greater share of the losses. Thus, the average returns of the stakeholder increase along this dimension.

[Insert Figure 2 about here]

It is worth emphasizing two points here. First, note that both the risk and the value associated with the firm's strategy have to be allocated entirely to stakeholders. For example, in the case of two stakeholders, if one occupies position (0.3,1), the other should occupy position (0.7,0). Hence, both the risk dimension (vertical axis) and the value dimension (horizontal axis) can be thought of as "pies" that need to be split entirely among stakeholders. If one stakeholder reduces its risk exposure, some other stakeholder must bear more risk. The same logic applies to the value dimension. Second, a stakeholder may be outside the diamond because there is no theoretical restriction on the extent of gains or losses accruing to a stakeholder. In particular, if a stakeholder's returns are more than 100% of the value created or destroyed, its position will be outside the square, since s_p and s_n may be greater than one.

Locating stakeholder value appropriation models in the diamond

The diamond can be used to represent the alternative models of value appropriation described in Table 1. Consider the neoclassical economics model (Friedman 1970; Jensen & Meckling 1976) with capital as the sole residual claimant of the firm's economic profit and no spillovers. If the firm is a price-taker in all markets and benefits from Ricardian rents (Hopenhayn 1992; Peteraf 1993), capital receives all value created (Ricardian or efficiency rents) and bears all value losses (drops in efficiency), while all other stakeholder groups pay or receive the market price for their contributions. Thus, capital occupies the *full residual claimant* position, while all other stakeholders are in the *fixed claimant* position. Similarly, the winning firm in a Bertrand competition model occupies the *full residual claimant* position, while all other stakeholders occupy the *fixed claimant* position.

In contrast, if the firm operates in perfectly competitive input and output markets with no adjustment costs (that is, entry is instantaneous as are spillovers of any value-creating innovations), capital has no market power. When value is created by a firm through an innovation, competitors immediately copy that innovation, and all the gains flow to consumers; however, when value is destroyed, shareholders bear all the losses. Hence, in this case, capital is in the *powerless pawn* position, consumers are in the *exploitative dictator* position, and other stakeholders are in the *fixed claimant* position. Increases in market power in input or output markets allow capital to move from the *powerless pawn* position and split value creation and losses with stakeholders in markets where the firm has market power (the exact division depends on the elasticity of demand and supply curves).

With bargaining power models, the firm can have multiple residual claimants (Barney 2018), and the division is obtained through bargaining (e.g., Stoelhorst 2023). The diamond can be especially helpful in describing value appropriation patterns in these models since, unlike with neoclassical economics models, the allocations of gains and losses are not described as equilibrium outcomes. Stakeholders may occupy different positions depending on the context. Stakeholders with greater residual claimancy on the firm's value creation occupy higher positions along the vertical axis. The horizontal axis measures each stakeholder's value appropriation vis-à-vis others and therefore measures its bargaining power. Note that following Stoelhorst (2023), such bargaining can be in the form of "competitive bargaining" (determined by market competition and equilibrium prices) or "pure bargaining" (determined by non-market forces, such as formal and informal institutions).

The diamond can also represent pie-sharing partnerships. In this case, each stakeholder in the partnership occupies a position on the vertical axis and obtains an equal share of gains and losses (e.g., a partner with a 50% share will be at the intersection of the axes). For example, the vertical axis can be used to describe cooperatives, where members and resource providers are also the consumers of the products or services produced based on fixed shares.

In sum, the diamond can be helpful in visualizing the allocation of value and risk among stakeholders and benchmarking their position against theoretical models discussed in the literature. In the next sections, we use the VCA model (Lieberman et al. 2017, 2018) to derive empirical estimates on the value creation and appropriation of stakeholders in the U.S. airline industry, and use the diamond framework to benchmark these estimates against the theoretical models illustrated in Table 1.

SAMPLE AND METHODOLOGY

Airline data and VCA measures

Our sample covers U.S. mainline passenger airlines over the period 1980–2019.[7] We end our sample in 2019 to avoid the disruption to air travel caused by the Covid-19 pandemic, which began in early 2020. We sourced airlines' data from 10-Ks and annual reports.[8] Using these data, we apply the VCA model (Lieberman et al. 2017, 2018) to assess the total value created in each year relative to the previous year, and the distribution of that value among the firm's value chain stakeholders, including shareholders, employees, suppliers, and customers.

Thus, our measures capture the annual change in economic value and the appropriation of that value by stakeholders. More specifically, by applying the VCA model to the airline data we obtain a measure, VT, of the percentage change in total economic value created by the airline relative to the previous year, as well as measures of change in the value appropriated by consumers (VC), employees (VL), fuel suppliers (VF), other suppliers (VM), and shareholders (VK). Below, we describe the computation of our measures. A broader introduction to the VCA model is included in Lieberman et al. (2017, 2018).

Total value created. The annual measure, VT, is an estimate of the additional value created by the airline relative to the year before, expressed in percentages. Intuitively, this variable reflects the additional output created, typically due to innovations and operational improvements, using the same level of resources. In the airline industry, it is essentially equivalent to the change in the airline's total factor productivity. VT is computed as:

$$VT = \Delta Y/Y - s_L(\Delta L/L) - s_F(\Delta F/F) - s_M(\Delta M/M) - s_K(\Delta K/K),$$

[7] The sample includes American Airlines, America West, AirTran, Alaska, Allegiant, Continental, Delta, Frontier, Hawaiian, JetBlue, Northwest, Southwest, Spirit, US Airways, United, and Virgin.
[8] For recent years, we obtained the digital copies from companies' websites and other online sources (e.g., Mergent Online, Lexis Nexis, ProQuest Historical Annual Reports, etc.). When old annual reports or 10-Ks were not available online, we obtained physical or microfiche copies from library archives.

