HOW TO MEASURE THE IMPACT OF OVERSEAS MERGERS & ACQUISITIONS ON THE UK VIDEO GAMES INDUSTRY

A FEASIBILITY STUDY FOR THE BFI AND CREATIVE INDUSTRIES POLICY AND EVIDENCE CENTRE

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Creative Industries Policy and Evidence Centre

Led by Newcastle University with RSA

ABOUT GAMES INVESTOR CONSULTING

Games Investor Consulting (GIC) is a specialist video games strategy, research and corporate finance consultancy whose founders, Nick and Rick Gibson, have over 27 years' game industry experience. GIC has provided market and company assessments and due diligence, corporate strategy, market entry and development, corporate finance opportunity identification and government policy services to over 120 international clients. GIC has worked on numerous video games M&A and private equity transactions. It has worked with multiple countries' governments on indigenous video games industry projects. In the UK, GIC has worked with DCMS, Scotland's ITI, the NHS, DirectGov, BERR/DTI and Serco/DotGovLabs. It has conducted several video games projects with NESTA and worked with a variety of national and regional video games trade bodies including TIGA for whom GIC has tracked the UK video games development ecosystem in granular detail since 2008, producing a regular report, Making Games In The UK Today with TIGA. The 12th of these reports was published in August 2023.

GIC is the lead author of Sections 1, 3, and Section 5 (except 5.2.1) of this report.

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Oxford Economics is the lead author of Sections 2, 4, 6 and 7 of this report.

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The BFI is a cultural charity, a National Lottery distributor, and the UK's lead organisation for film and the moving image.

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- To support creativity and actively seek out the next generation of UK storytellers
- To grow and care for the BFI National Archive, the world's largest film and television archive
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The BFI Board of Governors is chaired by Tim Richards.

ABOUT CREATIVE IINDUSTRIES POLICY AND EVIDENCE CENTRE (CREATIVE PEC)

Creative PEC is led by Newcastle University with the Royal Society of Arts, and funded by the Arts and Humanities Research Council.

We provide independent research and policy recommendations to support the inclusive and sustainable growth of the UK's Creative Industries.

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EXECUTIVE SUMMARY

The BFI, through its National Lottery-supported Research and Statistics Fund, and the Creative Industries Policy and Evidence Centre (the "Creative PEC"), led by Newcastle University with the Royal Society of Arts and funded by the Arts and Humanities Research Council, jointly commissioned specialist video games industry consultancy Games Investor Consulting Ltd ("GIC") to conduct this scoping study to assess the feasibility of research into the economic consequences, including possible market failures, of overseas acquisition of UK games development studios. GIC partnered with economics specialists Oxford Economics ("OE") to carry out this work.

Our study focuses on the consequences of overseas acquisitions of UK games development studios on the UK video games industry. We start by reviewing the current evidence base, and we then propose a data strategy and analytical methodology to provide a clearer understanding of the impacts of overseas mergers and acquisitions (M&A). It is hoped that the research will also lead to more evidence-based debate on the subject of overseas acquisition of UK games development studios, a phenomenon that is likely to continue in the coming years.

Key Findings and Insights

- There were 118 transactions involving the acquisition of UK-incorporated video games development companies by overseas buyers between 1993 and 2022. Of these, 49% involved USA-headquartered buyers, then followed by China (15%) and Sweden (10%).

- Deal volume and value accelerated between 2018 and 2021. The two years with the highest published values were 2020 (US$2.0bn) and 2021 (US$2.7bn). The three highest years for deal volume were in 2021 (13), 2018 and 2020 (both 9).

- The vast majority of overseas acquirers of UK-incorporated video games development companies were businesses already operating in the games sector, with the largest group among those being games publishers (56% of all transactions). We tentatively suggest that the two main drivers of deals to date have been bringing games development talent and established games intellectual property in-house. These are then used synergistically within existing games operations.

- We identified a number of potential impacts, both positive and negative, of overseas M&A in the video games industry based on a literature review, the authors' industry knowledge and the findings from six interviews undertaken with senior figures whose UK development companies were acquired by overseas buyers. Potential impacts identified on the positive side include acquired games development studios benefitting from improved access to capital, and access to the acquirer's expertise in marketing and distributing video games. On the negative side, possible impacts may include the loss of creative autonomy for UK games development studios, which may

be harmful for innovation, and the overseas transfer of profits realised by UK games development studios.

