Killer Acquisitions – Killing Innovation?

Navigating the Disruptive Tech World's Most Lethal Deals
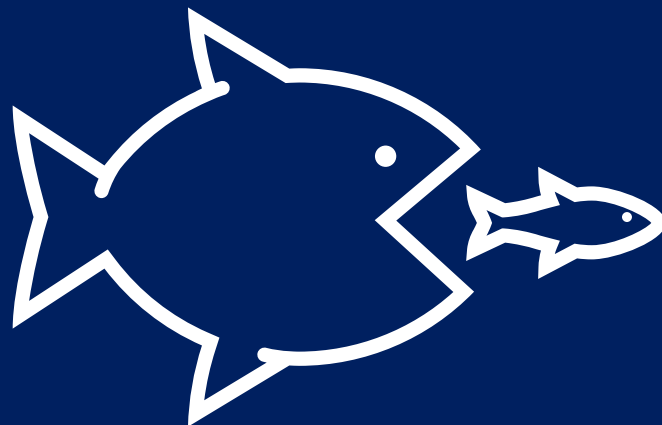
Abstract

Understanding killer acquisitions is of critical importance in anticipating a future where dominant tech firms build even greater market power stifling innovation, attenuating competition, and potentially negatively impacting society. While evidence on the prevalence of killer acquisitions in the pharmaceutical sector has been documented, evidence in the technology sector is scarce. In response, this work uses a mixed-method research design to examine the frequency, motivation, and role of killer acquisitions within *disruptive technology firms.* Through case study analysis on NATU (Netflix, Airbnb, Tesla, and Uber) firms we demonstrate that killer acquisitions are carried out by disruptive tech firms when aligned with four characteristics: 1) investments are solely focused on adjacent or transformational activities, 2) do not follow cross-border geographical expansion, 3) have an undisclosed price, and 4) both firms operate in high-tech segments similar to the incumbent. Given these findings, we then present a framework, combining a *Killer Acquisition and Hostility Spectrum*, for better understanding of more nuanced acquisition strategies, associated motivations, and potential outcomes in the technology sector. Theoretical, managerial and policy implications are then discussed. Theoretically, the findings contribute to existing literature by addressing research gaps and providing a more nuanced approach to an otherwise binary framework, while the work provides managerial understanding of future competitive dynamics, and importantly aides policymakers with insight on potentially anti-competitive behaviour with negative societal impact.

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Introduction

The transformative impact of technology on society is undeniable, and disruptive technology firms have consistently led these transformations. However, as markets mature the Schumpeterian innovation-competition debate becomes increasingly important, as firms seek to secure their position, building barriers to entry via broad ecosystems and operational and financial synergies. These barriers are often strengthened via targeted acquisitions used to secure profit streams and ultimately limit competition, potentially negatively impacting society. This behaviour is particularly prevalent in the tech sector where the value of strategic acquisitions increased 64% since 2016 with total valuations in 2021 in excess of $700 billion, accounting for approximately 19% of all strategic M&A transactions (Bain & Company, 2022). Similarly in 2022, tech remained the most active M&A sector (BCG, 2023). These acquisitions are used to reset market boundaries and push sectors forward, while allowing dominant firms to avoid the excessive costs and risks of innovating independently and potentially thwarting competition.

In traditional finance and strategic management literature, acquisition motives were historically centred on the realisation of either operating or financial synergies (Diwei Lv et al., 2020; Rabier, 2017; Seth, 1990). However, some scholars argue this is too simplistic and does not account for the high failure rates (Angwin, 2007). Failure rates for acquirers have been documented between 45% to 82% across various performance measures (D. Mueller, 2003), suggesting poor due diligence (Galpin & Herndon, 2014), inaccurate performance assessments (Wang & Moini, 2012), or alternative motivations (Angwin, 2007). It has been suggested that other motives drive acquisition behaviour as firms acquire nascent competitors only to discontinue the target's innovation projects, thereby pre-empting the emergence of future competition (Cunningham et al., 2021). This anti-competitive behaviour has been demonstrated in the pharmaceutical industry where acquiring firms did not integrate acquired products or seek to realise traditional synergies, rather they discontinued the target's development in order to increase their own market share (Cunningham et al., 2021). These acquisitions were therefore deemed hostile, and the notion of "Killer Acquisitions" (KA) was developed. The concept of KA challenges the notion that post-acquisition market share is a reliable measure of potential harm to the competitive environment. This evidence from the pharmaceutical industry begs the question of whether such innovation-impairing acquisitions are present in the other sectors, including the tech industry, where innovation is critical for success. This leaves us with the purpose of the paper and our broad line of inquiry:

Do disruptive technology firms engage in killer acquisitions?

This inquiry holds significant importance for theoretical research, business practice, and public policy due to its relevance and potential negative impact and contributes to our understanding in several ways. First, it investigates the potential loss of acquisition-based innovation in a new sector, which can negatively impact market competition, consumer welfare, and product offerings, thus recalibrating the innovation-competition debate and impacting business practices and public policies. More specifically, this work expands theoretical understanding of innovation and acquisition motivation, offering a more comprehensive and nuanced interpretation of acquisition motives in non-linear markets, particularly within the disruptive tech industry with the presentation of a new framework, combining a *Killer Acquisition (KAS) and Hostility Spectrum (HS)*. Second, from a business practice and managerial perspective, the question has significant implications for the market positioning of companies in the tech industry, their vulnerability to acquisitions, and the competitive dynamics within and beyond the sector. Lastly, from a policymaking perspective, understanding acquisition motives and outcomes can aid in decisions concerning antitrust regulation and merger control to maintain competition, consumer choice, and societal welfare.

Based on this inquiry, we present 3 research questions which direct the structure of the work. The paper begins with a theoretical exploration of various typologies and models related to innovation, acquisition motives, and the regulatory landscape. These literatures additionally shed light on the unique characteristics of the tech industry and lead to our first research question: *Do selected characteristics of the tech industry enhance innovation or act as a breeding ground for anti-competitive acquisitions that stifle innovation?* The literature suggests KA differ from traditional acquisitions in terms of prioritisation of the target's innovative capacity while negatively impacting consumer welfare via stifling of innovation. Additionally, we find the tech industry's unique market characteristics, including the importance of network effects and big data (Broda, 2019; Bughin et al., 2011; Currier, 2022), make it particularly susceptible to KA.

Having theoretically determined the susceptibility of the tech sector to increased KA activity, the paper also examines the four disruptive tech firms, Netflix, Airbnb, Tesla, and Uber (NATU), and their

acquisition activity to determine theoretical applicability of KA motivation and outcome. The analysis reveals that NATU firms hold dominant market positions in their respective sectors which they aim to protect via anti-competitive acquisitions, suggesting a prevalence of KA higher than previous findings in the pharmaceutical industry. Furthermore, these firms tend to acquire an increasing number of innovative, early-stage companies located in the same geographic region, thereby addressing the second research question: *Are the patterns of the NATU acquisition data consistent with theoretical expectations as expressed in the extant literature?*

Importantly, based on gaps in the literature and our findings in the NATU analysis, this work introduces a theoretical framework, the KAS, aimed at refining understanding of the different types of acquisitions and their impact on innovation, consumer welfare, and product offerings. By doing so, the third research question can be at least partially answered: *Given the conceptual framework of the acquisitions, what is the broader potential societal impact?* The framework posits that while KA are one form of anti-competitive behaviour, there are other acquisitions that share similar characteristics but have different impacts. To illustrate, the KAS identifies four categories of acquisitions, each with varying degrees of hostility and potential harm. The KAS is intended to provide policymakers with a nuanced approach to understanding and addressing anti-competitive behaviour in the tech industry.

Overall, the thesis aims to fill gaps in the literature by providing new insights to potentially anti-competitive acquisition behaviour, specifically within the tech industry. The development of the KAS framework highlights the complexity of acquisition motives and their impact on innovation, product offering, and consumer welfare, serving as a potential tool for regulators to make more informed policy recommendations that meet the nuanced challenges within the tech sector. The thesis ultimately emphasises the importance of monitoring the expansion of disruptive tech firms and supports the position of EU Commissioner on Competition Magrethe Vesterager, who notes regulators must follow the expansion of tech firms closely to avoid them "undermining competition as it goes, like a bloom of algae that kills off every other form of life as it expands" (Stolton, 2019).

Theoretical Background and Literature Review

This section prefaces with a theoretical delimitation of the three central concepts on which the exploration of the main line of inquiry rests. Firstly, the section delves into the notion of innovation followed by a discussion on acquisitions and then a consideration of KA. The theoretical construction and literature review of each of these three concepts features the application of a range of typologies. By applying typologies, the investigation of classes or categories linked by common characteristics, brings multiple benefits (Angwin, 2012). It allows for differentiation, creation of frameworks to access knowledge, deeper understanding, and explanations and explorations of complex phenomena and their outcomes (Angwin, 2012). Nonetheless, various issues are also present if there is an inherent reliance on typologies. They may become atheoretical, lead to clustering, be too narrowly focused and remain static rather than continuous. Overall, however, typologies are a useful tool for descriptive and exploratory studies based on complex topics with substantial literature (Angwin, 2012). Lastly, the section reviews the tech sector to highlight the key characteristics of the industry and the disruptive innovative NATU firms operating in it.

2.1. Introduction to Innovation

This primary section concentrates on establishing a foundational overview and delimitation of the concept of "innovation". As innovation is an essential factor for businesses to adapt and overcome the challenges of change, and to remain afloat in today's highly competitive world (Boyles, 2022; Henderson, 2017). It requires a conscious and purposeful search for innovation opportunities and is mostly achieved through either acquisition, realising synergies amongst resources or increased R&D (Bicen & Johnson, 2014). Innovation does not only improve the competitive capabilities of the firm, but also increases the value proposition for consumers, increasing overall consumer and societal welfare (Marshall & Parra, 2019). Making it a win-win for all.

The below section explores the four central types of innovation, followed by a consideration of 2 key approaches to innovation: The Innovation Ambition Matrix and Innovation Ecosystems.

2.1.1. A Broad Definition

Overarchingly, innovation can be defined as "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations" (Gault, 2018, p.617). This is centred around the definition from the OECD and is seen to be applicable to conceptualising "innovation" across all economic sectors. Beyond this, for the purposes of this paper, the innovation framework will also draw on the tenets of "open innovation". This signifies a recent scholarly focus on trying to measure innovation as a feature of open systems of firms. Open innovation occurs between distributed, yet interdependent firms, and facilitates both value creation and capture. Importantly for this paper, open innovation also allows a firm to harness research and development (R&D) spill overs such that the firm can acquire and transfer external knowledge into their own innovative activities (Chesbrough et al., 2018). Thereby there is a more accurate capture of how intangibility, market orientation, growth capabilities and the external environment influence innovation (Stoyneva, 2022).

However, there are a plethora of definitions, delineations, and operationalisations of the concept of "innovation" and the difficulty in separating these into clear, mutually exclusive terms raises concerns about comparability and generalisability of conclusions drawn (Kovacs et al., 2019). Thus, further delimitation is provided by implementing a constellation of typologies and frameworks below.

2.1.2. Types of Innovations

Understanding the different types of innovation is crucial when addressing KA as it provides insights into how innovations can disrupt established markets or challenge incumbent players. By recognising the implications of various types of innovation, it is possible to gain a deeper understanding of the complex interplay between innovation and competition in the context of KA. Academic works categorising and defining types of innovation are abundant and ever-changing, but one of the key pieces was created by Greg Satell (2017) and identifies four types of innovation consistent with general trends and definitions across the literature; 1) Basic Research, 2) Sustaining Innovation, 3) Breakthrough Innovation, and 4) Disruptive Innovation.

2.1.2.1. Basic Research

The first type of innovation classified by Satell differs in the sense that it can more be seen as the preliminary action taken in order to unlock the other innovation types as it stems from situations where neither the problem nor the domain is well-defined or known (Satell, 2017). Research into discovering new phenomena is required before pathbreaking innovations can begin as they "never arrive fully formed" (Satell, 2017). Subsequently, basic research often occurs in the preliminary innovation stage for firms where entry barriers are still relatively low as economies of scale have yet to fully flourish (D. C. Mueller & Tilton, 1969). These innovations can be seen as "basic innovations" consisting of more fundamental discoveries, advances, and paving the way for future research (Akcigit et al., 2021). Several firms, including Tesla, attribute numerous resources and funds to their R&D efforts and invest in basic research to propel their innovation efforts. In 2012, the company allocated 65% of its operating expenses, equivalent to $274 million, towards R&D and basic research to solve substantial problems and foster an environment that nurtures breakthrough innovations (Weick & Jain, 2014). In 2022, Tesla's R&D and basic research expenditure surged to $3.1 billion (Statista, 2023a).

It is important to recognise that this type of innovation may not be as prevalent in discussions about large-scale innovation or immediate tangible results. However, it should be viewed as a means to an end, enabling firms to translate basic research into other types of innovation. Additionally, nurturing basic research carefully is crucial to avoid falling into the "Valley of Death," a concept coined by Dean et al. (2022), which refers to the gap that exists between the development of new and promising innovations at the basic level and their successful commercialisation. Overcoming the Valley of Death often requires strategies such as increased R&D spending, a user-centred approach, experimentation, adaptation, and perseverance (Klitsie et al., 2019; Valcarcel & Giner-Casares, 2021).

2.1.2.2. Sustaining Innovation

Most innovative behaviour presents as sustaining innovation as it occurs in the face of well-defined problems and well-known skill domains to enhance existing abilities in existing markets (Satell, 2017). Accordingly, sustaining, or incremental innovation occurs more regularly as it involves smaller scale improvements on already existing products or processes as opposed to the infrequent, revolutionary nature of radical or breakthrough innovations (Rakic, 2020). As this type of innovation requires less

effort and less substantial R&D investments to be realised, it is also used more broadly by both small entrants as well as larger, more path-dependent incumbents (Rakic, 2020).

A notable example was seen with the optimisation of the Consumer Communication Gateway system by Uber in order to further improve their already innovative platform Uber Eats by seeking to enhance the timing of push notifications (Sharma et al., 2022). This highlights the ability of firms to target sustaining innovations by offering performance improvements to the attributes valued by demanding customers (David, 2020). Overall, there is a lower degree of novelty when considering sustaining innovation as it builds on existing knowledge or products by modifying already available platforms, which also leads to this type of innovation being less risky and less expensive than its radical counterpart (Gui et al., 2022).

2.1.2.3. Breakthrough Innovations

Breakthrough innovations are most likely to occur when the problem is specific and the area of expertise is not well defined, and thus are best produced through exploring unconventional and diverse skill domains (Satell, 2017). Consequently, these innovations are seen as discontinuous as they result in revolutionary changes that can contribute to sustaining long-term competitiveness (Yordanova, 2018). These actions and this type of innovation are most often relied upon by small and medium-sized firms (Shvetsova et al., 2023) as more established incumbents in an industry may endure resistance to change in the face of technological shifts and thereby be less likely to make use of radical and breakthrough innovations (Rakic, 2020). Specifically in the digital market, rapid innovation by new entrants follows a more drastic path in comparison to the more incremental, non-drastic approach of more seasoned market participants (Calvano & Polo, 2021).

Thus, breakthrough innovations are often conflated with "radical innovations" and the terms may be used interchangeably to refer to new innovations challenging the existing market (Yordanova, 2018). Airbnb was able to embody this form of innovation by building on the existing sharing economy market but tailoring the hospitality sector to be digitalised, personalised, convenient, and accessible to individuals of a range of disposable incomes (Moreno-Gil & Coca-Stefaniak, 2020). The innovations pertain to the introduction of new technologies and new products that do not initially impact the overall market

structure or business models, and manifest as a competence-enhancing process driven by already existing dynamic capabilities (Rakic, 2020). Consequently, newcomers in an industry can leverage radical innovations in attempt to circumvent the high entry barriers often imposed by market incumbents (Han et al., 2001).

2.1.2.4. Disruptive Innovation

Pioneered by Christensen in 1997, this fourth and final type of innovation is broadly researched and the most prevalent when striving to discuss KA. For Satell, disruptive innovation occurs when a firm faces changes to their external or internal environment and an innovation of products and processes is simply not enough – an innovation of the entire business model is required for firm survival in the face of these undefined problems in what was previously a well-defined domain (Satell, 2017).

Following the original definition, disruptive innovation is the process following when a small entrant firm focuses on overlooked consumer segments through presenting a novel idea which then gradually moves upmarket and eventually presents a challenge to the market leaders (Christensen et al., 2015). Disruptive innovations especially emerge in markets marked by high R&D intensity and both incumbents and small entrant firms may be incentivised to pursue this type of innovation to either achieve or sustain a monopoly profit position (Coccia, 2017a). For example, Netflix's business model and emergence is often regarded as a disruptive innovation in the entertainment industry to firstly incumbents such as Blockbuster and more recently the cable-television sector. The subscription-based video-on-demand (SVOD) innovation presented by Netflix targeted the low-end market with low prices to create new market footholds (Anindita, 2021; Christensen et al., 2015). Consistently, these disruptive innovations may contribute to higher entry barriers as they impose a significant investment requirement for future firms wishing to compete in the market (Nadler & Cicilline, 2022).

Subsequently, disruptive innovations are categorised as both having a high degree of novelty as well as a high degree of impact (Kovacs et al., 2019), as they incite changes to the market, to competitors' structure, to adopted business models and can ultimately result in the failure of industry incumbents if not mitigated (Coccia, 2017a). The attributes and true application potential of disruptive innovations are

unknowable in advance and being unable to identify these a priori is why the disruption, often developed by new firms and new entrants, works to displace market incumbents (Coccia, 2017a).

The four innovation types and their main components, as delineated previously, are summarised in the below visualisation (Figure 1) in accordance with Satell's original framework. In this conceptualisation, each of the four innovation types is separate and they are mutually exclusive (Satell, 2017).
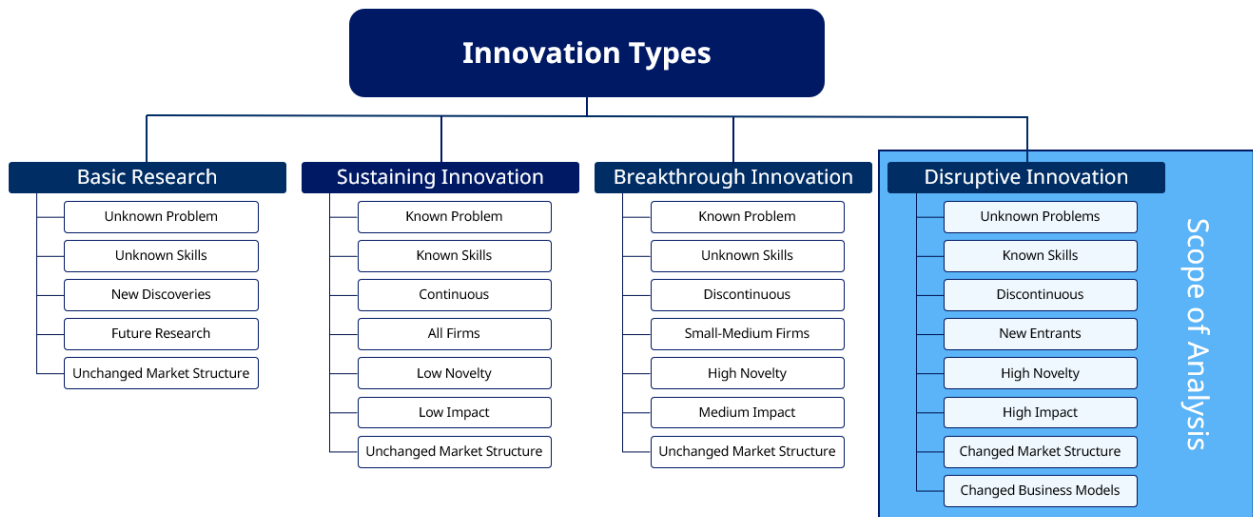
Figure 1: Satell's innovation typologies and main components, author's own creation

The dynamism and complexity of the tech industry and the recent innovation trends may influence how this framework is visualised. Consistently, it may be more accurate and applicable to consider a classification where the potential overlaps of the typologies are shown. As a result, the below visualisation is proposed for the purposes of delimiting innovation for this paper (Figure 2). Innovation types are increasingly being regarded as interconnected and the need for pursuing multiple, overlapping innovation forms in various business stages is further exacerbated as firms have to adapt to digital transformation, virtualisation, and globalisation (Aslam et al., 2020; Lampropoulos et al., 2019; Wellalage & Locke, 2020).
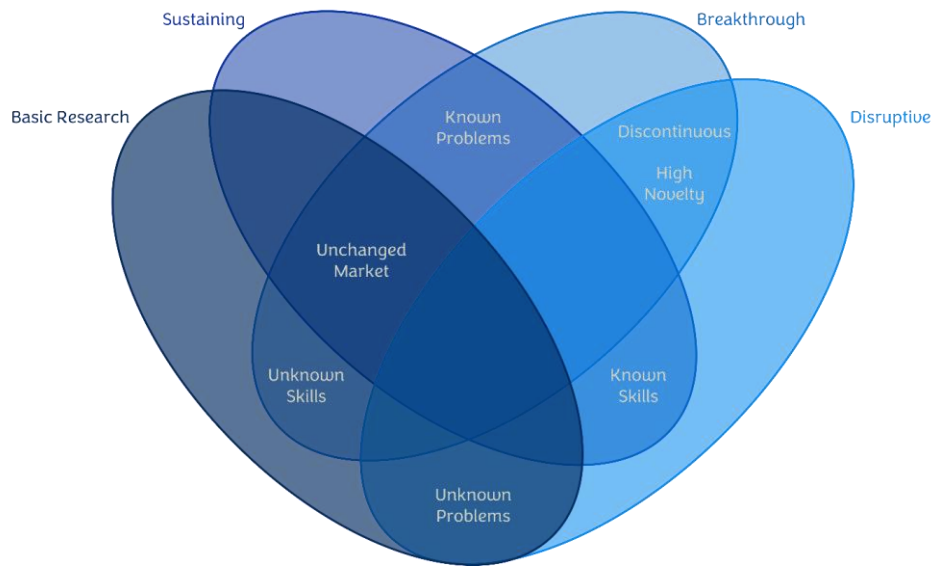
Figure 2: Overlapping characteristics of the innovation types, author's own creation

2.1.3. Innovation Ambition Matrix

Given the identified deficiencies in Satell's classification in terms of lacking recognition of the complexity of innovation activities, an additional model may be considered. Viewing innovation from a strategic perspective, decisions regarding the innovation strategy a firm pursues is influenced by a variety of factors. One model for deciphering this comes in the form of the Innovation Ambition Matrix (IAM) developed by Bansi Nagji and Geoff Tuff (2012). By correctly and adequately constructing an innovation investment portfolio based on this matrix, a firm can maximise their profits, shareholder value, market position, and improve overall growth (Nagji & Tuff, 2012). Beyond these internal competitive benefits, successful innovation investment also provides external value to the consumer through enhanced product offerings, quality, and convenience to improve overall societal welfare (Marshall & Parra, 2019). Thus, this matrix is a useful tool when evaluating the innovation and growth trajectory of a firm and how this may inform their acquisition strategy in terms of aggressiveness, choice of target firm, and motives for the transaction. Consistently, this matrix is outlined in more detail below and will be applied later in the paper as part of the data schematic and analysis sections. The IAM distinguishes between three levels of innovation initiatives in which a firm can invest, based on the degree of novelty of company offering and novelty of customer markets.

Firstly, the core innovation activities exist at the lower end of both spectrums in terms of company offering and customer market novelty as these initiatives focus on developing already existing products for existing customers. These may be reformulations, added features, or incremental approaches to new markets (Nagji & Tuff, 2012). Secondly, investing in adjacent innovation activities is similar to core activities in terms of utilising existing capabilities but then seeks to transfer and develop these in a new fashion – for a new market or new customer segment (Nagji & Tuff, 2012). Thirdly, transformational innovative activities occur at higher levels of novelty and thereby concentrate on drawing from unfamiliar skills, targeting brand-new sectors or expanding into a whole new business in a market that has yet to mature. Often these are the innovations that would be categorised as breakthrough or disruptive (Nagji & Tuff, 2012).

The IAM points to an optimum ratio of investment for each of the three innovation spheres to give the highest possible share price and returns (Nagji & Tuff, 2012). This constellation consists of attributing 70% to core innovations, 20% to adjacent activities, and lastly 10% to transformational initiatives. Nonetheless, depending on the competitive landscape, industry, and goals of the firm this ratio may differ. Thus, for a midsize high-tech firm, a much more sizeable portion of investment is given to adjacent and transformational innovations to maintain relevance in a dynamic market and remain resilient to prevalent competition. A tech-based firm might then benefit from investing 45% in core activities, 40% for adjacent innovations, and 15% in the high-risk transformational space (Nagji & Tuff, 2012) (Figure 3).
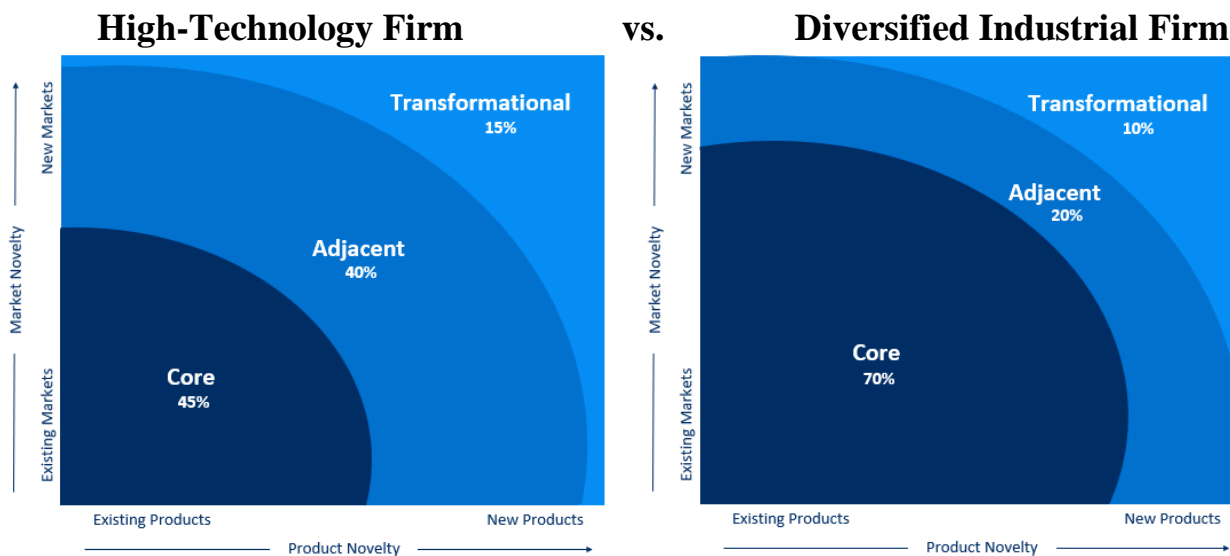
Figure 3: Optimum IAM innovation ratios for different firms, author's own creation

In summation, the concept of innovation is complex, and a range of typologies and literature have been touched upon in order to sufficiently construct an applicable theoretical framework. Primarily, Satell's (2017) four typologies served to demystify the idea of innovation and provide a tangible categorisation based on skills, problems, and the outcomes of innovation for products, processes, and business models. However, this typology is not exhaustive and further analysis also indicated that it may not be as mutually exclusive as originally proposed. The existence of overlaps and spillovers across the four types of innovation highlights the complexity of the innovative environment. Consistently, the IAM was introduced to try and address this complexity through the inclusion of the role of firms in actively pursuing given innovation strategies influenced by their goals, competitive environment, and industry. Nonetheless, deficiencies also surfaced regarding the IAM as it is a more micro-level approach mainly considering individual firm-level decisions without incorporating the effects of external factors. Therefore, it may be beneficial to add a consideration of the overarching innovation ecosystems to move closer to complete theoretical construction.

2.1.4. Innovation Ecosystems

Consistent with the strategic understanding of innovation, there is inherent importance in considering that innovation exists as an entrenched notion within a broader ecosystem and not as an isolated occurrence. Broadly, innovation activities, investments, and systems can be summarised as being embedded and taking place within innovation ecosystems (Walls, 2021). These ecosystems are the culmination of the interconnections existing between the drivers, capital, talent, and actors of innovation systems and create boundaries to distinguish between neighbouring systems (Walls, 2021). The value produced by these ecosystems is also tied to network effects, externalities, and complementary structures promoting innovation and enhanced value creation dynamics (Autio & Thomas, 2014). One of the most notable examples is Apple and the innovation ecosystem the firm created comprised of complementary technologies, content providers, hardware, operating systems as well as competing actors such as record companies and gaming app developers (Granstrand & Holgersson, 2020).

In order to navigate the complexity of these ecosystems or to establish their own independent ecosystem, a firm can use strategic action such as developing internal products or acquisitions (Walls, 2021). Similarly, ecosystems can be leveraged to overcome otherwise high barriers to entry in an industry

or sector (Nadler & Cicilline, 2022). Executing acquisitions as part of a firm's strategic positioning within an innovation ecosystem can be seen as an exploitative strategy as it aims to give access to the competences of pivotal ecosystem players and especially start-ups existing in this innovation space (Visscher et al., 2021). This strategy can then strengthen core business, expand the ecosystem, and improve focal firm competitive advantage to defend against competitors (Liang et al., 2022).

2.2. Introduction to Acquisitions

The following section provides theoretical insight into how innovation and synergies may be obtained through acquisitions. This section defines and distinguishes acquisitions from related concepts such as mergers and strategic alliances to clarify the scope of the planned framework. It then summarises current research on acquisition motives and post-acquisition performance to help distinguish KA in the subsequent part of the paper.

An acquisition, sometimes referred to as a takeover, is the process by which one company, the acquirer, purchases another company, the target, to create value (Jensen, 1988). Acquisitions have been widely studied in the field of corporate finance and strategy, with a focus on understanding the motivations behind acquisitions, their impact on the financial performance of companies, and the challenges associated with successful integration. Although the interest of the paper is more concentrated on motivations, the other key streams of acquisitions such as post-acquisition performance are also reviewed to provide context for the study of potentially anti-competitive acquisitions.

An acquisition refers to the acquisition of a controlling stake in a target firm, usually with a minimum ownership of 51% (Piesse et al., 2006). It is important to note that an acquisition does not necessarily involve the integration of the target firm's administration and operations into the acquiring firm (Cartwright & Schoenberg, 2006). Mergers, on the other hand, involve the creation of a new joint organisation through the combination of two firms under common ownership (Yin and Shanley, 2008). Mergers and acquisitions are often referred to as "M&A". However, this paper does not cover mergers as they fall outside the scope of the proposed framework. Similarly, strategic alliances, which involve two or more firms working closely together to achieve a specific strategic goal (Ren et al., 2022), are also not discussed in this paper.

A large body of research has explored various aspects of acquisitions, including post-acquisition performance (D. Datta, 1991; Harrison et al., 1991; King et al., 2004; Rau & Vermaelen, 1998), learning effects (Barkema & Schijven, 2008; Beckman et al., 2022; Vermeulen & Barkema, 2001), stakeholder management and executive compensation (S. Datta et al., 2001; Devers et al., 2007; Schmidt & Fowler, 1990), target firm attributes and organisational suitability (Anand & Singh, 1997; Puranam et al., 2006; Villalonga & Mcgahan, 2005), and the influence of institutional and cultural differences (Contractor et al., 2014; Dikova et al., 2010; Sarala, 2010; Sarala & Vaara, 2010). Another frequently studied topic in the field of strategic management and finance is the motives behind acquisitions, which are rooted in the belief that the combined value of the acquiring and target firms is greater than the sum of their individual values (Kummer, 2008; Malik et al., 2014; Nguyen et al., 2012; Niemczyk et al., 2022). These motives are typically categorised as being the desire for either operational or financial synergies (Rabier, 2017). Thus, a research gap is apparent when addressing acquisition motives outside the traditional scope, such as instances where companies engage in acquisitions with the intention to hinder or suppress innovation.