where $\Delta Y/Y$, $\Delta L/L$, $\Delta F/F$, $\Delta M/M$, and $\Delta K/K$ are the percentage changes[9] in, respectively, total output (Y, measured with revenue passenger miles (RPM)), number of employees (L), gallons of fuel consumed (F), materials and services purchased (M, measured with available seat miles (ASM)), and capital employed (K), and s_L, s_F, and s_M, and s_K are the shares of employees, fuel suppliers, other suppliers, and capital, respectively, in the total operating revenues, averaged between the year and the year before. Specifically, the share of employees is wages and benefits divided by revenues, the share of fuel suppliers is the total cost of fuel divided by revenues, the share of other suppliers is computed by dividing all operating expenses items not imputable to the other stakeholders[10] divided by revenues, and the share of capital is computed as one minus the other shares. Throughout, we adjust all nominal dollar amounts for inflation using the GDP deflator from the US Bureau of Economic Analysis to get real amounts.

Value appropriated by consumers. The value appropriated by consumers (labeled VC) is given by $-\Delta p/p$, where $\Delta p/p$ is the percentage change from the previous year in the revenues per unit of output. The revenues per output unit is computed by dividing real revenues by RPM.

Value appropriated by employees. The value appropriated by employees (VL) is computed as $s_L \times \Delta w/w$, where $\Delta w/w$ is the percentage change from the previous year in the inflation-adjusted wages and benefits per employee.

Value appropriated by fuel suppliers. The value appropriated by fuel suppliers (VF) is given by $s_F \times \Delta f/f$, where $\Delta f/f$ is the percentage change from the previous year in the inflation-adjusted cost of a gallon of fuel.

Value appropriated by other suppliers. The value appropriated by other suppliers of

[9] Percentage changes are measured in log-differences (multiplied by 100) as in Lieberman et al. (2017).
[10] We subtract from the operating expenses all employee-related costs (used to compute s_L), fuel costs (used to compute s_F), and items imputable to capital (e.g., depreciation, amortization, impairment losses, gain or losses on asset dispositions, government grants, etc.).

materials and services (VM) is computed as $s_M \times \Delta m/m$, where $\Delta m/m$ is the percentage change from the previous year in the operating expenses not imputable to the other stakeholders per unit of input (measured as ASM), adjusted for inflation. Some of the main expenses in this category include maintenance, landing fees, aircraft rentals, and selling expenses. Online Appendix A reports additional details on the categories of expenses captured by VM.

Value appropriated by shareholders. The value appropriated by shareholders (VK) is the difference between the total value created (VT) and the value appropriated by other stakeholders (VC, VL, VF, and VM).[11]

Lastly, to ensure that our inference is not driven by possible outlier effects, we winsorize the VCA components (VC, VL, VF, VM, and VK) at the 2nd and 98th percentiles. We then recompute VT by summing the winsorized components.[12] Results are qualitatively similar using alternative winsorization thresholds (e.g., the top and bottom 1% or 5% of the observations) or using the unwinsorized variables.

Value creation and appropriation: Descriptive statistics

The descriptive statistics and correlation matrix of estimates of value creation and appropriation are reported in Tables 2 and 3, respectively. Table 2 shows an average annual value creation (VT) of 1.82%. Thus, on average, airlines were creating about 1.82% more economic value each year compared to the previous year. Compounded, this implies that over the 1980–2019 period, airlines more than doubled the extent of economic value creation.[13] The main

[11] While our measure of value appropriated by shareholders is based on the VCA model, in Online Appendix D we provide evidence that VK correlates strongly with traditional financial performance metrics, in particular, firms' stock market returns and returns on sales.
[12] A property of the VCA model is that the sum of the VCA components equals VT (i.e., the sum of the value appropriated by stakeholders equals the total value created). Winsorizing VT would cause VT to differ from the sum of the components for some observations. Hence, we recompute VT as the sum of the winsorized components.
[13] The VCA estimates, in general, represent the value created per unit of output. Thus, they ignore the value created via the expansion of output as the airline industry grew over time.

sources of value creation in the airline industry are increased utilization of aircraft (load factor), enhanced fuel efficiency, and growing labor productivity. These are plotted in Figure B1 in Online Appendix B. All three improved substantially over the period of our sample. Table 2 shows that the main beneficiaries of the overall value creation were consumers (VC, gaining 1.47% per year on average), followed by employees (VL, gaining 0.55% per year). Also notable in Table 3 are some large correlations, particularly between total value creation and returns to capital (0.51) and between the returns to fuel suppliers and returns to consumers (–0.47).

[Insert Tables 2 and 3 about here]

The flow of value can be more easily seen in Figure 3, which presents a visualization of the average annual value flows using a Sankey diagram. In this figure, value flows from left to right with the width of the channels representing the size of the flow. Three sources contributed to the "pot' of value available for distribution to stakeholders, the largest being the value creation of 1.82% per year discussed above (blue channel). In addition, two stakeholder groups, shareholders and other suppliers (e.g., travel agents), lost value on average (red channels), with that lost value becoming available for distribution to other stakeholders. Together, this pot of value available (2.25% per year; central bar) was then distributed to three stakeholder groups—consumers, employees, and fuel suppliers (green channels)—with consumers receiving the largest share (65% of the available value, calculated as $\frac{147}{225}$) and employees receiving a modest share (24%).