- A consistent, reliable, and accessible dataset covering the last decade of UK video games development industry history does not currently exist. Nonetheless, a combination of Companies House filings, the Office for National Statistics' Interdepartmental Business Register, and GIC's UK video games company database could be used to compile a dataset to assess a core set of financial impacts for a reasonable sample of UK video games development studios which have been subject to an overseas acquisition. However, due to data limitations, it would not be possible to assess all of the potential impacts identified in our study.

- Given the available data, the most promising methodology to assess the impacts of overseas M&A would be an econometric approach comparing a sample of video games development studios before and after an overseas acquisition with a counterfactual "control" group. In this way it would be possible to quantify the impact of overseas M&A on financial performance metrics such as profitability and revenue growth using accounts data from Companies House and other administrative data sources. The feasibility of assessing the impact on other metrics of interest which may be affected by overseas M&A such as share price (for listed studios), investment in R&D, and wages is mixed, and in some cases not possible.

- We identified four possible market failures that may arise from overseas M&A. In summary these were:

    - reduced innovative activity;

    - overseas relocation of production and intangibles reducing scope for positive spillovers on the wider video games development ecosystem;

    - value-reducing M&As where frictions between the acquirer and the acquired games development studio reduce profitability; and

    - overseas transfer of sales and profits due to changing accounting practices, resulting in losses to the UK Exchequer.

- We also identified a fifth "upstream" market failure in the provision of domestic sources of finance for UK games development studios, which may explain why some overseas M&A activity occurs in the first place. The lack of domestic sources of finance may force owners of studios to sell under disadvantageous circumstances if they are unable to raise the necessary capital through other means to continue running their business independently.

- Whilst it would be possible to identify whether such market failures may be present, the available data would likely not permit robust analysis to quantify the size of any such market failures in welfare terms.

Background

The acquisition of UK-incorporated video games development studios ("studios") by overseas buyers has a history stretching back to the early 1990s and the acquisition of Psygnosis by Sony, a deal that was to prove crucial for Sony's subsequent entry into the console games business. 118 transactions involving UK incorporated studios acquired by overseas buyers between 1993 and 2022 have been recorded in a video games Mergers and Acquisitions (M&A) database created for this research. These transactions will have had a range of positive and negative impacts for the UK games industry. Acquired studios, for example, may have benefited from improved access to capital and broader distribution reach allowing them to expand at a faster rate than if they had remained independent.

However, the cost to this may have been the loss of creative autonomy or the transfer of profits and intellectual property (such as games brands) overseas. To date there has been no detailed assessment of the economic impact of these acquisitions on the UK video games industry, despite the fact that these transactions have contributed to 51.9% of all UK video games development staff being employed at companies owned by overseas entities in April 2023.[1]

Methodology and limitations

The methodology for conducting this scoping study can be broadly split between:

(1) Collation of video games industry evidence and data; and
(2) An assessment of the feasibility of measuring the economic impact of overseas acquisitions and any associated market failures.

The UK video games M&A database was created using GIC's existing global games transaction database and was updated and supplemented with data from third-party sources as well as additional research by GIC into every transaction identified. To help identify the potential impacts of overseas M&A GIC also conducted six interviews with senior figures from the UK video games industry whose development companies were acquired by overseas buyers.[2]

The report sets out a theoretical framework for understanding the potential drivers and impacts of overseas acquisitions. We outline possible methodological approaches to measuring impacts and review the data available on UK games studios to assess which of these approaches provides a feasible basis for future research. We also consider market failures that may be associated with the impacts identified and suggest how they might be investigated in future research.

