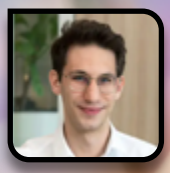
# TECH GIANTS AND STARTUP ACQUISITIONS: INSIGHTS FROM THE EVOLUTION OF ACQUIRED PRODUCTS

BY DAVID BOTTAN & AXEL GAUTIER[1]



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## TECH GIANTS AND STARTUP ACQUISITIONS: INSIGHTS FROM THE EVOLUTION OF ACQUIRED PRODUCTS

*By David Bottan & Axel Gautier*


Alphabet, Amazon, Apple, Meta, and Microsoft ("AAAMM," formerly GAFAM) have built vast ecosystems of online products and services. Over the past decade, these firms have extensively acquired other companies, primarily young startups. Previous literature has shown that incumbents may have several motivations to acquire new entrants: they may be interested in the product, technology, network of users, or staff of the acquired company, or they may seek to eliminate a potential competitor. In this paper, we rely on a database of 362 acquisitions carried out by AAAMM firms between 2015 and 2023 to provide evidence on the significance of these acquisitions and detailed statistics about the acquired companies. In particular, we find that they (i) acquired very frequently, with an average of 3.4 companies per month in the 2015-2023 period (despite a noticeable slowdown over the years) and (ii) targeted overwhelmingly young companies, with more than half of them being 5 years old or younger. We then examine the evolution of the acquired products to better understand the underlying motivations for these acquisitions, showing that a substantial portion of the acquired products are discontinued and proposing a framework to carry out an initial ex post screening of potentially problematic acquisitions.

# I. INTRODUCTION

The technology industry is characterized by a relatively high level of M&A activity. Over the past years, a group of companies acquired extensively in this industry. These are commonly known as AAAMM, i.e. Alphabet, Amazon, Apple, Meta, and Microsoft and formerly referred to as GAFAM, before the rebrand of Google and Facebook as Alphabet and Meta, respectively. In this paper, we focus on AAAMM's acquisitions with a twofold aim: first, we describe the main characteristics of such operations, in particular their frequency and the recurring features of the acquired companies; second, we shed some light on the evolution of acquired products (i.e. their continuation or discontinuation post-acquisition) and we use this information to carry out an initial screening of acquisitions whose motive might have been the discontinuation of the acquired firm's project.

Indeed, as is well known, each merger and each acquisition is motivated by a specific rationale, which is crucial in determining the effects of the operation on competition and on consumer welfare. Some M&A operations aim at improving efficiency (e.g. through economies of scale, or by obtaining better bargaining conditions *vis-à-vis* suppliers), or at developing products (e.g. by adding new functionalities, gaining access to new consumers or markets, etc.). These operations are likely to bring benefits to consumers. Others aim at gaining market power by reducing competition and are likely to reduce consumer welfare. One special case of welfare-reducing concentrations is given by the so-called killer acquisitions, as described in the context of the pharmaceutical industry, in which it has been claimed that "incumbent firms acquire innovative targets and terminate their innovative projects in order to preempt future competition."[2]

Given this difference in outcomes, jurisdictions around the world have introduced legislation on concentration control based on a case-by-case review of proposed concentrations, with the aim of blocking M&A operations likely to harm competition, while allowing welfare-enhancing ones to go ahead. In digital markets, concentrations are characterized by certain specific elements, which this paper seeks to explore, focusing on acquisitions carried out by AAAMM, which have massively acquired companies during the last decade, raising concerns, especially regarding their potential anti-competitive effects, among academics and policy experts.

Our analysis starts from the databases of AAAMM acquisitions constructed by Gautier & Lamesch (2021)[3] and Gautier & Maitry (2024),[4] which we have updated and extended and now includes 362 acquisitions carried out between 2015 and 2023. In section II, we present detailed statistics on the characteristics of all these operations and of the acquired firms. In section III, we focus on the 327 acquisitions carried out up to 2021 to document the evolution of products post-acquisition and we carry out an initial ex-post screening to identify the acquisitions that might have been motivated by the intention of discontinuing the target firm's product(s).