Economic gain appears uniformly positive in Figure 3, which is based on period averages that mask finer differences among firms and observation years. A more detailed breakdown reveals that value creation was negative for about one-third of the observations in the sample. (Recall that in the VCA framework, negative value creation in a year broadly implies that the firm was more inefficient with resource usage in that year relative to the previous year.) To explore this, Figure 4 compares value flows for two subsamples: the set of observations where value creation was positive (left panel), and the set of observations where it was negative (right panel). The differences are stark. When value creation was positive, on average, shareholders, consumers, employees, and fuel suppliers all gained, with consumers benefitting the most. On average, in the years with positive value creation, the gains were distributed 42% (calculated as $\frac{211}{501}$) to consumers, 31% ($\frac{154}{501}$) to shareholders, 18% ($\frac{89}{501}$) to employees, and 9% ($\frac{47}{501}$) to fuel suppliers. Thus, in years of positive value creation, the gains were broadly shared among the stakeholders. By contrast, shareholders lost the most when value creation was negative, bearing virtually all the value destruction. Other stakeholders showed only small gains or losses on average when value creation was negative.

[Insert Figures 3 and 4 about here]

Fitting estimates in the value-sharing diamond

Using the VCA measures, we obtain the coordinates of each stakeholder group in the value-sharing diamond as follows. First, we run for each stakeholder group *i* (C, L, F, M, K) the following regression on the subset of observations with VT > 0:

$$\mathrm{V}i = \alpha^p{}_i + \beta^p{}_i\ \mathrm{VT} + \varepsilon^p{}_i$$

The coefficients $\beta^p{}_i$ from these five regressions sum to one (since VT is the sum of the five components). These coefficients can be interpreted as the share of a one percentage point increase in total value created that flows to stakeholder group *i*. These are our estimates of s_p in Figure 1. The constant $\alpha^p{}_i$ captures the average return to the stakeholder group when there is no value creation and therefore represents fixed value transfers between stakeholder group *i* and the others. $\varepsilon^p{}_i$ is the error term.

Second, we run equivalent regressions on the subset of observations with VT ≤ 0:

$$V_i = \alpha^n{}_i + \beta^n{}_i \text{ VT} + \varepsilon^n{}_i$$

The coefficients $\beta^n{}_i$, which sum to one, represent the share of a one percentage point loss in total value created that is absorbed by the stakeholder groups. These are our estimates of s_n in Figure 1. (We also run supplementary regressions replacing the constant terms $\alpha^p{}_i$ and $\alpha^n{}_i$ with year and company fixed effects to examine to what extent these estimates are driven by year or company idiosyncrasies.)

Having developed the empirical equivalent of Figure 1, as described earlier, we then obtain the value-sharing diamond and each stakeholder group's coordinates in the value-allocation-risk-allocation space by rotating the (s_p, s_n) space anticlockwise by 45° and recentering it around the "equal sharing" point (0.5, 0.5). After this geometric transformation, the vertical dimension is $(s_p + s_n - 1)/\sqrt{2}$, while the horizontal dimension is $(s_p - s_n)/\sqrt{2}$. Finally, we rescale both dimensions by $\sqrt{2}$ and define the vertical axis, which we label *risk allocation*, as $s_p + s_n - 1$, and the horizontal dimension, which we label *value allocation*, as $s_p - s_n$. (Spanning between opposite points of the diamond in Figure 2, the risk allocation ranges from -1 (*fixed claimant*) to 1 (*full residual claimant*); the value allocation ranges from -1 (*powerless pawn*) to 1 (*exploitative dictator*).) To derive standard errors for these estimates, we run these regressions in 1,000 bootstrapped samples and obtain the 95% confidence ellipses of the coordinates of each stakeholder group.

FINDINGS

Table 4 reports the regressions of each stakeholder group's returns on VT when VT > 0 and VT ≤ 0, including no fixed effects (top rows), year fixed effects (middle rows), or year and company fixed effects (bottom rows). The patterns are highly consistent across the three specifications, suggesting that year or company idiosyncrasies do not substantially affect the coefficient estimates.

Figure 5 plots the value-sharing diamond using the estimates with no fixed effects from Table 4 (the figures using the estimates with the fixed effects are similar). Figure 5 reveals that shareholders are the main residual claimants of airline companies' value creation, occupying the highest position on the vertical axis. On the horizontal axis, shareholders are closer to the *powerless pawn* position, indicating that while they bear a large share of the losses, they appropriate a much smaller share of the gains. Indeed, Table 4 (first two rows) shows that shareholders are the main stakeholder group that bears the losses and lose 0.78 percentage points when VT decreases by one percentage point, while they gain only 0.52 percentage points when VT increases by one percentage point.

Consumers display an opposite pattern and occupy a position closer to the *exploitative dictator*. This stakeholder group is able to appropriate most of the gains and bears none of the losses (i.e., airlines cut prices in years when they make productivity gains but tend to keep fares unchanged in years when productivity falls). The coefficient estimates for VC in Table 4 (first two rows) indicate that, similarly to shareholders, consumers gain about 0.49 percentage points when VT increases by one percentage point. However, the coefficient when VT ≤ 0 is small and statistically not different from zero. Hence, unlike shareholders, consumers bear none of the losses.

Interestingly, employees, while very close to the *fixed claimant* position, are statistically different from a fixed claimant and obtain a small, almost equal, share of gains and losses. Table 4 (first two rows) shows that employees lose 0.14 percentage points when VT decreases by one percentage point (e.g., due to wage reductions and layoffs), and they gain 0.18 percentage points when VT increases by one percentage point (e.g., due to wage increases).

Fuel suppliers are statistically indistinguishable from a fixed claimant. Other suppliers are also close to a fixed claimant. However, Table 4 (first row) shows that when airlines create value, “other” suppliers tend to suffer losses and transfer value to other stakeholders. Thus, the “other supplier” stakeholder group (a heterogeneous set that was initially dominated by travel agents) occupies a position slightly lower and to the left of the fixed claimant, and being partly countercyclical, reduces the risk exposure and increases the value allocation of the other stakeholder groups.

Overall, the opposite positions on the value allocation axis of shareholders (to the left) and consumers (to the right) are consistent with the competitive nature of the airline industry. However, the data do not perfectly fit an extreme model of perfect competition, which would predict that shareholders occupy the *powerless pawn* position and consumers the *exploitative dictator* position.