[1] Source: Making Games In The UK Today 2023 report, TIGA/GIC

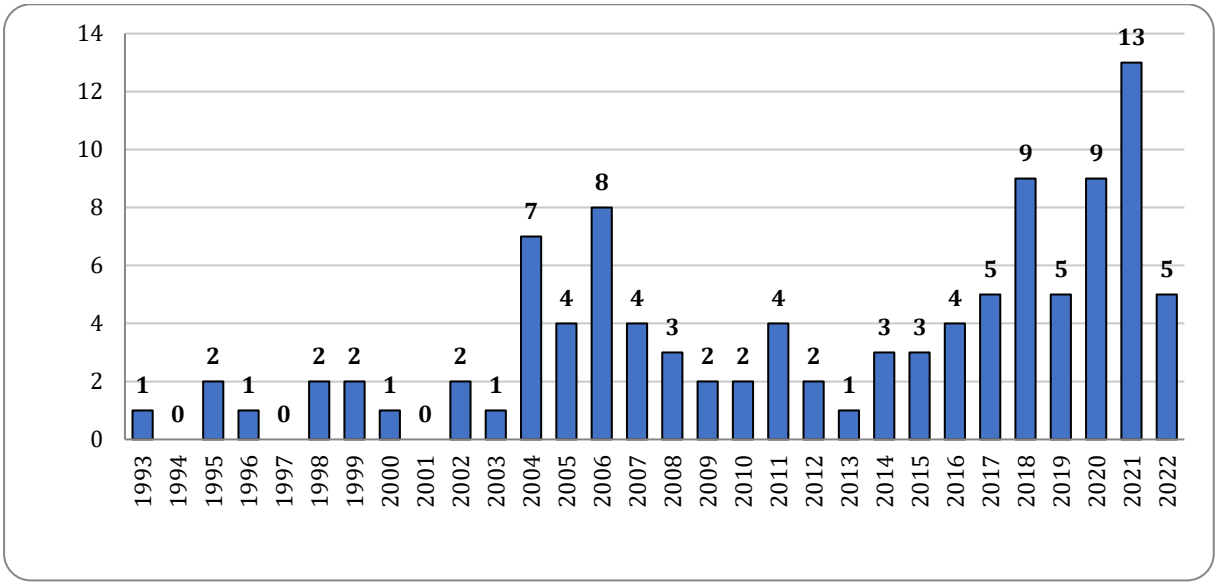
[2] To provide background for the study, seven chief executives of UK studios acquired by overseas companies were approached to discuss the positive and negative impacts of their studio's sale, the context to the transactions and the motives for both buyers and sellers. Six responded and were interviewed by GIC. Their responses were anonymised and shared with the report's authors. The terms of their interviews guaranteed that their names, companies and responses would not be published herein.

It should be noted that the study has not been tasked with implementing the data strategy and methodology for investigating impacts and possible market failures. As such this report does not draw conclusions in relation to which impacts and market failures have actually taken place. This would be a task for future research.

Key data from the UK video games M&A database

- 118 transactions involving the acquisition of UK-incorporated video games development companies (or "studios") by overseas buyers are recorded in the updated UK video game M&A database with the first occurring in 1993. Of the 118 transactions, 13 relate to target companies such as Zynga with some UK development operations but the majority of their development taking place outside the UK. 105 of the transactions therefore relate to what we term "predominantly UK-based" studio targets.
- 39% of the 105 predominantly UK-based studio transactions (41 transactions) have taken place between 2018 and 2022 with 2021 recording the highest number (13) in a single calendar year. Fig. 1 shows the distribution over time of the 105 transactions involving predominantly UK-based studios.

