

# **The Catalas Model: A Novel Theoretical Framework for Dual-role Producer-Consumer Exchanges Involving Third-Party Beneficiaries and Intermediaries**

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## **Abstract**

The Catalas Model introduces a novel theoretical framework for understanding dual-role producer-consumer exchanges involving third-party beneficiaries and intermediaries. This study identifies the limitations of traditional frameworks and develops the Catalas Model to capture the complexities of modern market exchanges. The model incorporates the roles of third-party beneficiaries and intermediaries in the exchange process, offering valuable insights into market efficiency, consumer welfare, and overall economic performance. The applicability of the Catalas Model is demonstrated through real-world case studies, showcasing its adaptability across various industries and market scenarios. Furthermore, the research identifies key factors influencing exchange performance and discusses potential policy implications for regulators, businesses, and consumers. This innovative framework contributes to the literature by providing a more comprehensive understanding of intricate producer-consumer relationships in contemporary market exchanges.

## **Introduction**

The Third-Party Driven Low-Cost Product Exchange Model (Catalas Model) presents an approach to understanding dual-role producer-consumer relationships, challenging traditional economic theories that typically regard producers and consumers as distinct entities (Smith, 1776; Marshall, 1920). This article examines the dual-role producer-consumer dynamic within the academic publishing industry, where research institutions and universities function as both producers and consumers of research outputs (Jubb, 2016; Borgman, 2010). The objective is to explore the factors contributing to this phenomenon and investigate its potential applications in other industries.

### **Catalas Model Concept**

The Third-Party Driven Low-Cost Product Exchange Model (Catalas Model) is an innovative framework that leverages the involvement of third parties to facilitate low-cost

exchanges of products between stakeholders who assume dual roles as both producers and consumers. The key components and principles of this model are as follows:

**Third-party driven:** The success and smooth functioning of the Catalas Model are contingent upon the active involvement of third parties, who play an integral role in orchestrating the exchange process.

**Dual-role producer-consumer relationship:** A fundamental requirement of the model is that producers and consumers assume dual roles, thereby participating as both providers and recipients of products or services in the exchange process.

**Third-party payer/beneficiary and intermediary:** The presence of a third-party payer/beneficiary and a third-party intermediary is essential for the effective implementation of the Catalas Model.

**Third-party payer coverage:** The third-party payer contributes to a portion or the majority of the costs associated with the product exchange, enabling the transaction to take place at a reduced cost for the involved parties.

**Third-party beneficiary benefits:** The third-party beneficiary derives value from the improvements in product quality that arise from the exchange. By investing in the process, the third-party beneficiary stands to benefit from the enhanced product quality resulting from the exchange.