2.2.1. Innovation Driven Acquisitions

As illustrated in the delineation of innovation ecosystems and as posited by the line of inquiry, there is an inherent connection between acquisitions and the concept of innovation as the latter can function as a driving force of the former. Dominating firms in innovation ecosystems desiring control of the produced innovations are often driven to aggressive vertical and horizontal acquisition strategies (Dedehayir et al., 2018). Acquisitions, and mergers, are an effective growth strategy for firms and are often engaged in in response to a changing business environment or intensification of market competition (Wang et al., 2022). This can be a crucial alternative to organic growth as it is a faster process with a multitude of benefits for the firm (Summerfield, 2022). Thereby acquisitions can assist firms in acquiring well-established innovation resources which in turn can be leveraged to mitigate competitor pressure, improve financial development, and strengthen institutional ownership (Wang et al., 2022).

Innovation driven acquisitions proliferate in a variety of industries globally but are especially prevalent in the tech industry where the value of M&A amounted to $672 billion alone in the first half of 2021, a sizeable portion of the total global value of approximately $3 trillion (Rivero, 2021). Thus, the tech sector had the largest value of M&A for this period (Rivero, 2021). Especially for firms in this

dynamic, high-competition, fast growing industry there are multiple benefits to pursuing innovation driven acquisitions such as acquiring the innovations of entrepreneurial firms and protecting future cash flows by controlling innovation leakage and stifling (Angwin, 2007). In addition to this, firms across industries may pursue innovation-driven acquisitions to avoid the excessive costs and risks of innovating independently, or potential negative returns and stakeholder dissatisfaction from large R&D investment campaigns (Summerfield, 2022).

Nonetheless, innovation is not the only tangible driver of acquisitions as this process has a multitude of intertwined considerations, processes, and applications. Whilst innovation driven acquisitions are not included in the overall framework and scope of analysis for acquisition motives, it serves an important role as a consideration that binds together the overarching concepts of innovation and acquisitions.

2.2.2. Traditionally Driven Acquisitions

Often, acquisitions are noted to be motivated either by the desire for operating synergies or financial synergies and the 2017 primary work by Rabier was the first to draw specific attention to the dichotomy between these. Moving forward, this is one of the cornerstone pieces of literature in outlining the 2 overarching drivers of M&A activity. Rabier's (2017) study aimed to resolve conflicting findings on the relationship between acquisition motives and acquisition performance by mapping new data and integrating the arguments made by prior authors. The paper thereafter classified acquisition motives into 2 categories: 1) Operating Synergies and 2) Financial Synergies.

2.2.2.1. Operating Synergies

Operating synergies stem from improvements in revenue, growth, or performance. The value can be derived from economies of scale and scope, such as cost savings through increased production, and are obtained through the recombination of resources and capabilities. These synergies are mostly tied to horizontal acquisitions, where the acquirer and target are in the same industry or adjacent markets, which can increase product characteristics (Capron, 1999). Moreover, these horizontal acquisitions and the quest for operational synergies can also enhance innovation capabilities which are seen as a source of customer value, enhanced revenues, and reduced costs (Capron, 1999). Despite generating economic

prosperity in theory, researchers have been unable to conclusively prove that there were considerable gains from economies of scale and scope in terms of economic value (Sakhartov & Reuer, 2022; Seth, 1990).

The extension of geographical reach and product offering can also result in key operating synergies as the firm can reduce competition and exert greater control over product characteristics such as price. The primary advantage of expanding geographical scope is that it allows the company to reach a critical mass quicker. Additionally, it helps overcome the liability of foreignness, where the acquirer might be at a disadvantage due to the foreign regulatory and political landscape (Johanson & Vahlne, 2009; Zaheer, 1997). For the expansion of product offerings, the purpose is for the acquirer to leverage their innovation superiority to increase revenue (Hitt et al., 1996), which subsequently also improves post-acquisition innovation (Bena & Li, 2014).

Moreover, the firm can achieve operating synergies through greater pricing power and functional strength. For improved pricing power, the value comes post-acquisition due to the acquirer's ability to use the higher market share and reduced competition to increase the product price point (Chatterjee et al., 2003). Like economies of scale and scope, researchers were unable to conclusively prove that the increased pricing power is in fact connected to value creation for the acquirer, despite the fact that this operating synergy theoretically creates value (Espen Eckbo, 1992; Seth, 1990). Functional strength comes when combining mutually stimulating qualities of the acquirer and target. The desire to merge functional strengths is strongly connected to the motivation of acquihire, i.e., hiring by acquisition, which involves buying a business in order to onboard new skilled workers who would have been hard to find on the open job market (Holmström et al., 2019; Kim, 2018; Ouimet & Zarutskie, 2016).

Compared to financial synergies, achieving, and maximising operating synergies typically requires greater coordination and control between the firms involved in the acquisition. On the other hand, firms may undertake acquisitions in order to secure financial synergies such as reducing capital costs, diversifying cash flow, and realising tax savings (Rabier, 2017).

2.2.2.2. Financial Synergies

The central idea behind financial synergies is that they lead to increased equity value and firm consolidation through the impact they have on future cash flows. This can be achieved through increased debt capacity, tax advantages, reduction of operating risk through cash flow diversification, and value creation with additional liquidity (Rabier, 2017).

Increased debt capacity occurs when the acquirer purchases a target with imperfectly connected activities. This makes the cash flows become more stable when combined, compared to the cash flows being separate, which decreases default risk and ultimately, increases overall debt capacity (Zhang, 2022). Even so, it should be noted that the advantage of greater leverage is debatable in the world of financial literacy as the default rate of the acquirer could increase post-acquisition, increasing the cost of equity as well (Modigliani et al., 1958). Subsequently, the acquirer is able to use the improved utilisation to leverage tax advantages such as tax savings generated post-acquisition due to the potentially more favourable financial structure of the new, merged firm (Rabier, 2017). Moreover, the realisation of tax benefits can occur if the net gains and losses can be offset, i.e., if a profitable company acquires an unprofitable target, which subsequently reduces the burden of taxation. They can reduce short-term net gains and tax expenditures, through an increase in depreciation (Todtenhaupt et al., 2020). However, the tax advantages are dependent on local official tax codes, information asymmetries, and bankruptcy costs of the acquirer's home country (Brown & Ryngaert, 1991; Haugen & Senbet, 1988; Todtenhaupt et al., 2020).

Diversifying streams of cash flows aims to reduce variability in the performance of the post-acquisition entity and minimise operational risks (Rabier, 2017). The diversification can be achieved through unrelated acquisitions to stabilise the combined revenue streams and reduce variance (Seth, 1990). This notion has been both supported and challenged. Several researchers found evidence that diversification of firm-level cash flows adds value (Duchin, 2010), whereas others mentioned that shareholders should diversify on their own. Moreover, they attributed post-acquisition underperformance to behavioural distortions caused by managers' self-interest and irrationality rather than to undiversified cash flows (Angwin, 2007; Modigliani et al., 1958; Riswan & Suyono, 2016).

Lastly, another way an acquisition can create value is if an acquirer with excess cash reserves purchases a target company with promising projects but lacking in financial resources. The value is derived from the ability of the post-acquisition entity to realise the project pipeline that the target, as a standalone entity, may not have been able to access due to limited financing options (Diwei Lv et al., 2020). However, while research shows that excess cash increases the likelihood of an acquisition, it is unclear whether the use of cash reserves as a significant acquisition motive actually adds value to the post-acquisition entity. The primary concern with this approach is that excess cash can lead to overinvestment and poor target selection (Diwei Lv et al., 2020; Duchin, 2010).

2.2.3. Alternatively Driven Acquisitions

Despite the notoriety of Rabier's synergistic framework for acquisition motives (2017), there are certain deficiencies with this binary approach as it may neglect to factor in other potential drivers of acquisitions. Consistently, an additional framework is considered for a more complete overview of acquisition motives.

The framework of acquisition archetypes introduced by Angwin (2007) is explored and discussed below as it will serve as one of the key theories for distinguishing between traditional and KA, as well as contributing to the paper's data schematic. Furthermore, the work by Angwin (2007) provides a pragmatic critique of the classic view of acquisition motives and strives to mitigate the oversimplification of acquisition motives in focusing on finance and strategy (Häkkinen et al., 2010). Thus, the framework provides a more enriched understanding of M&A motivations and outcomes by identifying additional constructs that go beyond the traditional prescriptive approach (Häkkinen et al., 2010).

Despite considerable research efforts to refine and redefine acquisition performance and motivation assessments, the consensus remains that most deals fail and negatively impact organisational performance (Rogan & Sorenson, 2014). Convinced of the high percentage of failures, scholars infer that the continuation of massive transactions can only be explained by misguided managerial actions. Managers' flawed desires to engage in value-maximisation have been explained through the lens of agency problems (Jensen & Meckling, 1976), hubris (Roll, 1986), winner's curse (Varaiya & Ferris, 1987), gambler's ruin

(Wilcox, 1971), bounded rationality, and loss aversion (Marks & Mirvis, 2001; Tversky & Kahneman, 1974).

Angwin (2007) began to unravel this claim by going beyond the manager's intentions and observing what actually happens once an acquisition is made. Angwin's paper labelled the failures a result of myopia of the performance studies themselves, showing that motivation is not singular in nature, and conceptualising the greater complexity of acquisitions (2007). Moreover, given the explicit recognition of differences in motivation, one must recognise that some acquisitions might be driven by motives other than profit maximisation (Angwin, 2007). According to Angwin (2007), acquisition motivations can be divided into four classifications: 1) Exploitation, 2) Exploration, 3) Stasis, and 4) Survival.

The first category, exploitation, focuses on increasing the value of the acquirer by achieving market share and critical mass. This is done through highly certain synergies and strong attention to maximising shareholder return. Additionally, aggregating deals is important to achieve the critical size necessary for credibility and ultimately achieve a successful IPO or listing, resulting in the final payoff of maximising shareholder return.

The second category, exploration, involves acquiring assets in new areas with potential for future growth, despite the low certainty of immediate returns. The motivations for exploration include sequential growth, learning, reinvigoration, influence, and political favours. The payoffs are focused on assembling a long-term market position for future success, building understanding through small deals to pave the way for larger investments, discovering new potential markets, products, technologies, or ideas for future growth, and gaining indirect control of other assets for potential benefits. The future benefits of exploration are indeterminate, but the ultimate goal is to achieve long-term payoff.

The third category, stasis, involves acquiring a company with the aim of preserving the acquirer's competitive position by either fossilising or killing the acquired firm. The motivation for this category includes stifling innovation, damaging competitors, and both customer and supplier driven initiatives. The payoffs of stasis are centred on preventing deterioration of the acquirer's competitive situation,

preventing competitors from presenting a future threat, and engaging in acquisitions to preserve relationships.

The fourth and final category, survival, is used as a means to prevent the acquirer's demise through acquisition, even if the acquisition may result in a loss of value. The motivations for this category include self-protection, regeneration, institutional pressures, and corporate social responsibility (CSR). The payoffs of survival are centred around using size as a defence against predation, M&A as a passage to a more promising industry, coping with imposed M&A as the least bad outcome, and M&A in anticipation of potentially fundamental changes in the way business is conducted.

Despite classifying the motivations as archetypes, it is important to note that motives do not occur in a vacuum. Given the complexity of having multiple motives, each archetype can have sub-categorical spill over from another. Thus, the context of institutions provides only a nuance to frame and determine the types of acquisitions that could take place. The distorting role of the process, both internally and externally to the firm, affects all parties involved in the acquisition. As a result, it can either undermine clear motivations or lead to creative and innovative outcomes, which the archetype framework cannot predict.

2.2.3.1. Angwin's Acquisition Archetypes

As mentioned above, the four categories are affected by multiple variables. Thus, in order to generate dimensional archetypes, which are closer to reality, three additional factors were chosen (Angwin, 2007).

The first dimension addresses the primary motives of the acquiring firm. It discusses whether they are focused on maximising shareholder value through short-term competitiveness, or if they are more interested in exploring new opportunities or taking the necessary risk to simply survive and maintain the status quo. Angwin summarises these variables as 1) Value-Maximising Behaviour (exploitation), and 2) Non-Value Maximising (exploration, stasis, survival). The second dimension focuses on the extent to which external contextual drivers are stable or fragile. These variables are described as 1) Consonant and 2) Dissonant. The third dimension refers to the classic agency problem, where it is unclear

whether top management is acting in the best interest of the firm and investors or prioritising their personal gain.

Through the combination of the four categories and three dimensions, 8 main archetypes were identified and all with different outcomes (Table 1).

Archetypes	Descriptions
Type 1	Assumed in performance literature, where firms pursue rational value-maximising strategies, such as cost reduction, to enhance shareholder value. Top management function as good agents and contextual drivers encourages this type of acquisitions, which can be expected to succeed in conventional terms.
Type 2	May face contextual pressures that contradict the firm's goal to maximise shareholder value, leading to conflicts between the firm and top management's motives and those of the context, making it challenging for the acquiring firm to benefit from the deal.
Type 3	Contextual factors that may be at odds with the firm's classical motives, but the deal may be beneficial long term, although it is unlikely to succeed in conventional terms.
Type 4	Contextual factors that set conditions for classic acquisitions, with top management aligned with this pressure. The returns may be in the future, requiring exploratory acquisitions, and the deal is likely to be risky.
Type 5	Contextual pressures that may pressure the acquirer into deals that do not fit with classical firm motives with an agency problem present. The deal may suit top management and address the context but is unlikely to benefit the firm in conventional terms.
Type 6	Contextual pressures that may be propitious for acquisitions in terms of maximising firm value. An agency problem may exist, but the deal may be successful in enhancing profitability through economies of scale.
Type 7	Contextual pressures that may be counter to the firm's classical motives but could fit with exploratory motives. An agency problem does give top management scope to benefit personally, making it unlikely that such a deal would bring benefits to the firm.
Type 8 (Scope of this Analysis)	Contextual pressures might be favourable for acquisition, even if motivated by non-maximising outcomes. This could lead to speculative acquisitions with apparent low commercial justification. This might be promoted by top management in situations where there is an agency problem.

Table 1: Angwin's 8 acquisition archetypes, author's own creation

Whereas few of the archetypes can be described as classically oriented, i.e., focusing on maximising shareholder value, most others would be deemed suboptimal or unsuccessful in conventional M&A academia. This begs the question of whether or not these are illegitimate forms of acquisitions as they might not maximise short-term value for shareholders. Given the nature of this paper and the focus on the untraditional concept of KA, this paper will focus on archetype 8, where the acquisition might be motivated by a non-maximising outcome with a potential low traditional commercial justification.

2.2.4. Post-Acquisition Outcomes and Performance

Having discussed the potential for non-maximising outcomes, this section delves further into the post-acquisitions outcomes and performance tied to the specific motives. In her study, Rabier's found that the driving force behind 69% of acquisitions was operating synergies (2017). Moreover, operating synergies were found to have more extreme upsides and coincidentally also more extreme downsides compared to financial synergies. Research has shown that these synergies are the key factor contributing to superior post-acquisition performance, as they allow for more effective utilisation of the entities' resources and capabilities (Damodaran, 2005; Krishnan et al., 2009; Loukianova et al., 2017). However, some studies have challenged this view, arguing that financial synergies are more profitable as they are easier to value and implement (Chatterjee et al., 2003; Fluck & Lynch, 1999; Leland, 2007; Qudaiby Rahatullah, 2013).

The potential post-acquisition benefits of both operating and financial synergies can be substantial, however, realising these benefits can be difficult as external factors play a significant role in the integration of the target firm. A key factor of integration is the pre-acquisition planning process. Research shows that firms that invest more time and resources in integration planning are more likely to realise the expected benefits of both operating synergies (Cartwright & Schoenberg, 2006; Graebner et al., 2017) and financial synergies (Hitt et al., 2001; Shleifer & Vishny, 2003). Another factor that can influence the realisation of operating and financial synergies is the level of cultural compatibility between the acquirer and the target firm. If the firms have similar cultures, it can be easier to realise the benefits of operating synergies, and improve communication to avoid misunderstandings, delays, and conflicts (Cartwright & Cooper, 1996; Marks & Mirvis, 2001; Schweiger & Denisi, 1991).

Finally, the degree of top management involvement in the integration process can also heavily influence the realisation of synergies post-acquisition. However, as mentioned by Angwin (2007), the landscape of top management involvement is extraordinarily complex and consists of a variety of motivations, which all have different payoffs post-acquisition. As 6 of the 8 archetype outcomes would be deemed "underperforming" in conventional acquisition theory, it would be impossible to generalise and value the impact post-acquisition. For archetype 8, the concentration for this paper, the outcomes may be non-maximising based on the motives for the acquisition and thus may not be classically associated

with positive post-acquisition performance (Angwin, 2007). As the archetypes offer more complex situations compared to the synergies discussed by Rabier (2017), the proposed motivations behind acquisitions and how each informs post-acquisition performance needs to be recognised and examined, as demonstrated in the figure below (Figure 4).
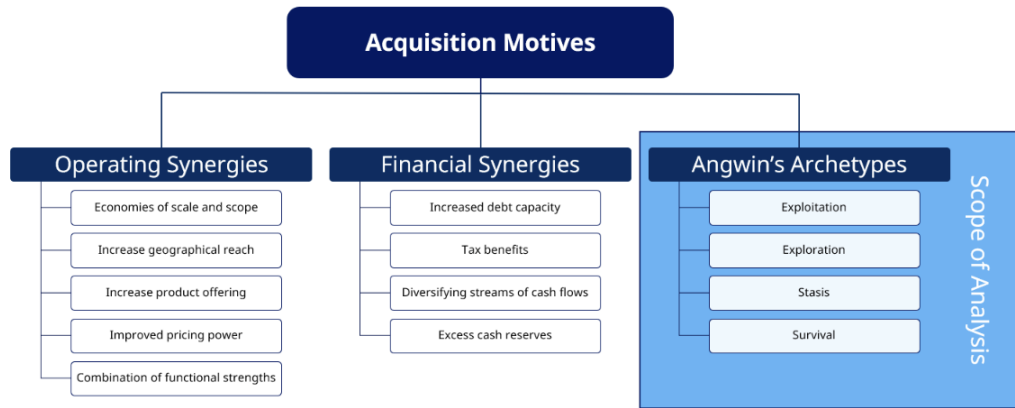
Figure 4: Traditional acquisition motives, author's own creation

2.3. Introduction to Killer Acquisitions

After having discussed the traditional motives of acquisitions, the emphasis is now on the concept of KA, a relatively new phenomenon that has emerged in modern literature. This section will begin with an introduction and definition primarily based on the work of Cunningham et al. (2021) as well as a recent application of the framework to the tech industry. Subsequently, in order to highlight the fundamental differences, the strategic drivers of killer acquisitions and the previously mentioned conventional acquisition motives are contrasted. Consequentially, merger control and the regulatory landscape are outlined. Lastly, the scope of killer acquisitions for the purposes of this paper is defined.

2.3.1. Cunningham et al. and the Origin of Killer Acquisitions

The conventional acquisition literature mostly focuses on financial and strategic synergies as well as misguided managerial actions. Nonetheless, the notion of KA as an alternative sphere in acquisition literature has begun to receive attention. This shift in focus is very recent and has been fastened by the publication and increased attention on the paper by Cunningham et al. (2021). Since its publication, the

paper has garnered a lot of praise from the academic world. It has been awarded the "Best Paper Award" by the Association of Competition Economists, the Jerry S. Cohen Award for Antitrust Scholarship, the Robert F. Lanzillotti Prize for "Best Paper in Antitrust Economics," and the AdC Competition Policy Award. Moreover, the paper was cited in a congressional report and briefing on the tech industry by the Biden White House administration (Yale School of Management, 2022).

Cunningham et al. (2021) proposed and assessed a new motive for acquisitions of innovative firms called KA, which they defined as "incumbent firms who may acquire an innovative target solely to discontinue the target's innovation projects and pre-empt future competition" (p. 1). Given the increased relevance of the paper and topic, the term, concept, and findings have been widely cited by numerous national and international organisations such as the Organisation for Economic Co-operation and Development (OECD), the European Union (EU), the U.S. Department of Justice (DoJ), the Federal Trade Commission (FTC), and the Competition and Markets Authority (CMA).

Despite having its origin within the pharmaceutical industry, the term KA has found its way into the tech debate and has become a key academic reference in the debate on tech acquisitions. As an indication of just how important the paper has become, it was the only academic paper that Jean Tirole, 2014 Economics Nobel prize winner, referred to in his opening speech to the European Commission's "Shaping competition policy in the era of digitisation" conference in 2019 (European Commission, 2019).

The Cunningham et al. (2021) paper provides a theoretical framework, supported by empirical data, about the concept of KA. They estimated that approx. 6.35%, or 45 acquisitions per year, in the US pharmaceutical sector are acquisitions with the intent to "kill," i.e., an incumbent acquires an innovative company that is developing a drug similar to the incumbent's products, and subsequently halts the development of the overlapping drug. R&D of new drugs typically involves multiple stages, takes years to develop and the outcome of the clinical trials is uncertain, making the investment highly risky. If a developed drug receives regulatory approval, patent protection provides an opportunity for companies to extract profits for the duration of the patent term, which creates an incentive for incumbents to discontinue the development of similar, potentially cannibalising drugs (Cunningham et al., 2021; Holmström et al., 2019).

The empirical data came from a conducted study of over 16,000 US pharmaceutical projects developed by over 4000 firms between 1989 and 2010. They found that 24% of these projects were acquired during the development phase. The authors determined that projects acquired by incumbents with overlapping drugs were 23.4% less likely to continue development compared to those projects that did not get acquired. The overall reasoning is that the acquirer's incentivisation increases if the target acquisition can solidify their market position or eliminate competition from substitute products, especially if the products are patent protected. The effect was more noticeable in markets with lower competition or when the incumbent's patent was further from expiration. The empirical findings were consistent with the parsimonious theoretical model, which predicted that incumbents would have a greater incentive to kill overlapping innovations when they had more to lose, such as when their patents are far from expiration and when cannibalised profits would be significant, or if they hold a significant portion of the total market share. The paper also found that projects in Phase 1 of clinical trials were 46.6% less likely to continue development and enter Phase 2 if they were acquired by an incumbent with an overlapping product. Lastly, the authors noted that projects were nearly 4 times more likely to be acquired if their products overlapped with the acquiring company's products (Cunningham et al., 2021; Holmström et al., 2019).

According to Cunningham et al. (2021), the results of KA in the pharmaceutical industry are consistent across various model specifications and subsamples, and thus, alternative explanations could be ruled out. Moreover, they found no evidence to support the idea that acquirers were using the acquired projects' technologies in their new products, nor was there any evidence to suggest that the acquisition was primarily for hiring purposes as only 22% of the acquired company's inventors continued to work for the acquirer. Furthermore, the paper identified that most of the identified KA occurred just below the US Hart-Scott-Rodino (HSR) transaction size review threshold. The HSR is a mandate for reporting stock purchases exceeding a certain threshold to the FTC and DoJ and for firms to await federal investigation into the acquisition's competitive impact. As a result, these acquisitions were not investigated, even though they could potentially harm competition. For acquisitions below the threshold, the product launch rate was lower, while the discontinuation rate was higher compared to acquisitions just above the threshold.

In summary, Cunningham et al. (2021) found compelling evidence for the existence of KA in the pharmaceutical industry, which could harm consumer welfare by reducing both drug development and price effects achieved through competition. However, the authors acknowledged that such an impact on welfare is difficult to estimate. The theoretical model used for empirical evidence does not consider ex-ante innovation incentives, and the empirical analysis is limited to observed drug development projects, making it difficult to measure the potential entry-for-buyout effect, i.e., the phenomenon where innovative start-up firms are motivated to invest in R&D with the ultimate goal of being acquired by a larger firm. While exit through acquisition can have positive welfare effects, the presence of KA may discourage innovation and lead to the production of overlapping generic drugs instead of new ones, which ultimately harms overall societal welfare (Holmström et al., 2019). Additionally, Cunningham et al. (2021) described innovation as a driver of economic growth and highlighted the probable loss of innovative capacity stemming from KA.

Despite the success and acknowledgement of the paper, some limitations need to be highlighted. Cunningham et al. (2021) posit the potential presence of KA in industries beyond the pharmaceutical sector. However, the pharmaceutical industry differs from other sectors in fundamental ways, including a distinctive product development process, market segmentation based on specific drug types with patent safeguards, and strong substitutability amongst biosimilar products. Thus, one could challenge the ability of transferability to other sectors (Holmström et al., 2019). The paper investigated acquisitions in the pharmaceutical industry that pertain to close substitutes of incumbent products. In contrast, technological conglomerates' acquisitions often involve complementary digital services, like in the case of Netflix's acquisition of the video streaming firm Roku in 2022 or Uber's acquisition of Middle East based ride-sharing service Careem in 2020 (Tracxn, 2023b, 2023d). Unlike the pharmaceutical industry, technological acquisitions may thus demonstrate minimal horizontal overlap. Also, the suggested framework is based on 2 assumptions that may not be easily observable in other industries: 1) it assumes innovation to be a binary variable with no possibility of gradual adaptation, and 2) it assumes product development to be easily observable (Cunningham et al., 2021).

Although Cunningham et al. (2021) are widely recognised for their conceptualisation of KA, the paper drew inspiration from other related concepts. For example, The Economist published an article

coining the term "shoot-out acquisitions" in 2016, and another in 2018 describing the concept of "kill zones". The first article described the purchase of start-ups with the purpose of eliminating potential competitors, i.e., a "shoot-out acquisition." The article was critical of policymakers for failing to require antitrust clearance for digital platform-driven firms acquiring companies in unrelated markets (The Economist, 2016). The second article introduced the idea of a kill zone whereby tech firms sought to embrace, intimidate, or eliminate younger competitors to solidify their market position (The Economist, 2018). Strategies employed in establishing a kill zone included partnering with start-ups, acquiring them, or announcing plans for market entry to suppress competitors' stock prices.

Additionally, a report commissioned by the German Ministry for Economic Affairs and Energy highlighted how large digital firms may acquire innovative start-ups with the aim of neutralising them and integrating them in a way that removes any future competitive threat (Holmström et al., 2019; Schweitzer et al., 2018). Although the three labels "killer acquisitions", "shoot-out acquisitions", and "kill zones" differ in their terminology, they share a common thread in describing similar overall concepts. Specifically, when acquirers purchase potentially competitive nascent companies with the purpose of eliminating them. Lastly, in 2010, Columbia law professor, Tim Wu, coined "the Kronos effect" in his book about information empires. The concept described tech companies such as Google, Facebook and Oracle killing their competitors in their infancy in order to maintain their market position (Wu, 2010).

Given the academic success and relevance of Cunningham et al. (2021), other scholars have subsequently proposed additions and modifications to the concept of KA. Marty & Warin (2020a) suggested distinguishing between "defensive acquisitions" and "offensive acquisitions", where the former is described as the acquirer's attempt to protect its market position by killing possible competitors, while the latter is aimed at extending the acquirer's dominant position to new markets. Secondly, the concept of "reverse killer acquisitions" was introduced by Crawford et al. (2020). This involves the acquiring firm terminating its own innovation efforts, and instead utilising those of the target firm, resulting in a "build vs. buy" conundrum. However, this approach may have negative implications for consumer welfare, as the incumbent firm's innovation efforts are lost (Crawford et al., 2020; Grise et al., 2020; Latham et al., 2020).

2.3.1.1. Antitrust in the Tech Industry

The piece by Cunningham et al. (2021) was the cornerstone study in introducing and defining the concept of KA. As previously noted, this study was based in the pharmaceutical industry and raised future research possibilities in attempting to apply the methodology and theoretical framework to other industries. As highlighted, the significant differences between the pharma and tech industries may make such a transference of conclusions difficult. The pharma industry is more subject to regulation, streamlined development and production processes, transparency and generally less dynamism in terms of innovation when compared to the tech sector (Drews & Ryser, 1996; Grabowski, 1982; Wang, 2017).

Nonetheless, in September 2021 the Federal Trade Commission (FTC) conducted a study of acquisitions and transactions made by large tech platforms between 2010 and 2019 (Federal Trade Commission, 2021). The purpose of the study was to investigate the acquisitions that did not trigger the HSR notification thresholds and the implications of this for antitrust regulation. The study featured findings from Alphabet Inc. (Google), Amazon, Apple, Facebook, and Microsoft otherwise known as the GAFAM (GAMAM) firms. This is one of the most substantial and officially supported studies aiming to further investigate the notions set forth by Cunningham et al. (2021). The main findings of the report were that most of the non-HSR reportable transactions were for Voting Security Control and Asset acquisition, the majority of transactions were for domestic target firms, and a significant portion of the transactions (39.3%) were of target firms less than 5 years old (Federal Trade Commission, 2021).

This paper will consequently follow a similar approach as it seeks to answer the line of inquiry and explore the applicability of KA to the innovative tech industry. However, a key deficiency identified in the FTC report concerns the inclusion of several broad types of transaction such as patents and voting control. For the purposes of this paper, a narrower and more in depth approach is taken to focus solely on company acquisitions. Additionally, the FTC report featured certain considerations that were deemed to be beyond the scope of this paper such as analysing transactions in terms of non-compete clauses and requisitioning primary data directly from the case firms. Specifically concerning the data, the FTC was able to access this by issuing a special order which essentially forced the firms to sequester the necessary data. Lastly, the report concentrated on the notable "Big Tech" companies whereas this paper has chosen

to shift the focus to the newly defined NATU companies as they are disruptive innovation firms. This choice is further discussed later in the paper.

2.3.2. Comparing Theoretical Acquisition Variations

As the distinct acquisition motives have been brought to light, this section aims to provide a precise definition and scope for the concept of KA. The acquisitions motivated by operating synergies, financial synergies, Angwin's "stasis" archetype, or by a killer perspective differ across their specific characteristics and these will be further explored in the following section. The four variations of acquisitions are compared and contrasted across 6 attributes pertaining to innovation, welfare, and competition (Adner & Zemsky, 2005). The 6 specific categories are: 1) Target's Innovation Investments, 2) Societal Impact, 3) Management & Acquihire, 4) Growth Ambition, 5) Competitive Landscape, and 6) Innovation Incentivisation.

2.3.2.1. Target's Innovation Investments

Building on the concepts introduced as part of the IAM, the motives and conceptualisation of an acquisition may be influenced by where the target firm is concentrating the majority of their innovation investments. According to the matrix, a firm can invest in one of three types of innovation activities based on the novelty of the product offering and of the customer markets (Nagji & Tuff, 2012). Whilst a firm is able to manipulate and optimise the ratio by which they invest in the three forms, more weight may be attributed to one of the innovation types (core, adjacent, transformational) according to the firm's strategy, ambitions, or operating industry. Linked to the innovation typologies, then core activities can be seen as aligned with basic research and sustaining innovation, adjacent activities as parallel to breakthrough innovations, and transformational activities as disruptive innovations.

In pursuing operating synergies, an acquirer may be inclined to target firms attributing more funds to adjacent innovations. Since the garnering of operating synergies is driven by economies of scale and desirable innovation, and because this is more likely to be present in a firm that is conducting more novel innovations, operating synergies can be improved through targeting firms with high adjacent activity investments (Rabier, 2017). On the other hand, when aiming to establish financial synergies, the acquiring incumbent is more likely to select a target firm that has a high proportion of investment in core

innovation activities. The process of obtaining innovation by acquiring firms with more unfamiliar products is highly uncertain, variable, and detracts from accurate pricing during valuation (Rabier, 2017). Subsequently, financial synergies are explicitly intended to reduce this form of variability. In this constellation, there is lower novelty and uncertainty which in turn can uphold the financial synergies (Nagji & Tuff, 2012; Rabier, 2017).

Lastly, both stasis and KA can be seen as focusing on target firms devoted to transformational innovation investments. Engaging in transformational innovation activities and investing significantly in these is akin to the development of disruptive innovations in that it results in a disruption of the current market status quo, has a high impact and high level of novelty, and thereby presents a challenge to existing incumbents (C. Christensen et al., 2015; Nagji & Tuff, 2012; Rakic, 2020). This creates the optimal conditions for motivating and inciting either a stasis archetype acquisition or a KA as they seek to stifle and cease this innovation trajectory of the target firm (Angwin, 2007; Cunningham et al., 2021).

2.3.2.2. Societal Impact

Societal impact refers to the overall change to social welfare that the acquisitions have (Chen & Schwartz, 2013; L. Gautier & Fikru, 2022). Given the nature of acquisitions, the most apparent impact in the economic literature is consumer welfare. This centres around both operational and financial synergies which theoretically provide cost savings and alter pricing models. Within the literature on innovation and strategy, a more comprehensive perspective is often taken, encompassing the broader societal impact and sustainability goals. This aligns with the emerging trend of generating value across three bottom lines: economic, social, and environmental. Certain scholars contend that by delivering social and environmental benefits to society, businesses can ultimately enhance their short-term and long-term economic performance (Adams et al., 2012; Elkington, 2004). However, due to the nuanced and multifaceted nature of the concept, the definition of consumer welfare, social welfare, and societal impact remains fluid and complex. For the purpose of this paper, these terminologies will be used interchangeably to ensure consistency in the analysis.