Fig. 1. Volume of M&A of predominantly UK-based targets

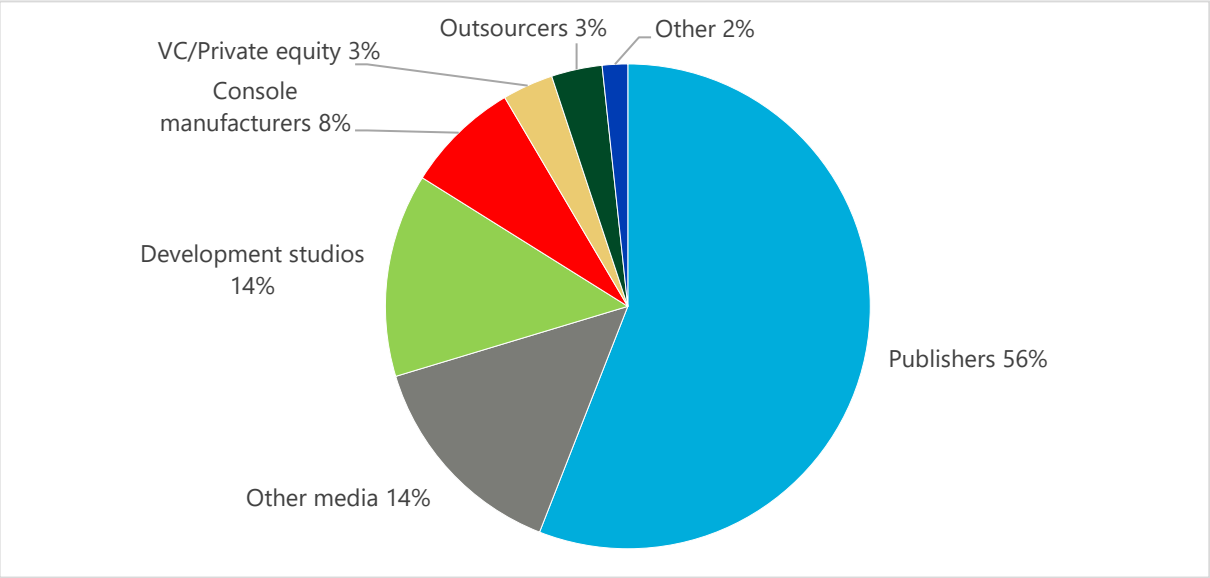


Source: UK video games M&A database

- Transaction values for 42 of the deals involving predominantly UK-based studios were made public and this data shows a sharp uptick in 2020 and 2021 when a number of leading UK games companies were acquired including Codemasters, Sumo Group and Playdemic, each of which was bought for sums in excess of US$1 billion. The combined total of transaction values for all 42 of these acquisitions is US$7.4 billion of which US$4.7 billion occurred in 2020 and 2021.

- The vast majority of the overseas acquirers of UK incorporated studios have been existing games companies, most notably games publishers who alone represent 56% of all transactions. Purchases by overseas games development studios, console manufacturers and other media companies (e.g. those primarily focused on TV and movies) represent 36% of all transactions as shown in Fig. 2.

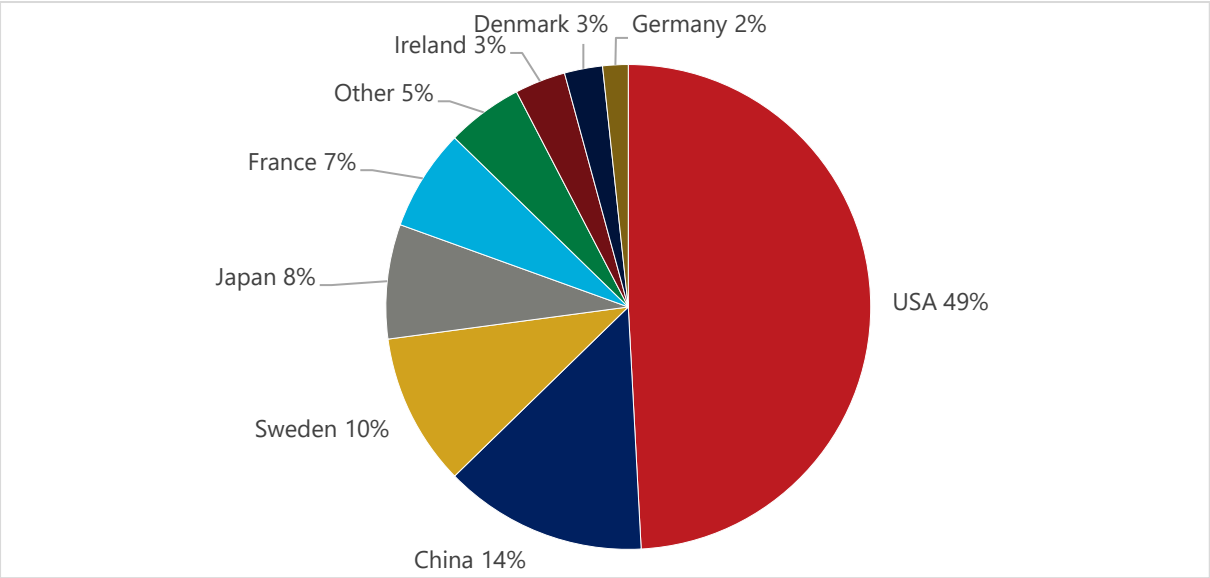
Fig. 2. All M&A transactions by acquirer category 1993-2022



Source: UK video games M&A database

- 49% of all UK incorporated studio sales have been to companies ultimately based in the USA as shown in Fig. 3. The next largest were China (14%) and Sweden (10%) both being relatively recent additions to the UK video games M&A database with their first acquisitions being announced in 2015.