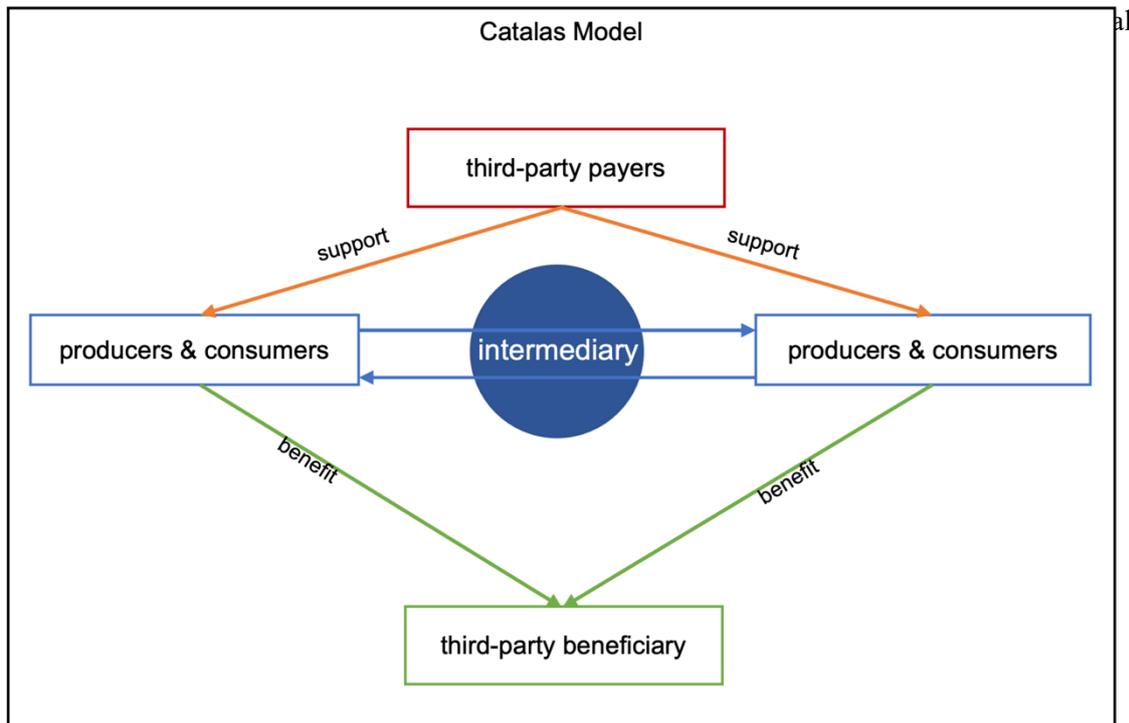
**Third-party intermediary role:** The third-party intermediary assumes the responsibility of establishing the exchange framework, which includes setting standards for the exchange, ensuring the quality of products being exchanged, and implementing a quality audit mechanism. This guarantees that the products being exchanged conform to the desired quality standards, ultimately benefiting both producers and consumers.

The Catalas Model consists of three essential components: a third-party beneficiary, a third-party payer (which can be the same entity), and a third-party intermediary. These parties play a pivotal role in facilitating low-cost and low-barrier exchanges between producers and consumers (Potts, 2011). Moreover, the product exchange or purchase-sale process between consumers and producers must be characterized by low costs and minimal barriers, ensuring accessibility and affordability. This should be achieved through the financial support of the third-party payer. Lastly, the third-party intermediary must ensure the quality of products exchanged, thus guaranteeing the model's sustainability (Bessen & Meurer, 2009).

The Catalas Model posits that the involvement of a third-party beneficiary and payer is essential for fostering effective collaboration between producers and consumers. This model diverges from traditional economic theories that focus on the direct exchange of goods and services between producers and consumers (Mankiw, 2012). The emergence of dual-role producer-consumer relationships within the scientific research industry highlights the necessity for a new theoretical framework that can better account for the unique features of such industries (Chesbrough, 2006).

The motivation for this article stems from the potential applicability of this model to other industries characterized by dual producer-consumer identities, which could foster more effective collaboration and ultimately benefit third-party beneficiaries. By recognizing and

embracing the unique nature of these industries, the Catalas Model offers a framework for optimizing resource allocation, encouraging innovation, and maximizing societal benefits (Porter & Heppelmann, 2014). This article seeks to provide an academic perspective on this



## Literature Review

The Catalas Model introduces a fresh perspective on the academic publishing industry, which is distinguished by its unique business model that has persisted alongside the industry. Universities and research institutions often provide their research outputs to journals and other platforms free of charge, while simultaneously serving as the primary consumers of these research outputs through journal subscriptions, which are primarily funded by these institutions (Björk & Solomon, 2012; Ware & Mabe, 2015). This seemingly counterintuitive practice has endured, with few questioning why universities and research institutions willingly share their valuable knowledge with the scientific community and pay for access to knowledge produced by their peers.

Society as a whole benefits from scientific breakthroughs and discoveries, prompting governments to prioritize R&D expenditure in their budgets (Aghion et al., 2008). Consequently, governments and other organizations act as third-party payers, financially supporting the production and dissemination of research outputs (Geuna & Martin, 2003). Journals serve as third-party intermediaries (promotional platforms), ensuring the quality of exchanged products (intellectual properties) and helping maintain the reputation of the academic publishing industry (Larivière et al., 2015).