# II. FACTS AND STATISTICS ABOUT THE AAAMM ACQUISITIONS

The empirical elements available to us show the high frequency of AAAMM acquisitions, but also a clear downward trend, particularly evident from 2020 onwards. Moreover, the distribution of acquired companies' age confirms that the typical targets of these acquisitions are young startups.

### *A. High but Decreasing Frequency*

Our dataset shows that the frequence at which AAAMM firms acquire other companies is very high. Indeed, we have identified 362 acquisitions in the 2015-2023 period, which equates to an average of 3.4 companies per month. According to Ederer & Pellegrino (2023),[5] acquisition has become the main exit route for startups, especially in the digital sector and the five large companies we are focusing on have contributed a lot to this trend.

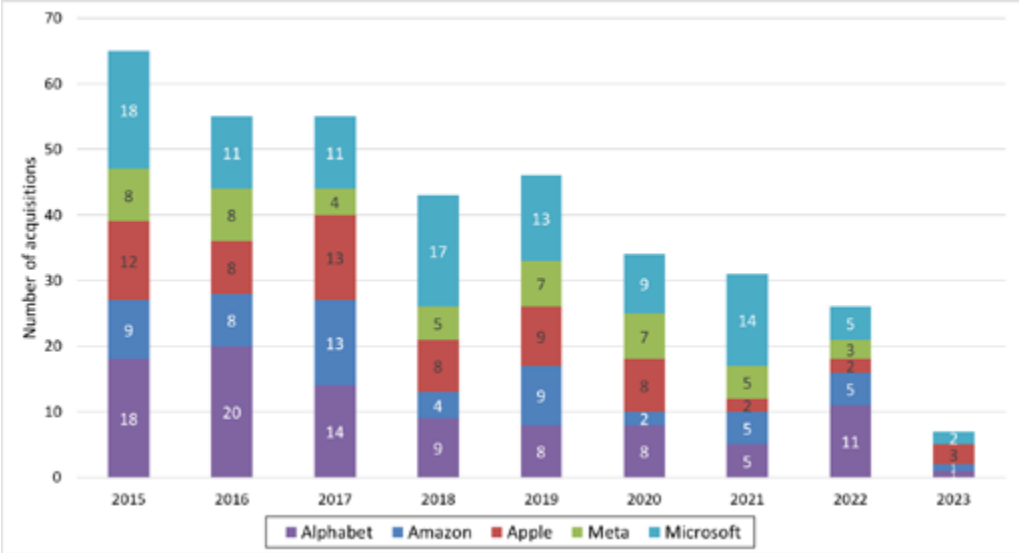
2 Cunningham, C., Ederer, F. & Ma, S. (2020). Killer acquisitions. *Journal of Political Economy, 129*(3), 649–702. https://doi.org/10.1086/712506.

3 Gautier, A. & J. Lamesch (2021. Mergers in the Digital Economy. *Information Economics and Policy*, 54, 100890. https://doi.org/10.1016/j.infoecopol.2020.

4 Gautier, A., & Maitry, R. (2024). Big tech acquisitions and product discontinuation. *Journal of Competition Law & Economics, 20*(3), 246–263. https://doi.org/10.1093/joclec/nhae010.

5 Ederer, F. & B. Pellegrino (2023). The Great Start-up Sellout and the Rise of Oligopoly, AEA papers and proceedings, 113, 274-78. https://doi.org/10.1257/pandp.20231024.