Acquisitions can benefit consumers if they aim to achieve operating synergies, resulting in cost savings and more product offerings (Rabier, 2017). However, if these synergies lead to increased pricing

power, consumers may suffer (Chatterjee et al., 2003). This is called Williamson's "Naive Trade-off Model," where cost savings are achieved through efficiencies, and higher prices from market power (Williamson, 1968). Acquisitions targeting financial synergies can also benefit consumers by improving corporate structure, leading to increased debt capacity, tax benefits, lower operational risk, and more projects using excess cash reserves. (Rabier, 2017). Academic literature suggests that financial synergies can reduce consumer prices and improve product options in the long-term (Amit & Livnat, 1988; Focarelli & Panetta, 2003; Williamson & Yang, 2021). However, some argue that these synergies do not have significant public performance outcomes since they are merely redistributive consequences. Therefore, while financial synergies are a crucial acquisition driver, their overall positive societal impact may be limited (Drobyazko et al., 2019).

Unlike operating and financial synergies, stasis has a neutral societal impact as the synergies are ambiguous. Thus, the overall societal impact depends on motive. This is also described by Angwin (2007), who states that the acquiring company may not receive any direct benefit, and the returns may be neutral or mildly negative. For example, if stasis is used as a customer or supplier-driven motive, they will engage in acquisitions to preserve or maintain relationships, which can create resource synergies and subsequent welfare benefits (Capron & Pistre, 2002; Chakkol et al., 2018; Hitt et al., 1993). Contrastingly, if the intention is to stifle innovation to avoid a decline in competitive capability, overall social welfare will be reduced as consumers are likely to encounter a decrease in the variety of products available, accompanied by an increase in prices (Kamepalli et al., 2020).

Lastly, in contrast to operating and financial synergies, KA produce a negative societal impact as they decrease consumer welfare by lowering price competition, impeding the development of new products and lower future innovation offerings (Bryan & Hovenkamp, 2020; Cabral, 2018; Cunningham et al., 2021; Holmström et al., 2019). However, this position is open to debate, as some argue that the increased likelihood of being acquired may increase the entrant's ex-ante innovation incentive, even without commercialisation by the incumbent (Furman et al., 2019; Letina et al., 2020).

2.3.2.3. Management & Acquihire

Management and acquihire consider 2 different types of knowledge-based acquisitions: 1) acquire and retain management to get access to tacit knowledge, and 2) acquire to get rare talents and teams with a proven record, which are scarce and difficult to hire. Given the difficulty of imitation, these motives can help cement a long-term competitive advantage for the acquirer (Calipha et al., 2018; Fantasia, 2016).

If the aim is to achieve operating and financial synergies, the incumbent firm often retains management of the target because they possess valuable tacit knowledge specific to the firm and market environment. Moreover, they can provide oversight of firm-specific processes and procedures, which improve overall chances of successful integration (Chancharat et al., 2012; Haynes & Hillman, 2010). Additionally, as acquihires are often seen when acquiring start-ups, these teams are smaller, highly reconfigurable, and mobile, making them easier to integrate with the acquirer's business (Bhargava & Venugopalan, 2013). Acquihire thus allows the acquirer to seek and gain access to expertise, experience, and talent rather than just an existing product (Varian, 2021).

For stasis, the acquisition is motivated by the desire to maintain the current competitive landscape by stifling innovation or intentionally freezing all future progress of the target. Therefore, if the target's management carries tacit knowledge that is hard to imitate, the acquisition could be management-motivated to neutralise the firm-specific knowledge to conserve the existing market and avoid future changes. Therefore, the potential outcome could be a financial setback for the acquiring firm. However, this scenario may prove to be significantly less detrimental compared to failing to impede the growth of the target firm (Angwin, 2007). Following this line of reasoning, the same principle can be applied to the concept of acquihire as the objective may be to obtain high-performing teams to safeguard potential cash flows and maintain strategic alternatives. Consequently, in the first situation where stifling is the goal, the management team is dismissed, while in the second situation where innovation is fossilised, the management team is retained. Thus, these opposing actions will offset each other, resulting in a neutral impact.

For KA, Cunningham et al. (2021) excluded the possibility of acquihire as an alternate explanation for the observed phenomenon as only 22% of the target's inventors continued working for the

acquirer and those who did, were not more productive post-acquisition. Moreover, as the purpose is to eliminate competition, the incentive would be to dismiss or marginalise the target's management team. This is because their knowledge and expertise may not only be dispensable but could also potentially impede the successful execution of the acquirer's plan to eliminate the company (Haynes & Hillman, 2010).

2.3.2.4. Growth Ambition

The concept of a growing entity is a relevant consideration in acquisition strategy. Notably, the four different acquisition motives exhibit differences regarding the entity that is expected to experience growth post-acquisition.

In instances where the acquisition is motivated by operating synergies, the primary objective is to increase post-acquisition performance for both the acquirer and the target. This is done with the aim of maximising available resources and capabilities, increasing market share, and realising synergies through geographical reach, product offering, greater pricing power and increased functional strength (Chakkol et al., 2018; Chatterjee, 1986; Hitt et al., 2001; Rabier, 2017). Similarly, when the primary motive for an acquisition is to achieve financial synergies, growing the target entity is generally considered of secondary importance. This is because other objectives, such as increasing debt capacity or realising tax benefits take precedence. Hence, the target is typically managed as a separate entity with its top management team responsible for steering the firm's strategic direction and which growth opportunities to pursue (Dean et al., 2022; Rabier, 2017; Salama & Samet, 2022; Seth, 1990). Therefore, operating, and financial synergies are two motivations that can generate value for both the acquiring and target entities.

Conversely, stasis and KA focus solely on the growth of the incumbent, as the purpose of the acquisition is to either fossilise or kill the target. Thus, a KA will stifle the growth of the target due to the sudden cessation of operations and the potential discontinuation of product development, while creating growth opportunities for the acquirer (Angwin, 2007; Cunningham et al., 2021; Holmström et al., 2019). While the acquirer may experience short-term benefits from eliminating competition and acquiring valuable assets, the acquisition could potentially hinder the acquirer's growth prospects by reducing

competition and innovation in the industry (Pérez De Lamo, 2019). This presents a double-edged sword, as the lack of new products and services in the industry resulting from the acquisition can ultimately lead to reduced demand and decreased growth potential of all industry players.

Moreover, if the acquisition is deemed a KA or unethical by the media or a governmental entity, it could have strong negative effects on the acquirer's reputation and relationships with stakeholders such as customers, suppliers, and regulators (Child, 2022; Maung et al., 2020). In turn, this backlash may negatively impact the growth ambition and opportunities following the acquisition. Two noteworthy examples of this phenomenon are Covidien and Microsoft. In 2012, Covidien received media criticism after it acquired Newport Medical and subsequently terminated its federal contract of 40,000 ventilators. This led to a national shortage of ventilators and sparked public backlash against Covidien (Stoller, 2020). The long-term societal impact of this anti-competitive transaction was a shortage of ventilators in the midst of the COVID-19 pandemic indicating significant public health consequences. Additionally, it brought further attention to the problems arising from these "power buyer" transactions (Stoller, 2020). Similarly, in 2015, Microsoft faced scrutiny for its acquisition and subsequent termination of the task management app Wunderlist and mobile calendar Sunrise. The Financial Times labelled Microsoft's strategy a "buy and kill" tactic and the acquisition became one of many deals which came under the scrutiny of the FTC (Waters, 2020).

2.3.2.5. Competitive Landscape

Regardless of whether an M&A transaction is motivated by financial synergies, operating synergies or other ambitions, these activities have consequences for the competitive landscape (Feldman & Hernandez, 2022; Kwilinski, 2020). The impact of M&A on the competitive environment, in terms of prevalence, reach, number of players, and density, varies depending on the type of acquisition.

More traditionally motivated acquisitions, such as the pursuit of operating and financial synergies, are perceived as one of the only viable strategies for achieving a competitive market advantage to avoid the excessive costs of in-house development and production (Yu et al., 2016). Generally, expanding the competitive landscape involves acquisitions providing incentives for innovation and investment, and offering benefits to consumers through a positive societal impact. These acquisitions are commonly

seen to generate pro-competitive efficiencies (OECD, 2020). Specifically, the potential to produce gains that are difficult to compete away and building the prevalence of competitors is a significant aspect of operating synergies in driving acquisitions (Rabier, 2017). Similarly for the case of financial synergies, as it has been illustrated that these seek to improve the target firm's growth prospects, and because this is relevant evidence of pro-competitive efficiencies this typology also expands the competitive landscape (OECD, 2020).

Opposingly, the outcome of stasis and KA is to shrink the competitive landscape. An anti-competitive KA results in the projects of the acquired firm being killed and overall competition being suppressed thereby also lowering consumer surplus (Motta & Peitz, 2021). When innovation is deterred post-acquisition or as part of the acquisition motives, then the competitive landscape is contracted (Bertrand, 2009). As stasis and KA mostly pertain to nascent competitors, these acquisitions result in a reduction of future competition and this in turn brings value to the incumbent (Angwin, 2007; Cunningham et al., 2021; OECD, 2020). Pertaining specifically to KA, these simplify and lessen the rigorousness of the competitive arena as the acquirers are able to behave more unilaterally in order to minimise competition (Feldman & Hernandez, 2022). As both the stasis and KA variations inherently seek to stifle competition then they consequently decrease the density and intensity of the competitive landscape (Keil et al., 2013; Uhlenbruck et al., 2017).

2.3.2.6. Innovation Incentivisation

Placing focus on the pre-acquisition time period, in this stage the target firm inherently possesses innovation incentives such as strengthening control rights, bargaining power, and contributing to consumer welfare (Chen & Schwartz, 2013; Frésard et al., 2015, 2020). Moreover, the existence of the ex-ante acquisition exit option is valuable enough to increase innovation incentives of the target firm (Cunningham et al., 2021; Haucap, 2019; Letina et al., 2021). Due to the presence of information asymmetries between acquirer and target in terms of acquisition motives, innovation incentives are ex-ante heightened by the prospect of acquisition regardless of whether this is to obtain stasis, financial synergies, or for another motive (Furman et al., 2019). Similarly, innovation incentives are in the first place high and raised further for entrants in the face of being acquired as the incumbents' desire to access these

profitable, innovative technologies drives a higher acquisition price which will subsequently benefit the target firm (Affeldt & Kesler, 2021; OECD, 2020).

Despite uncertainty and nuances to the extremity of the upsides (Rabier, 2017), it is clear that the vast majority of acquisitions create some form of value from the combination of the firms, establishment of synergies, exploitation of relatedness and so forth (Chatterjee, 1986; Hitt et al., 2012; Seth, 1990). Consistently, whether an acquisition is driven by operational or financial synergies, it creates some benefit (Rabier, 2017), including increasing innovation incentives for the post-acquisition entity. Specifically for financial synergies, there is an increase in innovation incentivisation due to the ability of the post-acquisition entity to realise more innovation project pipelines than the target as a standalone entity facilitated by the expansion of the previously limited target financing options (Diwei Lv et al., 2020).

In contrast to this, the stasis acquisition archetype results in the post-acquisition innovation incentives remaining static. The stifling purpose matches that of KA and if the dominant acquiring firm is engaging in this form of exclusionary conduct, then it will depress innovation incentives (Lundqvist, 2021). Contrastingly, when the stasis archetype is founded in fossilising and preserving the target firm's innovation capacity then the acquirer can dictate the targets rate of innovation and control any potential leakages or spill overs (Angwin, 2015). Thus, for the majority of stasis acquisitions the primary motive concerns preservation and preventing deterioration of the post-acquisition entity to reflect static innovation incentives (Angwin, 2007).

Lastly, KA cause innovation incentivisation for the post-acquisition entity to cease. The incumbent acquires the innovative entrepreneur in order to shut down the projects and terminate the new inventions thereby producing disincentives for innovation (Bryan & Hovenkamp, 2020; Cunningham et al., 2021; Feldman & Hernandez, 2022). Whilst the reduction of competition through such oligopolistic tendencies may be beneficial and attractive, this in turn decreases innovation incentives as demand becomes less sensitive to enhancements in efficiency and product quality (Stiebale, 2016). Despite KA reducing competition and stifling rivalrous innovation as a main goal, the following cease-to-innovation incentivisation may not be beneficial in the long-term or on a societal scale.

As this section has served to demonstrate, the notion of KA may be seen as a newfound variation that is the complete manifestation of the stifle component of Angwin's stasis acquisition archetype (2007) and thus this serves to bridge the gap and provide a segway from the more traditional acquisition theory towards the novel concept of KA. The similarities and differences between the four acquisition variations across the 6 characteristics are summarised below (Table 2).

Characteristic	Operating Synergies	Financial Synergies	Stasis	Killer Acquisitions
Target's Innovation Investments	Adjacent	Core	Transformational	Transformational
Societal Impact	Positive	Positive	Neutral	Negative
Management & Acquihire	Retain	Retain	Neutral	Dismiss
Growth Ambition	Acquirer & Target	Acquirer & Target	Acquirer	Acquirer
Competitive Landscape	Expand	Expand	Shrink	Shrink
Innovation Incentivisation	Increased	Increased	Static	Ceased

Table 2: Characteristics of acquisition variations, author's own creation

2.3.3. Merger Control and Regulatory Landscape

Whilst the global M&A landscape is closely monitored and subject to widespread regulation, little tangible merger control exists to cover instances of potential KA. Thus, a reconfiguration is needed to ensure the policies function effectively even in uncertain, dynamic markets characterised by the presence of digital, innovative ecosystems (Petit & Teece, 2021; Pike, 2020). Traditionally, merger control concentrates on the more static price effects of M&A activities but as innovation, competition, and the expansion of the digital economy become ever more prevalent there is a growing need for more targeted, dynamic policy (Holmström et al., 2019). However, there is simultaneously concern that if antitrust law and merger control become too vigorous that this may undermine smaller firm innovation and prevent pro-competitive integration (Latham et al., 2020). These pro-competitive acquisitions are defined as those wherein the achievable efficiencies of the acquisition outweigh any adverse horizontal price or non-price implications (Holmström et al., 2019).

The need to regulate M&A more closely stems from aiming to prevent potential concentration issues and since acquisition sprees by firms may be seen as systematic market foreclosures threatening innovation and competition (Holmström et al., 2019). KA function as a form of "anti-competitive leverage strategy" that can be either defensive to prevent entry or offensive to remove competitors, all whilst consolidating dominant incumbent positions and suppressing potential innovation (Marty & Warin, 2020b). Yet, all of these actions have so far managed to remain beyond the scope of competition authorities.

A wealth of explanations for the lacking regulation of the tech industry have been supplied, namely that the acquisition of start-ups and new, innovative entrants do not cross the notification thresholds due to the low annual firm turnover (Holmström et al., 2019). As concluded by Cunningham et al. (2021), a similar issue persists in the pharmaceutical industry where the majority of acquisitions and transactions fall below the HSR review thresholds. Consistently, the potential tech KA involving large firms typically feature a target and acquiring firm operating in different product markets leaving them less detectable to competition authorities (Haucap, 2019). This lack of relatedness and overlap between the innovations and technologies involved in these acquisitions is what separates the largely unregulated tech M&A environment from the more prolific regulation in the pharmaceutical industry. Additionally, mergers are less controlled in the tech industry since the antitrust authorities cannot as transparently investigate competitor pipelines to gauge the intentions of the acquiring firm as with pharmaceutical firms (Sokol, 2020). Reluctance from policy makers has also been cemented by the notion that any action, such as tightened merger control, could have negative impacts on the economy (Ezrachi & Stucke, 2022). Therefore, notable suggestions to address and close this regulatory gap are surfacing globally.

2.3.3.1. Policy Suggestions

Beyond national and organisationally specific suggestions, there have also been more overarching global proposals for how to engage antitrust authorities. The focus should be on identifying acquisitions that may be problematic, ensuring the authorities are notified, and making accurate distinctions between killer and pro-competitive acquisitions (Holmström et al., 2019). To improve identification, policies should concentrate on the broader ecosystems rather than particular markets or platforms and factor in the "bigger picture" of a firm's overall acquisition strategy (Ezrachi & Stucke, 2022; Haucap, 2019;

Holmström et al., 2019). Other proposals point to the superiority of breaking up monopolies, lowering turnover notification thresholds, and proliferating the reliance on internal documents (Holmström et al., 2019). The EU is currently leading this regulatory battle with numerous specific actions taken, but both the UK and the US are also engaging in the campaign.

The need for targeted tools and improved collaboration across national competition authorities has consistently been highlighted by EU officials as a way to improve merger regulation (Vestager, 2022). This need is further strengthened by the growth of the dynamic tech market and proliferation of digital players (Vestager, 2022). One of the main EU-level proposals seeks to reverse the burden of proof in antitrust legal proceedings, mostly for dominant companies, in order to highlight that planned mergers are often pro-competitive and thereby aid in separating the potential KA from those acquisitions that are in fact pro-competitive (Holmström et al., 2019;OECD, 2020).

Within the EU, the German and Austrian competition authorities have been at the forefront of combatting KA by introducing further transaction value thresholds in 2017 (Holmström et al., 2019). In addition to this, the German antitrust authorities also introduced the "Act against Restraints of Competition" allowing the prohibition of online platform conduct without a detailed assessment (Ederer, 2021). Moreover, in line with the general policy suggestions, the German regulators have also shifted the focus to "big picture" acquisition strategies. This form of merger control thus aims to incorporate the possible effects of the digital markets where competition often originates from niche, innovative activities that may not necessarily overlap as clearly with the incumbents (Holmström et al., 2019). Another approach has been adopted within the UK where the CMA has moved to widen consumer welfare standards of the current competition law, especially concerning digital markets. This is to ensure long-term innovation is not impacted by potential KA and irreversible harms to competition, consumer value, and societal welfare (Holmström et al., 2019).

On the other hand, the US has not been as vigilant in pursuing merger control that encompasses KA. Yet as the problem persists, both the government and several anticompetition agencies are beginning to act. The growing need for more regulation was further exacerbated by concerns raised following Facebook's involvement in the 2016 election, concerns about Section 230 of the Communications Decency

Act (which essentially exempts big tech firms from scrutiny and regulation of their growth activities), and concerns about shortfalls in consumer protection related to big tech's access to data and abuse of this data (Kirk, 2023). More overarching policy recommendations are also being made as the FTC is increasing scrutiny and investigation of the economic incentives and business strategies for tech firm acquisitions (Holmström et al., 2019). Finally, the US has also begun to launch several committees within the Senate and task forces within the Bureau of Competition with the express purpose of targeting KA (Holmström et al., 2019).

One of the principal actions taken in the US involved the DoJ when they blocked the acquisition of Plaid by Visa, set to take place in January 2020 (Marty & Warin, 2020b). As part of expanding and strengthening merger control, the DoJ raised antitrust concerns as there was speculation that this transaction was a KA and consequently the takeover was abandoned (Marty & Warin, 2020b). In blocking this acquisition, the DoJ highlighted three crucial aspects of the transaction that gave cause for concluding this to be a potential KA. Visa held a very dominant market position, Plaid was offering a niche, breakthrough innovation with the potential to disrupt Visa's core business, and Visa's intention to "neutralise" Plaid as a competitor posed the risk of damaging the ecosystem (Ang et al., 2021; Clark et al., 2021; Marty & Warin, 2020b). Damage was expected to occur to prices, innovation, competition, and market entry barriers (Ang et al., 2021; Clark et al., 2021; Marty & Warin, 2020b). The combination of these elements and the ability to accurately unearth them demonstrates the importance of merger control and the possibility of success in regulating M&A in the tech sector.

2.3.3.2. Consequences of Tightening Merger Control

Whilst institutions are beginning to make strides in fortifying regulatory frameworks to combat KA, there are certain issues and possible negative consequences of heightening merger control. Outright prohibition of acquisition and other highly restrictive policies have been shown to produce negative innovation effects whilst less severe remedies may not adequately capture KA (Affeldt & Kesler, 2021; Letina et al., 2021). Therefore, the crux of implementing merger control lies in weighting the negative innovation effects of restrictive policy with the pro-competitive effects of preserving competition (Letina et al., 2020). Consistently, whilst it has been established previously that the prospect of being acquired is a significant source of innovation incentive, there is also an inherent risk present if this is left

unmanaged. There is thus a risk that the prospect of an acquisition may lead to inefficient or duplicative innovations when incentives are tied to a desire for market power or disrupting incumbents (Argentesi et al., 2021; OECD, 2020).

The most significant difficulty is thereby in ensuring that the incentive to innovate is safeguarded against monopoly power, anti-competitive conduct, and KA to guarantee that idiosyncratic harms are not facilitated by tech market power (Petit, 2020). Most regulatory proposals for reform surround the notion that the social cost of lost competition far outweighs the reduced innovation incentives (Petit & Teece, 2021). Consequently, regulators are faced with a trade-off between preventing KA without jeopardising innovation (Haucap, 2019). Similarly, if this trade-off is mismanaged there is a risk that efficiencies in terms of complementarities, cost reductions, and network effects are foregone as pro-competitive acquisitions are blocked. Furthermore, this mismanagement may then set a precedent for too-strict merger control with negative long-term consequences (Holmström et al., 2019).

Consequences of improving the legal environment also include stringent legal precedence and high legal costs which may negate the viability of solutions such as breaking up big tech conglomerates (Rivero, 2021). Additionally, the process itself is marred with difficulty in terms of identifying those start-up or entrant firms with an innovative capacity capable of realistically challenge big tech incumbents, especially when innovation cannot be as easily measured by way of using patents as a proxy as in the pharma industry (Holmström et al., 2019). Another aspect that is difficult for competition authorities to measure and review is effective *potential* competition on which KA are based as opposed to effective *existing* competition which is simpler to identify (Holmström et al., 2019).

Overarchingly it is clear that there is an inherent need for improving the existing merger control and regulatory environment in terms of addressing KA and that agencies, competition authorities, and nations are beginning to do so. Yet, the potential for downsides and issues in implementing this more stringent policy could hinder fast, tangible progress. Nonetheless, the question remains: if innovation is so vulnerable and at risk to these killer acquisitions and kill zones, why has more not been done (Ezrachi & Stucke, 2022)?

2.3.4. Justifying Killer Acquisitions

Previously and traditionally, the notion of KA is viewed and discussed from a negative perspective in terms of the harm they bring to the competitive environment and innovation. In spite of this, there also exist several scholars and outlooks seen to be pro KA or negate the claim that there are only problematic outcomes (Byrne, 2018; Kennedy, 2020a; Prado & Bauer, 2022).

Firstly, it has been argued that the benefits brought from network effects in the tech industry far overshadows any potential downsides to anti-competitive behaviour by dominant firms (Kennedy, 2020a). Rather than utilising acquisitions and significant investments in R&D to artificially reduce supply or compete unfairly, large firms instead use these actions to retain users, innovate, and create new markets (Kennedy, 2020a). The cost synergies obtained by consolidating firms via acquisitions can then offset any potential harm they may create (Kirk, 2023). Thereby the resulting competition is simply seen as Schumpeterian rivalry where monopolists are temporary and technological progress is continuous. As a result, current merger control is seen to adequately address the small instances of legitimate antitrust issues. Introducing further regulation would only serve to dissuade the innovative spirit of incumbents and make it more difficult for entrants to obtain early-stage funding (Kamepalli et al., 2020; Kennedy, 2020a; Letina et al., 2020).

Whilst kill zones are often seen to limit competition, they could also be posited as enabling innovation by serving to guide entrepreneurial and innovative resources to the incumbents who possess the knowledge and capabilities to successfully commercialise these innovations (Kennedy, 2020b). In this case, the zones do not "kill" the innovation but rather allow for new companies to instead concentrate on breaking into other markets to better benefit the overall society (Kennedy, 2020b). Similarly, conducting acquisitions of nascent firms may be a preferable and attractive strategy to assist with technology transfer to the dominant digital incumbents who possess the abundant excess cash and high capacity for internal investment to realise successful innovations (Cabral, 2020). In addition to assisting technology transfer, kill zones and KA also contribute positively to the growth of venture investing and motivate start-ups to shift their innovations to ones that can improve incumbent technology (Bryan & Hovenkamp, 2020; Kennedy, 2020b).

Finally, digitalised, and innovative superstar firms inherently possess strong connections to global flows of finances and services through their use of highly skilled labour and access to intangible assets (Kennedy, 2021). Thereby, their dominance and market power are simply the product of superior business performance. This superiority then allows the firms to outcompete and outperform others to create public value. Resulting concentration and antitrust concerns are thus misplaced as they can be explained by the performance of these superstar firms rather than anti-competitive behaviour, and by the notion that the majority of global markets still have concentration levels low enough to not trigger anti-trust concerns (Kennedy, 2021). Moreover, without the high-performing business models and beneficial technology of these firms, data as a resource cannot be adequately used to advance consumer welfare (Popiel, 2023).

This section has aimed to show awareness for the existence of contradictory perspectives regarding the role of KA. Nonetheless, the majority of these arguments stem from a notoriously pro-tech, anti-antitrust think tank funded by large tech, pharma, and fintech firms and agencies (Information Technology & Innovation Foundation, 2023). Additionally, many of the presented ideas can be countered by the substantially larger body of literature dedicated to the negative impacts of KA. For example, buyouts by large tech companies cause substantially less venture capital funding and market-entry (Koski et al., 2020) and shifting innovations to improve incumbent technology means the innovations are no longer focused on aiding the broader society and markets (Bryan & Hovenkamp, 2020). Therefore, acknowledging the potential competing views is important in terms of strengthening the thoroughness of the paper but the position remains in line with the overall negative outlook on KA.

2.3.5. Conclusion on Killer Acquisitions, Operationalisation, and Jurisdiction

In conclusion, the concept of KA, as introduced by Cunningham et al. (2021), has brought attention to a crucial aspect of acquisitions that could have significant implications for innovation, consumer welfare and competition policy. The paper has led to a shift in focus in acquisition literature by highlighting the potential harm caused by incumbent firms acquiring innovative targets with the sole intention of discontinuing their innovation projects to pre-empt future competition.

Furthermore, the section has provided a comprehensive analysis of the four key acquisition strategies with the goal of highlighting the uniqueness of KA when compared to acquisitions motivated by operational or financial synergies. Here, Angwin's (2007) stasis archetype served as the bridge between the classic synergy motives and the newly introduced concept of KA. The study emphasises the importance of the pre-acquisition and post-acquisition stages in determining the societal impact, effects on innovation, growth ambitions, and the competitive landscape.

The theoretical construction also highlights the growing need for more targeted and dynamic merger control policies to address the potential negative impacts of KA. The rise of digital and innovative ecosystems necessitates more comprehensive and effective regulatory frameworks in the ever-changing global M&A landscape. The policies should focus on the broader ecosystem rather than particular markets or platforms and consider a firm's overall acquisition strategy, rather than single transactions in isolation. Breaking up monopolies, lowering turnover notification thresholds, and proliferating the reliance on internal documents when evaluating acquisitions are among the suggestions proposed. The regulatory landscape across the globe has begun to adapt to this emerging issue, with countries like Germany and Austria introducing further transaction value thresholds and shifting the focus to big-picture acquisition strategies to lead the regulatory effort in the EU. These changes in policy suggest a growing recognition of the potential for broader negative impacts of KA and the need for effective regulatory frameworks to mitigate them.

Following a collation of the previous theoretical discussion, a definition of KA is constructed. This notion encompasses Angwin's archetype and proposes that KA are the complete manifestation of the stasis archetype. Moving forward, this paper will follow the below definition when addressing the concept of KA:

Drawing from the specific definition proposed by Cunningham et al. (2021), killer acquisitions (KA) are defined as strategic acquisitions made by the incumbent with the sole intention of discontinuing their innovation projects to pre-empt future competition. When considering the tech industry, killer acquisitions affect innovation and competition, and have a negative societal impact. Specifically, these acquisitions typically target transformational innovation companies and decrease overall social welfare. They involve the dismissal of existing management, with the acquirer's only priority being their own growth ambitions. As a result, the competitive landscape shrinks, and the incentive for innovation ceases to exist, stifling the potential progress of the acquired company.

Thus, given the overarching ambiguity, this paper aims to further address the phenomenon of KA and seeks to explore whether this theoretical definition also is applicable to tangible acquisition data. Furthermore, it should be noted that the definition of KA in the tech industry may exhibit conflicting findings and instances where mutual exclusivity is lacking. Therefore, in order to provide a more comprehensive and precise understanding of this phenomenon, the paper aims to develop a framework that can clearly delineate KA in the tech environment. To achieve this, the key industry characteristics of the dynamic and rapidly evolving tech sector will be defined in the subsequent section.

2.4. Introduction to NATU (Netflix, Airbnb, Tesla, Uber)

The proceeding sections will serve to first provide an insight into the NATU firms followed by highlighting the key industry characteristics of the tech sector. Moreover, a delimitation of the noteworthy firm-specific characteristics for the four case companies is outlined.

2.4.1. Introduction and Definition

As internet companies continue to grow and digital giants dominate numerous industries, increased attention is being paid to these firms and their strategies. Looking at the "Big Tech" industry, it can be categorised into three major groups: "GAMAM" (Google, Apple, Meta, Amazon, and Microsoft), collectively referred to as the "Big Five" or "Tech Giants", which operate in the global information tech

sector. "BATX" consisting of Baidu, Alibaba, Tencent, and Xiaomi, represents the major tech players in China (Ferreiro, 2018). Finally, the "NATU" group, entailing Netflix, Airbnb, Tesla, and Uber, has emerged as the key disruptors in recent years because of their innovative technologies, which have profoundly disrupted traditional business models (Frimousse, 2022). NATU is aiming for ever more prevalence as they work to optimise the consumption of services in the specific industries to which they belong (Attarça, 2022). Previously, discourse and research have centred around the GAMAM companies as they were the characteristic tech giants with the most significant revenues, R&D expenditures, and overall market power (Ezrachi & Stucke, 2022). The acronym GAMAM was previously referred to as GAFAM but the former will be used following the conversion of Facebook into Meta.

Despite the inherent differences between the four firms, all of them possess the same core competence in relying on innovative tech to facilitate them in disrupting their respective sectors as each strives to, and succeeds in, attaining market leadership (Tigges et al., 2018). Beyond this, the firms may also be able to rely on exploiting network effects to gain a competitive edge and innovation resources (Jelassi & Martínez-López, 2020). By concentrating on this form of fast-paced and constant innovation, the firms are able to adapt consistently to changes in the surrounding society, economy, industry technology and managerial practices (N'Goala et al., 2019). Furthermore, this high adaptability and ability to trump less agile competitors can be partially attributed to the technological lead possessed by the NATU firms. As newcomers, these firms are *built* for the digital age from the outset unlike those firms seeking to add digital capabilities to an existing business model (Jelassi & Martínez-López, 2020).

2.4.2. Tech Industry and Disruptive Firm Characteristics

The tech industry, and the subcategory of disruptive tech firms, are characterised by certain industry and firm-level attributes that augment the likelihood of potential KA. Thus, this segment will firstly concentrate on 6 specific industry features, which fall under three broader categories, summarised at the end of the section (Figure 5): 1) Network Effects and Economies of Scale and Scope, 2) Competition and Market Uncertainty, and 3) Data and Innovation. Once they have been described, they will be used as an indication of why KA might thrive or wither within the tech industry. Secondly, the segment will consider the firm-level factors defining innovative, disruptive tech firms. However, as these

characteristics remain somewhat ambiguous and undefined (Nagy et al., 2016), the selected features will be based on the definition by Agarwal et al. (2017).