Traditional economic theories have grappled with explaining the dual-role producer-consumer relationship prevalent in the academic publishing industry. Classical economic models, such as the supply-demand framework, presuppose a clear distinction between producers and consumers (Smith, 1776; Marshall, 1920). However, this assumption falters within the context of the academic publishing industry, where the roles of producers and consumers frequently overlap (Jubb, 2016).

The Catalas Model offers an innovative framework for comprehending the dual-role producer-consumer relationship within the academic publishing industry. By incorporating the roles of third-party beneficiaries and payers, the model accounts for the intricate dynamics between producers and consumers in this unique context. This approach acknowledges the importance of third parties, such as governments and funding agencies, which often subsidize the costs of research production and dissemination due to the recognition of societal benefits derived from research outputs (Geuna & Martin, 2003).

Numerous empirical studies endorse the Catalas Model's validity in elucidating the dual-role producer-consumer relationship within the academic publishing industry. For example, a comprehensive analysis of the United States' scientific research landscape from 1976 to 2010 underscores the growing significance of third-party beneficiaries in shaping research outcomes. This study reveals that the involvement of third-party beneficiaries, including governments and funding agencies, has contributed to disruptive research outcomes and influenced traditional scientific metrics, underscoring the need for an innovative theoretical framework like the Catalas Model (Aghion et al., 2008).

In conclusion, the Catalas Model provides a valuable theoretical framework for understanding the unique dual-role producer-consumer relationship within the academic publishing industry. By incorporating the roles of third-party beneficiaries and payers, this model offers a more comprehensive and accurate portrayal of the complex dynamics at play in this context. The burgeoning body of empirical evidence supporting the Catalas Model highlights its potential for further application and development in future research.

## **Catalas Model in Academic Publishing**

The Catalas Model elucidates the dual-role producer-consumer relationship in the academic publishing industry by accounting for the involvement of third-party payers, beneficiaries, and intermediaries. These core elements collectively facilitate the exchange of research outputs, ensuring quality and fostering the dissemination of valuable knowledge.

### **Definition and Core Elements**

#### ***Third-party payers***

Third-party payers, such as governments and funding agencies, play a vital role in covering a substantial portion or even the entirety of the costs associated with the exchange (Geuna & Martin, 2003). Driven by an understanding of the societal benefits derived from

research outputs, these entities support the production and dissemination of knowledge (Aghion et al., 2008).

### ***Third-party beneficiaries***

Third-party beneficiaries, in contrast, derive significant benefits from the improved quality of the exchanged products (knowledge). Their benefits act as a driving force behind the operation of the Catalas Model, as the absence of third-party benefits would render third-party payments unnecessary. Examples of such beneficiaries include the broader scientific community and society at large, which gain advantages from research outputs, such as technological advancements, public health improvements, and economic growth (Geuna & Martin, 2003; Aghion et al., 2008).

### ***Third-party intermediaries***

Third-party intermediaries, including academic journals, contribute by providing a structured framework for the exchange, encompassing standardized procedures and quality assurance mechanisms (Larivière et al., 2015). These intermediaries guarantee that the exchanged products adhere to the required quality standards, thereby contributing to the overall reputation and credibility of the industry (Jubb, 2016).

### ***Producers and Consumers***

Producers, such as universities and research institutions, supply their research outputs to journals and other platforms at no cost (Björk & Solomon, 2012). Motivated by prospects of increased visibility, recognition, and impact, these producers also seek future funding and collaboration opportunities (Ware & Mabe, 2015).

Conversely, consumers, often the same entities as the producers, primarily finance journal subscriptions and access research outputs produced by their peers (Björk & Solomon, 2012). This dual-role relationship fosters the exchange of valuable knowledge and promotes scientific advancement.