Moreover, employees are statistically different from a fixed claimant and are residual claimants of a small share of value gains and losses. This pattern is consistent with models that reject the view that shareholders are the sole residual claimants of the firm and envision multiple residual claimants (e.g., Coff 1999; Barney 2018). However, Figure 4 shows that shareholders are still the main residual claimants of airlines’ value creation, sharing only a small share of the risk with employees.

[Insert Table 4 and Figure 5 about here]

DISCUSSION AND CONCLUSIONS

This study develops the value-sharing diamond, a framework to describe value appropriation patterns among stakeholders. Applying this framework to estimates derived from the VCA model using U.S. airline data reveals patterns that are neither fully consistent with a model of perfect competition with capital as the sole residual claimant nor fully reflective of a model of equal sharing among multiple residual claimants.

We make two broad contributions. Our first contribution is the conceptual framework of the value-sharing diamond. Besides combining theoretical and empirical elements in a simple, intuitive manner, its usefulness lies in allowing researchers to succinctly characterize and compare value appropriation patterns. In this regard, the two axes of risk assumption and value allocation can potentially help interpret differences across contexts or over time. Furthermore, by separating risk assumption from value allocation, our framework also furthers current literature, which has focused on value-sharing and stakeholder bargaining power to explain value appropriation (e.g., Coff 1999, 2010; Bosse et al. 2009; Harrison et al. 2010; Di Gregorio 2013; Bridoux & Stoelhorst 2014; Stoelhorst 2023). Put differently, if we observe one stakeholder capturing a larger share of value than another, researchers should consider differences in the willingness to assume risk in addition to differences in bargaining power as a possible explanation. Although we have used the VCA model to generate empirical estimates, the diamond framework can be meaningfully used with estimates from other approaches, including potentially using other proxies for value creation and appropriation. Moreover, the framework can be used to analyze value appropriation in contexts beyond the airline industry.

Our second contribution is empirical. We offer several pieces of new evidence on patterns of value appropriation in the airline industry. The value flow diagrams help to visualize patterns of value creation and appropriation and, in particular, show that stakeholders who gain value (green channels in Figure 3) can receive that gain both from value creation (blue channels) and by capturing value from other stakeholders (red channels). Similarly, the diagrams make clear that any negative value creation (orange channel in the right panel of Figure 4) must come at the expense of some stakeholders (mostly shareholders but also fuel suppliers and employees in Figure 4). Lastly, they illustrate that value creation can co-exist with some stakeholders incurring value losses (e.g., other suppliers in the left panel of Figure 4) and value destruction can co-exist with some stakeholders gaining value (consumers in the right panel of Figure 4), thus supporting the independence of value creation and value capture noted in studies such as Coff (1999, 2010).

Another empirical highlight in our findings is the centrality of value creation to shareholder gains and losses. As seen in Figure 4, unlike other stakeholders, shareholders gain only when value creation is positive. Table C1 in Online Appendix C further elaborates on this point by splitting the sample into four quadrants depending on whether VT and VK are positive or negative; it shows that instances of negative value creation and positive shareholder gains comprise only 9.6% of the total sample. Thus, our findings strongly suggest that at least in the context of the US airline industry, gains to shareholders largely depend on value creation.

Our study also highlights some empirical realities that are commonly overlooked in discussions of value creation and value capture by stakeholders. While the theoretical literature tends to focus on (positive) value creation, for about one-third of our annual observations value creation was negative, with the losses being absorbed primarily by shareholders. Such negative value creation over the previous period is likely to be relatively important and common in the presence of negative demand and supply shocks as well as poor strategic decisions (e.g., when airlines entered new routes or expanded faster than warranted by demand).

Directions for future research and limitations

As discussed, the diamond framework can be used to *describe* patterns of value appropriation and compare them with theoretical models of value appropriation (such as those in

Table 1). However, it cannot *explain* such patterns; knowledge of the institutional context is essential to interpret the diamond. We briefly consider some factors that could cause a stakeholder to move along one or the other dimension of the diamond. Each of these factors could be investigated in future research. By doing so, researchers could provide causal explanations for observed movements within the diamond in their context of interest.

First, the vertical axis of the diamond measures the risk allocated to the focal stakeholder. Several forces may contribute to changing the stakeholder's risk assumption. Everything else equal, the relative positions of stakeholders along this axis can reflect their relative risk aversion: less risk-averse stakeholders should be more likely to occupy positions higher up on the vertical axis. Risk aversion can be affected by aspects such as the stakeholder's level of diversification, wealth constraints, and behavioral attitude. Moreover, risk allocation can be affected by formal or informal institutions (Stoelhorst 2023). For example, prior to 1979, fares and routes were regulated in the U.S. airline industry, which reduced the shareholders' risk.

Second, the horizontal axis of the diamond measures the extent to which the stakeholder appropriates the gains and makes other stakeholders bear the losses. The key force affecting value allocation is the bargaining among stakeholders. Stoelhorst (2023) clarifies that bargaining can take two distinct forms. Competitive bargaining is determined by market competition and equilibrium prices. Hence, if the value of the outside option of a stakeholder increases, the stakeholder may be able to appropriate a greater share of the gains and reduce its bearing of the losses (and therefore move from left to right in the diamond). In "pure bargaining," market forces can only determine an interval of possible value allocations, and the final allocation is determined through non-market forces. The latter include bargaining skills but also sociopolitical processes (e.g., regulations or cultural norms that require "fair" redistribution of gains).

One important limitation of our work is that we only observe outcomes, such as the stakeholder's share of total value creation. Hence, we cannot separate out the extent to which a given point on the diamond arises from ex-ante contracting or from ex-post bargaining among stakeholders (Barney 2018), including whether it reflects differences in efforts by stakeholders. Extending our methodology to incorporate these aspects can be a fruitful endeavor.