Defining the tech industry is a complex task that has been undertaken by scholars for a long period of time and thus a degree of consensus exists regarding which characteristics classically can be attributed to delineate this industry. The tech industry centres around young and new activity and has been categorised as being innovative, science-based in producing information and applied knowledge, and creating products that seek to alter the behaviour of groups and individuals (Aydalot & Keeble, 1988; Balashova et al., 2020; Zakrzewska-Bielawska, 2010). Consistently, the environment of tech firms is regarded as having high prioritisation of R&D, frequent innovation, high mortality rates, rigorous competition, and significant information management (Lin et al., 2012; Mohr, 1996; National Research Council, 1996). A similar characterisation points to the competitive disruption, network effects, big data, and increasing returns of network externalities that are typical in high-tech industries wherein monopolistic firms operate (Currier, 2022; Jacobides & Lianos, 2021; Motta & Peitz, 2021; Teece & Coleman, 1998). Lastly, a more modern constellation points to the "Seven Deadly Sins of Tech" pertaining to the industry's features of competition, innovation, acquisitions, switching costs, entry, size, and entry barriers (Motta & Peitz, 2021; Varian, 2021). Collating these tendencies produced the 6 overarching characteristics that will be further discussed below.

2.4.2.1 Operating Externalities

Network Effects. Network effects refer to the positive impact experienced by users of a product or service as its overall number of users increases. Thus, as the network becomes larger and denser, its value-proposition to the users increases exponentially (Bansler & Havn, 2004). The technological sector is subject to notable network effects, to the extent that some scholars have labelled it the greatest predictable attribute of the most valuable tech firms (Currier, 2022).

More specifically, 2 types of network effects exist: 1) Direct Network Effects and 2) Indirect Network Effects. Direct network effects occur when the value of a platform increases as more users join, leading to network growth. (Farrell & Klemperer, 2007). For example, as more hosts list their properties on Airbnb, the platform becomes more attractive to travellers looking for accommodations (O'Briant, 2018), and as more drivers join Uber, riders have access to more cars, resulting in shorter wait times and

increased value for the service (Stobierski, 2020). Conversely, indirect network effects occur when a platform or service relies on multiple user groups, like buyers and sellers, producers and consumers, or users and developers (Farrell & Klemperer, 2007). As more individuals from one group join a platform, the other group experiences an increase in value. For example, as more charging stations are installed to support Tesla cars, they become more practical and convenient for drivers, thus increasing their value to passengers (Xing, 2015), and as Netflix continues to create popular original content, it attracts more users to the platform and thus, increasing the value to both existing and potential users (Mcintyre & Srinivasan, 2017).

Moreover, strong network effects serve as a powerful barrier to entry and when combined with a high market concentration, become a source of durable market power (Nadler & Cicilline, 2022). Additionally, network effects create value externalities, making innovation ecosystems more valuable and encouraging complementary innovation for superior value creation (Autio & Thomas, 2014). Given the power of network effects and innovation ecosystems, an innovative start-up with an expanding user base could become a potential competitor to the incumbent, even without an initial product overlap (Cabral, 2020). Thus, incumbents may consider pre-emptive acquisitions to safeguard their market position, which contributes to the creation of kill zones (Prado & Bauer, 2022; Holmström et al., 2019).

Notably, this emerging topic bears a close association with conventional notions such as economies of scale and scope. To illustrate, a firm's pricing strategy may engender a network effect among buyers when prices decrease as demand increases. Consequently, such an approach may reflect economies of scale on the production side, particularly if these benefits are passed on to consumers (Bagwell & Ramey, 1994). Likewise, direct network effects are sometimes characterised as demand-side economies of scale (Parker & Van Alstyne, 2005), whereas indirect effects constitute demand-side economies of scope (Gawer, 2014).

Economies of Scale and Scope. Economies of scale refer to the cost advantages that a business can achieve as it grows and produces more products or services. Economies of scope, on the other hand, refer to the cost advantages that a business can achieve by producing a variety of products or services using the same resources (Morris, 2008). In a tech context, this can manifest as the ability to leverage

existing technology infrastructure and experiences to create new products or services. Thus, innovative tech firms must leverage digital assets to create platforms that aggregate demand and create network effects (Parker et al., 2016; Rethans, 2016).

Since the seminal work of Adam Smith (1909), economies of scale and scope have been studied in a wide range of industries and fields (Deller et al., 1988; Murray & White, 1983; Venkatraman & Subramaniam, 2002). Recently, it has become a critical consideration within the tech industry as it contains high start-up costs and low variable costs (Büchi et al., 2018; Qiu & Anadon, 2012). Thus, it generates a notable decrease in unit costs as sales volume increases (Nadler & Cicilline, 2022). This effect is further intensified by the role of data as large tech firms use their vast datasets to improve product quality, for example, technology-driven customisation to user preferences (McClean, 2020). This is supported by Schmarzo's theorem (2020), which explains that digital assets can reduce marginal costs through digital economies of scale while simultaneously accelerating economic value creation through digital asset reusability. Additionally, the utilisation of data can result in significant economies of scope within product development, as it can be employed to create diverse products given its versatile nature (Cennamo, 2021; Eisenmann et al., 2011). An example is evident in Uber entering the food-delivery market with UberEats, a service that leverages the current infrastructure and data collected from its pre-existing platform (Lawrence et al., 2022). Therefore, tech firms can capitalise on their economies of scope by expanding their presence in adjacent markets with low start-up costs and through their existing innovation ecosystem (Bourreau, 2020; Nadler & Cicilline, 2022).

The potential downside of expanding in such a manner is the emergence of a digital landscape that is monopolised by large conglomerates with formidable innovation platform ecosystems (Nadler & Cicilline, 2022). Consequently, firms that operate multiple platforms, interconnected by user data, may develop a gravitational pull similar to that of a black hole. This could result in their ability to exercise a high degree of control over multiple platforms, creating a kill zone around them (Condorelli & Padilla, 2020; Kamepalli et al., 2020; The Economist, 2018).

2.4.2.2. Market Externalities

Competition. A wide range of factors perpetuating the dynamic, high level of competition in the tech industry exists including the prevalent use of knowledge and human resources as special means of production (Zakrzewska-Bielawska, 2010). Dependence on these means of production enables high levels of competition as firms strive to embolden their unique capabilities, intellectual capital, and continuous effective innovations. This supports firms in increasing and maintaining a potential competitive advantage in the face of such a dynamic market (Lin et al., 2012; Zakrzewska-Bielawska, 2010). As innovation and business ecosystems become ever more profound across the industrial landscape, these spaces of complementarity create power asymmetries that feed into a whole new field of competition (Jacobides & Lianos, 2021; Petit & Teece, 2021).

Consumers in the tech industry face high switching costs when considering switching to another product. This is due to learning costs, inability to appropriate data, and accessibility issues (Adner & Zemsky, 2005; Farrell & Klemperer, 2007). While these costs tend to be regarded as softening competition as incumbents face difficulty in capturing consumers from competitors, the addition of network effects contributes to all-or-nothing and often exclusionary competition that becomes complex and treacherous for firms when combined with high switching costs (Farrell & Klemperer, 2007). Despite this, firms in the tech industry compete intensely for consumer attention, preserving competition in the industry (Nadler & Cicilline, 2022). The competitive advantage gained from being capable of disrupting others to attract consumers is one that firms are willing to protect via exclusionary and predatory behaviour (Farrell & Klemperer, 2007).

Inadvertent impacts of the industry's rigorous competition include the increased likelihood of imitative learning and me-too products that reduces the creation of new, innovative products (Lin et al., 2012). On the other hand, the existence of intense competitive overlap may also drive rapid technological progress, increased output, and declining prices benefitting consumers, suppliers, and competitors alike (Varian, 2021). Mostly, however, the widespread competition in the industry inspires predatory strategies. Acquisitions especially are purposefully used to claim smaller start-ups or nascent firms with the express purpose of eliminating potential competitors that threaten to dethrone existing incumbents and their entire business models (Jacobides & Lianos, 2021; Lemley & Mccreary, 2020; Varian, 2021).

Moreover, the high competition levels between tech firms producing disruptive innovations can induce exclusionary conduct in the form of kill zones created to prevent competition from occurring and reduce the external value of nascent firms to drive down acquisition prices (Motta & Peitz, 2021).

As an industry feature, intense competition between tech firms concentrates increasingly on non-price outcomes such as data collection and innovation when compared to other more traditional industries (Affeldt & Kesler, 2021; Zakrzewska-Bielawska, 2010). The fostered KA, especially in online dynamic markets, thereby raise considerations regarding privacy and innovation wherein the impacts of these transactions extend to consumers and competitors (Affeldt & Kesler, 2021). The turbulence and uncertainty of this industry as a whole thus make it difficult to fully grasp the gravity of the competitive threats posed by nascent firms and start-ups (Roberts, 2022).

Market Uncertainty. Operating in a high-tech environment may prove difficult in the face of the high uncertainty and supercharged competition present (Petit & Teece, 2021), yet high-tech firms are more likely to be accepting of this uncertainty and skilled at finding ways to mediate the impacts as it is inherent in the industry (Zakrzewska-Bielawska, 2010).

Several factors may explain the high uncertainty characterising the tech industry. Primarily, the volatility of demand, complexity of production processes, and high acquisition costs of knowledge, other firms, and technologies make it difficult for firms to conduct capacity planning thereby acting as a source of turbulence. Firms can hedge against this uncertainty by expanding their capacity via investments (Smirnov et al., 2021). Leading incumbents controlling the ecosystem can orchestrate transactions in the environment and control the future of innovation (Ezrachi & Stucke, 2022). Another set of conditions contributing to the high-tech industry's prevalent uncertainty is the technological complexity and vast skill sets required for breakthrough innovations as these can distort signals from target firms (Anagnostopoulos & Rizeq, 2019). Decision-making in these acquisition transactions occurring under uncertainty thereby also often results in the imitation of innovations (Ozmel et al., 2017).

Consequently, one of the more notable outcomes of the industry uncertainty is heightened ex-ante innovation incentives that in turn function as strong motivations for potential KA (Motta & Peitz,

2021). Similarly, whilst there is uncertainty about the likelihood that acquisitions will become fully fledged KA, even if they simply result in a loss of competition as opposed to a complete innovation shutdown this is still deemed to pass the threshold for consumer harm (OECD, 2020). Nonetheless, deep uncertainty as a culmination of dynamic potential competition is a key tenet for the occurrence of KA (Petit & Teece, 2021).

Despite this seemingly problematic high uncertainty in the tech industry, large incumbents or "survivors" of the industry are able to harness certain innate capabilities to navigate such an ecosystem. Where uncertainty and high entry barriers traditionally lower the incumbency advantage as new entrants may possess more knowledge about potential innovative technologies (Varian, 2021), the survivors can leverage their capital intensity, large size, economies of scale benefits, and use of M&A to sustain market power (Qiao, 2023). Beyond leveraging existing capabilities, firms may be driven to develop high-level dynamic capabilities in order to thrive and secure competitive advantage in uncertain environments (Petit & Teece, 2021). Especially for digital firms seeking competitive advantages, these dynamic capabilities aid in managing uncertainty and securing crucial data-related advantages (Petit & Teece, 2021).

2.4.2.3. Industry Advantages

Big Data & Self-Reinforcing Data. The quote by Yuval Harari, "those who own the data own the future", highlights the importance of handling vast amounts of data to create competitive advantages (Broda, 2019; Harari, 2018). As data has become a critical determinant of future success, large companies with the power to collect and analyse extensive data reinforce their positions of power, allowing them to accumulate even more data (Bughin et al., 2011). This section will explore the role of data in technology and focus on 2 overall concepts: 1) Big Data and 2) Self-Reinforcing Data.

Focusing on the role of big data, Olsson & Bull-Berg (2015) provide a commonly accepted definition. They state that the differences between structured data in conventional databases and big data can be illustrated by "the three Vs": volume, velocity, and variety. Volume refers to the most prominent characterisation and addresses the vast amount of data which increases by 40% each year, and needs to be managed (Manyika et al., 2011). Velocity encompasses 2 aspects: the first is the continuous flow of data, while the second is the ability to use real-time data. Lastly, there's the variety which denotes the

diverse characteristics of data, such as unstructured data or data presented in various structures, and the sources that generate them (Ekambaram et al., 2018; Olsson & Bull-Berg, 2015).

As big data are extremely large datasets generated through the three Vs, they are often too complex for traditional data processing techniques and require advanced analytics tools such as machine learning, artificial intelligence, and natural language processing (Davenport & Dyché, 2013; Laney, 2001). In the tech industry specifically, big data has played a critical role in enabling companies to innovate and create new products and services (Lohr, 2012). Additionally, with the ability to collect and analyse vast amounts of data, companies can make more informed and data-driven decisions (Patil & Davenport, 2012). Overall, the role of big data is multifaceted and has the potential to drive significant value by enabling innovation, improving decision-making, and driving efficiencies.

Self-reinforcing data in the tech industry refers to the phenomenon where the data that a company collects and analyses influences its future decisions and actions (Dobusch & Schüßler, 2012). Essentially, as a company collects more data, it gains a better understanding of its customers, operations, and markets, and this knowledge is used to make more informed decisions that, in turn, generate more data. This means that, if done correctly, the large companies who have power right now, get to collect more data and reinforce their own positions of power (Fish, 2020).

According to Dobusch & Schüßler (2012), there are four types of self-reinforcing mechanisms: coordination, complementarity, expectation, and investment and learning effects. Coordination effects are the result of actors making similar choices or following the same rules, leading to more efficient interactions and network effects (Dobusch & Schüßler, 2012; Katz & Shapiro, 1985; Sydow et al., 2008). Complementarity effects make technology more attractive to buyers and users by making it more affordable and accessible as related products, services, and processes improve (Farrell & Saloner, 1985; Katz & Shapiro, 1985). Expectation effects arise from people adjusting their expectations based on the expectations of others, which can influence individual preferences and behaviour. Thus, individual preferences are, to a certain extent, influenced by the anticipated future choices of others (Dobusch & Schüßler, 2012; Onufrey & Bergek, 2015). Investment and learning effects make people more likely to stick with a

particular technology because they have invested resources and knowledge in it, resulting in economies of scale and product improvements (Dobusch & Schüßler, 2012).

The combination of big data and self-reinforcing mechanisms serves as a barrier to entry and exacerbates anti-competitive conduct in the tech industry. As dominant tech firms operate in multiple markets, they can mine commercially valuable information from third-party businesses to benefit their own competing products (Dobusch & Schüßler, 2012; Nadler & Cicilline, 2022). This has been labelled "The Matthew Effect", which describes the phenomenon where those with more resources or advantages are more likely to accumulate even more resources and advantages over time, while those with less fall further behind (Fish, 2020; Perc, 2014). In the context of big data and machine learning, the Matthew Effect is amplified by self-reinforcing data. Those who already have access to large amounts of data are better positioned to improve their algorithms, models and products, leading to even more data and success (Broda, 2019). Making those with less data face a disadvantage in terms of innovation and competitiveness. As a result, the concentration of data and power in the hands of a few large companies can limit competition and stifle innovation, reducing overall industry innovation (Davenport & Dyché, 2013; Katz & Shapiro, 1985; Lohr, 2012; Nadler & Cicilline, 2022; Teece, 1986).

Innovation. As a dynamic and central industry characteristic, innovation is an outcome of, as well as a condition for, competition and network effects. The uncertainty and disequilibrium of the tech industry act as a foundation for dominant firms to obtain profits by continuously creating value through innovation (D'Aveni, 1999). This creativity and innovation can be spurred by the economies of scale and specialisation provided by high-tech ecosystems and the digital environment itself is also driven by potential competition and innovation (Jacobides & Lianos, 2021). In turn, the highly competitive and dynamic nature of the technology-driven market embeds open innovation as a successful pathway to foster further growth and positive economic performance. Open innovation models additionally serve to enhance network effects that can largely drive innovation in the high-tech industry (Dooly et al., 2021). However, in certain cases, the high switching costs of the industry may lead incumbents to delay these innovations to instead rely on new entrants to introduce breakthrough innovations that the dominant firms then can imitate and access (Farrell & Klemperer, 2007).

As a result, it is inherently clear that the tech industry is driven by innovation and correspondingly, the firms contained in this sector must also exhibit innovative behaviour (Jacobides & Lianos, 2021; Zakrzewska-Bielawska, 2010). Innovative firms operating in this innovative industry are then capable of creating and absorbing technological innovations, adapting to the uncertain environment, and attaining market leadership to beat out the high competition (Zakrzewska-Bielawska, 2010). Consistently, a sufficient innovative capacity is a crucial source of competitive advantage in dynamic markets like the tech industry where innovative dynamism exists given the industry's shorter life cycles, rapidly changing technologies, and high competition (Lin et al., 2012).

Incumbent, monopoly tech firms possess stronger incentives to target innovation in a primary segment of new entrants, start-up firms, and early adopter consumers as a culmination of the disruption brought to the industry by uncertainty and rigorous competition (Adner & Zemsky, 2005). Realising this targeting may take the form of acquisitions and such M&A activity in the tech industry influences the level of innovation in the environment. In the short term, this may have positive effects by improving the ecosystem and encouraging additional network effects. Yet the long-term impacts may be adverse as these competitor-oriented strategies can lower innovation and cement firm dominance to such a degree that it becomes incontestable (Bourreau & de Streel, 2019; Crémer et al., 2019). Nonetheless, scanning for resources and performing acquisitions as part of external technology scouting can facilitate innovation by allowing firms to gain access to innovative developments in spite of the uncertain tech environment (Wang & Quan, 2021).

The prevalence of innovation in the tech industry contributes to flourishing KA as new entrants produce disruptive innovations that challenge the position of the incumbents (Cunningham et al., 2021). However, since the digital industry has an abundance of products, many entrants, widespread innovation, and unpredictability, then the motive for KA to pre-empt potential competition may be weakened as there are so many potentially disruptive innovations to sift through (Affeldt & Kesler, 2021). Despite this potential for uncertainty, innovation in the industry is still becoming increasingly dependent on external innovation resources, which may be accessed via acquisitions, as opposed to internal resource integration (He et al., 2022). As the high-tech industry faces fast-paced technological advancement, newer firms become more willing to embrace outbound open innovation where innovation flows from inside the firm

and out to the ecosystem. The goal of this open innovation approach is to inspire commercialisation, which can be seen as a source of innovation incentivisation. Thereby, the firm may outwardly innovate and contribute to the supply of external innovation resources in the hope that they may be acquired by a dominant player able to realise these innovation projects (He et al., 2022).
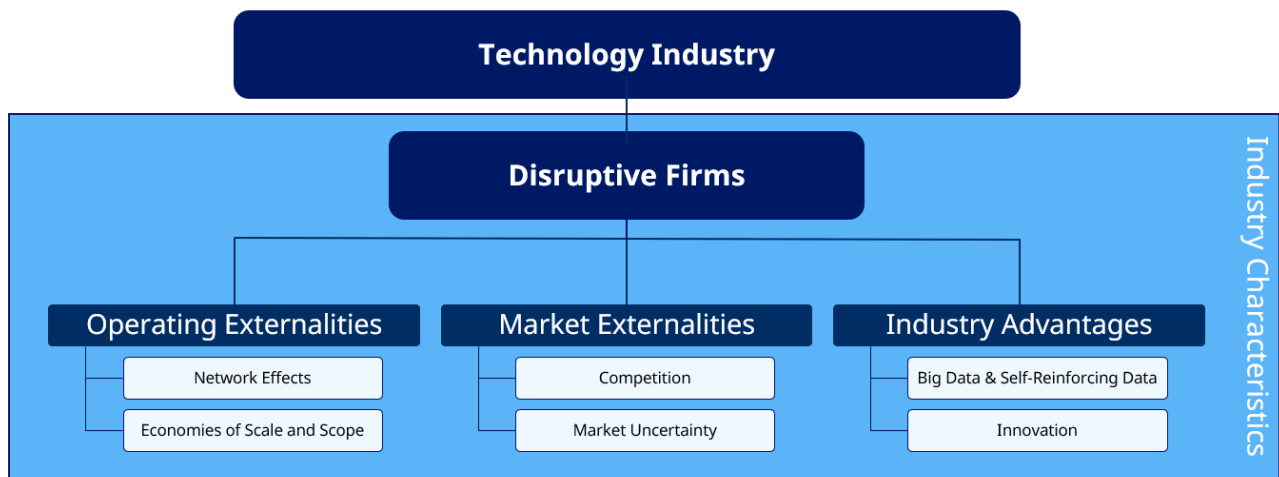
Figure 5: Central characteristics of the tech industry, author's own creation

2.4.3. Firm-Specific Characteristics

As previously discussed, reaching a consensus regarding the characteristics that may be used to define disruptive, innovative tech firms has proved difficult as there exist a multitude of considerable factors. Nonetheless, Agarwal et al., (2017) provided a comprehensive delineation based on a systematic literature review with 32 features viewed to be possessed by such firms. For the purpose of this paper, this has been narrowed down to 4 overarching characteristics, summarised at the end of the section (Figure 6): 1) Advanced, 2) Convenient, 3) Large Scale, and 4) Radical. Each of the 4 characteristics will be discussed below and draw on existing literature and theory as well as concrete examples tied to the NATU companies.

2.4.3.1. Advanced

As a result of digitalisation and the opportunity for real-time data collection, the tech industry has access to vast amounts of data, i.e., big data. However, big data is just raw data and thus, the disruptive innovation coming from advanced big data is through analytics processes and tech development

(Ravindra, 2017). For example, the process of booking an Uber ride may seem simple as it involves just a few clicks to set the pickup location, request a car, go for a ride, and make the payment. However, the simplicity of the user interface belies the advanced complexity of the processes and data analytics that underpin the operation of the \$64 billion start-up. Uber's ability to disrupt a traditional market can be attributed to the strategic collection and effective use of big data for informed and intelligent decision-making (Project Pro, 2023). To transform advanced data sets into tangible products, disruptive firms are increasingly spending more on R&D to improve scientific labour, integrative capabilities, and advanced cumulative learning (Coccia, 2017b).

2.4.3.2. Convenient

Products based on disruptive technology are typically cheaper, simpler, smaller, and more convenient to use. Thus, if technology has such characteristics, it can displace more sophisticated incumbents (Christensen, 1997). As a result, big tech companies try to become a one-stop shop for all consumer's needs through unified experiences and ease of use across all platforms and products (Along, 2017). Critics have pointed out that one of the challenges posed by tech companies is that their relentless pursuit of making things seamless and convenient can also make it difficult for users to escape their grasp (Nadler & Cicilline, 2022; Naughton, 2019). This can limit consumer choice, foster monopolies, raise concerns about data privacy, and reduce the overall innovation ability of the tech industry (Chen & Schwartz, 2013; Nadler & Cicilline, 2022; The Economist, 2016, 2018).

For example, Netflix was able to disrupt the movie industry by providing customers with the convenience of watching movies instantly online (Pallid, 2021). Today, they provide a viewing experience that never ends through their endless supply of shows and films and their tailor-made data-driven recommendations (Miller, 2022), making some scared that Netflix is becoming a monopoly (Masters, 2016; Souza & Romero, 2021).

2.4.3.3. Large Scale

Being characterised as large scale goes beyond the physical or financial size of the firm to include notions of market power, dominance, access to resources, and economies of scale and scope. These features are able to be leveraged by the disruptive, innovative firms inhabiting the tech industry as having a

large size is a key feature in generating technological change and attaining strong market power able to support industry leadership (Coccia, 2017b). Airbnb has, for example, capitalised on the market power it possesses as a leading sharing economy tech-based firm to acquire a wide user base and offer their innovative service in an effective, competitive manner (Russo & Stasi, 2016).

In the context of an innovation ecosystem, this degree of market power affords the firm the ability to orchestrate the ecosystem trajectory to expand their output in order to secure a dominant, disruptive design (Jacobides & Lianos, 2021). External characteristics of the tech industry such as uncertainty and competition, as previously discussed, exacerbate this effect of large scale output (Jacobides & Lianos, 2021). Large, established firms can further their solidification as highly innovative and disruptive if they possess a clear inclination towards innovation and differentiation via radical, breakthrough activities (Camisón-Haba et al., 2019). The establishment of the Tesla Giga Factory in Germany in 2019 helped to reduce the costs that were previously incurred due to the lack of economies of scale. This move allowed Tesla to benefit from both economies of scale and scope in their production process (Breul & Neise, 2020; Jezierski, 2015).

2.4.3.4. Radical

Inherently the disruptive tech firms are innovative in their strategies, project pipelines, and activities. Consistently, this tends to be in the vein of radical, breakthrough innovations which sets these types of firms apart from competitors and complementors. Radical innovations come mainly from large firms with higher R&D capabilities and more complementary assets (Sood & Tellis, 2011), and this is especially apparent for computing-based platforms, software development, as well as digital services and processes (Latzer, 2009). Often, these pioneering radical innovations are driven by forward-looking executives and are accompanied by high R&D investments serving to create new technological trajectories (Coccia, 2017b). Introducing radical, breakthroughs such as their subscription-based video-on-demand (SVOD) service as well as the use of artificial intelligence in their recommendation algorithms, highlights the disruption and innovation of Netflix (Anindita, 2021; Vrabie, 2022). These features contribute to Netflix's successful business model and approach to innovation for customer centricity, quality, and value-creation (Souza & Romero, 2021).
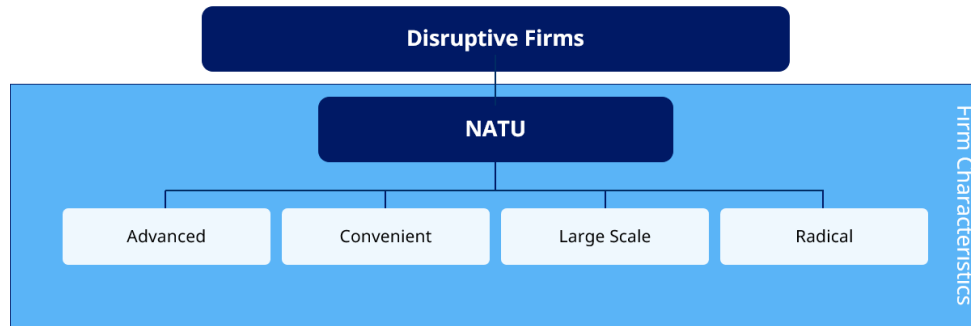
Figure 6: Central characteristics of disruptive innovative tech firms, author's own creation

2.5. Development of Primary Propositions

On the basis of the constructed theoretical background and the gaps identified as part of the extant literature, 4 general propositions are set forth to guide the analysis and discussion of the given line of inquiry. Since the research follows a broader, exploratory approach propositions are used in place of testable hypotheses as the purpose is to explore the phenomenon of KA as opposed to testing the chosen data against predicted or expected models. This choice is further discussed and justified in the proceeding methodology section. Moreover, these primary propositions are drawn from the theoretical perspectives presented and will consequently be used to filter the NATU acquisition data to give 4 additional propositions.

As informed by the innovation typologies and the significance attributed to disruptive innovation (Christensen, 1997), it was shown that KA are primarily driven by incumbents seeking to prevent potential competition from targets who are disruptive and devoting sizeable resources to novel, breakthrough, and transformational innovations as prescribed by the Innovation Ambition Matrix (IAM) (Cunningham et al., 2021; Nagji & Tuff, 2012). Consequently, the first proposition can be stated:

Proposition 1: Target firms that closely follow the IAM optimum ratio for tech firms are more likely to be subject to killer acquisitions.

KA are centrally motivated by anti-competitive considerations as the incumbent pre-emptively combats potential competition and stifles disruptive innovation from the target firm (Angwin, 2007; Cunningham et al., 2021). Consistently, they do not follow traditional acquisition motives such as operating

and financial synergies, geographic expansion, or entry into new global markets (Johanson & Vahlne, 2009; Rabier, 2017). As a result, the second proposition can be defined:

Proposition 2: The occurrence of killer acquisitions is not likely to follow a distinct cross-border geographic pattern as they are not motivated by traditional synergies.

As a result of the anti-competitive nature of KA, such acquisitions will strive to evade antitrust scrutiny by maintaining transaction prices below notification thresholds, as postulated by Cunningham et al. (2021), Holmström et al. (2019), and Kirk (2023). Drawing on this literature, Proposition 3 can be formulated as follows:

Proposition 3: The transaction price will be below notification thresholds to avoid intervention from antitrust authorities.

As KA seek to prevent potential competition, previous research has suggested that such acquisitions target firms operating in similar tech ecosystems (Motta & Peitz, 2021), as this can provide the incumbent with higher market concentration and a source of durable market power (Nadler & Cicilline, 2022; Liang et al., 2022). Drawing on this literature, Proposition 4 can be posited as follows:

Proposition 4: Killer acquisitions are more likely to occur when the incumbent and target firms operate in similar tech ecosystems.

Research Design and Methodology

3.1. Philosophy of Science

Research Philosophy refers to the nature and progression of knowledge through research. The philosophy adopted involves assumptions about the paper's worldview, which impacts both the research strategy and methods selected (Easterby-Smith et al., 2018). Thus, this section will begin by addressing the 2 primary research assumptions: 1) Ontology and 2) Epistemology. Finally, the section will present the chosen philosophy for this thesis: critical realism.

The first perception of research philosophy is ontology, it is a discipline of philosophy that explores the nature of reality, which is sometimes elusive and difficult to understand (Moses & Knutsen, 2019; Saunders et al., 2019). Epistemology, in contrast, is concerned with the fundamental presumptions of what knowledge is thought to be genuine. In essence, epistemology establishes the types of knowledge that are deemed appropriate for use in research, resulting in a variety of methodological options based on permissible knowledge diversity (Easterby-Smith et al., 2018).

There are five research philosophies, according to Saunders et al. (2019): positivism, critical realism, interpretivism, postmodernism, and pragmatism. Each philosophy has its own assumptions about the 2 terms defined above. In the context of this paper, critical realism is deemed to be the most appropriate as its epistemological position emphasises the necessity of understanding the underlying mechanisms and structures that drive social phenomena (Belfrage & Hauf, 2017; Hu, 2018; Moses & Knutsen, 2019), which is crucial when investigating the dynamics of KA in the tech industry. A key component to critical realism is the 'structured ontology', which consists of three individual layers. The first layer consists of the empirical domain, which encompasses the subjective perceptions of individuals. Secondly, the actual domain comprises the events that occur even though they may or may not be detected or observed. Lastly, the real domain expresses mechanisms which cannot be observed or detected but have significant consequences for the individuals (Bryman, 2006; Easterby-Smith et al., 2018; Hu, 2018).

This thesis' critical realism stance aims to define an objective reality. Despite accepting the existence of objective reality, the critical realist viewpoint emphasises that our understanding of it is limited

by our perceptions and experiences. Thus, the research methods are adopted to account for the structured realist ontology and interpretivist epistemology of this philosophy (Moses & Knutsen, 2019; Saunders et al., 2019). Thus, the critical realism approach is most suitable for this thesis as it strives to identify the underlying causal mechanisms that drive the observed phenomena (Bryman, 2006; Easterby-Smith et al., 2018; Hu, 2018).

3.2. Research Design

The given research design for this paper has been developed to best suit the line of inquiry and drive the further exploration of the concept of KA. The primary purpose of this paper is to develop an understanding of the complexity of KA in order to propose a more nuanced framework that may provide theoretical, managerial, and regulatory insights. As a result, an exploratory research design employing a comparative case study approach and mixed methods has been selected. This is consistent with previous work in this domain (Holmström et al., 2019; Latham et al., 2020; Lundqvist, 2021; Marty & Warin, 2020b; Pérez De Lamo, 2019).

In order to adequately explore the topic of interest, a plan for examining this and how to conduct the relevant research is required and is summarised as the research design (Marczyk et al., 2005; Saunders et al., 2019). Three key choices are made when outlining a research design concerning the purpose, the methodological position, and the research strategy. The decisions made regarding each of these parameters will be outlined below followed by a more thorough discussion of the comparative case study approach and the relevant case selection procedures used.

The purpose of the research design is to facilitate the exploratory nature of the paper. For an exploratory research design, the focus is on open-ended questions seeking to discover more about the topic of interest, gain useful insights into a given phenomenon, and clarify understanding of topics where the nature of them may be unclear or imprecise (Makri & Neely, 2021). This type of design is beneficial as it is highly flexible and allows for a broader initial focus that becomes narrower as the research is conducted (Saunders et al., 2019). Secondly, exploratory research designs often consist of a mixed methods approach where a combination of quantitative and qualitative methods are employed to further the understanding of the research and to supplement theory development via abduction (Saunders et al.,

2019). Abduction, or retroduction as it is often referred to, is a key tenet of critical realism wherein data can be used to explore phenomena, identify patterns, and generate new or modify existing theory (Belfrage & Hauf, 2017; Saunders et al., 2019). Retroduction is thus the socially positioned, subjective yet reflexive, and continuous movement between the actual and the real domains to connect theoretical and empirical research (Belfrage & Hauf, 2017).