### ***Incentives and Interactions***

The benefits enjoyed by third-party beneficiaries underpin the operation of the Catalas Model. In the absence of such benefits, third-party payers may lack the incentive to cover the costs associated with the exchange. Consequently, the interactions among producers, consumers, and third parties are crucial for the proper functioning of the model.

In summary, the Catalas Model presents a theoretical framework for understanding the dual-role producer-consumer relationship in industries such as academic publishing. By integrating the roles of third-party payers, beneficiaries, and intermediaries, this model offers a comprehensive insight into the complex dynamics involved in these unique contexts. The existing literature and empirical evidence supporting the Catalas Model emphasizes its potential applicability across various industries and highlights the need for continued exploration and validation of the model.

# Compared to Cooperation and Sharing

The Catalas Model offers a unique lens through which to view the dual-role producer-consumer relationship in industries involving third-party beneficiaries, payers, and intermediaries. Nevertheless, it is crucial to distinguish the Catalas Model from the concept of cooperation and sharing. This section will outline the key differences between the Catalas Model and cooperation and sharing in terms of their underlying nature, the necessity of third-party involvement, cost structures, and the role of intermediaries in ensuring quality.

Firstly, the Catalas Model diverges from the concept of cooperation and sharing in terms of its nature. While cooperation and sharing typically involve voluntary exchanges of resources or services without the expectation of monetary compensation, the Catalas Model is characterized by the presence of third-party beneficiaries and payers who finance the costs associated with the exchange process (Aghion et al., 2008; Cropf, 2006).

Secondly, the Catalas Model necessitates the involvement of third-party beneficiaries, payers, and intermediaries to guarantee its proper functioning and sustainability. In contrast, cooperation and sharing generally do not require the participation of third parties. For instance, collaborative initiatives like open-source software development often involve direct exchanges between contributors and users without the need for third-party involvement (Cropf, 2006).

Thirdly, the Catalas Model entails low costs for both producers and consumers, signifying that payments and purchases still occur within the framework. Conversely, cooperation and sharing usually do not involve financial transactions, as resources or services are exchanged voluntarily without the expectation of monetary compensation (Cropf, 2006).

Lastly, the Catalas Model depends on the presence of third-party intermediaries to provide a framework for product exchange, establish standards, and conduct quality audits (Larivière et al., 2015). Through this model, the quality of exchanged products can be maintained, increasing the likelihood of producing higher quality outputs after the exchange. In cooperation and sharing arrangements, such intermediaries are often absent, which can potentially result in variable quality outcomes.

In short, the Catalas Model offers a distinct perspective on the dual-role producer-consumer relationship by emphasizing the critical roles of third-party beneficiaries, payers, and intermediaries. This model should not be conflated with the concept of cooperation and sharing, which generally involve voluntary exchanges without financial transactions or third-party involvement. Understanding these key differences is essential for a comprehensive analysis of the unique characteristics and challenges faced by industries operating within the Catalas Model framework.

## Case Studies

The Catalas Model has significant implications across various industries, including research, education, renewable energy, pharmaceutical research, and transportation. In this section, we will present an integrated analysis of case studies from these industries, illustrating the model's applications and versatility.

The growing trend of open access publishing exemplifies the Catalas Model in research and education. Open access journals offer free access to research articles, often with the support of third-party payers, such as research funders that cover publication fees (Suber, 2012). This model enables the wide dissemination of research findings, benefiting both producers and consumers of knowledge, while relying on third-party payers to finance the costs associated with the publishing process (Björk & Solomon, 2012).

Another example within education is the rise of open educational resources (OER) and course sharing initiatives. OERs, such as digital textbooks and online courses, are made freely available to educators and students, reducing costs for both producers and consumers (Wiley, 2014). Third-party intermediaries, like OER repositories and online learning platforms, ensure the quality and accessibility of shared resources, while third-party beneficiaries, such as governments and funding agencies, may support the development and dissemination of OERs (Downes, 2007).