Furthermore, because the empirical part of our study relies on the VCA model, it is also constrained by the limitations of that model, discussed in Lieberman et al. (2017, 2018). An important limitation is that it relies on accounting and other publicly available data, and hence our estimates are likely to be noisy. Accordingly, we have been guarded when explaining our findings and not presenting estimates based on individual or a few firm-year observations. Also, our study is limited to one context and to stakeholders within the value chain. The US airline industry is known to be a highly competitive industry, and patterns of value distribution might be quite different in other industries. Future studies can extend these analyses to other industry contexts and potentially include stakeholders outside the value chain. Notably, the diamond is likely to be helpful when making comparisons across industries. Lastly, we have not delved into inter-firm heterogeneity in value creation and appropriation in this study. Hence, our analyses reflect averages across airlines; future studies could examine such heterogeneity in greater detail.

In conclusion, this study has taken a step towards improving our understanding of value creation and appropriation in firms and offered several pieces of descriptive evidence along with a synthesizing framework. Existing stakeholder value appropriation models typically conceptualize the firm's value creation as a "pie" to be allocated to stakeholders. The diamond framework highlights that in addition to the "value pie", there is a "risk pie" to be allocated, and how one pie is allocated does not necessarily imply how the second pie is allocated. The diamond helps to visualize these two pies jointly. It is also interesting to note that while the literature shows that the RBT is inconsistent with a model of shareholder supremacy where shareholders are the sole residual claimants, the diamond highlights that, in some cases, shareholders may be *forced* to be the sole residual claimants of losses. Overall, we believe the tools developed in this study can help scholars push the boundaries of our knowledge about value creation and appropriation in firms. We invite them to do so.

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FIGURE 1. Landmarks Underlying the Value-Sharing Diamond Framework