Lastly, the research strategy adopted for this paper is the case study and specifically, a comparative multiple case study (Saunders et al., 2019). Case studies are one of the foremost approaches within a non-experimental research design. However, they present a limitation as they are not as effective in controlling for extraneous variables or the impact of the external environment when compared to experimental research designs (Marczyk et al., 2005). Nonetheless, this non-experimental research design and case study research strategy are beneficial for multi-case research and this thesis regarding KA where the context of the tech industry, regulatory landscape, and innovation have significant influence.

3.2.1. Comparative Case Study

This paper follows a comparative case study approach in order to provide background and allow for a thorough discussion of a concrete problem and complex phenomena, such as KA and innovation, where a precise solution or outcome may not be apparent (Gustafsson, 2017). The comparative case study involves multiple cases and thus it is important to clearly define the comparison. Thus, the primary comparison parameter is of the pharma and disruptive tech sectors in accordance with the first research question. The secondary comparison lies across the NATU firms to further explore the specific nature of KA occurring in the disruptive tech sector. The selection of the NATU case firms gives a more concrete sample to represent the more fluid, complex tech sector.

Whilst difficult to define precisely, a case comprises of an individual, group, institution, or phenomenon that is self-contained and acts as a vehicle for the study of the functions and relationships existing both within and surrounding the case (Gustafsson, 2017; Saunders et al., 2019; Stake, 1995, 2010). Case study-based research designs thus contribute to furthering understanding of the case itself (Stake, 2010). Moreover, a qualitative case study allows for the study of the experience of real cases occurring in real situations and thereby serving to provide experiential knowledge (Stake, 1995). Consistently, this

follows the critical realism exploration of the real domain where structures, causal powers or deeper mechanisms can be discovered (Hu, 2018). However, these predominantly qualitative case studies are often intricate and may lack a degree of scientific thoroughness which can impact the validity of the findings. Yet, this is a beneficial research strategy when the goal of the research is exploratory and aims to evaluate and develop theories (Gustafsson, 2017).

Specifically, multi-case research simply involves the study of more than one case, often in a comparative manner, and features cases that share some common condition and are categorically linked in some fashion (Stake, 1995, 2010). The cross-case comparison also contributes to shedding light on the surrounding context in which the cases are embedded which is exceptionally relevant for explorative research (Stake, 1995, 2010). Other advantages of this approach include that multiple case study research provides more convincing theory creation, wider exploration of research questions and theory evolution, and contributing to the reliability of the findings (Baxter & Jack, 2008; Marczyk et al., 2005).

Overall, the best case studies are those with a few specific cases with many observations to raise within-case explanatory power and reliability (Skarbek, 2020). However, this research choice does have a weakness in terms of external validity pertaining to generalisability as findings tend to be more specific to the cases and their context (Bryman, 2006; Skarbek, 2020). Nonetheless, when including multiple cases, the data and phenomena being studied can extend to beyond just each individual case to account for external context and serve to mitigate the challenges this research strategy presents in terms of validity (Eisenhardt, 1991; Vannoni, 2015; Yin, 2009). Additionally, case studies are particularly vulnerable to experimenter bias as there is heightened interaction between the researcher and "participant" (Marczyk et al., 2005). But as long as there is a soundness to the research design and it is sufficiently and thoroughly considered then this often means the results produced maintain their accuracy and meaningfulness (Marczyk et al., 2005).

3.2.1.1. Case Selection

As a culmination of the research strategy and constructed theoretical background, the case selection procedure for this paper is primarily driven by theoretical sampling. This process encompasses key elements from critical realism, exploratory research design, and comparative case studies (Coyne, 1997).

Theoretical sampling contributes to theory exploration, understanding of social phenomena, and comparative analysis (Campbell et al., 2020). This sampling procedure involves the simultaneous selection, collection, and analyses of data (cases) to build, modify, and challenge emerging theory (Campbell et al., 2020; Coyne, 1997; Draucker et al., 2007). More specifically for this paper, the theoretical sampling includes a purposive selection of typical cases following a most similar approach. For most similar case selection, the cases should share key variables of interest and vary meaningfully across one or more other variables (Nielsen, 2016). For this paper, the NATU case firms share similar firm characteristics whilst all belonging to the disruptive tech sector. The variation thus occurs across their acquisition activity. This approach ensures a representative sample for exploratory research whilst contributing to generalisability and the isolation of the findings from potentially noisy externalities (Moses & Knutsen, 2019; Seawright & Gerring, 2008).

Sampling is typically categorised as being either random or purposive when discussing case selection. Even though it is most effective in avoiding selection bias, random sampling is not used for this thesis as it can be problematic for smaller samples and comparative case studies with less than five cases since it then may lead to the sample being substantially unrepresentative of the total population (Seawright & Gerring, 2008). Thus, purposive case selection can be applied to address the unreliability and lack of generalisability associated with smaller sample case studies because it allows the researchers to choose the appropriate cases given the line of inquiry (Seawright & Gerring, 2008). Generally, the comparative case method uses purposive rather than random sampling for case selection (Moses & Knutsen, 2019).

As a subset of purposive sampling, this thesis directly concentrates on typical case selection to give the strongest base for generalisation whilst conforming to the exploratory nature of the research (Seawright & Gerring, 2008). Typical cases demonstrate stable cross-case relations and are representative of the phenomena being studied as they possess strategic importance for the research questions and main line of inquiry (Bartlett & Vavrus, 2016). The puzzle to study thus lies within each typical case and the existing model and underlying causal mechanisms which can then be confirmed, moderated, or disproved via the research (Seawright & Gerring, 2008). For this paper, this pertains to cases that are known

characterisations of tech-based innovative and disruptive firms culminating in the selection of the NATU firms.

3.3. Research Methods

Once the research design has been established and the cases selected, it is important to make and justify choices regarding research methods. Firstly, the mixed methods research approach will be outlined and discussed. Proceeding this is a discussion of the data collection of the paper including the considerations made regarding primary and secondary data, triangulation, and how this will serve the crux of the paper's discussion and analysis.

The research methodology follows from the research design to highlight the specific principles, procedures, and practices that will henceforth dictate the research (Marczyk et al., 2005). Based on critical realism and the existence of an external objective reality, the research methods are adopted to account for the realist ontology and interpretivist epistemology of this philosophy (Saunders et al., 2019). Exemplary critical realist research may then take an outset in quantitative analysis of published secondary data and then supplement with qualitative research methods to explore surrounding perceptions and the underlying mechanisms of the existing structures (Belfrage & Hauf, 2017; Saunders et al., 2019). This is in keeping with the use of abduction, or retroduction, as part of critical realism pointing to the advantages of employing a variety of methods to explore a theory and develop a richer understanding (Saunders et al., 2019). As a result, this thesis follows a mixed methods approach rather than a purely quantitative or qualitative methodology.

Traditionally in economics and institutional research case studies are quantitative, but the addition of qualitative evidence can expand the amount of informative evidence available, increase understanding, shed light on findings that are not easily quantifiable, and ease the navigation of "thick" concepts (Skarbek, 2020). The combination of both methods facilitates a deeper understanding of the selected cases such that the research can develop, evaluate, and amend measurements and conclusions more accurately (Skarbek, 2020). Mostly, the mixed methodology for the paper follows a concurrent triangulation design wherein the quantitative and qualitative evidence is collected in the same phase of research as this brings more attention to how they complement and support one another (Saunders et al., 2019).

Following the exploratory nature of this study, more prioritisation is given to the qualitative data and methods and the quantitative aspects are designated a more secondary role (Saunders et al., 2019). As part of the mixed methods, the ensuing data collection and analysis becomes more complementary, credible, supported by complete knowledge and the research benefits from heightened data triangulation and a greater confidence of conclusions drawn (Bryman, 2006; Saunders et al., 2019).

3.3.1. Data Collection

This thesis employs a combination of quantitative and qualitative methodologies to address the line of inquiry. The study uses qualitative data through academic reports, journal articles, books, and professional reports, to acquire concept- and industry-specific insights, which help formulate the theoretical framework. Additionally, qualitative data is used to supplement the acquisition history, which is inherently quantitative in nature. The implementation of mixed methods is deemed appropriate for this paper as it mitigates the limitations of each method (Bryman, 2006). Additionally, it provides the foundation for a richer approach to data collection, analysis, and discussion (Saunders et al., 2019).

3.3.1.1. Primary Data

Given the nature of the topic, collecting primary data was deemed particularly difficult given the lack of transparency in anti-competitive behaviour and specific acquisition motives by the chosen case firms. This notion carries over to the collection of secondary data as it is collected by others and might be subject to limitations and biases.

Since the paper addresses KA, a concept mainly used in a negative context, usable data collection directly from the four companies would most likely be limited. Thus, given the high cost and risk of collecting primary data, this paper will be based on secondary data (Saunders et al., 2019). That being said, some authors argue that utilising secondary data offers an advantage over primary data as it is readily available and can be assessed beforehand (Stewart & Kamins, 1993).

3.3.1.2. Secondary Data

As mentioned, this paper is based on both quantitative and qualitative data. The quantitative data comes from a thorough examination of Netflix, Airbnb, Tesla, and Uber's acquisition records, which

consist of 64 individual acquisitions. Most of the acquisition data is sourced from Traxcn, which is powered by the largest start-up data platform in the world (VC Stack, 2023). The collected data was spot checked against other databases such as Crunchbase, Statista, and PitchBook to further uphold data triangulation. Other quality indications for the data collected from the Traxcn database include its use by governments, universities, and Fortune 500 companies to track innovative firms (G2, 2023), and its recognition as a Top 100 Analytics Startup by Forbes in 2015 (G2, 2023). Moreover, the utilisation of a comprehensive database such as this streamlines the research process by making copious quantities of data available in one location in a collated manner. However, the database data was supported using information that was made publicly available, including press releases, corporate reports, and news stories. Subsequently, the information was filtered in chronological order to clearly illustrate each company's history of acquisitions. Additionally, descriptive statistics such as frequency distributions were applied to assist in accurately characterising the variables observed (Marczyk et al., 2005).

As a supplement to the quantitative acquisition data, observations regarding the general investments made by each company across the same time period were also collected. This was done to further increase the sample size and facilitate the generalisability and identification of broader, overall patterns of the firm activity. Acquisitions can be seen as a subset to general investment activity, and therefore this data was analysed to further support the conclusions drawn and strengthen the general trends discussed. However, one notion surfaced from the investment data, indicating that it contributed a significant number of observations to companies that were already abundant in terms of data points for acquisitions. Therefore, it simply amplified the existing patterns rather than contributing significant observations to the datasets for all of the firms.

The acquisition data for the four case companies was simultaneously supplemented with qualitative data regarding the nature, features, and outcomes of each of the acquisitions as designated by the concurrent triangulation design for mixed method, comparative case studies (Gustafsson, 2017; Saunders et al., 2019; Skarbek, 2020). Including qualitative secondary data can address gaps in the quantitative data and allow for better responses to the research questions and more thorough analysis of the main line of inquiry (Skarbek, 2020). For example, quantitative data does not offer insight into the company and sector reactions to the acquisitions, nor analyst and governmental evaluations of the outcomes.

Consistently, beginning with a quantitative analysis of published secondary data supplemented by further qualitative research adheres to the critical realism philosophy to contribute to the reliability, validity, and thoroughness of the findings (Belfrage & Hauf, 2017; Saunders et al., 2019).

On the other hand, if following the three-step process for determining the suitability of a second-ary data source, some of the qualitative sources may not sufficiently qualify as being valid. The process involves first looking at measurement validity and coverage, followed by reliability and measurement bias and lastly the costs and benefits of a data source (Saunders et al., 2019). Some of the sources included in the research do not stem from academic journals or peer-reviewed, reputable sources. This is justified by the dynamic, fast-paced, and ever-changing nature of the tech industry as certain developments and events cannot be covered quickly enough by the academic literature and thus the thesis draws on data sources such as tech database announcements, news sources, and tech-based online expert forums.

Especially in case studies performed under critical realism, the use of additional qualitative data forms a research activity which supports the move from the empirical to the actual domain (Hu, 2018). For example, this thesis constructs theoretical frameworks regarding key concepts such as KA based on the key piece by Cunningham et al. (2021); disruptive innovation drawing on the primary text by Chris-tensen (1997); and acquisition motives as outlined by Rabier (2017). As such, the central concepts are upheld by data sourced from the literature that coined the frameworks and then further explored with either newer or more critical pieces such as the works by Letina et al. (2020;2021), Satell (2017) and Angwin (2007). A thorough data process such as this ensures analytical stability of the explanatory power through the constant comparison, re-evaluation, and iterative reflection between the literature and data (Hu, 2018).

3.3.2. Data Analysis Approach

One of the foremost methodological decisions made for this paper concern the choice to concen-trate on theoretical propositions as opposed to testable hypotheses. As previously discussed, the 4 pri-mary propositions presented rest on the foundation of the theoretical background and extant literature to illustrate what one could expect of KA in the tech industry. Furthermore, these 4 primary propositions are intended to guide the analysis of the specific NATU acquisition activity to produce an additional 4

propositions that are less theoretical and more specifically tied to the trends identified in the data. Three key arguments are made to support the inclusion of propositions rather than hypotheses.

Firstly, the NATU acquisition data set only contains 64 observations thus giving it a small sample size. Additionally, the variables are primarily qualitative and categorical rather than numerical. Even the variables which have numerical values, such as purchase price, are binary in nature as they are coded based on whether they are disclosed or undisclosed to address their relation to notification thresholds (Proposition 2). As such, these specific features of the presented and analysed data were deemed to prevent the formulation of hypotheses requiring statistical testing. Nonetheless, the use of propositions grounded in theory and the existing literature facilitate a broader exploration of the data to drive the analysis for the paper.

Secondly, the chosen research design for the paper follows an exploratory approach which may be better upheld using propositions rather than testable hypotheses. Once more, the purpose of the paper is not to test the selected case data against a predicted or expected model but rather seeks to delve deeper into the concept of KA in the tech industry. Consistently, it has been argued that when studying KA, use of more traditional economics models such as diversion ratios or merger simulation may provide limited insights and exhibit less efficacy (Latham et al., 2020). On the other hand, concentrating on propositions and theoretical frameworks gives a more conclusive approach to exploration as they may be used to filter and screen given data to unearth acquisitions with killer characteristics (Latham et al., 2020). Similarly, the innovation perspective of the paper is also more aligned with a theoretical and not testable approach since innovation is a fluid, complex concept that is difficult to measure and summarise in an economic model (Ezrielev, 2022).

Thirdly, the choice to use qualitative propositions is not only supported by the data and prescribed research design but it also follows the trends of methods employed by other key researchers studying the topic (Holmström et al., 2019; Latham et al., 2020; Lundqvist, 2021; Marty & Warin, 2020b; Pérez De Lamo, 2019; Wu, 2010). The study by Cunningham et al. (2021), which guides the majority of this paper, applies an intricate econometric model with various statistical testing. Nonetheless, this study still remains grounded in theory but also used a dataset with over 16,000 observations across various transaction

types and thus a statistical and testable modelling format such as this was deemed beyond the scope of this research paper.

Overall, the decision to employ propositions rather than testable hypotheses is supported by the nature of the data, the selected research design, and consistency with other similar studies. This approach will allow for more nuanced understanding and deeper exploration of KA in tech and the application to the NATU firms, which are presented in the following section.

3.4. NATU Presentation

As informed by the research design and methodology, this section will present an overview of the four case companies, focusing on their history, financials, innovation, and ambitions. The main findings are summarised in four specific company profiles that can be found in the appendix (Appendix C, E, G, I).

3.4.1. Netflix

Reed Hastings and Marc Randolph created Netflix, a global streaming entertainment corporation, in 1997. By offering on-demand streaming of movies and TV episodes to its 231 million subscribers, the firm has transformed the way people consume entertainment. Netflix has grown its business globally and become a household name in the entertainment industry. It is a subscription-based streaming service that provides a wide range of films, TV episodes, documentaries, and other content. Users can watch on their TVs, laptops, tablets, or smartphones, and the platform delivers personalised suggestions based on their viewing history (Netflix, 2022). The market for video streaming services is highly competitive with approximately 1.175 billion subscribers across the industry. The five largest companies have roughly 70% of all the monthly users. Netflix, as the market leader, has 18.77% of the total market, whereas Amazon Prime Video, the second largest, has 17.70% of the total market, a difference of 1.07% or 12.6 million subscribers (Statista, 2023c).

Looking at Netflix's key innovation efforts, they include the creation of original content, with 85% of expenditure focused on original TV series and movies, and a group of independent filmmakers and established directors and writers, creating a high-quality innovative content-creating ecosystem

(Rabang, 2019). Additionally, they created Cinematch, a personalised video suggestion system, which has grown into an algorithm that can curate material based on customers' viewing patterns. To improve their algorithm, Netflix also hosted an external innovation crowdsourcing event, Netflix Prize, a competition with the goal of developing a recommender system that could outperform their own and a one-million-dollar prize (Rahman, 2020).

From its beginning, Netflix has experienced significant growth. In 2022, they reported $31.6 billion in revenue, a 6.46% increase over the previous year. Their net income was $4.5 billion for the year, a 12.2% decline from 2021 (Netflix, 2023). Over the years, they have also made significant investments in content creation and technology, with the goal of growing their global impact. This is also seen in the number of acquisitions that aims to broaden its products and boost its market position (Netflix, 2022). In total, Netflix has acquired 10 companies with the first being in 2017. Moreover, they made their first and only investment in 2021. The total portfolio size is 11, making it the smallest of the four NATU companies (Appendix D).

Netflix's purpose is to delight the globe by providing high-quality, tailored content that people enjoy. Its mission is to remain the market leader in streaming entertainment and to give the greatest content available to its members. Additionally, it includes growing its subscription base and continuing to generate high-quality, original content that will appeal to people worldwide. Furthermore, to remain at the forefront of the entertainment sector, the company is focused on developing new technologies and expanding into new markets (Netflix, 2022).

3.4.2. Airbnb

Airbnb is a prominent online marketplace that connects travellers with property owners worldwide for short-term rentals of apartments, homes, and unique lodgings. Established in 2008, the company has quickly evolved to become one of the world's most valuable start-ups and a prominent example of the benefits of a sharing-economy business model. Their main business concept is upon offering a platform for property owners to rent out their spare rooms or homes to travellers looking for economical and unusual accommodations. The company has over 7 million listings worldwide and operates in over 220 countries and regions (Airbnb, 2023). The firm operates in the travel accommodation industry, which is

notoriously known for its fierce competition. However, Airbnb has managed to stay afloat through innovation efforts and today, it is estimated that they account for upwards of 20% of the total bookings in the vacation rental industry. The remaining market share is mostly dominated by the 2 heavyweight conglomerates, Booking.com and Expedia, and their subsidiaries (Clifford, 2023).

Similar to every other innovation, the first-mover advantage is only valid for so long. However, through constant innovation initiatives, Airbnb has managed to maintain and improve its market position. Some notable examples are Airbnb Experiences, which allows guests to book unique activities and tours hosted by locals, Airbnb Plus, a collection of high-quality homes verified for quality and comfort, Open Homes, a program where hosts can offer their homes for free to people in need during emergencies, natural disasters, or other crises (Airbnb, 2021, 2023; Ma, 2018). Lastly, in 2021 they introduced over one hundred innovations and upgrades across their entire platform such as an optimised search engine and a new 10-step process to become a host (Airbnb, 2021).

In 2022, Airbnb generated $8.4 billion in revenue, a 40% increase compared to 2021. This resulted in a net income of $1.9 billion making 2022 their first year with a profit (Airbnb, 2023). To support their growth, they have made several strategic acquisitions over the years, including Luxury Retreats, a high-end vacation rental company, and HotelTonight, a last-minute hotel booking service. In total, Airbnb have acquired 24 companies with the first being in 2011 (Tracxn, 2023a). Moreover, they have made 11 investments with the first being in 2016 and the last being in 2021. Thus, their total portfolio consists of 35 companies, making it the second biggest portfolio of the four companies (Appendix F)

The objective of Airbnb is to build a world in which individuals can belong anywhere. The company's mission is to facilitate meaningful travel experiences that connect people and encourage cultural understanding. Moreover, they have announced plans to grow beyond their main industry of short-term rentals to other sectors such as transportation and hospitality services. The company also intends to continue extending its footprint in emerging markets and to provide its users with new and creative products and services (Airbnb, 2023; ProjectPro, 2023).

3.4.3. Tesla

Elon Musk started Tesla, an American electric vehicle and clean energy firm, in 2003. The company is well-known for its innovative electric automobiles, renewable energy products, and cutting-edge technologies. Its core business is designing, manufacturing, and selling electric automobiles such as the Model S and Model Y. They also manufacture solar panels, solar roofing, and energy storage systems (Tesla, 2023). Tesla automobiles are noted for their extended range, high performance, and innovative technology features like Autopilot. The business has also built a network of Supercharger stations, which allow its customers to charge their vehicles swiftly and easily (Breul & Neise, 2020). In 2021, Tesla had a market share of 2.59% in the U.S. automotive market but a 68% market share in the U.S. electric automotive market (Lambert, 2022; Statista, 2023b). In 2022, their global market share was 12% within the electric vehicle industry, only surpassed by the Chinese firm BYD Auto (CounterPoint, 2023).

Looking at its innovation capabilities, Tesla has made innovation efforts across multiple sectors. For example, they launched Tesla Autopilot, their self-driving technology which detects and responds to road conditions through the use of cameras and sensors, Tesla Solar Panels and Tesla Powerwall, which are solar panels that are designed to work with the Powerwall battery to store energy during the day and power your vehicle during the night (Tesla, 2023).

In 2022, their annual revenue was $53.8 billion, while their net income was $12.6 billion, which is a 71% and 127.79% increase compared to 2021 (Tesla, 2023). To support its growth, they have undertaken a few acquisitions throughout the years in order to broaden their skills and product offerings. To develop its renewable energy sector, the corporation bought SolarCity, a solar panel start-up, in 2016. It also acquired Maxwell Technologies, a battery component company in 2020 to increase the performance of its batteries (Tracxn, 2023c). Their portfolio consists of 11 acquisitions and 2 investments in total, making it the second smallest of the four NATU companies (Appendix H).

Tesla's objective is to expedite the global transition to renewable energy. The company's goal is to build a world powered by renewable energy while decreasing reliance on fossil fuels. It is also exploring additional markets and products, such as autonomous driving technologies and electric semi-trucks,

in addition to its main business of electric automobiles and renewable energy. To fulfil the rising demand for its products, the company intends to expand its global base and enhance production (Tesla, 2023).

3.4.4. Uber

Uber Technologies, Inc. is a global transportation network company that uses its proprietary mobile application to provide ride-hailing, ride-sharing, and other transportation services. It was founded in 2009 by Travis Kalanick and Garrett Camp in San Francisco, California, and has since expanded to operate in over nine hundred metropolitan areas worldwide. Their principal business is ride-hailing, which connects riders with drivers via the company's mobile app and uses a similar sharing-economy business model as Airbnb to connect consumers and suppliers. In 2022, Uber had a 72% market share of the total U.S. ride-sharing industry, while their biggest competitor, Lyft, had a 27% market share. Thus, Uber and Lyft make up 99% of the total U.S. market (Stasha, 2023). Globally, Uber had 37.2% of the total market share, closely followed by the Chinese competitor, DiDi Chuxing, which had 32.4%. Lyft, the third biggest operator, had 9.26% and the remaining competitors were all sub 3% (Statista, 2022).

Since 2009, Uber has launched several innovative products. Today, their mobility offerings include UberEats, a food delivery platform that connects users with their favourite restaurants; Uber for Business, which allows firms to manage employee transportation; Uber Freight, a logistics platform for trucking companies; Uber Health, a service that offers healthcare providers with the ability to schedule rides for patients; Uber Incubator, a platform where both internal and external stakeholders can develop products and services on top of Uber's platform (Dickey, 2019; Horn, 2016; Project Pro, 2023; Uber, 2016).

Uber recorded an annual revenue of $26.7 billion in 2022, an increase of 68% compared to 2021. However, their net income was -$9.1 billion, a significant increase compared to the previous year (Uber, 2023). Despite the sub-optimal financial performance, the company has exhibited consistent revenue growth and a strong dedication to extending its operations abroad. Over the years, the company has made a number of strategic acquisitions, including the 2020 acquisition of food delivery service Postmates and the 2016 acquisition of autonomous driving start-up Otto. The corporation has also made investments in numerous transportation-related businesses, including Lime, a dockless bike and scooter sharing

platform, and Jump, a bike-sharing company (Tracxn, 2023d). They have made 19 acquisitions with the first one being in 2010, and 20 investments, making their total portfolio the biggest of the four NATU companies (Appendix J).

The purpose of Uber is to generate possibilities through movement. The company envisions a world in which individuals may move throughout their cities effortlessly and economically, regardless of where they are or what they require. Uber is committed to growing its transportation services to new markets and creating new technology to improve the safety and convenience of its services in pursuit of this vision. The company is also looking into prospects in the autonomous driving arena, with the objective of someday providing customers with entirely self-driving journeys (Uber, 2023).

NATU Acquisition Activity

This section utilises the theoretical framework and previously developed research design to analyse the acquisition activities of the NATU firms. Through applying the chosen methodologies, the data collected on acquisitions and investments by the companies can be explored to identify patterns and trends. The collated data can be found in Appendix A or as part of each company's Acquisition Overview (Appendix D, F, H, J).

This section analyses both the quantitative and qualitative aspects of the acquisition history of the 4 case firms from 4 key perspectives. These perspectives are rooted in the previously outlined primary propositions. Given the small sample size across the categories, traditional quantitative data tests are not applied, however, the data is directionally supportive of the patterns observed in the propositions. Firstly, the frequency and time horizon of the acquisitions and investments are considered as informed by previous literature regarding the intensity, dynamism, and prevalence of transactions in the tech sector (Rivero, 2021; Wang, 2017). This is followed by an analysis of the technological relatedness of the acquisitions based on the classifications from the IAM (Proposition 1) (Nagji & Tuff, 2012). Next, the cross-border aspect as part of the geographic market expansion motive for acquisitions is discussed (Proposition 2) (Rabier, 2017). Lastly, the specifications of the acquired target firms in terms of purchase price (Proposition 3) and their business segment are explored (Proposition 4). In order to uphold the robustness and

contextualise the findings, the section concludes with a consideration of the acquisitions undertaken by notable NATU competitors.

4.1. Frequency of Acquisitions and Investments

Analysing the frequency of the acquisitions is one of the foremost quantitative and descriptive statistical methods applied as it provides a clear overview of the NATU acquisition history as well as providing insights into the trajectory of their acquisition strategies. This is visualised below (Figure 7). Temporally, the acquisition sample spans from 2010 to 2022. Additionally, when also considering the investment data explored later in this section, the sample includes observations from 2023 where Tesla has engaged in investment activity.
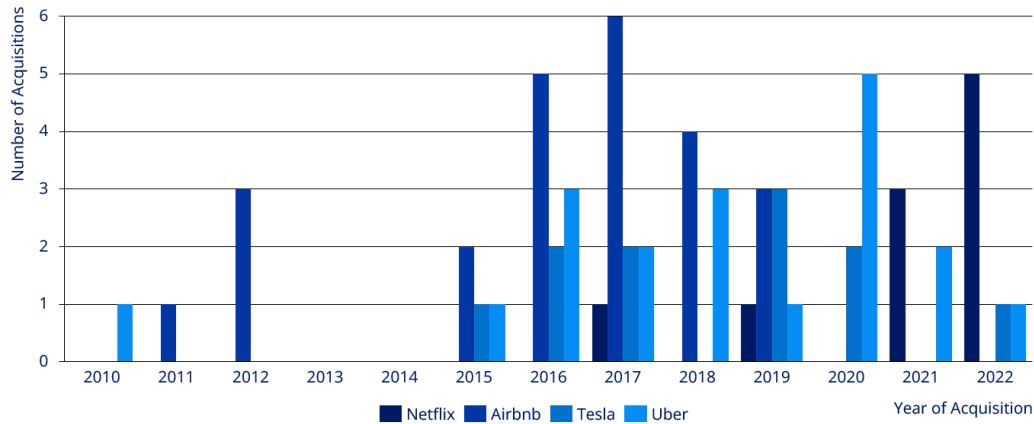
Figure 7: Frequency of NATU acquisitions per year, author's own creation

For Netflix, the first of their 10 acquisitions occurred in 2017 as part of their Q3 report wherein the letter to shareholders detailed the company's ambitions to launch an active acquisition strategy (Ari-fin, 2018). For Airbnb, the IPO in late 2020 shifted the strategic focus of the firm and may explain the recent decline in acquisitions following the 2019 purchase of HotelTonight and a corresponding uptick in investments during 2020 and 2021 (Hallowes, 2023). For Tesla, the primary years following the 2010 IPO were concentrated on the production and introduction of new vehicles, yet the acquisition activity spurred from 2015 onwards as the firm began focusing on new innovations through their factories, the introduction of autopilot, the launch of the Powerwall and Powerpack, and obtaining new capabilities (Thompson et al., 2022). Lastly, for Uber, no acquisitions were completed between 2011 and 2014 as the

years following the IPO centred around funding rounds and establishing the UberX offering (Blystone, 2022). Yet from 2015 onwards, Uber embarked on a far more aggressive acquisition strategy to boost profits as the firm sought to consolidate their position, growth, and stabilise their financials (Blystone, 2022).

In total, the NATU firms have engaged in 64 acquisitions with Airbnb (24) performing the most followed by Uber (19), Tesla (11), and Netflix (10). Initially, this sample size may appear slightly minimal, especially if compared to the sizeable acquisition portfolios of other tech companies such as the GAMAM firms who made 819 transactions between 2010 and 2019 which only includes those below the HSR threshold (Federal Trade Commission, 2021). Consistently, although based on the pharmaceutical industry, Cunningham et al. had a sample size of 16,000 drug projects spanning two-and-a-half decades (2021). However, the given sample is still found to be valid and contribute to the exploration of correlation and causation mechanisms as there are over 40 data points (Budiu & Moran, 2021). Additionally, when considering the age and relative size of the NATU group, the acquisition sample is still significant and indicates that there is a high degree of activity acting as a potential platform for KA.

Aside from acquisitions, firms may also make broader investments in new projects, new technologies, or new companies as part of their overall strategy. To increase the sample size and to provide a broader overview of the activities engaged in by the NATU firms, data regarding their investments was also collated and can be seen as an addition to the acquisition activities below in Figure 8. The inclusion of this investment data serves to further strengthen the argument that the NATU companies are disruptive, innovative, and consistently taking action to uphold their market dominance.

Whilst there are variations across the four case companies, the overall trend suggests a rise in investment activity from 2016 to 2023 (Appendix K). The investment data can be viewed as a parallel to the acquisition data as the 2 firms with the least acquisitions, Netflix, and Tesla respectively, also made the least investments. Conversely, Uber conducted both most acquisitions as well as most investments and closely followed by Airbnb. As previously mentioned, the same pattern thus emerges following the inclusion of the investment data regarding the levels of activity for the NATU companies.
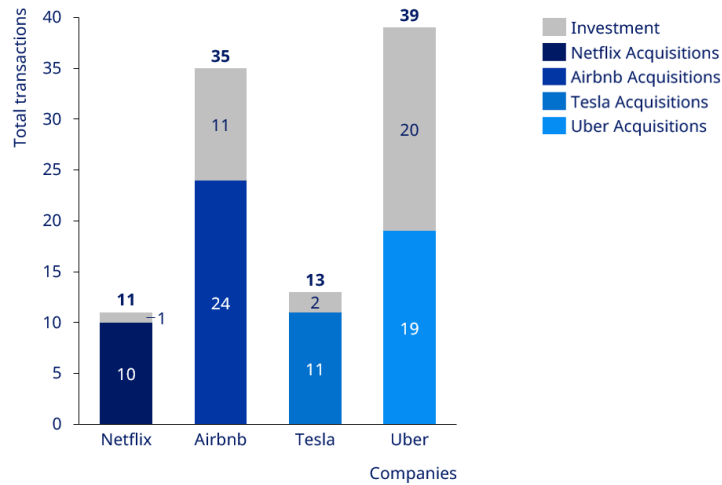
Figure 8: Investment and acquisition activity of NATU, author's own creation

It is essential to highlight that although this section examines both investments and acquisitions separately, they share similar characteristics as they aim to achieve synergies between the incumbent and target. Both involve allocating capital to generate long-term returns, and they typically require careful evaluation of potential risks and benefits. Despite some differences in the degree of ownership, the underlying analysis of these two concepts is often the same, given their common goal of enhancing the value of the participating firms. Therefore, due to the parallels between the acquisition and investment data, the similarities of the two concepts reinforce the conclusions drawn about the NATU transactions and the occurrence of KA.