**Figure 1:** Number of acquisitions by AAAMM firm and by year, 2015-2023.



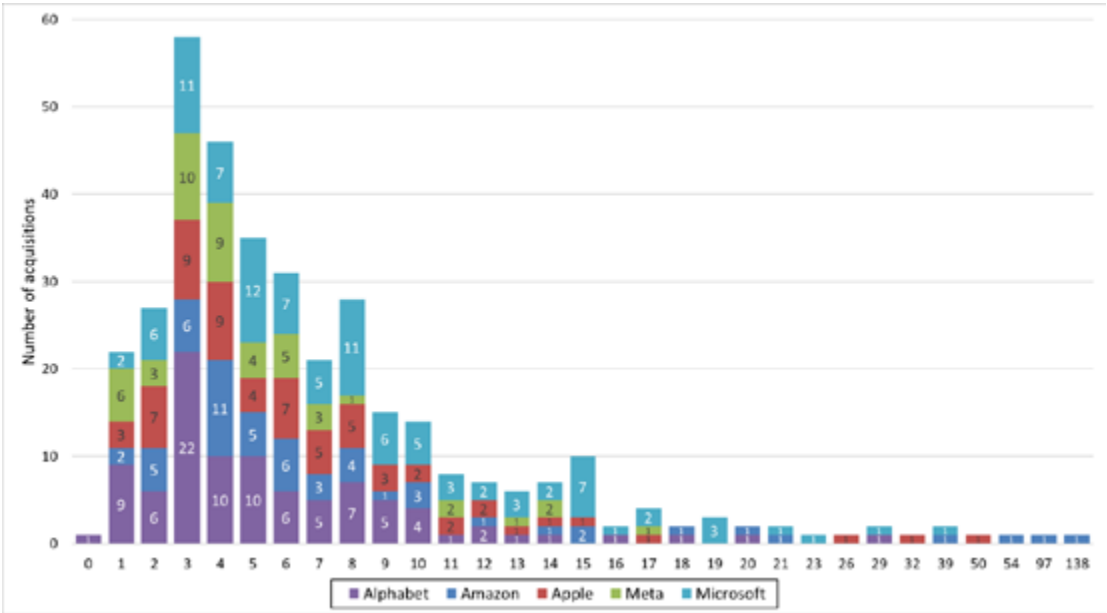

Over the entire period, Microsoft was the company that acquired most (100 acquisitions), followed by Alphabet (94) and Apple (65). In particular, we notice that Alphabet was particularly active in the first part of the period analyzed, being the company with the highest number of acquisitions in 2016 and 2017, while Microsoft acquired more than any other AAAMM firm between 2018 and 2021.

Another result that emerges clearly from this chart is the slowdown in acquisitions over the period. Indeed, the monthly average of companies acquired by AAAMM per month is 3.4 over the entire period, this was 4.9 in the first three years analyzed (2015-2017) and only 1.8 in the last three. Although a potential incompleteness of data (especially for 2023) might have played a role in the emergence of this trend in our results, we consider this finding to be reliable because the trend has been going on for several years (if not for the entire period analyzed) and because it finds confirmation in trade publications.[6]

### *B. Young Startups as Typical Targets*

Data also show that AAAMM firms acquire overwhelmingly young targets, as illustrated by the following figure.

**Figure 2:** Number of acquisitions by AAAMM firm and by target age, 2015-2023.




6 See, for example, SVB (2025) State of the Markets: "*For startups encountering financial strain, options are more constrained than in previous years. Acquisitions, whether full buyouts or tech-focused deals, have become less frequent.*"

It emerges that the most common age of targets is 3 years, with the median being 5 years and the average just above 7.5 years. This is particularly true for Meta, which acquires targets aged 5 years on average, while Amazon tends to acquire relatively older targets, with an average age of 12 years.

We observe that the distribution is skewed towards younger targets, with some noticeable outliers. Indeed, while the dataset captures four firms aged 50 years or more, targets aged more than 15 years are rare and represent 7.2 percent of the acquisitions analyzed.

## III. MOTIVES AND OUTCOMES

Economists usually classify acquisitions into three different categories, depending on their relations between the products involved. These categories are horizontal, vertical and conglomerate mergers, corresponding respectively to the acquisition of products in the same market, in the same supply chain or in different but closely related markets (e.g. complementary goods or goods of the same product range). However, this classification may not be pertinent for startup acquisitions in digital markets. Indeed, Big Tech acquirers have a large ecosystem of products and services, which complicates the definition of the relevant market. Furthermore, young startups' products might still be in the earlier stages of development and their evolution is hard to predict. In this section, we look at the evolution of the acquired products post-acquisition to investigate the acquisitions' motives.