Fig. 3. All M&A transactions by acquirer location 1993-2022



Source: UK video games M&A database

- Compared with 2021, 2022 saw a marked decline in both volume and value of transactions with just five transactions involving predominantly UK-based studios in 2022. Announced values for three of them total US$80.5 million vs 2021's 13 transactions representing US$2.7 billion in announced transaction value. By contrast, globally, games M&A transaction volume increased from 295 announced deals in 2021 to 314 announced deals in 2022 although this includes all games company categories not just games development studios.[3]

POTENTIAL DRIVERS AND IMPACTS OF M&A IN THE UK GAMES INDUSTRY

We set out a theoretical framework which explores what drives M&A and changes in M&A activity in an industry. In this framework, an increase in M&A activity could be due to an increase in the expected financial returns associated with acquisitions; an undervaluation of targets (typically development studios) relative to acquirers; or a reduction in the opportunity cost of capital (the return on the "next best investment").

This framework provides a basis for considering the UK games industry evidence reviewed for this study, notably UK games industry M&A databases, interviews with senior industry figures, academic literature and other literature such as working papers.

We suggest a number of drivers of M&A specific to games development studio acquisitions:

- **Bringing talent in-house**; Acquisitions can deliver proven development teams, which are scarce and take time to build, thereby expediting the development of new products.

[3] Source: Drake Star Global Gaming Report 2022

- **Bringing games brand intellectual property (IP) in-house**: Creating a hit from original IP is difficult. Acquiring established IP provides instant access to a successful brand and its fan base.
- **Bringing technology IP in-house:** Games development can be complex, costly and fraught with an array of technological risks. Acquiring studios with proprietary technology can mitigate that risk and reduce development costs.
- **Accessing an existing player base:** Building high-value player bases from scratch can be costly and difficult. Acquiring player bases through acquisition mitigates against the risk of building a player base from nothing, also avoiding costly marketing expenses to do so.
- **Bringing studio partner revenues in-house:** Some acquisitions are between publishers and development studios who are pre-existing partners. Interview evidence suggested avoiding the need for royalty pay-outs once a game is released was a partial motivation for acquisition in these cases.
- **Gaining strategic diversification:** Acquirers may see an acquisition of a development studio as a means of establishing a presence in a new geography, or access to a new platform, revenue model or target demographic that the development studio specialises in.

These drivers may explain why the majority of games development studio acquirers are trade buyers already active in the industry, such as games publishers. For these acquirers, there is a greater strategic value in acquiring studios that can be integrated into and bolster existing business areas compared with purely financial acquirers such as private equity companies that have few synergies to offer acquirees. As such, we believe that the two main drivers for acquisitions of UK studios throughout UK video games industry history to date have been access to intellectual property and top-tier video games development talent.

Our research identified a range of potential impacts of games development studio acquisitions on target firms, acquirers, and third parties. Key examples include:

- Development studios could realise greater profits from increased investment in the business due to the acquisition. However, dis-synergies between the acquirer and target may affect employee turnover and staff wellbeing.
- Acquiring firms may realise improvements in share price if, for example, development studio IP enhances the value of their distribution platform or if the merger or acquisition provides access to new skills or know-how thereby raising productivity.
- Impacts on third parties could include changes in the quality of video games due to changes in competition and/or innovation; and changes in the demand for services from supporting companies and industries.