In the renewable energy sector, the Catalas Model is exemplified by the solar power industry. Government agencies and energy companies, acting as third-party beneficiaries and payers, provide subsidies and incentives to support the installation of solar panels for both producers and consumers (Bird et al., 2005). Intermediaries such as energy utilities and grid operators play a vital role in maintaining quality standards and facilitating the exchange of solar-generated electricity (Parag & Sovacool, 2016).

The pharmaceutical research field also demonstrates the Catalas Model through public-private partnerships that fund and develop new drugs. In these partnerships, public funding agencies and private firms (i.e., third-party beneficiaries and payers) collaborate with research institutions and pharmaceutical companies (i.e., producers and consumers) to accelerate drug discovery and development (Gates, 2018; Pisano, 2006).

Lastly, the transportation industry showcases the Catalas Model through ride-sharing platforms such as Uber and Lyft. These platforms act as intermediaries connecting drivers (producers) with riders (consumers), generating revenue from third-party payers, including advertisers and investors (Cramer & Krueger, 2016). By providing a digital marketplace for transportation services, these platforms facilitate low-cost exchanges and maintain quality standards through user ratings and feedback mechanisms (Rayle et al., 2016).

In short, the Catalas Model has broad applicability across various industries, as demonstrated by the case studies presented in this section. These examples emphasize the model's versatility and potential in addressing the challenges and opportunities arising from dual-role producer-consumer relationships, third-party beneficiaries, and intermediaries. Further research is warranted to explore additional applications and implications of the Catalas Model in other sectors and contexts.

# Potential Implications

The Catalas Model may have the potential to bring significant implications in various domains, particularly in the fields of economics, policy-making, and innovation. This section aims to provide a comprehensive analysis of the potential implications of the model and how these might be realized in practice.

First and foremost, the Catalas Model has the potential to revolutionize the understanding of the value creation and exchange processes in modern economies. The model highlights the importance of dual-role agents and their contributions to the overall economic system. This novel perspective could lead to new insights and more effective policy interventions that promote inclusive growth, sustainability, and equitable distribution of resources (Bussolo, 2018; Mazzucato, 2018).

Furthermore, the Catalas Model may enable a better comprehension of the dynamics of sharing and gig economies, which have been gaining traction in recent years (Sundararajan, 2017). By providing a solid theoretical foundation for these emerging economic models, the Catalas Model could pave the way for innovative solutions to pressing societal challenges such as unemployment, environmental degradation, and social inequality (Botsman & Rogers, 2010).

Another potential implication of the Catalas Model relates to the role of intermediaries and third-party beneficiaries in facilitating dual-role exchanges. The model suggests that intermediaries, such as digital platforms, play a crucial role in reducing transaction costs and increasing the efficiency of these exchanges. This insight might encourage policymakers and business leaders to invest in the development of innovative intermediation mechanisms, fostering a more collaborative and efficient economic environment (Hagi & Wright, 2015).

Lastly, the Catalas Model could have significant implications for the design of incentive systems, particularly in the context of collaborative consumption and production. By recognizing the dual-role nature of agents and the complex interplay of their interactions, the model could guide the development of more effective incentive structures that encourage collaboration, co-creation, and value sharing among stakeholders (Cropf, 2006; Füller et al., 2009).

By exploring the potential implications of the model, the author hopes that researchers, policymakers, and practitioners alike can work together to harness the opportunities presented by these novel economic arrangements, ultimately fostering a more sustainable, inclusive, and innovative society.

# Challenges and Limitations

While the Catalas Model presents a firm theoretical framework for understanding dual-role producer-consumer exchanges involving third-party beneficiaries and intermediaries, several challenges and limitations must be acknowledged. This section critically discusses

these challenges, focusing on the model's financial sustainability, quality assurance, scalability, applicability to different industries, and its current limited application in the knowledge economy.