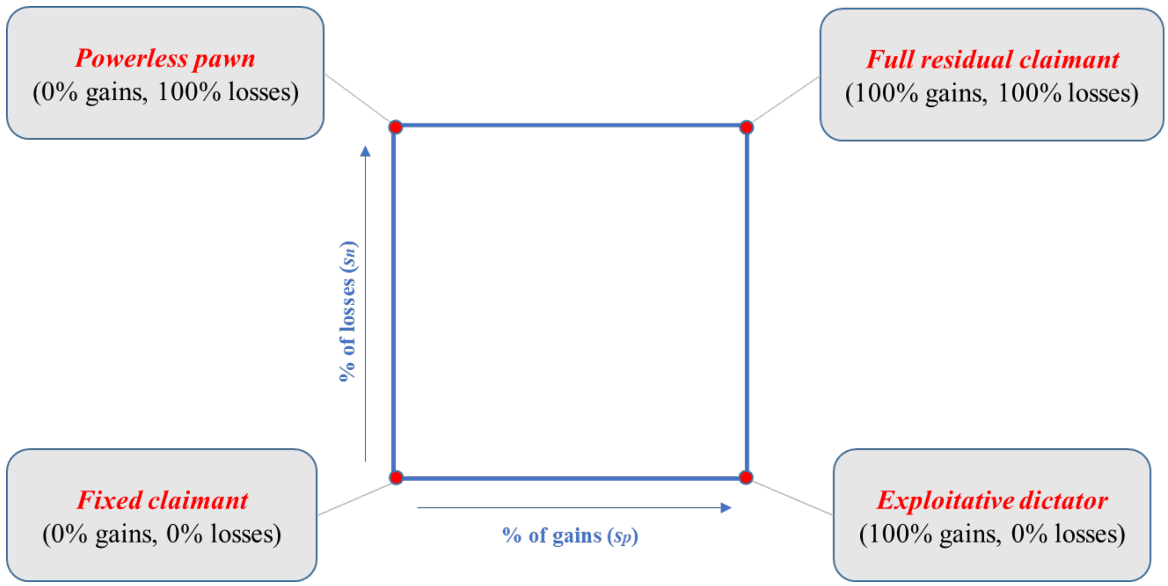


FIGURE 2. The Value-Sharing Diamond

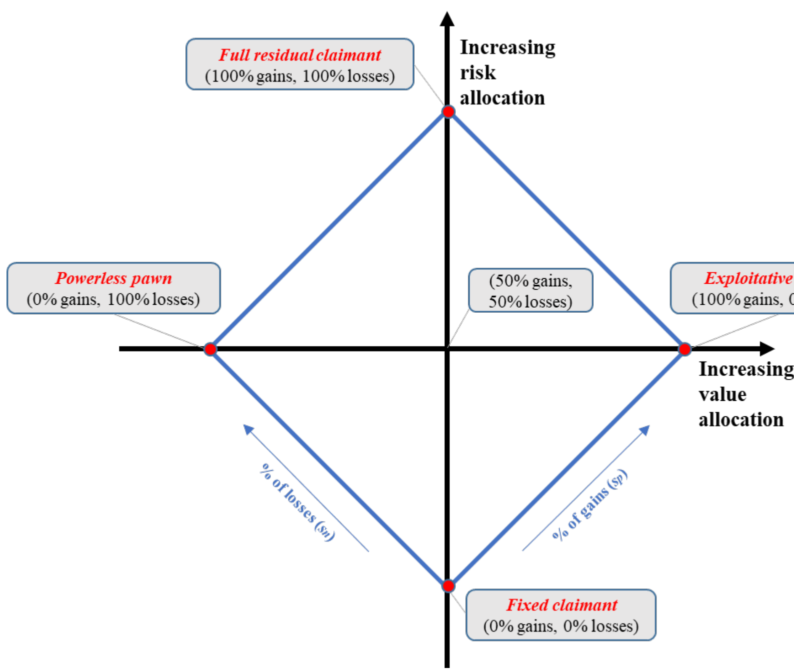
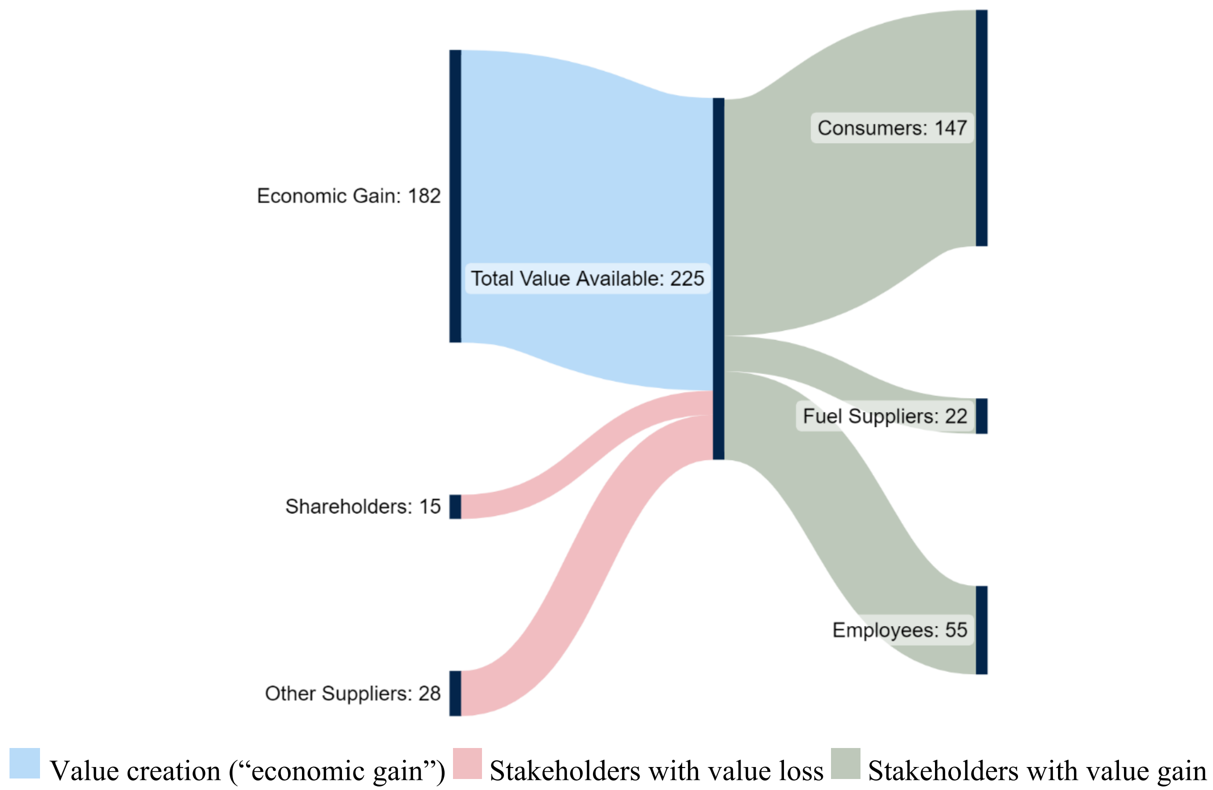
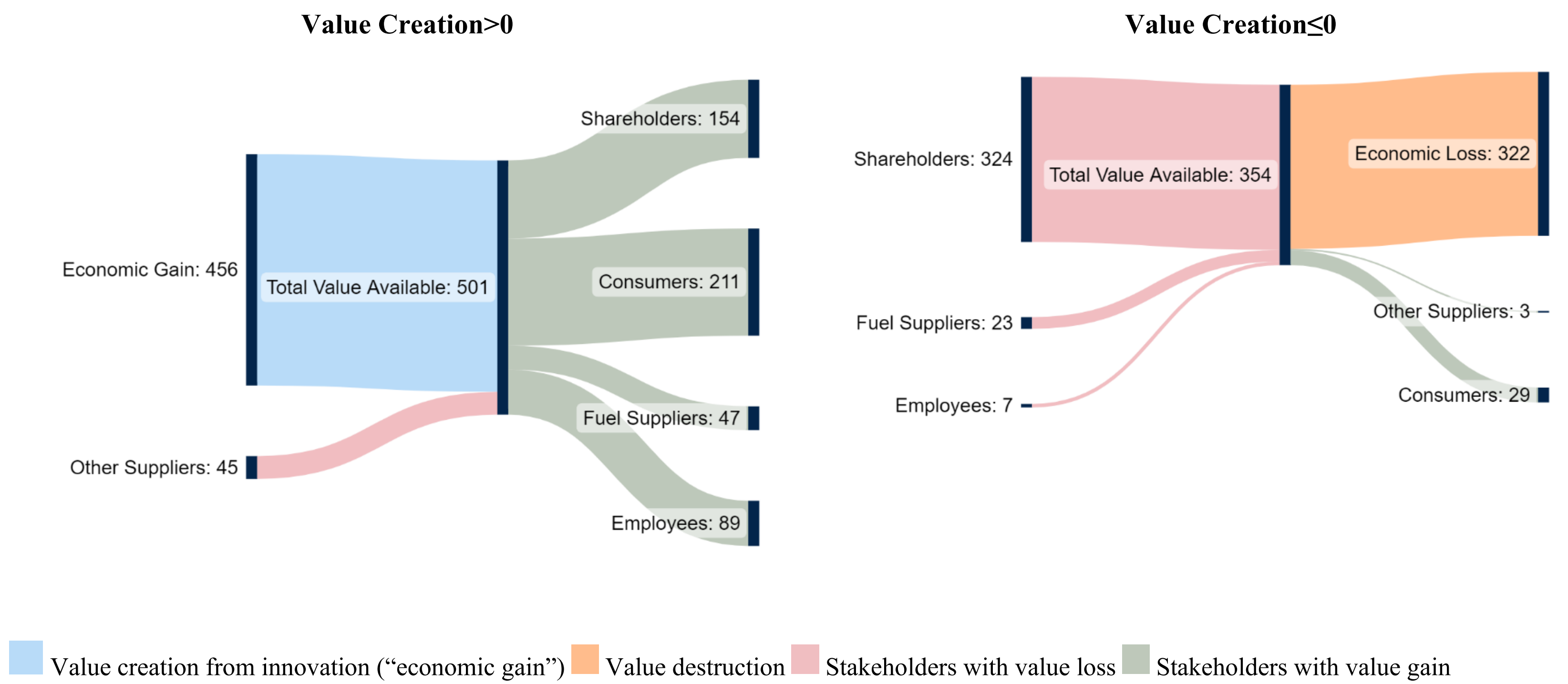