POTENTIAL APPROACHES TO ASSESSING THE IMPACTS OF OVERSEAS M&A

We undertook a wide-ranging review of data sources to identify UK games development studios, and to flag those among them that had been subject to an acquisition by an overseas buyer. We also looked at associated impact data. We found that consistent and reliable data covering the last decade

of UK video games development industry history are scarce. The most suitable sources for this type of analysis are:

- **GIC's UK games company database** which provides longitudinal data going back to 2008 and can be used to create comparison groups as well as analyse development studio headcounts over time. However, the headcount data even when supplied by the studios themselves are unverified and includes some estimates.
- **Companies House filings and the Interdepartmental Business Register** which offer the best source of firm-level financial performance for targets. However, even these data have limitations due to different reporting standards adopted by studios of varying sizes that mean that not all of the potential effects identified may be tested for all firms.
- **Commercial international M&A databases** such as Crunchbase and Pitchbook contain varying degrees of UK studio acquisition information including transaction values where available. However, none was found to include all transactions and company performance information (e.g. sales or headcount) was rare.

We outline two possible approaches which have been widely used to measure the impact of overseas M&A, and discuss their data requirements and pros and cons. The first of these is the "event study approach" which uses high-frequency share price data to study the impact of transaction announcements on firms' share price. The second is the "accounting-based approach" which uses data from acquired firms' accounts pre- and post-acquisition and compares this to non-acquired firms to estimate the impact of an acquisition.

We suggest that the most promising methodology to assess the impacts of overseas M&A given the available data would be an accounting-based approach quantifying the impact of overseas M&A on financial performance metrics such as profitability and revenue growth. This would use business registry data from the Office for National Statistics, and accounts data from Companies House, linked to GIC's databases covering UK development studios and overseas M&A transactions involving them.

As an alternative to GIC's UK games company database, other data sources such as general business databases might be combined to provide some impact data but not without potentially considerable additional investment in augmenting the data set, for example adding and verifying game studio categorisation meta data, and sourcing and appending historic impact data.

We recommend applying an econometric methodology to robustly assess the performance of the group of firms subject to overseas M&A, as compared with a control group of similar firms not subject to an overseas acquisition. This quantitative research could be complemented by additional qualitative research to build a more in-depth understanding of the drivers and impacts of overseas M&A.

We also investigated the feasibility of using historical share price data on acquired studios to implement an event study. While share price information is readily available, very few acquired firms in our data set were listed pre-acquisition, which means that approaches based on the analysis of share prices would not be viable for studies focused on the UK games industry alone.

POTENTIAL MARKET FAILURES

Following HM Treasury's Green Book definition, we consider a market failure as occurring when a market allocation of resources does not maximise "social welfare" (or wellbeing) in the UK.[4]

From this viewpoint, market failures which could in principle arise from overseas M&A include:

- Reduced innovation, which reduces the scope for other UK entities (such as other development studios) to benefit from knowledge "spillovers", in turn reducing their potential innovation and productivity growth.
- The overseas relocation of production and intangibles could result in fewer opportunities for other UK firms to collaborate with development studios, for example as suppliers or sub-contractors. This could also reduce the scope for knowledge spillovers to these related industries.
- Value-reducing M&As which, due to potential information asymmetries and dis-synergies between the acquirer and target, lower the combined value of acquirer and target post-acquisition.
- Overseas transfers of profits due to changing accounting practices, which imply a loss of tax revenues to the UK exchequer.

Interview evidence also suggested the possibility of a fifth, upstream market failure in access to domestic sources of finance for development studios, which may suggest that overseas M&A is used as an alternative to other sources of growth capital. This could imply that acquired studios are undervalued versus a scenario where alternatives were available.

The econometric approach proposed above to assess the impacts of overseas M&A could be used to assess whether some of the potential causes of market failure identified are present. For example, it may be possible to assess whether overseas M&A in the UK in aggregate positively or negatively affects UK firm performance metrics such as profitability, revenue growth, employment, and R&D spending. However, we do not believe it would be possible to robustly quantify changes in social welfare resulting from overseas M&A and thereby quantify the size of any market failure. This is primarily due to data limitations such as small sample sizes for some metrics of interest, such as investment in innovation and incomplete or imperfect data, such as on wages.