4.2. Technological Relatedness (Proposition 1)

This section analyses the technological relatedness of the NATU firms and their acquisition targets and based on the findings it suggests that Proposition 1 can be substantiated. Based on the degree of relatedness, each acquisition was designated one of the 3 innovation activity categories outlined in the IAM (Nagji & Tuff, 2012). This theoretical framework, as outlined earlier, is applied as part of the data schematic since more focus attributed to transformational innovation creates the optimal conditions for a KA as the acquiring firm seeks to stifle and cease the potentially disruptive innovation trajectory (Angwin, 2007; Cunningham et al., 2021).

As displayed (Figure 9), of the total 64 acquisitions, 37.5% are of core innovation capabilities, 32.81% are adjacent, and 29.69% belong to the transformational sector. Both Netflix and Tesla have an equal division between core and adjacent acquisitions whilst Airbnb focuses on core innovation firms and Uber dedicates most off their acquisition activities to adjacent firms. Each firm possesses an existing large market share and therefore may make significant core investments to strengthen their core business where much of their competitive advantage is derived from. In this arena, there is thus a higher potential for challenges from new entrants and start-ups likely to contribute to the potential for KA, kill zones, or innovation stifling as the NATU incumbents seek to combat threats to their strong core. As an extension of this, the NATU incumbents may also begin seeking to diversify their innovation portfolios by acquiring firms in adjacent or transformational sectors to further expand their innovation ecosystems and strengthen their position.
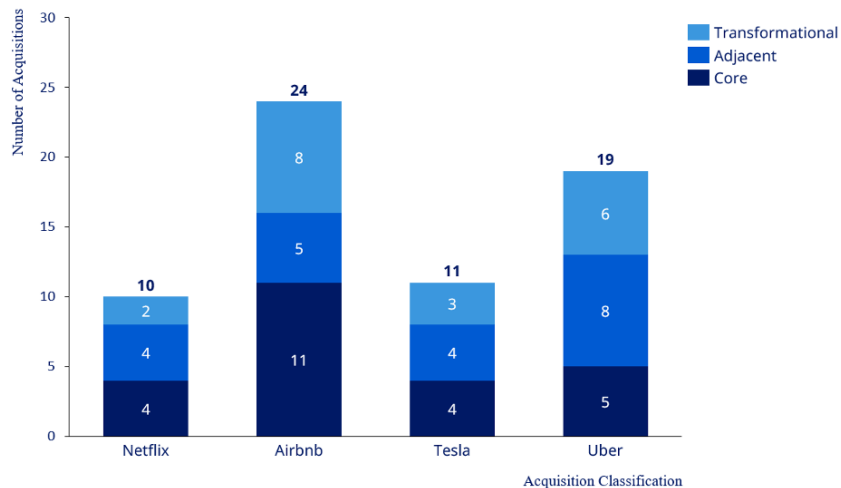
Figure 9: Technological relatedness of NATU acquisitions, author's own creation

The IAM literature points to an optimal portfolio ratio for tech-based firms wherein the overall innovation investments should be accordingly divided; 45% core, 40% adjacent, and 15% transformational (Nagji & Tuff, 2012). For Netflix's acquisitions, this ratio is almost perfectly upheld whereas Airbnb, Tesla, and Uber attribute significantly more of their acquisitions to innovative targets that are seen as transformational pointing to an even stronger objective of acquiring breakthrough innovations. A similar trend is identified for the overall NATU acquisition data (37.5% core, 32.81% adjacent, and

29.69% transformational); with significantly more resources devoted to acquisitions that support trans-formational innovation. Thereby contributing to the conclusion that the tech firms are pursuing ambitious innovation goals, which may inform their desire to acquire target firms that are equally as innovative and disruptive. Once more as indicated by the other characteristics of the acquisition data, this forms a strong basis for potential future KA.

4.3. Cross-Border Acquisitions (Proposition 2)

The findings obtained from the investigation of the geographic distribution of NATU's acquisitions, which aimed to determine whether a cross-border trend exists, indicate that Proposition 2 can be validated.

This section focuses on the geographical scope of the 64 acquisitions performed by the NATU companies. All four companies are headquartered in the United States with Netflix, Airbnb and Uber being in California, while Tesla is in Texas. The home country of the four companies is important to consider when determining if the acquisitions are driven by a desire to expand their geographic reach. As mentioned previously, acquiring firms in other regions helps the company reach a critical mass quicker through operating synergies (Rabier, 2017), while also overcoming the liability of foreignness. Thus, analysing the geographical scope could provide insight into the motivation behind the acquisitions.

NATU has acquired companies across 5 continents: North America, Europe, Asia, Oceania, and South America. Most of the acquisitions are observed to be in North America, where 44 acquisitions were in the US, while 2 were in Canada. Thus, North America accounts for 72% of all acquisitions made by the four companies. The second largest area of activity is Europe with 20%, amounting to 13 acquisitions. These are spread widely but with most acquisitions happening in the United Kingdom (4), Germany (3) and France (2). Surprisingly, the last three continents only make up 8% when combined: 3% in Asia, 3% in Oceania and 2% in South America. When converted, Asia and Oceania only have 2

acquisitions each and South America only has 1. A complete overview of acquisitions by geographical region can be found below in Figure 10.

Region and Acquisition Distribution

Region	Ⓐ Absolute Values	Ⓑ Percentage
North America	46	72%
Europe	13	20%
Asia	2	3%
Oceania	2	3%
South America	1	2%

Ⓐ *Absolute Acquisitions in the Specific Region.*
Ⓑ *Regional Percentage of Total Acquisitions*
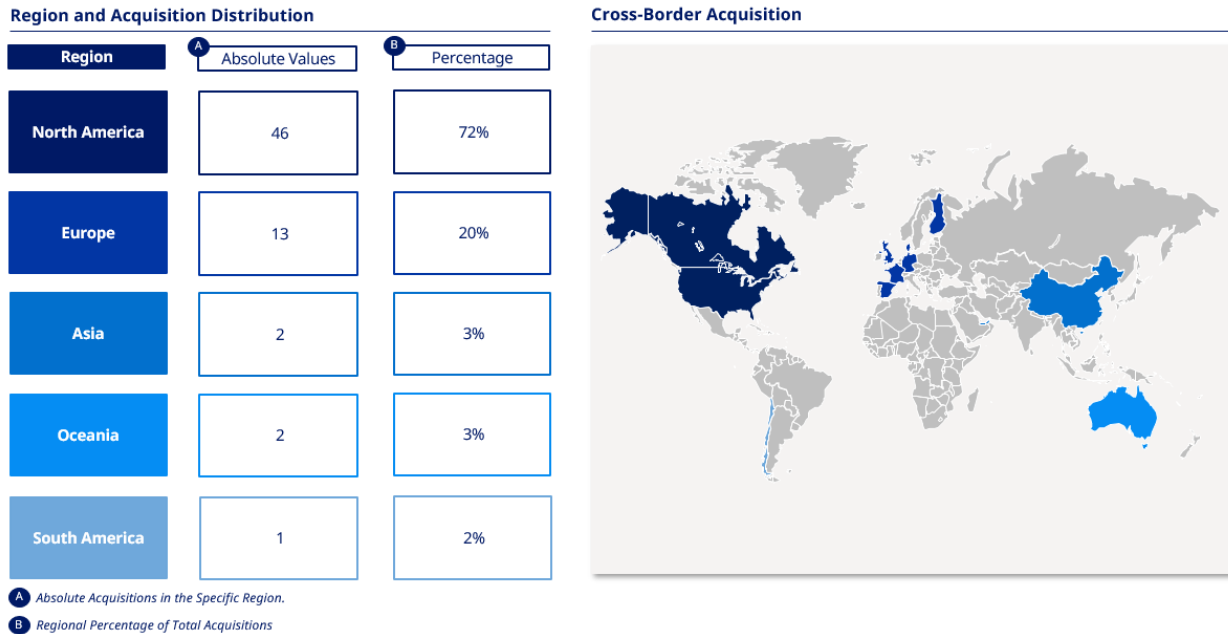
Figure 10: Geographical scope of NATU acquisitions, author's own creation

Of the four case companies, Uber has the densest cross-border acquisition portfolio as they also acquired target firms both in Asia, the Middle East, and South America which none of the other NATU companies have ventured into. However, when it comes to individual countries, Uber has made acquisitions in 6, whereas Airbnb has expanded its acquisitions to 7 different countries. A possible reason for this trend is that Uber and Airbnb may require a physical market presence in their operating countries to enhance or establish their driver and host networks. In contrast, Netflix and Tesla have made comparatively few acquisitions in diverse global markets, with most of their efforts focused on the United States. An explanation could be that Netflix operates primarily as a content-based platform and are thus more interested in acquiring capabilities such as publishing rights, software skills, or innovation talents. Similarly, as a manufacturing company, Tesla may place greater value on capability acquisitions than market-based acquisitions.

The above-mentioned findings provide an important insight into the motivation behind the acquisitions. As mentioned, 72% of the total acquisitions are observed to be in North America, which coincidentally is the same region as the four headquarters. Thus, it can be assumed that the majority of the acquisitions are most likely not performed with the ambition of geographical expansion. In fact, most acquisitions took place in markets where the NATU companies were already the market leaders within their respective industries. This begs the question of whether certain acquisitions may have been motivated by alternative strategies, such as stifling innovation, killing competition, or enhancing existing innovation ecosystems (Angwin, 2007; Cunningham et al., 2021; Liang et al., 2022).

Furthermore, the analysis enables broader conclusions to be drawn regarding the institutional landscapes and degree of technological progress within the home nations of the target entities. To begin with, an examination of The Human Development Index (United Nations Development Programme, 2022) reveals that all the mentioned countries, except for China, have been classified as having a "Very High" level of development. China, however, is still very close and has been classified as having a "High" level of development. Moreover, a considerable proportion of acquisitions take place in countries with well-respected tech ecosystems. This could be an explanation for why 92% of the total acquisitions are in North America and Europe. North America, more specifically the U.S., have created a fertile environment for tech start-ups, placing the country ahead of most others. Some of the main contributors are the massive consumer market, various tax incentives, knowledge-sharing ecosystem benefits, and the high level of venture capital funding (StartUp Blink, 2022). Europe experiences similar contributing factors, supported by a commitment to free trade and a willingness to invest in the globalised economy (Amitrano et al., 2017; McKinsey, 2020).

Finally, it is noteworthy that despite their significant market size, technological capabilities, and growing presence within the disruptive tech sector, the NATU companies have made only 2 acquisitions in Asia, only 1 of which is in China. Possible explanations for this could involve cultural differences and strict governmental regulations designed to safeguard domestic firms against international competition, which both have been categorised as main contributors to unsuccessful market entries (Johnson & Tellis, 2008; Li, 2019).

In conclusion, the analysis has revealed that NATU companies predominantly acquire targets in regions with a significant pre-existing user base, specifically the United States and Europe. Thus, it can be inferred that most acquisitions are not primarily aimed at expanding their geographic reach. Additionally, the study indicates that the bulk of acquisitions are concentrated in countries with high levels of development, a robust tech start-up ecosystem, and strong institutional frameworks. Taken together, these findings suggest 2 potential rationales for the extensive acquisition activity in existing geographic markets: 1) eliminating future rivals to consolidate the existing market position, or 2) acquiring the most promising tech start-ups to enhance the product offerings.

4.4. Target Firm Specification (Proposition 3 & 4)

Two specific target firm specifications have been analysed in order to shed light on how these may influence the acquisition decisions made by the NATU firms. For the purchase price, the findings provide a nuance to Proposition 3 to suggest that intervention from antitrust authorities is avoided through undisclosed purchase prices. For the operational business sector, the findings uphold the ideas of Proposition 4.

Firstly, the *purchase price* for the transactions is analysed with regards to deal size, notification thresholds, and an indication of value and desirability of the target firm. The purpose is to examine the findings presented which revealed that most KA occurred below the HSR threshold. However, as acquisitions with undisclosed prices are more likely to be anti-competitive and have higher discontinuation rates (Cunningham et al., 2021), and considering the variation in global acquisition thresholds across different countries, this analysis will focus on acquisitions with undisclosed prices.

Secondly, the *operational business sector* of each target firm is discussed to showcase the diverse nature of the targets and to facilitate the further classification of the target as a tech or non-tech-focused company. Moreover, it provides an insight into whether the company is trying to leverage network effects and big data, which was mentioned as an important driver for acquisitions. By classifying according to these specifications, it allows for the establishment of a pattern in whether the NATU firms are acquiring simply to strengthen existing innovations or behaving disruptively and anti-competitively to limit threats

from new high-tech innovative competencies. In this latter situation a KA would thus be more likely (Cunningham et al., 2021; Ezrachi & Stucke, 2022; Holmström et al., 2019).

Purchase Price. Beyond frequency, another quantitative aspect typically considered when analysing acquisition data is purchase price as part of highlighting the significance of the deal, willingness to pay of the acquirer, and the inherent value placed on the target firm and, in this case, their innovation capabilities. Overall, for the NATU sample, a total of 30 acquisitions had a published transaction price, leaving 34 undisclosed (Figure 11). Typically, it can be concluded that the acquisitions with a disclosed price are pro-competitive and of target firms where the motivation for the acquisition is to strengthen the existing innovation trajectory, contribute to the core business, and uphold current sources of competitive advantage. Due to the inherent dominance, innovativeness, and dynamism of the tech market, the NATU firms do not provide comprehensive disclosure of acquisition purchase prices. This lack of exhaustive disclosure can be tied to potentially anti-competitive behaviour and their unique positions in the industry. The firms often acquire smaller start-ups and when these purchase prices remain undisclosed it indicates they fall below the notification thresholds and thereby are more likely to be of an anti-competitive, or killer, nature (Cunningham et al., 2021).

For the 30 transactions with disclosed purchase prices, these involved target firms with inherent value to the acquiring firm and remain more closely tied to improving core business rather than as part of a campaign to stifle innovation from potential competitors. Netflix's biggest acquisition was Roald Dahl in 2021 for $686 million, Airbnb's was HotelTonight for $117 million in 2019, Tesla's was Solar-City for $1.28 billion in 2016, and Uber's was Postmates for $903 million in 2020. These acquisitions enhance the NATU firms' innovation trajectory, competitive advantage, and current vision, despite varying in technological relatedness.

For the 34 transactions wherein the purchase price was not disclosed, there is a stronger likelihood that this has been done to avoid raising antitrust suspicions or regulatory involvement (Cunningham et al., 2021). This implies that these acquisitions may be motivated by anti-competitive drivers, rather than traditional operational or financial synergies. Within these remaining acquisitions, there is thus a higher chance of discovering KA or stifled innovation carried out by the NATU acquirer as they seek to hinder

potential future competition from these target firms. Consistently, these are the acquisitions occurring below the notification thresholds and are those with greater anti-competitive tendencies, lower launch rates for new products, higher termination rates, and killer outcomes (Cunningham et al., 2021).

Operational Business Segment. When analysing the categorisation of the acquisitions, the first thing to notice is the diversity of acquisitions and the different business segments to which the target firms belong. However, despite the different segments, most acquisitions are driven by the target's high-end tech abilities (Figure 11). Netflix has made acquisitions in 7 distinct segments, with the largest share being in gaming (3) and publishing (2). The remaining acquisitions are spread across animation, educational entertainment, mobile apps, streaming, and visual technology. Notably, 7 out of the 10 targets are companies with high technical capabilities, whereas the remaining 3 (publishing and educational entertainment) possess resources and capabilities related to the entertainment development of Netflix. Similarly, Airbnb has acquisitions in 11 different segments, with the most significant concentration in online booking (10) and financial technology (4). The remaining categories comprise AI, entertainment, information services, location services, mobile infrastructure, cleaning, pricing estimation, technology, and hospitality. An important observation is that half of the 24 targets have been identified as companies with advanced technical capabilities, whereas the remaining 12 targets hold resources and capabilities that are directly relevant to the product offering of Airbnb.

Meanwhile, Tesla has executed acquisitions in 7 distinct segments, with the most substantial emphasis on machinery (4) and electrical equipment (2). The remaining 5 categories consist of electronic components, energy equipment, engineering automation, multi-line insurance, and road segments. It is noteworthy that most of Tesla's targets (9 out of 11) are high-tech companies, with the remaining 2 entities possessing resources that can augment Tesla's existing product line. Finally, Uber has completed acquisitions in 12 distinct segments, with business software (5) and automotive (3) being the largest shares. The remaining categories consist of autonomous driving, beverages, B2C electronics, information Services, internet retail, media services, other services, restaurants and bars, social platform software, and vertical market software platforms. Out of the 19 acquisitions, 14 have been categorised as high-tech targets, while the remaining 5 hold resources that are advantageous to UberEats.
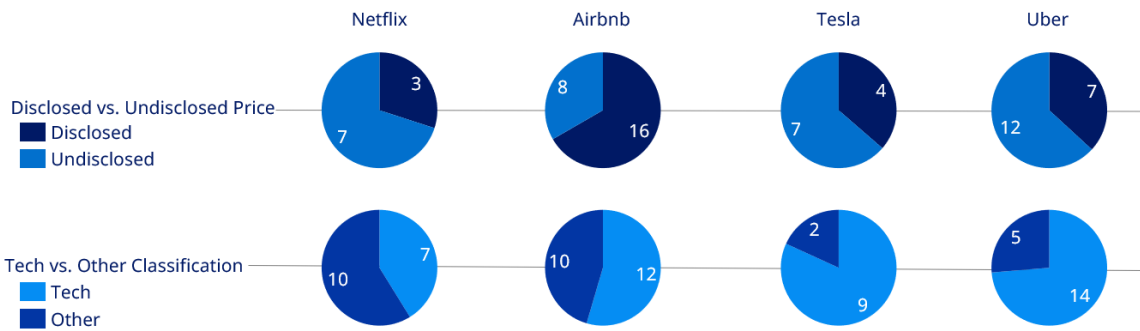
Figure 11: Purchase price and business segment of NATU acquisitions, author's own creation

Given the segments, it can be assumed that the non-tech acquisitions indicate a dedication to expanding or improving the incumbents' current product offerings. However, the motivation behind their high-tech acquisitions remains ambiguous. While these acquisitions may have the potential to reinforce existing innovations, they could also behave in a disruptive or anti-competitive manner, aimed at limiting threats from emerging high-tech competitors. This raises questions about the true intentions behind high-tech acquisitions and creates a fertile breeding ground for the emergence of KA.

4.5. Sector Competitor Acquisition Activity

Similarly, to the analysis of the investment activity, this section serves to further contextualise the analysis and findings of the NATU firms and their acquisition history. For each case company, the top three competitors from the previously delineated operational sectors are discussed. The acquisition activity for each NATU firm and their central competitors are analysed briefly below based on the data presented in Figure 12. The purpose is to highlight whether the NATU companies are investing more than their competitors, creating a potential breeding ground for firm-specific KA.

4.5.1. Netflix

As a player in the tech and entertainment industry, Netflix faces competition from rivals such as Amazon Prime Video, Disney+, and Tencent Video. While Amazon Prime Video and Disney+ are U.S.-based platforms, Tencent Video is affiliated with the Chinese conglomerate Tencent (Statista, 2023c).

Amazon Prime Video is a subscription-based streaming service provided by Amazon.com Inc., a leading global technology and e-commerce company. While Amazon Prime Video has not engaged in any acquisitions, its parent company has strategically pursued content-related acquisitions, including the prominent production company MGM (Maas, 2022). Although this acquisition has had a positive impact on Amazon Prime Video, it was not initiated directly by the streaming platform and is not included in its specific acquisitions. Disney+, a streaming service offered by The Walt Disney Company, has made a total of 19 acquisitions, primarily focused on content improvement, with a few categorised as tech-driven acquisitions (The Walt Disney Company, 2009; Weprin, 2022). However, caution should be exercised in interpreting the number of acquisitions made by Disney+ as some may be driven by the parent company's overarching strategies. Unlike Netflix, Disney+ has not made any acquisitions to optimise its platform with AI and suggestion algorithms. Tencent Video, a streaming service provided by Tencent, a leading tech conglomerate in China, has not seen any specific link or impact from its parent company's multiple acquisitions.

4.5.2. Airbnb

Airbnb has established itself as a leader with the highest number of acquisitions compared to its competitors, which include Expedia, Booking.com, and FlipKey (Clifford, 2023). While Expedia and FlipKey are US-based companies, Booking.com is headquartered in the Netherlands. It is worth noting that FlipKey has not made any acquisitions. However, upon comparing the acquisition strategies of Expedia and Booking.com, it becomes evident that Expedia has made a total of 5 non-tech related acquisitions to expand their hospitality offerings. On the other hand, Booking.com has made 2 tech-related acquisitions aimed at optimising their platform. Despite this, Airbnb remains ahead of its competitors in terms of the total number of acquisitions, positioning them as the leader in acquisitions in the hospitality and lodging industry.

4.5.3. Tesla

After categorising Tesla's primary sector as the electric vehicle industry, its top three competitors were identified as Volkswagen, China-based BYD Auto, and Wuling based on market share (Counter-Point, 2023). However, all these firms and Tesla have operational spill-overs to other areas such as battery technology and the automotive industry. BYD Auto, as the largest competitor, has not disclosed any

acquisitions but has invested in tech-related endeavours. Similarly, Wuling has no acquisitions or disclosed investments, despite its significant presence in the electric vehicle market. Volkswagen is the only notable competitor to have carried out acquisitions, with a total of 5 acquisitions, all directly related to the company's core business rather than high-tech, innovative acquisitions to improve their position in the sector. In contrast, Tesla has the strongest presence in terms of disruption, high-tech, and transformational innovation driven acquisitions with the potential to develop into KA compared to its direct competitors. This may be attributed to Tesla's unique business offering, characterised by convenience, a radical business model, and exploitation of the uncertainty in the tech industry.

4.5.4. Uber

Due to the highly competitive nature of the sharing economy and ride-hailing platform sector, companies like Uber are actively seeking growth strategies to gain a competitive advantage and dominate the market. Uber faces stiff competition from its top three competitors: Lyft, DiDi Chuxing, and Ola. Lyft is based in the United States, Ola is based in India, and DiDi Chuxing is based in China (Statista, 2022). These competitors are challenging Uber in terms of acquisition activity, especially those focused on high-tech target firms. Lyft, being the largest competitor, made 11 acquisitions between 2013 and 2022 with 6 being of target firms specialising in innovative high-tech offerings, while the remaining 5 acquisitions were focused on fleet optimisation. Similarly, Ola, an Indian ride-sharing service, made 10 acquisitions over 7 years from 2015 to 2022, with 6 of them being classified as high-tech target firms contributing to Ola's food delivery and fintech initiatives. DiDi Chuxing, on the other hand, completed only 1 acquisition in 2018, which was an online platform with high-tech capabilities. Uber faces a challenge in accessing innovative digital capabilities and maintaining a significant market share due to its competitors' high-tech acquisition activity. Uber's cross-border acquisition profile is diverse, as it seeks to outcompete its global counterparts in the ride-hailing industry.

Uber's three main competitors pose a significant challenge for the company. They have made a relatively high number of acquisitions, with the majority aimed at gaining access to target firms with advanced and innovative tech capabilities. This creates an environment conducive to KA, which may drive Uber to engage in anti-competitive behaviour, stifle innovation, and engage in KA to maintain their competitive edge and market-leading position.

	Competitor	No. of Acquisitions	Tech Classification	Other Classification
Netflix	Amazon Prime	0	0	0
Netflix	Disney+	19	6	13
Netflix	Tencent Video	0	0	0
Airbnb	Expedia	5	0	5
Airbnb	Booking.com	2	2	0
Airbnb	FlipKey	0	0	0
Tesla	BYD Auto	0	0	0
Tesla	Volkswagen	5	1	4
Tesla	Wuling	0	0	0
Uber	Lyft	11	6	5
Uber	DiDi Chuxing	1	1	0
Uber	Ola	10	6	4

Figure 12: NATU sector competitor acquisition activity, author's own creation

Developing The Killer Acquisition Spectrum

The purpose of this section is to build a framework capable of identifying the distinct forms of acquisitions performed by innovative tech firms based on the factors highlighted in the primary and additional propositions. Firstly, this section will summarise the existing key findings derived from the primary propositions to highlight the identified gaps and deficiencies. These propositions are outlined in the subsequent section and will guide the construction of the spectrum of killer acquisitions. This framework is further discussed and applied to the acquisition data in order to address the line of inquiry and explore whether this new nuanced classification of KA is relevant for and applicable to tech-based disruptive innovative firms.

5.1. Addressing the Research Gaps

The previous sections have shown that current research on motives for acquisitions is rooted in traditional literature, which tend to neglect tech acquisitions, and are inclined to focus on operational or financial synergies such as geographical expansion (Rabier, 2017), ignoring other possible motivations (Angwin, 2012). This non-tech focus is also evident in global antitrust policies, which still rely on market share and revenue thresholds to determine the need for the approval of an acquisition (Bryan & Hovenkamp, 2020; Teece & Coleman, 1998). However, the emerging literature by Cunningham et al. (2021) highlights how existing research and legislation fail to adequately address unconventional acquisition motives and the potential exploitation of regulatory loopholes by certain companies. For instance, firms may neglect to disclose purchase prices to avoid the intervention of antitrust authorities. As a result, there are significant research gaps in understanding acquisition motives beyond the traditional scope, including instances where companies engage in acquisitions with the aim of hindering or suppressing innovation, and the effectiveness of global antitrust policies in addressing such issues.

The fundamental difference between traditional acquisitions and KA is in the loss of the target company's innovative capacity as the incumbent seeks to stifle the target's adjacent and transformational innovation investments. These two aspects of the innovation portfolio, as outlined in the IAM, are the most significant source of breakthrough and disruptive innovations that can challenge the incumbent. Compared to traditional acquisitions, KA also spurs a negative impact on consumer welfare and

deterioration of the competitive landscape. According to Cunningham et al. (2021) KA are especially prevalent in the pharmaceutical industry given the extensive and expensive R&D drug pipeline, which includes multiple product stages, takes years to develop and patent safeguards. However, other authors have also argued that these types of acquisitions are particularly relevant in the tech industry where the incumbent and target firms may operate in the same ecosystems (Ezrachi & Stucke, 2022; Holmström et al., 2019; The Economist, 2016; Wu, 2010). The reason is that this industry exhibits traits such as significant barriers to entry, network effects, and data-driven economies of scale and scope, which often evolve into zero-sum markets where few players dominate the market. Hence, hostile acquisition motives, such as KA, may impede the opposing dynamics of disruptive innovation in challenging firms, consequently reinforcing the market dominance of incumbents both short- and long-term. This theoretical stance is corroborated through an examination of 4 disruptive tech companies, namely NATU, which have already established dominant market positions and actively engage in acquisitions in both tech and non-tech markets, and in both related and unrelated sectors.

5.2. Additional Propositions

As previously stated, the theoretical background and literature review led to the construction of 4 primary theoretical propositions to guide the 1) exploration of KA and 2) analysis of the NATU acquisition activity. These have led to the identification of 4 additional propositions rooted in the specific trends discussed in the analysis. The findings of the analysis and the theoretical background inherently uphold the ideas presented in the additional propositions. While this paper focuses on the NATU companies, it is likely that similar conclusions would be reached if applied to other disruptive innovative tech firms. In the discussion section, the application of these propositions to industries beyond the tech sector will be explored.

Firstly, following the discussion of the Innovation Ambition Matrix (Nagji & Tuff, 2012) and product relatedness in the tech market (Haucap, 2019) it was determined that KA are more likely to occur when acquirers and targets operate in different product markets and when innovation is disruptive to the incumbent (Angwin, 2007; Cunningham et al., 2021) (Proposition 1). Disruptive innovations are more likely to occur when a target firm invests significantly in adjacent and transformational innovations. The lack of relatedness ensures the anti-competitive acquisitions are less detectable to antitrust authorities

(Haucap, 2019) whilst a target firm concentration on adjacent and transformational activities means the acquirer can access well-established innovation resources to mitigate competitor pressure (Summerfield, 2022; Wang et al., 2022). As a result, the fifth proposition can be disclosed:

Proposition 5: Killer Acquisitions seek to prevent disruptive innovation and thus, the target firms will have significant innovation investment ambitions.

       Proposition 5.A: The innovation investment portfolio is focused solely on adjacent or transformational activities.

Secondly, the exploration of acquisition motives revealed that KA are not driven by the desire for geographical expansion (Proposition 2). Rather, engaging in acquisitions to grant market access and expand geographic scope was shown to be part of the pursuit of operating synergies (Rabier, 2017). For the NATU acquisitions, 72% of these were observed to occur in North America where the four firms have their headquarters and a pre-existing dominant market presence. Thus, these acquisitions are likely to be motivated by other killer or innovation stifling drivers (Angwin, 2007; Cunningham et al., 2021). From this, the sixth proposition can be drawn:

Proposition 6: Killer Acquisitions are not motivated by geographic expansion and thus, they will occur in North America and will not be cross-border.

Thirdly, as previously mentioned, the rising prevalence of antitrust regulation and strengthening of merger control, specifically for digital markets, presents a significant influence for the acquisition activity of the tech sector (Holmström et al., 2019; Petit & Teece, 2021). Transactions occurring above the HSR notification thresholds will draw the attention of antitrust authorities and may lead to the investigation of the transaction, blocking of the acquisition or other intervention to prevent anti-competitive behaviour (Holmström et al., 2019; Kirk, 2023; Marty & Warin, 2020a) (Proposition 3). Consistent with Cunningham et al. (2021) and their findings, it is expected that acquisitions with undisclosed prices are more likely to be anti-competitive and have higher discontinuation rates. Thus, the seventh proposition emerges:

Proposition 7: Killer Acquisitions are anti-competitive and thus, will have undisclosed purchase prices to avoid antitrust notification thresholds.

Fourth and finally, the analysis of the target firm specifications drew attention to the classification of the business segment to which the target firms belong (Proposition 4). The NATU acquisitions exhibited diversity of the target firm business segments, contributing to the argument by Haucap (2019) that these acquisitions are more likely to be of a killer nature. Overarchingly, these segments were categorised binarily as being either "tech" or "other". Here, the former classification covered high-tech capabilities such as big data, software and platform technologies, and AI and machine learning. Even without an initial product overlap, due to the power of network effects and innovation ecosystems, incumbents may resort to pre-emptive KA to safeguard their position against threats from potential competitors (Prado & Bauer, 2022). These potential competitors are those that are innovative, tech-driven, and have an expanding user base (Cabral, 2020). This gives rise to the final proposition:

Proposition 8: Killer Acquisitions seek to prevent potential competition and thus, the target firms will also operate in high-tech business segments.

Once these additional propositions have been outlined, and confirmed by the primary propositions, they can serve to transition to the paper's key contribution – The KAS and subsequently, the HS. Primarily, both sets of propositions can be applied to filter the 64 acquisitions to highlight which fit the proposed criteria for a KA. This process revealed that 16 out of the 64 transactions could potentially be classified as KA. Subsequently, a range of qualitative data was collated to give insight into the outcomes, motives, potential antitrust concerns and the firm and industry reactions to the acquisitions. From this exploration, 3 out of the 16 potentially anti-competitive acquisitions were deemed to be true KA based on the paper's definition drawing from Cunningham et al. (2021).

However, this unearths the central research gap which this paper seeks to address – what about the remaining potentially anti-competitive acquisitions that may not satisfy these conditions for being seen as full KA?

For instance, when firms with significant market share invest in their core business to strengthen their competitive advantage, it can lead to competition from new entrants or start-ups with overlapping products. This, in turn, may prompt incumbents to resort to tactics such as KA, kill zones, or innovation stifling to protect their core business. However, existing literature and Propositions 1 and 5 tend to focus on adjacent and transformational acquisitions as the main drivers for KA. These opposing rationales highlight the need for a more nuanced approach, as there may be variations of KA or anti-competitive acquisitions that specifically target the core innovation activities of the target firm.