FIGURE 3. Average Value Creation and Appropriation in the Airline Industry Sample, 1980-2019



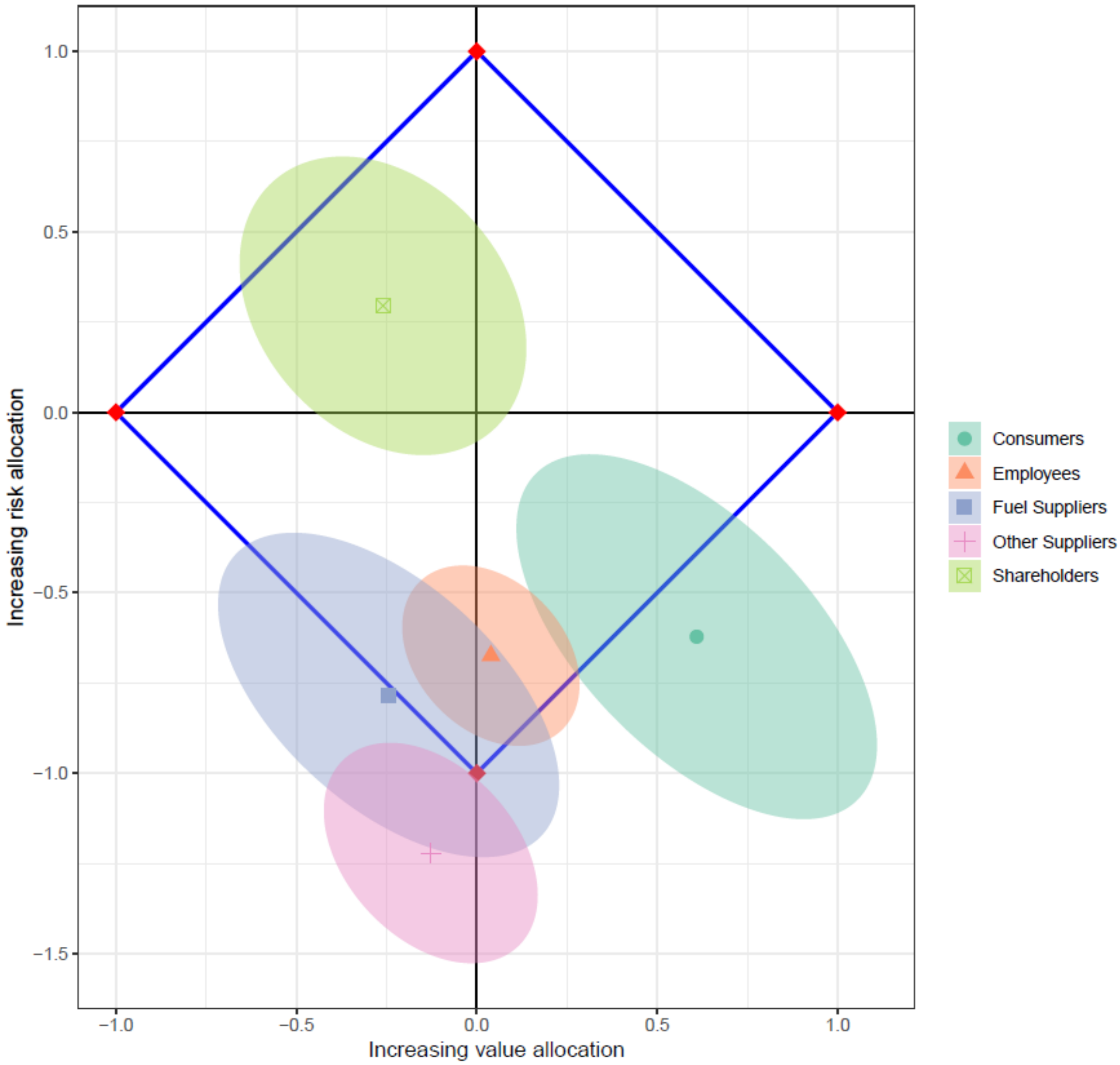
Notes: In this diagram, value flows from left to right with the width of the channels representing the size of the flow. Inflows may not add up exactly to outflows due to rounding. As elsewhere, we present average percentage gains or losses (multiplied by 100 here for presentation purposes). For example, economic value arising from economic gain (VT, 1.82%), and value capture from shareholders (VK, -0.15%), and material suppliers (VM, -0.28%) (the three bars on the left) flows into the total pot of value available for distribution (central bar), which then flowed to consumers, employees, and fuel suppliers (bars on the right).

FIGURE 4. Average Value Appropriation by Positive or Negative Value Creation



Note: The left panel presents average value flows for the subsample of firm-years with positive value creation (VT>0) while the right panel presents for the remaining firm-years. Widths of flow channels are comparable across the two panels. The VT>0 panel has 242 observations; the VT<0 panel has 132 observations.