Financial sustainability remains a significant challenge for the Catalas Model. As the model relies on third-party payers to finance the costs associated with the exchange process, ensuring their continued support and willingness to fund these transactions is crucial (Björk & Solomon, 2012). The model may face difficulties in attracting and retaining third-party payers, particularly in times of economic downturn or shifting priorities. A potential solution could involve exploring alternative funding models, such as public-private partnerships or government subsidies (Geuna & Martin, 2003).

Quality assurance is another critical concern in the Catalas Model, as third-party intermediaries are responsible for overseeing the quality of exchanged products or services. However, these intermediaries may lack the necessary resources or expertise to effectively carry out quality assurance processes (Jubb, 2016). To address this challenge, the model could benefit from incorporating more robust quality control mechanisms, such as standardized performance metrics, accreditation systems, and periodic audits by independent organizations.

Scalability poses a challenge to the Catalas Model, particularly in contexts where third-party intermediaries need to manage vast quantities of exchanged products or services. The model may struggle to maintain its low-cost structure and efficient exchange processes as it scales up (Porter & Heppelmann, 2014). To tackle this issue, the Catalas Model may require the implementation of advanced technological solutions, such as artificial intelligence or blockchain technologies, to automate and streamline various aspects of the exchange process (Chesbrough, 2006).

The applicability of the Catalas Model to different industries remains an open question. While the paper discusses its potential applications in the healthcare sector, further research is needed to understand the model's effectiveness and feasibility across a broader range of industries (Arrow, 2003). This would involve conducting empirical studies and comparative analyses to identify the contextual factors that influence the success of the Catalas Model in different settings (Bessen & Meurer, 2009).

Furthermore, the current limited application of the Catalas Model in the knowledge economy warrants further investigation. As knowledge products and services play an increasingly vital role in modern economies, understanding how the model can be adapted to facilitate exchanges in this domain is crucial (Cohen et al., 2000). This could involve exploring the role of intellectual property rights, licensing, and collaboration mechanisms in shaping the dynamics between producers, consumers, and third parties in the knowledge economy (Nelson, 2004).

## **Case Studies on Challenges and Limitations**

The Catalas Model aims to provide insights on understanding dual-role producer-consumer exchanges involving third-party beneficiaries and intermediaries. While the model

has several strengths, it is important to recognize its limitations in real-world scenarios. This section presents case studies and empirical evidence to highlight these limitations and challenges.

One limitation of the Catalas Model is its reliance on rational behavior among all stakeholders. In reality, individuals and organizations may not always act in their best interests, and irrational behavior can compromise the effectiveness of the model. For instance, a study by Gavetti and Rivkin (2007) on the pharmaceutical industry showed that, despite the clear benefits of collaboration, companies often engaged in irrational competitive behavior, such as withholding information and sabotaging competitors. This behavior reduced the effectiveness of the dual-role producer-consumer exchange and hindered the development of new drugs.

Another limitation is the potential for information asymmetry between the different stakeholders, leading to suboptimal outcomes. In a case study conducted by Kwon and Kim (2020), they found that in the Korean electric vehicle (EV) market, the lack of transparent information about charging infrastructure and battery performance caused consumer distrust, leading to lower adoption rates of EVs. This case study illustrates how information asymmetry among stakeholders can hamper the effectiveness of the Catalas Model in promoting the desired exchange (Clarkson, 2007).

Moreover, the Catalas Model may not adequately account for external factors, such as market fluctuations and policy changes, that can influence the interactions between the stakeholders. In a study of the solar energy industry in Spain, Del Río and Mir-Artigues (2014) found that abrupt changes in government policies led to significant declines in investments and market growth. The Catalas Model's inability to predict and adapt to such external factors limits its applicability in these situations.

Lastly, the model assumes a relatively stable and well-regulated environment for producer-consumer exchanges, which may not always be the case. In a study of the subprime mortgage crisis in the United States, Gorton (2010) found that lax regulations and oversight contributed to the proliferation of risky lending practices and, ultimately, a financial collapse. This example demonstrates that the Catalas Model's assumptions may not hold in environments with weak regulation and oversight.