There are different reasons to acquire firms in digital markets. First, the acquirer may be interested in the product or the network of users developed by the target company. Acquisition of complementary products, or of large network of users and their further integration into the acquirer's ecosystem may be a source of value for the acquiring firm and a potential growth path for the acquired firm. Second, the acquiring firm may be interested in some of the assets developed by the target, such as R&D results or patents. In this case, the main reason for acquisition is not the product (it might not even exist) but the technologies developed. As Cabral (2021)[7] points out, in digital industries, acquisition is an efficient mechanism for technology transfer. Third, the acquirer may be interested in the human capital and acquisition can be used to recruit employees with specific expertise and talent, the so-called "acqui-hires," which according to Varian (2021)[8] are common in the Silicon Valley. Last, tech incumbents could acquire promising startups with the aim of discontinuing their products to preempt future competition, the so-called killer acquisitions.

It has been documented that most of the products acquired in some high-tech industries are no longer available, at least under their initial brand name, a few years after the acquisition (Lamesch & Gautier 2021; Affeldt & Kesler, 2021;[9] Eisefeld, 2023;[10] Gautier & Maitry, 2024). Not all cases of discontinuation of the target company's product are killer acquisitions, as discontinuation decisions can also be driven by the target's product not being as successful as expected, or by the fact that some targets were not acquired for their products in the first place, but rather but for their technology, the user base, or the human capital.

### *A. Context and Classification*

To further investigate the motives and outcomes of AAAMM acquisitions, we document the evolution of the acquired companies and their products post-acquisition. We develop a classification of acquisitions based on the evolution of the product post-acquisition based on Gautier & Maitry (2024). We have identified four categories corresponding to the following situations.

A product is said to be *"continued"* if it is still offered under its initial brand name and with its own website. If the product is still offered but without its own website, it is said to be *"integrated,"* for instance as a package in a larger product offering. Third, and it is the case for most of the acquisitions, if the product, the name of the acquired company and its website have disappeared, it is said to be *"non-active."* This category may cover different realities: technology acquisitions, acqui-hires, technical or commercial failures, etc. Last, if the acquirer announced that the product will no longer be supplied or maintained, we say the acquired *"discontinued"* it and we classify them as *"announced discontinuation"*. The decision to discontinue a product may be driven by the wish to supply a competing product designed in-house, a situation that would be similar to the killer acquisitions identified by Cunningham et al. (2021), or by the obsolescence of the acquired product. In section III.C, we look at the existence of competing in-house products and at the time lapses between each acquisition and the relevant discontinuation announcement to carry out a tentative screening between these two possible explanations.

7 Cabral, L. (2021). Merger policy in digital industries, *Information Economics and Policy*, 54, 100866. https://doi.org/10.1016/j.infoecopol.2020.100866.

8 Varian, H. (2021). Seven deadly sins of tech?, *Information Economics and Policy*, 54, 100893. https://doi.org/10.1016/j.infoecopol.2020.100893.

9 Affeldt, P. & R. Kesler (2021). Competitors' reactions to big tech acquisitions: Evidence from mobile apps. DIW Discussion Papers 1987. https://www.diw.de/documents/publikationen/73/diw_01.c.831752.de/dp1987.pdf.

10 Eisfeld, L. (2023). Entry and acquisitions in software markets. Working paper. https://luiseeisfeld.github.io/assets/docs/JMP_Eisfeld_TSE.pdf.

### *B. Illustrative Examples*

To further clarify this classification, we provide an example to illustrate each category.