Similarly, the analysis indicates that there are 2 potential explanations for why 72% of NATU acquisitions are concentrated in North America instead of cross-border locations. The first rationale is to eliminate potential future rivals and consolidate their existing market position, which aligns with Propositions 2 and 6 and the general literature on KA. However, the second rationale suggests that the acquisitions may be driven by the goal of acquiring the most promising tech start-ups, in the most promising tech ecosystems, to enhance their product offerings. While the first rationale is consistent with existing literature, the second rationale highlights that acquisitions aimed at product enhancement and acquiring technology may also have anti-competitive implications.

Thus, the paper contributes a more nuanced approach wherein KA exist on a continuum rather than as a binary classification as that proposed by Cunningham et al. (2021). This spectrum is presented and discussed further below.

5.3. The Killer Acquisition Spectrum

As a result of the previous analysis and additional propositions, this section puts forward a continuum-based framework that goes beyond Cunningham et al. (2021) and their binary classification, aiming to capture the complexity of KA. The proposed spectrum-based framework will describe 4 types of acquisition classifications.

From the identified research gaps and both the primary and additional propositions, 7 overarching questions were developed by which the 64 NATU acquisitions were differentiated to belong to one of the 4 proposed categories of The Killer Acquisition Spectrum (KAS). The categories are labelled

according to the main characteristics of the acquisition type, covering the central aspects of acquisition motives, acquisition process, and acquisition outcomes.

Firstly, the acquisitions were classified according to the facets of their motives including the maintenance of the target's current product offerings and innovation, and the realisation of traditional synergies. An acquisition was seen to either maintain, potentially maintain, or discontinue target product offerings and innovation (Cunningham et al., 2021), whilst traditional acquisition synergies were deemed either realised or non-realised (Rabier, 2017). Secondly, the acquisition process was considered in terms of retention of employees and if an acquisition either retained or dismissed the target employees (Holmström et al., 2019). Furthermore, the spectrum considered whether retained employees subsequently were either kept separate from or integrated into the acquiring firm. Thirdly, to cover the acquisition outcomes the spectrum categorisation delved into the impact on the competitive landscape, consumer welfare, and future innovation efforts. For the competitive landscape, this was determined to either remain unchanged or shrunk whilst consumer welfare was classified as either being increased or decreased. Lastly, the future innovation efforts of the target were either maintained, fossilised, or stifled (Angwin, 2007).

The visualisation of The KAS based on the 7 defining questions can be seen below (Figure 13).

		SYNERGISTIC	ABSORPTIVE	PROTECTIVE	KILLER
Acquisition Motives	Are the target's current product offering and innovation maintained?	Maintained	Maintained	Potentially	Discontinued
	Are traditional acquisition synergies realised?	Realised	Realised	Non-realised	Non-realised
Acquisition Process	Are the target employees retained?	Retained	Retained	Dismissed	Dismissed
	Are the target employees integrated into the acquirer?	Separate	Integrated	N/A	N/A
Acquisition Outcomes	Does the acquisition shrink or expand the competitive landscape?	Unchanged	Shrink	Shrink	Shrink
	Does the acquisition increase or decrease consumer welfare?	Increase	Increase	Decrease	Decrease
	Does the target maintain future innovation efforts?	Maintained	Fossilised	Stifled	Stifled

Figure 13: The Killer Acquisition Spectrum, author's own creation

5.3.1. Synergistic Acquisitions

Synergistic acquisitions occur when the target remains independent and continues to enhance its current product offering while retaining existing employees and capabilities. The innovation efforts are maintained, and the future innovative capacity remains a priority. The acquisition fully leverages the target's innovation capabilities and ambitions, and therefore, it is considered highly pro-competitive. Synergistic acquisitions align with traditional acquisition theory, where the motivation is to realise operating and financial synergies such as maintaining company culture and tacit knowledge while increasing pricing power and retaining talent (Rabier, 2017). This makes this motive particularly appealing when the goal is to enhance the core business. Additionally, the risk of failed integration is significantly reduced as the target remains fully autonomous (Rabier, 2017). Considering the impact on consumer choice and overall societal welfare, the acquisition will have a positive impact given the potential of tangible benefits in terms of product and service innovation, advancements in existing offerings, and the development of new business models. However, it should be noted that negative welfare effects could arise from competition dynamics if the post-acquisition entity gains a significant market share and misuses its pricing power (Chatterjee, 1986). If this occurs, Williamson's "Naive Trade-off Model" may come into play, leading to increased prices to the detriment of consumers (Williamson, 1968). The latter leaves a minor aspect of hostility, however, given the rarity it is still considered overall pro-competitive.

Overall, these tenets result in synergistic acquisitions being viewed as the most pro-competitive of the 4 categorisations when placed on The HS (Figure 14).

5.3.2. Absorptive Acquisitions

Absorptive acquisitions involve integrating the target company into the incumbent firm, leading to an expansion of the incumbent's product offering and potentially new core market dominance. Therefore, this acquisition motive shares similar characteristics with offensive killer acquisitions, in which the incumbent aims to eliminate a competitor, even a potential one, from an ecosystem that the predator intends to enter (Marty & Warin, 2020b). Although the target's innovation efforts are fossilised, the incumbent may improve their own innovation offerings post-acquisition through operating synergies and access to capital.

One popular motive for absorptive acquisitions is acquihire, which can improve the incumbent's functional strength by bringing in highly skilled workers that are difficult to find on the open job market (Holmström et al., 2019; Kim, 2018; Ouimet & Zarutskie, 2016). This is based on the notion that start-ups are often easier to integrate due to their smaller, more flexible, and mobile teams (Bhargava & Venugopalan, 2013). This enables the acquiring company to access expertise, experience, and talent, beyond just the existing products, which makes it particularly compelling when the incumbent seeks to enhance their transformational offerings. If the acquiring company has the capability and willingness to integrate the innovation efforts of the target company, it may not have an immediate impact on consumer choice and societal welfare. However, it is crucial to note that this is solely contingent on the motivation of the incumbent. Yet as market concentration increases following these acquisitions, there is still a reduction in competition highlighting the anti-competitive aspect of this acquisition. Lastly, similar to synergistic acquisitions, absorptive acquisitions can have additional adverse effects on the competitive market landscape if the post-acquisition entity attains a dominant market position.

Subsequently, the central facets of the absorptive acquisition type inform its placement on the precipice between pro and anti-competitive, yet leaning towards anti-competitive, on The HS.

5.3.3. Protective Acquisitions

Protective acquisitions demonstrate comparable characteristics to defensive acquisitions, wherein the incumbent aims to neutralise potential threats to preserve their market dominance (Marty & Warin, 2020b). After the acquiring company has successfully thwarted the potential threat, the target company's innovation efforts come to a halt, ultimately to the detriment of the consumer. The incumbent discontinues the R&D of the target, whilst the present product offerings are commonly fossilised or, in a few cases, allowed to remain on market. In the latter scenario, the goal is to deliberately allow the target to fall behind in terms of innovation in the market, thus eliminating its potential as a future competitor, while avoiding media backlash or antitrust intervention. Although current innovation efforts may be preserved in some cases, the target's long-term innovation capacity will always become obsolete. Hence, protective acquisitions are commonly linked to the acquisition of adjacent or transformational capabilities, where the intention is to eliminate companies that may pose a disruptive challenge to the incumbent's

long-term market dominance. As a result, protective acquisitions can harm consumers through reduced competition, leading to higher prices and reduced product quality.

While protective acquisitions share similarities with KA, the societal impact is less significant since they typically avoid core-related acquisitions and may leave the target's existing product offerings intact. However, this study recognises that if both current and future innovation initiatives are terminated, which can be identified more easily in hindsight, the difference between the two types of acquisition may become indistinguishable. Lastly, as protective acquisitions are motivated solely by competitive considerations, no operating or financial synergies are realised.

Protective acquisitions are inherently an anti-competitive transaction to a high extent, as visualised on The HS and informed by the above definition.

5.3.4. Killer Acquisitions

Killer acquisitions exhibit the same characteristics as the definition proposed, where the incumbent strategically acquires the target with the sole intention of discontinuing its innovation projects to pre-empt future competition. However, unlike protective acquisitions, KA result in the termination of both current and future innovation, as the target's existing product offerings are withdrawn from the market and R&D is abandoned. Since all forms of innovation are lost, consumers are deprived of potential new products, developments to existing products, as well as potentially disruptive business models that could have emerged from the target. Moreover, all existing management and employees from the target are dismissed. Acquisitions of this nature typically target transformational innovation companies and have a broad negative societal impact. For instance, the competitive landscape shrinks, while the incentives for innovation cease to exist, stifling all potential progress of the target. Additionally, the dominance of incumbents and their acquisition of potential competitors can also result in deteriorating privacy standards in the tech sector. Like protective acquisitions, KA are driven solely by competitive considerations and do not involve the achievement of any operating or financial synergies.

As the full manifestation of the typology, KA are deemed to be the most anti-competitive of the four proposed categories as seen on the HS.
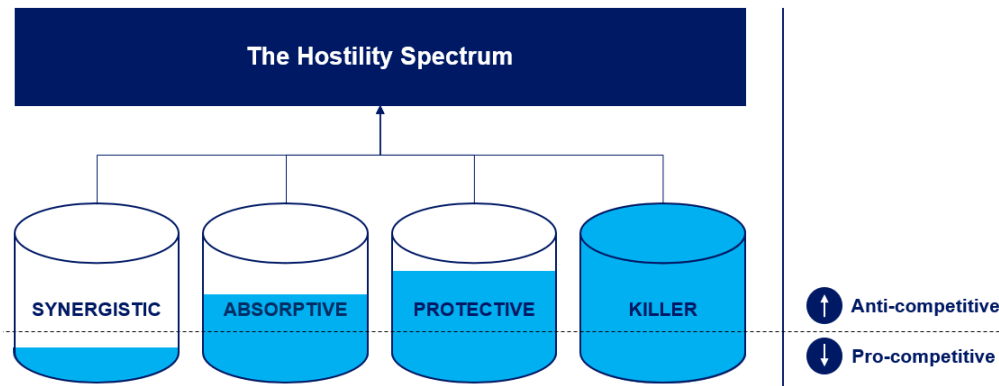
Figure 14: The Hostility Spectrum of acquisitions, author's own creation

Applying The Killer Acquisition Spectrum

The application of the four propositions and the considerations of the spectrum (Appendix B) allowed for a classification of the 64 NATU acquisitions into one of the 4 categories, synergistic (19), absorptive (34), protective (8), and killer acquisitions (3), as seen in Table 3. The prime exemplar transactions for each category are detailed below.

6.1. Synergistic Acquisitions

As detailed previously, the synergistic categorisation follows more traditional acquisition motives and is deemed to be overall pro-competitive as it seeks to strengthen and create further synergies. All of the NATU firms have engaged in synergistic acquisitions, with Netflix (9) conducting the most, followed by Airbnb (5), Uber (3), and Tesla (5). Consistently, these acquisitions do not conform to the propositions set forth and range from cross-border acquisitions with disclosed prices to costly acquisitions of non-tech targets related to the acquiring firms core business. These synergistic acquisitions produce tangible benefits for the involved parties as well as mostly producing positive societal welfare effects.

The 2019 acquisition of HotelTonight by Airbnb exemplifies how synergistic acquisitions may be advantageous in terms of product and service innovation. This acquisition facilitated Airbnb in innovating and creating a unique offering of boutique hotels on their platform and moving to target a new

consumer group (Somerville, 2019). Secondly, synergistic acquisitions also contribute to the advancement of existing offerings as seen in the acquisition of Riviera Tool LLC, the machinery firm, by Tesla in 2015 to improve the manufacturing and cost-effectiveness of Tesla's metal, plastic, and stamping parts (Harbour, 2015). Finally, synergistic acquisitions may even result in the long-term development of new business models to bring new innovations and opportunities to society. A primary case of this was Netflix's acquisition of Night School Studio in 2021 which launched Netflix's foray into the gaming industry (Spangler, 2021). The three target companies exhibited a shared characteristic in their retention of autonomy post-acquisition, thereby mitigating integration risk, while simultaneously capitalising on the advantages of knowledge spill-over effects and enhancement of product offerings.

On the other hand, as noted prior to this, negative welfare effects may appear even following synergistic acquisitions if competition dynamics become skewed leading to misuse of pricing power by the acquiring incumbent (Chatterjee, 1986). This was, for example, observed when Tesla acquired Riviera Tool LLC as they effectively blocked capacity and access to the tools for all other vendors and manufacturers indicating misuse of the enhanced post-acquisition position and market power (Harbour, 2015). Nonetheless, the remaining synergistic acquisitions uphold the proliferation of operating and financial synergies through enhancing functional strength, cash flow diversification, and product offerings (Rabier, 2017).

6.2. Absorptive Acquisitions

The absorptive acquisition typology is multi-faceted and broadly follows the tenets of an offensive acquisition as defined by Marty and Warin (2020b) whilst simultaneously presenting aspects of innovation fossilising as discussed by Angwin (2007) to produce a "milder" form of anti-competitive acquisition. This was the category with most acquisitions (34) indicating the inherent need for a more nuanced approach to defining anti-competitive acquisitions. Once more, all four NATU firms conducted absorptive acquisitions led by Airbnb (15) and followed by Uber (11), Tesla (7), and Netflix (1).

Primarily, absorptive acquisitions concentrate on integrating the capabilities and employees of the target into the acquiring firm to expand product offerings and exert dominance in new or existing markets. When Tesla acquired Grohmann Engineering in 2016, the engineering talent and technologies

were integrated into Tesla's automotive business whilst Grohmann's work with other clients was phased out (Lambert, 2017). Consistently, absorptive acquisitions also possess an anti-competitive aspect as incumbents may fossilise the innovations of the target firm to benefit their own innovation pipelines and strengthen competitive advantage (Angwin, 2007). As also indicated by the above Tesla acquisition, fossilisation was also apparent when Airbnb purchased Lapka in 2015, a firm specialising in smartphone assisted environmental sensors and medical breathalysers (Bagga, 2020). Following the acquisition, Airbnb has to date never launched any products related to Lapka's innovations despite stated plans to leverage the skills and designs to produce future synergies in the future (Bagga, 2020). This could point towards the potentially adverse effects for societal welfare if the innovations are fossilised rather than commercialised.

Lastly, one of the central notions of absorptive acquisitions is the acquihire motive allowing the acquiring firm to gain access to highly skilled workers to improve functional strengths and solidify competitive advantage (Calipha et al., 2018; Holmström et al., 2019; Varian, 2021). A significant portion of the identified absorptive acquisitions followed this motive and explicitly stated acquihire as one of the key drivers of the acquisitions. Specifically in acquiring Swipe Labs in 2017, Uber fully acquihired the platform software as the approximately dozen employees and CEO of Swipe Labs joined Uber to improve driver and rider experience with the platform (Constine, 2017).

6.3. Protective Acquisitions

The third acquisition type, protective, also exemplifies an anti-competitive acquisition yet in a more nuanced manner than a full KA. The most notable parameter by which these are distinguished is by the level of impact post-acquisition where protective acquisitions often have more firm-level effects compared to the broader societal impacts associated with KA. Due to antitrust concerns tied to these more anti-competitive acquisitions, only 8 out of 64 acquisitions were seen to be protective with none carried out by Netflix, followed by Tesla (1), Uber (3), and Airbnb (4). The defining characteristics of a protective acquisition are incumbents thwarting competition by discontinuing current and fossilising future innovations of the target firm leading to adverse impacts for consumers and the industry. Thus, this acquisition type is motivated solely by competitive considerations such that operating and financial synergies are not intended to be realised.

Halting the target firm's innovation trajectory involves the shelving of product offerings and discontinuation of the targets R&D efforts to protect the incumbent from potential competitive threats. This protective acquisition type was observed in the 2018 acquisition of Ando Food by Uber. Ando Food specialised in delivery-only dishes and its services were shut down immediately to strengthen the UberEats platform and combat competition from smaller, local options with significant growth potential (Golightly, 2018; Lunden, 2018). On the other hand, in certain instances of protective acquisitions, the product offerings of the target are allowed to remain on the market and as such these acquisitions result in a less significant societal impact. When Airbnb acquired both NabeWise and Localmind in 2012, the local guide businesses were discontinued once their services had been adapted to Airbnb's "Neighbourhood" guide and recommendation offering (Thomas, 2012). This example illustrates how target services may remain available on the market but the incumbent ensures they do not constitute a continuing competitive threat.

As a consequence of protective acquisitions, the tech industry becomes further marked by reduced competition, higher prices, and reduced product quality to the detriment of both firms and consumers. For example, the food delivery sector faced significant pressure to drive down prices in light of heightened competition and similarity of offerings spurred by Uber's 2020 acquisition of one of the key competitors to their delivery sector, Postmates (Isaac et al., 2020).

6.4. Killer Acquisitions

Finally, at the far end of the spectrum of hostility, are the "true" killer acquisitions of which there were deemed to be 3 wherein Uber carried out 2 and Tesla performed 1. Drawing from the paper's definition of KA, these transactions result in broad societal impacts, failure to enhance existing product offerings, and a complete stifling of both present and future innovation endeavours of the target firm.

Tesla's acquisition of battery producer SilLion Inc. was concluded in 2020 and resulted in Tesla launching a new patent for a silicon anode intended to exceed their previous battery product offerings to produce cheaper, long-range options (Randall, 2021). Furthermore, Tesla absorbed and customised the technology before abandoning the innovative start-up and all of its ensuing innovation pipelines as SilLion went dark following the acquisition (Punter, 2021). This is exemplary of the stifling of innovation

and killing of an innovative competitor to uphold Tesla's dominant position, whilst bringing adverse effects to society by limiting access to new innovations from the target that were intended to provide safer, low-cost energy storage devices (PitchBook, 2023).

Subsequently, Uber has engaged in 2 KA beginning with their purchase of Post Intelligence in 2017. Rather than seeking to enhance the target's existing capabilities, this acquisition was driven by Uber aiming to launch a new venture into deep learning models for AI services (Crunchbase, 2023). Beyond the societal impact of limiting product offerings, the acquisition also contributed to reducing consumer welfare as the killing of Post Intelligence meant a disappearance of the $100 million in advertising revenue gained by over 1.5 million social media influencers through the use of the firm's service (Crunchbase, 2023). Additionally, the acquisition by Uber meant the death of the second key offering of the target firm, an app called Candid, capable of anonymising newsfeeds and social media discussion forums to remove spam and flag negative posts (Solsman, 2016). Thereby providing another indication of the decrease in social welfare and resulting consumer harms from hate speech, fake news, and potential mishandling of information (Petit, 2020).

The third and final KA involved Uber when they acquired Dallas-based orderTalk in 2018. The target firm was an online ordering platform specialising in direct integration with restaurant point-of-sale (POS) systems to allow direct communication (Hawley, 2018). As such, the acquisition allowed Uber to quash a potential competitor to their existing offering with manual input of orders or via third-parties (Martson, 2018). The acquisition led to a cease of orderTalk's previous operations which contributed to customer satisfaction, as well as the dismissal of employees including both the chairman and CEO (Eldon, 2019; Witts, 2018). The long-term and widespread societal impacts exacerbated by this acquisition were further detailed in a filing made by Uber to the SEC where they refer to issues from the acquisition such as features failing to work, failing to provide the intended value to platform users, and the storing of consumer payment information and order history (Securities and Exchange Commission, 2019). Once more, this KA raises consumer harms and concerns regarding privacy violations and data protection (Affeldt & Kesler, 2021; Chen & Schwartz, 2013; Nadler & Cicilline, 2022).

NATU	Synergistic Acquisitions	Absorptive Acquisitions	Protective Acquisitions	Killer Acquisitions
Netflix	9	1	0	0
Airbnb	5	15	0	4
Tesla	2	7	1	1
Uber	3	11	2	3
Total Acquisitions	19	34	3	8

Table 3: Application of The Killer Acquisition Spectrum to NATU, author's own creation

Discussion & Limitations

7.1. Discussion

A three-fold purpose was identified in addressing the given line of inquiry related to disruptive technology firms and the use of KA. Our research generally suggests that disruptive technology firms have a theoretical propensity to engage in KA at rates beyond other sectors as these firms exhibit strong network effects, access to big and self-reinforcing data, and prevalent economies of scale and scope. Further, the NATU firms tend to support this theoretical finding, and the broader societal impact is potentially harmful as these firms build strong ecosystems, giving them significant market power and limiting competition and innovation. In response to these findings, this section provides insights and potential tools for researchers, managers, and regulators, but not definitive answers. Additionally, the findings point to several avenues for future research. Firstly, the purpose of bridging the gap between existing KA literature and anti-competitive behaviour in the tech industry is discussed. Secondly, the purpose of practically applying these conclusions to a sample of acquisition data to explore the existence of KA in the tech sector is covered. Finally, stemming from the previous two discussions, the paper's main contribution is detailed and evaluated.

7.1.1. Killer Acquisitions in Pharma vs. Tech

The literature review and theoretical construction of the paper delved into existing frameworks within innovation, acquisitions, and antitrust concerns. This theoretical background revealed a gap in

terms of the potential existence of non-traditional acquisition motives and processes that may be of an anti-competitive and killer nature (Angwin, 2007; Cunningham et al., 2021, Rabier, 2017). Additionally, growing concern for lacking merger control and regulation of this behaviour in specifically the tech industry points to the existence of a viable issue in need of being addressed. The traditional acquisition literature and works on KA stem from non-tech industries, or the pharmaceutical sector, and thereby lead to the identified gap of the first research question: *Do the selected characteristics of the tech industry enhance innovation or act as a breeding ground for anti-competitive acquisitions that stifle innovation?*

The industry-specific component of the originally developed KA framework has received critique as it may glance over the potential for such behaviours to also be occurring in other industries and thus it may drive discriminatory antitrust regulation (Ivaldi et al., 2023). Since the pharmaceutical industry follows streamlined development and production processes and generally has less dynamism in terms of innovation when compared to the tech sector (Drews & Ryser, 1996; Grabowski, 1982; Wang, 2017), horizontal acquisitions are more prevalent. These transactions mediate the impact of the less nimble, more cumulative innovation in the pharma industry to speed up the general innovation process. On the other hand, the tech sector strives to utilise the widespread network effects, dynamism, and fast-paced development to build ecosystems via non-horizontal acquisitions (Ivaldi et al., 2023). Moreover, in this work, it is theorised that anti-competitive behaviour in the tech industry negatively impacts consumer pricing and value.

As such, the paper identified key characteristics of the tech industry such as its operating and marketing externalities, and industry advantages that constitute a breeding ground for KA. From this theoretical discussion it was clear that the phenomenon of KA was also applicable to the tech sector, and this was then further proposed to exist in this industry according to a different set of parameters than in the pharmaceutical sector. Subsequently, the 4 primary propositions for the paper were set forth in order to address this gap. Tech KA were suggested to be driven by disruptive innovation, to not follow specific geographic patterns, to have transaction prices specifically below notification thresholds, and to encompass acquiring and target firms operating in similar ecosystems. Consistently, this can then be tied to the innovation literature to suggest that KA are likely to be associated with breakthrough and disruptive

innovations according to Satell's typologies (2017), yet further exploration of this relationship provides an interesting area for future research.

7.1.2. NATU Killer Acquisitions

Once the propositions were constructed and it was established that KA also were expected to exist in the tech sector, this was explored through an analysis of the acquisition activity of the NATU firms. Netflix, Airbnb, Tesla, and Uber were selected as the case companies based on their exemplification of the identified characteristics of disruptive innovative tech firms such as being advanced, radical, and operating on a large-scale. Therefore, the paper sought to investigate the applicability of the suggested theoretical framework to address the second research question: *Are the patterns of the NATU acquisition data consistent with theoretical expectations as expressed in the extant literature?*

Guided by the 4 primary propositions, the analysis of the 64 NATU acquisitions confirmed these and led to the further development of additional propositions specifically tied to the trends and patterns unearthed. Consistently, this formed a set of specific criteria for KA in the tech industry which could be applied as filters to the sample set resulting in the discovery of 3 potential KA. If other firms beyond this classification also follow the firm-specific characteristics for a disruptive innovative tech firm it is expected that the conclusions and propositions also would hold in this setting. Beyond this, the findings may also be transferred and applied outside of the tech sector to other industries, such as big food or the energy sector, that also exhibit network effects, economies of scale and scope, market uncertainty driven by competition, and innovations built around data. These two considerations present viable avenues for future research applications.

However, this binary application drawing on the original definition by Cunningham et al. (2021), as well as the definition adapted to the paper's interest in the tech sector, revealed a range of additional considerations, potential gaps, and inconsistencies in the propositions. The NATU acquisition activity could not be sufficiently explained by this delineation of KA. This culminated in the need for a more nuanced approach wherein all of the additional factors and externalities of acquisitions in the tech sector could be included when identifying KA.

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Sentiments surrounding the need for a revised approach to identifying and defining KA in the tech industry was also shared by Gautier and Lamesch (2021). Findings of the study of the GAMAM firms and KA also revealed the difficulty in transferring pharma-based definitions to the tech industry where societal impacts are more easily observable than in the tech sector (Gautier & Lamesch, 2021). Whilst the authors only found 1 out of 175 GAMAM acquisitions to potentially be of a killer nature, they indicated that over 60% of the acquisitions still had product discontinuation, and adverse competition and innovation impacts. Therefore, whilst traditional KA may be difficult to observe in reality in the tech-sector there are still anti-competitive transactions being made which may be better captured by a nuanced spectrum of KA.

7.1.3. The Killer Acquisition Spectrum

Lastly, as the product of the two previous discussion points this paper developed "The Killer Acquisition Spectrum" proposed as a nuanced categorisation tool capable of more adequately identifying and classifying anti-competitive and KA in the tech industry to address the third research question: *Given the conceptual framework of acquisitions, what is the broader potential societal impact?*

When applied to the 64 NATU acquisitions, the spectrum was able to capture the nuances and variations of the transactions based on the motives, processes, and outcomes in order to place these accordingly across the HS ranging from more pro-competitive synergistic acquisitions towards the more anti-competitive absorptive, protective, and killer acquisitions. Generally, the HS framework extends the work to include the various levels of anti-competitive behaviour tech firms engage in. Overall, 45 of the 64 NATU acquisitions were of an anti-competitive nature (classified as being absorptive, protective, or killer) which closely follows the conclusions presented by Gautier and Lamesch (2021) to demonstrate that in the tech-industry for disruptive innovative firms, the notion of killer acquisitions is fluid and complex rather than rigid as originally proposed by Cunningham et al. (2021).

On the other hand, it is important to acknowledge that there may be a degree of oversimplification and overlap between the categories on the spectrum as these can be difficult to clearly delineate from one another in hindsight. Consistently, moving forward, an even broader spectrum with further categories may be required to fully encompass all possible externalities of KA. Moreover, these spectrum

classifications may benefit from utilising metrics rooted in quantitative data as opposed to qualitative questions that may have resulted in slightly "fuzzy" boundaries between the 4 conceptualisations on The Killer Acquisition Spectrum. These improvements to the spectrum could thereby also extend its potential applicability to other disruptive innovation tech firms or new industries to increase generalisability and provide more evidence for causation as opposed to just correlation.

Nonetheless, The KAS is still a significant contribution made by this paper which has made strides toward addressing the research gaps, shortcomings, and lack of nuances in the study of KA. Thus, the framework enhances the ability for regulators and other stakeholders to understand and predict more nuanced anti-competitive behaviours. This framework is intended to function as a practical tool for regulators to inform policy prescriptions, for the media to guide the narrative on anti-competitive acquisitions, for other firms to consider in their own M&A strategies, and for antitrust authorities to add to considerations of broader societal impacts of acquisitions. Consistently, the paper introduces the argument that the negative impact of anti-competitive behaviour extends beyond consumer pricing to include societal impact, which in turn may be better captured by a nuanced approach to KA. Nonetheless, the broad topic of societal impact has immense applications and potential avenues for further research.

7.2. Limitations

Although the thesis has made significant strides in shedding light on a highly relevant research area and adding nuance to capture the intricacies of the conceptual framework, it is imperative to acknowledge the presence of certain limitations that warrant consideration.

Firstly, Cunningham et al. (2021) employed the number of patents as a measure of innovation in their analysis, which provides the study with precise, quantifiable metrics. However, in the pharmaceutical industry, the density of patents is higher due to slow drug development, cumulative innovation, and the presence of generic entry (Ivaldi et al., 2023). Whereas in tech, patents may not suit the rapidly evolving industry as they might become outdated by the time granted. Therefore, significant differences in outcomes should be interpreted with caution due to the apparent differences in data sources. Secondly, this paper is based on the conventional theory that regards acquisitions as single agency transactions, where a sole acquiring company purchases a single target company. As a result, this study overlooks the

possibility of joint ventures, strategic alliances like joint ventures, hostile takeovers, and other complex acquisition structures.

There are also several limitations to consider when discussing the acquisition purchase prices in this study. Firstly, it should be noted that the data for this study was collected in February 2023, meaning that any subsequent changes such as additional acquisitions (Airbnb acquired Letting Cloud in March), divestitures (Uber divested Careem in April), or acquisition-related publications have not been accounted for (Barker, 2023; Korosec, 2023). Secondly, the HSR threshold has been used as the only regulatory anti-trust indicator since all four companies are based in the United States. However, it should be noted that different thresholds exist for anti-competitive regulations across various countries, and these differences could potentially have impacted the cross-border acquisition behaviour of tech companies (Bundeskartellamt, 2023; Denton, 2023; European Union, 2023). For example, NATU might acquire more in North America if the HSR limit is higher compared to other countries. However, due to the complexity of these regulations and the cross-border variations, every regulatory threshold, except for HSR, has been deemed beyond the scope of this study.

Lastly, when discussing whether the target's future innovation efforts are maintained, the primary indicator is R&D. However, the intricate and multidisciplinary nature of innovative tech firms has proven to be a significant challenge when measuring R&D activity (Bloom et al., 2019; Holmström et al., 2019; Ivaldi et al., 2023b), and as a result, the framework will be impacted by this challenge. Furthermore, even if R&D activity could be accurately measured, it is essential to consider that heavy investments in R&D may not necessarily lead to successful innovation, particularly in the context of highly uncertain and disruptive innovation areas.

7.3. Implications for Future Research

Despite the creation of a sophisticated framework that adds nuance to a critical topic, the work is far from complete. Subsequently, a range of possible areas for future research can be identified following the conclusions drawn from the paper.

Initially, the conceptual development of the spectrum should be advanced further as there exist several areas that could benefit from future research to refine, expand, and question the propositions presented in this paper. For instance, future research could go beyond the assumption of single agency transactions and incorporate scenarios of several acquirers and targets. Furthermore, as Angwin (2007) suggests, acquisitions could potentially be impacted by external factors such as management biases, creating an additional area for future research to examine the contrast in anti-competitive conduct between hostile acquisitions and friendly takeovers. Such external factors could also affect the incentives to innovate both pre- and post-acquisition, which could add further depth to the theoretical framework. Regarding the dynamic nature of the industry, a more in-depth examination of the characteristics of disruptive tech firms could be interesting. This may involve scrutinising institutional voids, the degree of technological advancement, and variations in innovative ecosystems. Finally, it is worth noting that future research may shed light on potential positive consequences of KA. One such effect could be the establishment of a higher level of market concentration, which in some cases may increase societal welfare. The basis of this is that network effects, when coupled with substantial economies of scale and scope, imply that a single large provider is more efficient than multiple smaller providers duplicating resources (Kennedy, 2020a, Crémer et al., 2019).

Secondly, the spectrum framework may be subjected to application to other disruptive tech firms exhibiting similar characteristics to NATU, such as the other two prominent "Big Tech" groups, GAMAM and BATX. This approach could further reinforce the reliability of the framework and potentially introduce additional nuances and trends. Following its validation on "Big Tech" firms, it would be worthwhile to explore its applicability to other industries. Such a step would enable the accumulation of more evidence to establish whether correlation does indeed equate to causation. Interestingly, another potential avenue for future business research could involve conducting a counterfactual analysis to ensure that the claimed impacts are tied to the specific instances of anti-competitive acquisitions. This may involve investigating alternative scenarios in the absence of acquisition – would the target have continued to operate independently, or would it have been acquired by an alternative acquirer, and if so, what would the impact be (OECD, 2020)?