Questions for future research: The authors note the following questions resulting from the research:

- **Should overseas acquisitions of UK studios be regularly tracked?** The marked, recent acceleration in volume and value of acquisitions by overseas companies who now employ nearly half of the UK video games development workforce suggests that there is value in tracking the number, value and impact of such acquisitions, especially given the profile of this world class IP-driven creative technology sector in which employment grew at nearly 10% per annum between 2014 and 2021.
- **Which policy interventions could tackle a potential market failure, if one was found and quantified?** If the impact of these acquisitions is established and

[4] HM Treasury, "The Green Book", 2022, accessed March 2023

quantified, a review of potential policy interventions will be necessary to establish which policy interventions could practically address these failures.

1. INTRODUCTION AND BACKGROUND

1.1 RESEARCH BACKGROUND AND OBJECTIVES

The BFI, through its National Lottery-supported Research and Statistics Fund, and the Creative Industries Policy and Evidence Centre (the "Creative PEC"), led by Newcastle University with the Royal Society of Arts and funded by the Arts and Humanities Research Council, jointly commissioned specialist video games industry consultancy Games Investor Consulting Ltd ("GIC") to conduct this scoping study to assess the feasibility of research into the economic consequences, including possible market failures, of overseas acquisition of UK games development studios. GIC partnered with economics specialists Oxford Economics ("OE") to carry out this work.

The main goal of the scoping study is to review the existing evidence base on the consequences of overseas acquisition of UK games development studios on the games industry and games industry ecosystem and propose a methodology for quantifying the impacts. A clear and rigorous evidence base on impacts is essential to inform discussions as to whether there is a need for further research to aid policymakers in their assessment of any case for government intervention. The research therefore proposes a data strategy and methodology for future work investigating impacts and any possible market failures.

It is hoped that the research will also lead to more evidence-based debate on the subject of overseas acquisition of UK games development studios, a phenomenon likely to continue in the coming years.

Definitions for key terms used in this report can be found in Appendix 1.

1.2 STRUCTURE OF THIS REPORT

The report is structured as below:

- **Section 1: Introduction and background:** Research background.
- **Section 2: Why do Mergers and Acquisitions take place and what impact might they have?:** Framework of potential M&A drivers, M&A waves, potential impacts of M&A.
- **Section 3: Empirical evidence from the UK video games industry:** Data collation and reporting methodology, Key findings from the M&A database, UK video games M&A history, potential motivations for studio acquisition, video games M&A waves.
- **Section 4: Measuring impact: potential methodologies:** Event studies, accounting studies.
- **Section 5: Review of data sources to apply the methodologies:** Generic and video games industry-specific data sources.
- **Section 6: Recommended Approach:** Mapping data to impacts, feasibility analysis, econometric approaches.
- **Section 7: Market Failures:** Potential sources of market failure, feasibility of quantitative assessment of market failure.
- **Appendices:** Definitions, M&A time sequence, Evidence review to identify long list of impacts.

2. WHY DO MERGERS AND ACQUISITIONS TAKE PLACE AND WHAT IMPACT MIGHT THEY HAVE?

This section sets out a simple theoretical framework for why M&A transactions happen, and from this offers possible explanations for the recent increase in M&A activity in the video games industry. Understanding the drivers of M&A in this way may offer insights into the post-acquisition performance of both the acquirer and acquiree as well as impacts on third parties. The final part of the section considers the potential impacts of M&A.

2.1 FRAMEWORK TO EXPLAIN THE POTENTIAL DRIVERS OF M&A[5]

In classical economic theory, acquisitions occur because managers of acquirers seek to maximise their shareholders' wealth. As such, any investment by an acquirer only takes place if there is an expected positive financial return for the acquirer. In practice, these positive financial returns typically come about because acquiring firms believe the acquisition will result in synergies between the two entities. This could, for example, be due to economies of scale and scope, managerial efficiencies, or tax savings.

One way of thinking about an acquiring firm's decision to acquire another firm is in a "net present value" (NPV) framework.[6] This compares the present "discounted" value of the acquirer's future cash flows resulting from an investment to the initial investment cost. If the present value of future cash flows exceeds the initial investment cost, the acquisition will result in positive financial returns for the acquirer. Future cash flows could come directly from the acquired firm (e.g. as dividends, or a future sale), or indirectly via cost savings to the acquiring firm (e.g. through the acquisition of previously licensed IP).