Microsoft is a major player in the gaming industry, with the Xbox and a large catalogue of games. To develop its game portfolio, Microsoft acquired many game studios, for instance in 2018, it acquired Obsidian Entertainment, Playground Games, Compulsion games, among others. These studios are integrated in the Xbox game studio, a part of the Microsoft's gaming division, but they continue to develop and publish game under their initial brand names, besides continuing to have their own websites. In our classification, we say that these companies are *"continued."*

Peer5 was founded in 2012 and developed tools to optimize bandwidth usage, a solution that was used by companies that manage large-scale video streaming. Peer5 raised over 3.5 million USD in funding. The company was acquired by Microsoft in 2021 to contribute to the development of its video conferencing solution, Teams. After the acquisition, Peer5 was integrated in Microsoft eCDN and the product will no longer be developed under its initial brand name (see https://peer5.com/). Peer5 has been *"integrated"* in Microsoft.

To develop its VR and AR solutions, Google has acquired many startups, for instance Moodstocks in 2014 or Eyefluence in 2016. It is said that the technologies and the solutions they developed, and their staff have been integrated in Google's broader VR and AR initiatives. These companies are therefore no longer active on their own and their products are no longer supplied ("*not active*").

Two years after its acquisition by Apple in 2020, Fleetsmith, a company that provided solutions to manage fleets of Apple devices, was closed. Apple announced to Fleetsmith's consumers and users that the service will be interrupted, advising them to migrate to an alternative solution, one of them being Apple Business Essentials, a service comparable to Fleetsmith. Apple had two comparable products in its portfolio and decided to terminate one of them, preferring to develop its in-house service than the service it acquired, possibly integrating the technologies of Fleetsmith in its own product. In our classification, we say that Fleetsmith was an *"announced discontinuation".*

### *C. Evolution of Acquired Products*

Applying this classification to the 327 acquisitions that took place between 2015 and 2021, we managed to recover the information for 298 of them.[11] The following table presents our updated classification of acquired companies. We observe that only a minority of the acquired products continue to exist under their initial name, or inside the acquirer's ecosystem as we classify 19 percent of the companies as *continued* and 12 percent of them as *integrated*.

Most of the acquired companies (48 percent) are classified as *non-active* and their products are no longer being supplied by the acquirer. Finally, we found in 13 percent of the cases an explicit *announcement* by the acquirer that the product will no longer be available. So, product discontinuation, be it announced or not, remains an important phenomenon.

Regarding the acquirer, we observe that Microsoft discontinues products less often, with a product being *continued* or *integrated* in 44 percent of the cases. On the contrary, Apple has less products than the other AAAMM firms in those two categories.

**Table 1:** Continuation status of companies acquired by AAAMM between 2015 and 2021.[12]

| Acquirer | Continued | Integrated | Not active | Announced disc. | NA | Total |
|---|---|---|---|---|---|---|
| Alphabet | 14 (17%) | 11[13] (13%) | 39 (48%) | 9 (11%) | 9 (11%) | 82 |
| Amazon | 12 (24%) | 8 (16%) | 17 (35%) | 7 (14%) | 5 (10%) | 49 |
| Apple | 3 (5%) | 2 (3%) | 43 (72%) | 7 (12%) | 5 (8%) | 60 |
| Meta | 7 (16%) | 1 (2%) | 26 (60%) | 5 (12%) | 4 (9%) | 43 |
| Microsoft | 25 (27%) | 16 (17%) | 31 (33%) | 15 (16%) | 6 (6%) | 93 |
| Total | **61 (19%)** | **38 (12%)** | **156 (48%)** | **43 (13%)** | **29 (9%)** | **327** |