The concept of innovation being path-dependent implies that today's removal of innovation will have an impact on future innovations. Consequently, the past and present anti-competitive practices of

tech companies will have long-term repercussions, with some potential innovations being lost forever. Left to their own, disruptive tech firms will pursue their own interests, distancing themselves further from public interests. Although regulatory intervention is necessary, the potential costs of regulatory failure are high and could stifle innovation and competition if policymakers are imprecise in their targeting. However, as regulators navigate the complex terrain of innovation ecosystems, killer firms will continue to kill and distort these ecosystems, producing toxic innovations that increasingly extract or destroy value. Thus, future research may explore the measures that can be taken to mitigate such anti-competitive behaviour.

Lastly, due to the dynamic nature of disruptive innovation, it is challenging to develop regulatory tools simultaneously with its occurrence. Despite the increased attention and focus on this issue, more decisive action is needed. Regulators must determine whether they are more concerned about monopolies or a reduction in the competitive landscape. These are two fundamentally different situations that necessitate distinct approaches to policy and regulation in M&A - one requires an economic perspective, while the other requires a regulatory perspective. Similarly, this paper recognises the negative perception of monopolies and restricting competition, but that managing competition is necessary for safety and quality in certain industries such as airlines or public utilities. This could open new research opportunities to explore whether a similar approach is necessary in the tech industry. However, it is crucial to analyse each case's unique circumstances and assess the need to restrict competition to promote public welfare. Relying on tech firms, whose incentives may not align with ours, to provide a paradigm-shifting innovation and act in the public interest is a risky proposition. Instead, we must fundamentally overhaul the policy framework to better address the challenges posed by disruptive innovation and anti-competitive M&A.

Conclusion

The theoretical discussion and analysis of the paper illustrated the presence and significant role of KA, but also drew attention to the need for a more nuanced approach capable of highlighting the specific way in which KA exist in the tech world. The creation of this nuanced spectrum further demonstrated the challenges and potential broader impacts of anti-competitive acquisitions for disruptive tech firms, consumers, and policymakers. Consistently, answers may be given to the proposed line of inquiry and three research questions.

The prevalence of disruptive innovation, network effects, and the central role of data distinguish the tech sector from the pharma industry and facilitate the occurrence of KA. Consequently, the first research question can be addressed: *Do the selected characteristics of the tech industry enhance innovation or act as a breeding ground for anti-competitive acquisitions that stifle innovation?* As the tech industry is competitive, disruptive, marked by network externalities, and shaped by big data it inherently features incumbent firms striving to exploit these characteristics. In order to do so, the incumbents seek to build ecosystems via non-horizontal acquisitions to stifle disruptive innovation and kill potential competition.

Disruptive firms in the tech industry were defined to be advanced, convenient, large-scale, and radical. Thereby the NATU firms were selected as the focal case companies due to their emergence as key disruptors possessing these attributes that they aim to protect from potential competition from innovative targets via predatory, anti-competitive behaviour. Following this, the second research question can be addressed: *Are the patterns of the NATU acquisition data consistent with theoretical expectations as expressed in the extant literature?* Consistently, the tech-based KA identified from NATU's acquisition theory occurred in the following manner; 1) prevented disruptive innovation by selecting target firms with adjacent or transformational innovation ambitions, 2) strayed from traditional synergy or expansion motives by not following distinct cross-border patterns, 3) followed anti-competitive behaviour by avoiding antitrust notification thresholds through undisclosed transaction prices, and 4) impeded potential competition by being concentrated on target firms operating in similar business segments and high-tech ecosystems as the incumbents. Therefore, the theoretical expectations delineated in the primary

propositions were also mirrored in the additional propositions stemming from the NATU analysis to corroborate the second research question.

Nonetheless, the conclusions on the empirical existence of KA conducted by the NATU firms glossed over a myriad of other transactions that still exhibited anti-competitive tendencies. As a way to capture these acquisitions, the paper sought to contribute a nuanced spectrum capable of defining KA in the tech sector more sufficiently. The KAS classified transactions based on their motives, processes, and outcomes. Acquisitions were deemed to be either synergistic, absorptive, protective, or killer. Thus, ranging from pro to anti-competitive in line with the HS. The acquisitions had varying degrees of outcomes, with the defined KA resulting in consumer harms. Consistently, the third and final research question can be addressed: *Given the conceptual framework of the acquisitions, what is the broader potential societal impact?*

In both the pharmaceutical and technology industries, acquisitions can have significant impacts on innovation and competition. While KA in pharma can directly impact life-saving drugs, the consequences of acquisitions in tech may not be as immediately apparent. But that does not mean that they are any less damaging. This paper found a variety of negative impacts on consumer welfare in relation to these lethal deals in the tech world. Primarily, the cease to innovation incentivisation and stifling of target progress limit product offerings, shrink the competitive landscape, and lower price competition. These translate to a constraining of overall social welfare that may further involve tech-specific consumer harms such as privacy violations, abuse of data protection, hate speech, fake news, and potential mishandling of sensitive information. Therefore, the majority of proposed policy encapsulates the notion that the social cost of lost competition from regulating KA far outweighs the reduction in innovation incentives.

Overall, the concluding address of each of the research questions along with the overarching discussion of the topic culminate in providing an answer to the main line of inquiry: *Do disruptive technology firms engage in killer acquisitions?* Simply put, yes, KA are carried out by disruptive tech firms as evidenced by the characteristics of the industry acting as a breeding ground for the phenomenon and by the NATU acquisition activity. Yet when one delves further into the premise of the question, it can be concluded that the KA performed by these disruptive tech firms are more nuanced than in the binary

framework suggested by Cunningham et al. (2021). The paper's definition of a full "killer acquisition" has been tailored to the specific tenets of tech whilst the creation of The KAS brought nuance to the notion of anti-competitive behaviour by these firms. Nonetheless, the existence of killers in the tech industry once more illustrates the growing need for adequate merger regulation and control capable of eradicating KA without sacrificing innovation incentives and societal welfare. Achieving this balance is crucial to avoid tech firms becoming, as in the words of EU Commissioner Margrethe Vestager, a deadly "bloom of algae that kills off every other form of life as it expands" (Stolton, 2019).

On the premise of this conclusion, one may look forward to considering – what happens to the competitive landscape in the tech sector if such anti-competitive behaviour is not sufficiently tackled? With the established prevalence of anti-competitive acquisitions, the current trend creates a "cyclone effect" that enables monopolistic tech firms to rapidly collect and acquire dispersed knowledge and intangible assets. Given the increased focus on open innovation, KA are especially relevant as Big Tech firms may absorb apparent open innovation initiatives, claim them as their own, and integrate them into their closed innovation processes. As time progresses, the growing concentration of aggregated knowledge and intellectual property rights held by Big Tech will provide limited opportunities for disruptive competitors. Therefore, Big Tech's growing ability to absorb data may not lead them to completely kill innovation, but it does put them on a path towards becoming a data and knowledge monopoly. Thereby potentially positioning them as, in the words of Yuval Harari, the owners of the future (2018).

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Appendix

Appendix A - NATU Acquisition Overview

NATU ACQUISITION OVERVIEW

	Acquired Company	Located in (city)	Located in (country)	Located in (continent)	Date of Acquisition	Purchase Price (in USDm)	Business Segment	Overall Business Segment	Relatedness	Category for Framework
NETFLIX	Millarworld	California	USA	North America	07/08/2017	N/A	Publishing	Other	Transformational	SYNERGISTIC
	StoryBots	California	USA	North America	09/05/2019	N/A	Educational entertainment	Other	Core	SYNERGISTIC
	Roald Dahl	London	United Kingdom	Europe	22/09/2021	$502 m	Publishing	Other	Transformational	SYNERGISTIC
	Night School Studio	California	USA	North America	29/09/2021	N/A	Gaming	Tech	Adjacent	SYNERGISTIC
	Scanline VFX	California	USA	North America	22/11/2021	N/A	Visual Technology	Tech	Core	SYNERGISTIC
	Next Games	Helsinki	Finland	Europe	01/03/2022	$72.7M	Mobile/App	Tech	Adjacent	SYNERGISTIC
	Boss Fight	Texas	USA	North America	24/03/2022	N/A	Gaming	Tech	Adjacent	SYNERGISTIC
	Roku	California	USA	North America	09/06/2022	$214M	Video Streaming Technology	Tech	Core	ABSORPTIVE
	Animal Logic	Sydney	Australia	Oceania	20/07/2022	N/A	Animation Technology	Tech	Core	SYNERGISTIC
	Spryfox	Texas	USA	North America	31/10/2022	N/A	Gaming	Tech	Adjacent	SYNERGISTIC
AIRBNB	Accoleo	Hamburg	Germany	Europe	01/06/2011	100	Online Booking	Other	Core	ABSORPTIVE
	CrashPadder	London	United Kingdom	Europe	21/03/2012	N/A	Online Booking	Other	Core	ABSORPTIVE
	NabeWise	New York	USA	North America	01/07/2012	N/A	Information Platform/Technology	Tech	Adjacent	PROTECTIVE
	Localmind	California	USA	North America	01/12/2012	$650K	Location Service Technology	Tech	Adjacent	PROTECTIVE
	Vamo	Washington	USA	North America	11/09/2015	$1.6M	Online Booking	Other	Core	ABSORPTIVE
	Lapka	California	USA	North America	29/09/2015	N/A	Entertainment Technology	Tech	Transformational	ABSORPTIVE
	ChangeTip	California	USA	North America	12/04/2016	$4.66M	FinTech	Tech	Transformational	ABSORPTIVE
	Proprly	New York	USA	North America	01/05/2016	$30K	On Demand Cleaning	Other	Transformational	PROTECTIVE
	Bold	California	USA	North America	01/06/2016	$2.17M	FinTech	Tech	Transformational	PROTECTIVE
	Minbox	California	USA	North America	01/06/2016	$800K	Technology	Tech	Adjacent	ABSORPTIVE
	Trip4real	Madrid	Spain	Europe	17/09/2016	$2.92M	Online Booking	Other	Core	ABSORPTIVE
	Luxury Retreats	Montreal	Canada	North America	16/02/2017	$300M	Online Booking	Other	Core	SYNERGISTIC
	Tilt	California	USA	North America	23/02/2017	$67.2M	FinTech	Tech	Transformational	ABSORPTIVE
	Deco software	California	USA	North America	02/05/2017	N/A	Mobile Infrastructure	Tech	Adjacent	ABSORPTIVE
	Troo.ly	California	USA	North America	19/06/2017	$10M	FinTech	Tech	Transformational	ABSORPTIVE
	AdBasis	Illinois	USA	North America	13/11/2017	N/A	Technology	Tech	Transformational	ABSORPTIVE
	Accomable	London	United Kingdom	Europe	16/11/2017	$439K	Online Booking	Other	Core	ABSORPTIVE
	Koko	New York	USA	North America	01/06/2018	$2.57M	AI Technology	Tech	Transformational	ABSORPTIVE
	Eliot	California	USA	North America	01/06/2018	N/A	Rent Estimation Platform/Technology	Tech	Adjacent	ABSORPTIVE
	Luckey	Paris	France	Europe	01/06/2018	N/A	Online Booking	Other	Core	SYNERGISTIC
	Luckey Homes	Paris	France	Europe	01/12/2018	$2.36M	Online Booking	Other	Core	SYNERGISTIC
	Gaest	Copenhagen	Denmark	Europe	25/01/2019	$3.5M	Online Booking	Other	Core	ABSORPTIVE
	HotelTonight	California	USA	North America	07/03/2019	$117M	Online Booking	Other	Core	SYNERGISTIC
	Urbandoor	California	USA	North America	05/08/2019	N/A	Travel & Hospitality	Other	Core	SYNERGISTIC
TESLA	Riviera Tool LLC	Grand Rapids	USA	North America	08/05/2015	N/A	Machinery	Tech	Core	SYNERGISTIC
	Grohmann Engineering	Prüm	Germany	Europe	08/11/2016	$136M	Engineering automation	Tech	Core	ABSORPTIVE
	SolarCity	San Mateo	USA	North America	21/11/2016	$1.28B	Energy Equipment	Tech	Transformational	SYNERGISTIC
	Perbix	Brooklyn Park	USA	North America	07/11/2017	$10.5M	Machinery	Tech	Adjacent	ABSORPTIVE
	Compass Automation	Elgin	USA	North America	01/12/2017	N/A	Electronic Components	Tech	Adjacent	ABSORPTIVE
	Maxwell Technologies	San Diego	USA	North America	16/05/2019	$218M	Electrical equipment	Tech	Adjacent	PROTECTIVE
	DeepScale	Mountain View	USA	North America	01/10/2019	N/A	Road	Other	Transformational	ABSORPTIVE
	Hibar Systems	Richmond Hill	Canada	North America	02/10/2019	N/A	Machinery	Tech	Core	ABSORPTIVE
	SilLion Inc.	Broomfield	USA	North America	01/02/2020	N/A	Electrical equipment	Tech	Adjacent	KILLER ACQUISITION
	German ATW Automation	Berlin	Germany	Europe	25/09/2020	N/A	Machinery	Tech	Core	ABSORPTIVE
	Balboa Insurance Company	Irvine	USA	North America	21/01/2022	N/A	Multi-line Insurance	Other	Transformational	ABSORPTIVE
UBER	Moop	Amsterdam	Netherlands	Europe	01/01/2010	N/A	Business/Productivity Software	Tech	Adjacent	ABSORPTIVE
	deCarta	San Jose	USA	North America	05/03/2015	N/A	Information Services (B2C)	Other	Adjacent	ABSORPTIVE
	ShadowMaps	San Francisco	USA	North America	01/07/2016	N/A	Business/Productivity Software	Tech	Adjacent	SYNERGISTIC
	Otto (Road)	San Francisco	USA	North America	18/08/2016	$680M	Autonomous Driving	Tech	Transformational	ABSORPTIVE
	Geometric Intelligence	New York	USA	North America	05/12/2016	N/A	Business/Productivity Software	Tech	Transformational	ABSORPTIVE
	Swipe Labs	Los Angeles	USA	North America	14/07/2017	N/A	Social/Platform Software	Tech	Transformational	ABSORPTIVE
	Post Intelligence	San Francisco	USA	North America	01/09/2017	N/A	Media and Information Services (B2B)	Tech	Transformational	KILLER ACQUISITION
	Ando Food	New York	USA	North America	22/01/2018	N/A	Restaurants and Bars	Other	Adjacent	PROTECTIVE
	Jump	San Francisco	USA	North America	01/05/2018	$100M	Electronics (B2C)	Tech	Transformational	PROTECTIVE
	OrderTalk	Dallas	USA	North America	15/05/2018	N/A	Vertical Market Software	Tech	Adjacent	KILLER ACQUISITION
	Mighty AI	Seattle	USA	North America	25/06/2019	N/A	Autonomous Driving	Tech	Transformational	ABSORPTIVE
	Careem	Dubai	UAE	Asia	02/01/2020	$3,10B	Automotive	Tech	Core	ABSORPTIVE
	Cornershop	Santiago	Chile	South America	06/07/2020	$450M	Internet Retail	Other	Adjacent	PROTECTIVE
	Routematch Software	Atlanta	USA	North America	14/07/2020	$114M	Business/Productivity Software	Tech	Core	ABSORPTIVE
	Autocab	Manchester	UK	Europe	05/08/2020	N/A	Business/Productivity Software	Tech	Core	ABSORPTIVE
	Postmates	San Francisco	USA	North America	01/12/2020	$2.65B	Other Services (B2C Non-Financial)	Other	Adjacent	PROTECTIVE
	Drizly	Boston	USA	North America	02/02/2021	$1.1B	Beverages	Other	Adjacent	SYNERGISTIC
	HKTaxi	Hong Kong	China	Asia	20/08/2021	N/A	Automotive	Tech	Core	SYNERGISTIC
	Car Next Door	Sydney	Australia	Oceania	19/01/2022	N/A	Automotive	Tech	Core	ABSORPTIVE

Appendix B - Total Acquisition Overview Classification

	Classification	Total
Acquisitions		64
Purchase Price	Disclosed	30
	Undisclosed	34
Business Segment	Tech	42
	Other	22
Relatedness	Core	24
	Adjacent	21
	Transformational	19
Category	Synergistic	19
	Absorptive	33
	Killer Acquisition	4
	Protective	8

Netflix Overview

Introduction

Netflix, Inc. was founded in 1997 and is located in Los Gatos, California, United States.
Company went public via IPO in May 2002.
Founded by Reed Hastings (Co-CEO), Ted Sarandos (Co-CEO), Marc Randolph (Exited).
Currently employs approximately 11,300 people.

Business Overview

The firm is one of the leading companies in the media industry in terms of streaming entertainment services. These include international and domestic streaming where revenues are derived from monthly membership fees and offered on an online and offline video platform. Netflix also produces in-house content including films and television programs.

Financials

2022 Revenue of $ 30.4 billion.
2022 Assets of $45.3 billion and Profits of $5 billion.
2022 Net Income of $55.28 million.

Acquisitions

Netflix has made a total of 10 acquisitions between 2017 and 2022.
Largest disclosed amount was $214 million for the 2022 acquisition of Roku.
Acquisitions span 4 countries and various industries such as Gaming, Publishing, and Entertainment.

Mission, Vision & Ambitions

The vision is to bring entertainment via films, documentaries, television programs and gaming in multiple languages, to all countries, and in one simple subscription. Moving forward, the firm has an ambition to achieve net zero emissions from 2022 onwards, educate their viewers on sustainability, and contribute to supporting underrepresented writers and creators.

Sources: Forbes, 2022a. Tracxn, 2022a. Netflix Annual Report, 2022.

Appendix D – Netflix Acquisition Overview

NETFLIX ACQUISITIONS

Acquired Company	Located in (city)	Located in (country)	Located in (continent)	Date of Acquisition	Purchase Price (in USDm)	Business Segment	Overall Business Segment	Relatedness	Category for Framework
Millarworld	California	USA	North America	07/08/2017	N/A	Publishing	Other	Transformational	SYNERGISTIC
StoryBots	California	USA	North America	09/05/2019	N/A	Educational entertainment	Other	Core	SYNERGISTIC
Roald Dahl	London	United Kingdom	Europe	22/09/2021	$502 m	Publishing	Other	Transformational	SYNERGISTIC
Night School Studio	California	USA	North America	29/09/2021	N/A	Gaming	Tech	Adjacent	SYNERGISTIC
Scanline VFX	California	USA	North America	22/11/2021	N/A	Visual Technology	Tech	Core	SYNERGISTIC
Next Games	Helsinki	Finland	Europe	01/03/2022	$72.7M	Mobile/App	Tech	Adjacent	SYNERGISTIC
Boss Fight	Texas	USA	North America	24/03/2022	N/A	Gaming	Tech	Adjacent	SYNERGISTIC
Roku	California	USA	North America	09/06/2022	$214M	Video Streaming Technology	Tech	Core	ABSORPTIVE
Animal Logic	Sydney	Australia	Oceania	20/07/2022	N/A	Animation Technology	Tech	Core	SYNERGISTIC
Spryfox	Texas	USA	North America	31/10/2022	N/A	Gaming	Tech	Adjacent	SYNERGISTIC
Total	**10**	**5**	**4**	**3**			**7**		

	Classification	Total
Purchase Price	Disclosed	3
	Undisclosed	7
Business Segment	Tech	7
	Other	3
Relatedness	Core	4
	Adjacent	4
	Transformational	2
Category	Synergistic	9
	Absorptive	1
	Killer Acquisition	0
	Protective	0

Airbnb Overview

Introduction

Airbnb was founded in 2008 and is located in San Francisco, United States.
Company went public via IPO in late 2020.
Founded by Brian Chesky (CEO), Joe Gebbia (Airbnb.org Chairman), Nathan Blecharczyk (CSO).
Currently employs approximately 6,200 people.

Business Overview

The company operates an online marketplace for travel information and booking services. In 2022, the platform had more than 4 million hosts, who have welcomed more than 1.4 billion guests in almost every country across the globe. The company collects a "platform tax" by charging guests an average service fee of 13.3% on an average booking value of $161.

Financials

2022 Revenue: $8.4 billion.
2022 Assets of $14.87 billion and Profits of $319 million.
2022 Net Income of $1.9 billion.

Acquisitions

Airbnb has made a total of 24 acquisitions between 2011 and 2022.
The largest disclosed amount was $400 million for the 2019 acquisition of Hotel Tonight.
Acquisitions span 7 countries and various industries such as online booking, FinTech, and AI tech.

Mission, Vision & Ambitions

The mission of Airbnb is to create a world where anyone can belong anywhere, and be focused on creating a full-circle travel platform that will handle every part of the trip. Their vision is described as "Belong Anywhere", which talks about overcoming regional and national limitations when travelling. Their long-term ambitions are to unlock more hosting opportunities through reach and innovation and to become a net zero company by 2030.

Sources: Forbes, 2022b. Tracxn, 2022b. Airbnb Annual Report, 2022.

Appendix F – Airbnb Acquisition Overview

AIRBNB ACQUISITIONS

Acquired Company	Located in (city)	Located in (country)	Located in (continent)	Date of Acquisition	Purchase Price (in USDm)	Business Segment	Overall Business Segment	Relatedness	Category for Framework
Accoleo	Hamburg	Germany	Europe	01/06/2011	100	Online Booking	Other	Core	ABSORPTIVE
CrashPadder	London	United Kingdom	Europe	21/03/2012	N/A	Online Booking	Other	Core	ABSORPTIVE
NabeWise	New York	USA	North America	01/07/2012	N/A	Information Platform/Technology	Tech	Adjacent	PROTECTIVE
Localmind	California	USA	North America	01/12/2012	$650K	Location Service Technology	Tech	Adjacent	PROTECTIVE
Vamo	Washington	USA	North America	11/09/2015	$1.6M	Online Booking	Other	Core	ABSORPTIVE
Lapka	California	USA	North America	29/09/2015	N/A	Entertainment Technology	Tech	Transformational	ABSORPTIVE
ChangeTip	California	USA	North America	12/04/2016	$4.66M	FinTech	Tech	Transformational	ABSORPTIVE
Proprly	New York	USA	North America	01/05/2016	$30K	On Demand Cleaning	Other	Transformational	PROTECTIVE
Bold	California	USA	North America	01/06/2016	$2.17M	FinTech	Tech	Transformational	PROTECTIVE
Minbox	California	USA	North America	01/06/2016	$800K	Technology	Tech	Adjacent	ABSORPTIVE
Trip4real	Madrid	Spain	Europe	17/09/2016	$2.92M	Online Booking	Other	Core	ABSORPTIVE
Luxury Retreats	Montreal	Canada	North America	16/02/2017	$300M	Online Booking	Other	Core	SYNERGISTIC
Tilt	California	USA	North America	23/02/2017	$67.2M	FinTech	Tech	Transformational	ABSORPTIVE
Deco software	California	USA	North America	02/05/2017	N/A	Mobile Infrastructure	Tech	Adjacent	ABSORPTIVE
Troo.ly	California	USA	North America	19/06/2017	$10M	FinTech	Tech	Transformational	ABSORPTIVE
AdBasis	Illinois	USA	North America	13/11/2017	N/A	Technology	Tech	Transformational	ABSORPTIVE
Accomable	London	United Kingdom	Europe	16/11/2017	$439K	Online Booking	Other	Core	ABSORPTIVE
Koko	New York	USA	North America	01/06/2018	$2.57M	AI Technology	Tech	Transformational	ABSORPTIVE
Eliot	California	USA	North America	01/06/2018	N/A	Rent Estimation Platform/Technology	Tech	Adjacent	ABSORPTIVE
Luckey	Paris	France	Europe	01/06/2018	N/A	Online Booking	Other	Core	SYNERGISTIC
Luckey Homes	Paris	France	Europe	01/12/2018	$2.36M	Online Booking	Other	Core	SYNERGISTIC
Gaest	Copenhagen	Denmark	Europe	25/01/2019	$3.5M	Online Booking	Other	Core	ABSORPTIVE
HotelTonight	California	USA	North America	07/03/2019	$117M	Online Booking	Other	Core	SYNERGISTIC
Urbandoor	California	USA	North America	05/08/2019	N/A	Travel & Hospitality	Other	Core	SYNERGISTIC
Total	**24**	**10**	**7**	**2**		**11**			

	Classification	Total
Purchase Price	Disclosed	16
	Undisclosed	8
Business Segment	Tech	12
	Other	12
Relatedness	Core	11
	Adjacent	5
	Transformational	8
Category	Synergistic	5
	Absorptive	15
	Killer Acquisition	0
	Protective	4

Tesla Overview

Introduction

Tesla was founded in 2003 and is located in Austin, Texas, United States.
Company went public via IPO in June 2010.
Founded by Elon Musk (Co-Founder and CEO).
Currently employs approximately 99,300 people.

Business Overview

The firm designs, develops, produces, and sells electric vehicles and accessories such as service centers and supercharger stations. The focus is on high-tech storage systems, as well as energy generation beyond developments in the automotive industry.

Financials

2022 Revenue: $53.8 billion.
2022 Assets of $62.1 billion and Profits of $5.5 billion.
2022 Net Income of $12.58 billion.

Acquisitions

Tesla has made a total of 11 acquisitions between 2015 and 2022.
Largest disclosed amount was $218 million for the 2019 acquisition of Maxwell Technologies.
Acquisitions span 3 countries and various industries such as Machinery, Automation, and Insurance.

Mission, Vision & Ambitions

Beyond aiming to provide the ultimate user experience for automobiles in terms of technology, design, and automation, the firm is also dedicating significant resources in pursuit of accelerating the transition to sustainable energy and reducing pollution. Ambitions focus on reusing raw materials, fully integrating transportation ecosystems, and enhancing safety.

Sources: Forbes, 2022c. Tracxn, 2022c. Tesla Annual Report, 2022.

TESLA ACQUISITIONS

Acquired Company	Located in (city)	Located in (country)	Located in (continent)	Date of Acquisition	Purchase Price (in USDm)	Business Segment	Overall Business Segment	Relatedness	Category for Framework
Riviera Tool LLC	Grand Rapids	USA	North America	08/05/2015	N/A	Machinery	Tech	Core	SYNERGISTIC
Grohmann Engineering	Prüm	Germany	Europe	08/11/2016	$136M	Engineering automation	Tech	Core	ABSORPTIVE
SolarCity	San Mateo	USA	North America	21/11/2016	$1.28B	Energy Equipment	Tech	Transformational	SYNERGISTIC
Perbix	Brooklyn Park	USA	North America	07/11/2017	$10.5M (Tesla Stock)	Machinery	Tech	Adjacent	ABSORPTIVE
Compass Automation	Elgin	USA	North America	01/12/2017	N/A	Electronic Components	Tech	Adjacent	ABSORPTIVE
Maxwell Technologies	San Diego	USA	North America	16/05/2019	$218M (Tesla Stock)	Electrical equipment	Tech	Adjacent	PROTECTIVE
DeepScale	Mountain View	USA	North America	01/10/2019	N/A	Road	Other	Transformational	ABSORPTIVE
Hibar Systems	Richmond Hill	Canada	North America	02/10/2019	N/A	Machinery	Tech	Core	ABSORPTIVE
SilLion Inc.	Broomfield	USA	North America	01/02/2020	N/A	Electrical equipment	Tech	Adjacent	KILLER ACQUISITION
German ATW Automation	Berlin	Germany	Europe	25/09/2020	N/A	Machinery	Tech	Core	ABSORPTIVE
Balboa Insurance Company	Irvine	USA	North America	21/01/2022	N/A	Multi-line Insurance	Other	Transformational	ABSORPTIVE
Total	11	11	3	2			7		

	Classification	Total
Purchase Price	Disclosed	4
	Undisclosed	7
Business Segment	Tech	9
	Other	2
Relatedness	Core	4
	Adjacent	4
	Transformational	3
Category	Synergistic	2
	Absorptive	7
	Killer Acquisition	1
	Protective	1

Uber Overview

Introduction

Uber Technologies, Inc. was founded in 2009 and is located in San Francisco, United States.
The company went public via IPO in May 2019.
Founded by Travis Kalanick (former CEO, exited) and Garrett Camp (former Chairman, exited).
Currently employs approximately 29,300 people.

Business Overview

The firm is a provider of ride-hailing services and offers services through a variety of mobile and desktop platforms. In 2014, they expanded their services to include Uber Eats, their online food ordering and delivery platform. The company makes money by collecting fees from the platform's gross bookings.

Financials

2022 revenue: $17.5 billion.
2022 Assets of $38.8 billion and Profits of - $496 million.
2022 Net Income of - $8.85 billion.

Acquisitions

Uber made a total of 19 acquisitions between 2010 and 2022.
The largest disclosed amount was $3.1 billion for the 2019 acquisition of Careem Networks FZ.
Acquisitions span 6 countries and various industries such as Software, Automotive, and Delivery.

Mission, Vision & Ambitions

Uber aims to reimagine the way the world moves and improve it for the better through its relentless mission to help people go anywhere, get anything and earn their way. Their vision is to make transportation as reliable as running water, everywhere and for everyone. Their ambition is to become a fully-electric, zero-emission platform by 2040, with all their rides taking place in zero-emission vehicles.

Sources: Forbes, 2022d. Tracxn, 2022d. Uber Annual Report, 2022.

Appendix J - Uber Acquisition Overview

UBER ACQUISITIONS

Acquired Company	Located in (city)	Located in (country)	Located in (continent)	Date of Acquisition	Purchase Price (in USDm)	Business Segment	Overall Business Segment	Relatedness	Category for Framework
Moop	Amsterdam	Netherlands	Europe	01/01/2010	N/A	Business/Productivity Software	Tech	Adjacent	ABSORPTIVE
deCarta	San Jose	USA	North America	05/03/2015	N/A	Information Services (B2C)	Other	Adjacent	ABSORPTIVE
ShadowMaps	San Francisco	USA	North America	01/07/2016	N/A	Business/Productivity Software	Tech	Adjacent	SYNERGISTIC
Otto (Road)	San Francisco	USA	North America	18/08/2016	$680M	Autonomous Driving	Tech	Transformational	ABSORPTIVE
Geometric Intelligence	New York	USA	North America	05/12/2016	N/A	Business/Productivity Software	Tech	Transformational	ABSORPTIVE
Swipe Labs	Los Angeles	USA	North America	14/07/2017	N/A	Social/Platform Software	Tech	Transformational	ABSORPTIVE
Post Intelligence	San Francisco	USA	North America	01/09/2017	N/A	Media and Information Services (B2B)	Tech	Transformational	KILLER ACQUISITION
Ando Food	New York	USA	North America	22/01/2018	N/A	Restaurants and Bars	Other	Adjacent	PROTECTIVE
Jump	San Francisco	USA	North America	01/05/2018	$100M	Electronics (B2C)	Tech	Transformational	ABSORPTIVE
OrderTalk	Dallas	USA	North America	15/05/2018	N/A	Vertical Market Software	Tech	Adjacent	KILLER ACQUISITION
Mighty AI	Seattle	USA	North America	25/06/2019	N/A	Autonomous Driving	Tech	Transformational	ABSORPTIVE
Careem	Dubai	UAE	Asia	02/01/2020	$3,10B	Automotive	Tech	Core	ABSORPTIVE
Cornershop	Santiago	Chile	South America	06/07/2020	$450M	Internet Retail	Other	Adjacent	PROTECTIVE
Routematch Software	Atlanta	USA	North America	14/07/2020	$114M	Business/Productivity Software	Tech	Core	ABSORPTIVE
Autocab	Manchester	UK	Europe	05/08/2020	N/A	Business/Productivity Software	Tech	Core	ABSORPTIVE
Postmates	San Francisco	USA	North America	01/12/2020	$2.65B	Other Services (B2C Non-Financial)	Other	Adjacent	PROTECTIVE
Drizly	Boston	USA	North America	02/02/2021	$1.1B	Beverages	Other	Adjacent	SYNERGISTIC
HKTaxi	Hong Kong	China	Asia	20/08/2021	N/A	Automotive	Tech	Core	SYNERGISTIC
Car Next Door	Sydney	Australia	Oceania	19/01/2022	N/A	Automotive	Tech	Core	ABSORPTIVE
Total	**19**	**13**	**7**	**5**		**12**			

Classification		Total
Purchase Price	Disclosed	7
	Undisclosed	12
Business Segment	Tech	14
	Other	5
Relatedness	Core	5
	Adjacent	8
	Transformational	6
Category	Synergistic	3
	Absorptive	11
	Killer Acquisition	2
	Protective	3

Appendix K – NATU Investment Overview