In conclusion, while the Catalas Model sheds light on dual-role producer-consumer exchanges involving third-party beneficiaries and intermediaries, addressing its challenges and limitations is essential to ensure its long-term viability and effectiveness. By examining real-world case studies and empirical evidence, we can better understand these limitations and work towards refining the model for broader application.

## **Discussion**

The Catalas Model, as a theoretical framework for understanding dual-role producer-consumer exchanges involving third-party beneficiaries and intermediaries, may contribute to reshaping various industries by addressing challenges and opportunities arising from these

complex relationships. In this discussion section, we will examine the implications of the Catalas Model, identify potential areas for future research, and consider its possible impact on various sectors and economies.

One potential implication of the Catalas Model is its ability to increase efficiency in exchanges between producers and consumers by involving third-party intermediaries. These intermediaries could provide valuable services such as quality assurance, information aggregation, and cost reduction (Rayle et al., 2016; Porter & Heppelmann, 2014). However, the success of these intermediaries in facilitating efficient exchanges may depend on their ability to maintain financial sustainability, effectively manage quality assurance processes, and scale their operations to accommodate growing demand (Björk & Solomon, 2012; Jubb, 2016). Future research might investigate the factors that contribute to the success or failure of third-party intermediaries in these roles, as well as the potential for collaboration or competition among intermediaries within a given industry.

Another important consideration is the applicability of the Catalas Model across different industries and contexts. While the case studies presented in the paper illustrate the possible potential of the model in the healthcare, education, and transportation sectors, further research is needed to explore its feasibility in other industries and settings (Arrow, 2003). This could involve conducting cross-industry comparative analyses to identify contextual factors that might influence the model's effectiveness, such as regulatory environments, market structures, and cultural norms (Bessen & Meurer, 2009). Additionally, investigating the role of the Catalas Model in the knowledge economy, which is characterized by the increasing importance of knowledge products and services, could be crucial for understanding its broader applicability (Cohen et al., 2000; Nelson, 2004).

The adoption of the Catalas Model may have significant implications for the role of governments and public institutions in various sectors. As the model relies on third-party payers for funding, it could lead to a shift in the allocation of resources and responsibilities away from traditional public institutions (Geuna & Martin, 2003). This may create opportunities for innovation and increased efficiency in service delivery, but it also raises concerns about the potential erosion of public services and the equitable distribution of resources (Chesbrough, 2006). Future research should examine the balance between public and private sector involvement in the Catalas Model and explore the potential for alternative funding mechanisms, such as public-private partnerships or government subsidies, to ensure its long-term sustainability (Geuna & Martin, 2003).

In conclusion, the Catalas Model offers a perspective on dual-role producer-consumer exchanges involving third-party beneficiaries and intermediaries that could be valuable. However, further research is required to address its challenges and limitations, explore its broader applicability, and assess its potential impact on various industries and economies. By deepening our understanding of the Catalas Model, we might better harness its potential to foster innovation, improve efficiency, and enhance the overall welfare of producers, consumers, and third parties alike.

## **Data Availability**

Upon acceptance, raw data and materials will be shared publicly. The data will be deposited in a recognized data repository (e.g., Open Science Framework) and made accessible under a Creative Commons Attribution License.

## **Code Availability**

All code associated with this study will be made publicly available upon acceptance. The code will be shared on a recognized platform (e.g., GitHub) and made accessible under an appropriate open-source license. Links to the live versions of the code for data simulation, power analyses, and pilot data analysis will be provided. The code will be made available for peer-review but can be placed under public embargo until acceptance.

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## **Author Contributions**

Author A is the sole contributor to this study. Author A conceived the study design, developed the research questions and hypotheses, and prepared the research protocol. Author A was responsible for drafting the manuscript, revising it critically for important intellectual content, and giving final approval for the version to be published. Author A also agrees to be accountable for all aspects of the work, ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

## **Competing Interests**

The author declare no competing interests, financial or non-financial, related to this study.

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