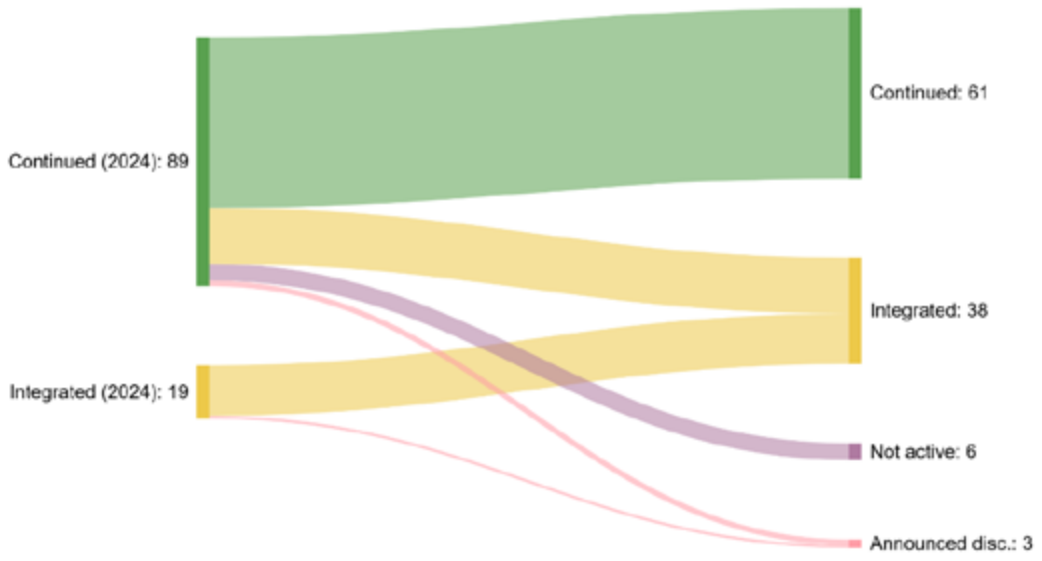
11 This exercise has been done in January 2024 by Gautier & Maitry (2024) and we updated their classification, with the same methodology in January 2025.

12 The list of acquisitions presented in Gautier & Maitry (2024) has been revised, which resulted in the removal of two deals considered as acquisitions in that article, which we found to be an individual hire (*Amazon/Angel.ai*) and a proposed acquisition blocked by the UK's Competition and Markets Authority (*Meta/Giphy*).

13 Includes one acquired product (Tilt Brush by Skillman & Hackett) which was open-sourced in January 2021.

Next, we compare our classification with the similar exercise that Gautier and Maitry have done in January 2024 and we observe the following evolutions, that we represent on Figure 3. In particular, we are interested in the evolution of the products they classified as continued or integrated. Doing the same exercise a year later, we found that, among the 89 companies that were active in 2024, only 69 percent of them remain in the same category. Most of the others have been integrated in an ecosystem, and few products should be considered as not active or have been explicitly discontinued. For the products that were integrated, we found that almost all of them are still integrated.

**Figure 3:** Status update of companies acquired by AAAMM between 2015 and 2021 and not discontinued until January 2024.




### *D. Potentially Problematic Acquisitions*

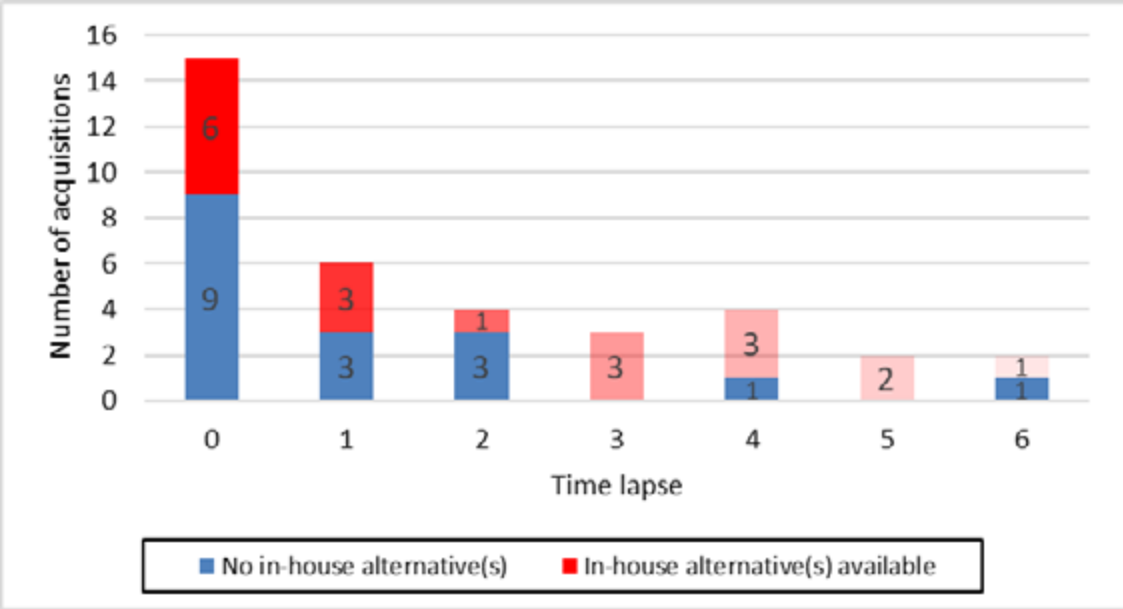
Lastly, we propose a framework to carry out an initial ex-post screening of potentially problematic acquisitions. As a reminder, in cases of announced discontinuation, the acquirer may seek either to eliminate a competitive threat or to use the acquired company to develop and improve its products.