FIGURE 5. Applying the Value-Sharing Diamond to the Airline Industry



Note: The figure reports the estimated coordinates of each stakeholder in the value-sharing diamond, including the mean coordinates and the 95% confidence ellipses. The confidence ellipses are obtained based on 1,000 bootstrapped samples.

TABLE 1. Models of Value Appropriation and Inter-Stakeholder Interactions

<table>
<tr><th>Model</th><th>Patterns of Value Appropriation</th></tr>
<tr><td>Shareholders as sole residual claimants of economic profits</td><td>Most prominent residual-claimancy-based model. Shareholders are the sole residual claimants of the firm’s economic profit (e.g., Jensen & Meckling 1976; Jensen 2002). Three stylized variants of this model can be considered with specific competitive structures.
(1) The firm is a price-taker in all markets; the value creation efforts by the firm do not affect market prices (i.e., no spillovers).
All stakeholder groups except shareholder groups pay or receive the market price for their contributions.
Shareholders receive all value created (Ricardian or efficiency rents) and bear all value losses (drops in efficiency) (Hopenhayn 1992; Peteraf 1993).
Implies value creation is positively correlated with shareholder returns, both in the case of value creation and value losses, but not correlated with returns to other stakeholder groups.
(2) The firm is a price-taker in all markets; the value creation efforts by the firm spill over instantly to competitors.
Theoretical definition of perfect competition. All stakeholder groups except shareholder groups pay or receive the market price for their contributions.
Shareholders bear all value losses. Consumers receive all value created.
Implies value creation is positively correlated with returns for consumers but not correlated with returns to other stakeholder groups. Value losses are positively correlated with losses to shareholders but not correlated with returns to other stakeholder groups.
(3) The firm has market power in output or input markets.
The firm has the power to set market prices and accrues some market power rents (e.g., monopoly, oligopoly, or monopsony).
Shareholders split value creation and losses with stakeholders in markets where the firm has market power (e.g., with consumers in a Cournot duopoly). The division depends on market power (e.g., consumers get a larger share of value creation in markets with more elastic demand curves).
Implies value creation is positively correlated with returns for stakeholder groups where the firm has market power.</td></tr>
<tr><td>Bargaining power models</td><td>A broader class of models than those above that allow for more flexible processes of bargaining and competition with multiple residual claimants of the firm’s economic profit.
Typically, a two-step process of value creation followed by value appropriation (e.g., MacDonald & Ryall 2004).
Allocation of value created to different stakeholder groups is based on an interplay of “competitive bargaining” and “pure bargaining” (Stoelhorst 2023). Groups with higher bargaining power will appropriate a larger share of the value created (e.g., Barney 2018; Coff 1999; Stoelhorst 2023). Allocation of value losses is typically not explicitly addressed in these models.
No unambiguous ex-ante correlations among value appropriated by different stakeholder groups.</td></tr>
<tr><td>Pie-sharing partnerships</td><td>Multiple, possibly all, stakeholders are residual claimants. Value created or lost is distributed to residual claimant stakeholder groups based on their share in and contribution to the partnership.
Implies value appropriated by different stakeholder groups is positively correlated with each other and with total value creation. Either all groups receive positive value, or all groups receive negative value.</td></tr>
</table>

TABLE 2. Descriptive Statistics

	Mean	S.D.	Median	Min	Max
VT (%)	1.82	5.24	1.64	-15.07	23.85
VC (%)	1.47	5.70	0.93	-10.90	14.36
VL (%)	0.55	2.61	0.33	-6.39	8.66
VF (%)	0.22	4.78	-0.21	-13.79	10.76
VM (%)	-0.28	2.96	-0.10	-9.12	6.74
VK (%)	-0.15	6.19	0.17	-14.93	15.77

Notes: VT: Total value created; VC: value captured by consumers; VL: value captured by workers; VF: value captured by fuel suppliers; VM: value captured by other suppliers; VK: value captured by shareholders. *N*=374.

TABLE 3. Correlation Matrix

	VT (%)	VC (%)	VL (%)	VF (%)	VM (%)
VC (%)	0.26				
VL (%)	0.30	0.07			
VF (%)	0.08	-0.47	-0.09		
VM (%)	-0.18	-0.37	-0.08	0.06	
VK (%)	0.51	-0.19	-0.13	-0.26	-0.30

TABLE 4. Average Shares of Value Created or Lost Allocated to Stakeholders

	VC (%)	VL (%)	VF (%)	VM (%)	VK (%)	*N*
No fixed effects:						
If VT > 0	0.49	0.18	-0.01	-0.18	0.52	242
	(0.000)	(0.004)	(0.917)	(0.027)	(0.000)	
If VT ≤ 0	-0.13	0.14	0.24	-0.04	0.78	132
	(0.561)	(0.094)	(0.179)	(0.725)	(0.000)	
With year fixed effects:						
If VT > 0	0.37	0.17	0.02	-0.16	0.61	242
	(0.004)	(0.030)	(0.694)	(0.014)	(0.001)	
If VT ≤ 0	-0.06	0.16	0.04	-0.07	0.93	132
	(0.778)	(0.086)	(0.188)	(0.573)	(0.000)	
With company and year fixed effects:						
If VT > 0	0.38	0.16	0.02	-0.14	0.58	242
	(0.005)	(0.061)	(0.700)	(0.026)	(0.002)	
If VT ≤ 0	-0.03	0.21	0.07	-0.06	0.82	132
	(0.873)	(0.075)	(0.057)	(0.663)	(0.001)	

Notes: Each cell in columns VC–VK presents the coefficients from a regression of the dependent variable on VT. (For example, the first cell of row 1 shows that the regression coefficient of VC on VT is 0.49.) The coefficients in each row sum to 1. *p*-values are in parentheses and computed with standard errors clustered by airline with the wild bootstrap procedure described in Cameron, Gelbach, and Miller (2008).