To screen between these two explanations, we focus on *announced* discontinuations, thus avoiding the risk of including in the analysis any company that may still be active but for which we have not found confirmation. Among those cases, we propose to look at the time lapse between the acquisition and the discontinuation announcement and whether or not, the acquirer supplies a similar product. In the case where the time lapse is short and the acquirer has its own solution, similar to the acquired one, we may suspect that the acquirer eliminates a competitive threat. On the contrary, if there is no comparable alternative in the portfolio of the acquirer or if there are several years between the acquisition and the discontinuation announcement, we may think that the decision to discontinue the acquired product has other motivations, such as product obsolescence or integration of its functionalities and technologies in the acquirer's ecosystem.

Starting from the 40 *discontinuations* that took place up to 2024 (while conservatively overlooking the three cases identified in 2025), we found conclusive information for all but four acquired products. We find that for almost half of these 36 discontinued products, the acquirer had an in-house alternative and supplies a similar product or service.

Regarding the time lapse, 15 products were discontinued during the calendar year of the acquisition, i.e. almost immediately after the company has been acquired. Among them, we found an in-house alternative for 6. For products discontinued one year after acquisition, 3 out of 6 have an in-house alternative. In conclusion, if we use these two criteria for a pre-screening for potentially problematic acquisitions, they seem to be relatively rare, which however does not imply that such rare cases cannot be welfare-reducing, or that AAAMM acquisitions cannot raise other kinds of concerns.

**Figure 4:** Number of discontinued products by age and availability of in-house substitutes.




## IV. CONCLUSION

In this article, we have provided quantitative evidence of the main characteristics of AAAMM acquisitions (high but decreasing frequency, preference for young startups and tendency to discontinue more than half of the acquired product) and proposed a framework to empirically identify potentially problematic acquisitions (the discontinuation of the acquired firm's product and the availability of an in-house alternative provided by the acquirer are necessary but not sufficient conditions). This framework paves the way for further research into the existence of potentially problematic acquisitions among the ones carried out by AAAMM.

Finally, a word of caution is in order with respect to the acquisitions that we define "potentially problematic" in this article. As explained, we have proposed a framework to identify acquisitions that might have been motivated by the intention of discontinuing the target firm's product(s). Nevertheless, one should be careful in concluding that any such acquisition is anti-competitive because this would require considering the correct counterfactual scenario. Firstly, survey data consistently show that between 50 percent and 60 percent of U.S., UK, and Canadian startups have as their long-term realistic goal to be acquired.[14] This suggests that, absent the possibility to be acquired by a (AAAMM) corporation, some of the target firms at hand might not have been founded in the first place. Secondly, given the notoriously high failure rates of startups and the young age of companies acquired by AAAMM, it is highly likely that a significant portion of target companies would not have remained in business had it not been acquired. Consequently, as far as this portion of target companies is concerned, AAAMM acquisitions are either welfare-enhancing (when the acquired firm is integrated or continued), or neutral (when, as in the case of the companies that we have identified in section III.D, the acquired firm is discontinued).

14 See, for example, the 2019 and 2020 "Global Startup Outlook" reports issued by the Silicon Valley Bank.

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