This can be expressed in an equation as below.

$$NPV = \sum_{t=0}^{n} \frac{R_t}{(1 + i)^t} - initial\ investment > 0$$

In this framework, Rt represents cash flows at time t, and i is the discount rate or opportunity cost of capital (the return on the next best investment).

[5] As the vast majority of M&A activity in the video games industry takes the form of acquisitions, this section refers to acquisitions, but the logic presented would apply equally to mergers.

[6] This NPV framework is commonly cited in corporate finance and economics texts, e.g. Richard Brealey & Stewart Myers, "Principles of corporate finance" (Singapore: McGraw-Hill, 1988)

For overall levels of M&A activity in the UK video games industry to change, one or more components of the NPV framework must change. In practice, for M&A activity to increase, one or more of the following must be true:

- The expected value of future cash flows has increased.
- The discount rate (or opportunity cost of capital) has decreased.
- The initial investment cost has decreased.

In some cases, an M&A transaction may occur even without positive financial returns. For example, self-interested managers may undertake acquisitions to further their own positions at the expense of the company (an example of "agency costs"). Separately, managers may systematically overvalue target companies such that the expected financial returns are positive, but the actual returns are not (known as the "hubris hypothesis").

2.2 EXPLAINING M&A WAVES

Several theories presented in the literature seek to explain why "waves" of merger and acquisition activity, such as that observed in the video games industry, may occur.[7] Understanding why M&A occurs, and why it is sometimes clustered in waves, may provide insights into the subsequent impacts, and help in conceiving policy interventions.

Firstly, industry-level "shocks" may occur which change the way individuals value firms. In the context of the video games industry this could, for example, be a new technology which stimulates demand in the industry. After the shock, some potential acquirers may value target firms more highly than the firms' owners, leading to the firm being acquired. This could be the case for example if the acquirer has access to complementary technology that means they place a greater value on the new technology.

Secondly, systematic mis-valuation of firms (or mis-pricing of stocks) in a sector may provide an opportunity for firms to acquire undervalued firms resulting in a positive financial return. This may occur if the acquiring party is relatively overvalued, the acquired party relatively undervalued, or both, as the acquirer can use its relatively overvalued stocks for the acquisition.[8]

Lastly, sets of acquirers, typically publishers in the video games industry, may interact strategically to compete over time for a set of scarce targets. In this case, it may pay for acquirers to wait for favourable market conditions, but in doing so they risk being pre-empted by rival acquirers. This sets off a "race" for scarce targets and creates a strategic wave of M&A activity.

[7] This subsection draws on a review of the literature on mergers and acquisitions, which focuses in part on why acquisitions occur in waves. Yaghoubi et al. 2015 "Mergers and acquisitions: a review. Part 1", Studies in Economics and Finance, 2016.
[8] Acquisitions using stocks are known as "stock-for-stock" acquisitions whereby the acquirer buys out shareholders of the target firms using its own stock as a payment. If the acquirer's stock is relatively overvalued, it is in a better position to make profitable "stock-for-stock" acquisitions.

2.3 POTENTIAL IMPACTS OF M&A

So far in this section we have considered why M&A occurs. We now turn our attention to potential effects which may arise once a transaction has occurred.

We undertook an evidence review to identify the potential impacts of overseas M&A. Given that very little published research on the impact of overseas M&A focuses on the video games industry, this review initially identified impacts of overseas M&A across all industries. The findings of our review are presented in full in the appendix. We used several databases (e.g. Google Scholar) to identify literature with robust research designs which seek to isolate the causal impact of overseas M&A. We drew on over 50 published academic articles, books and "grey literature" such as white papers, working papers, and government research.

We supplemented our evidence review findings with insights from six in-depth interviews conducted by GIC as part of this study with senior figures from the UK video games industry whose UK-based companies were acquired by overseas buyers. These acquired studios ranged widely in headcount, business model, games platform focus (e.g. console versus mobile) and geography. The interviews were confidential to ensure that the interviewees would be comfortable providing frank answers to potentially sensitive questions. The topics focused on the positive and negative impacts of their studio's sale but also explored the context to the transactions and the motives for both buyers and sellers.

We also received feedback from industry experts at the BFI and the Creative PEC. Combining these industry insights with our evidence review findings and the project team's own industry knowledge generated an initial long list of potential impacts.

We compared our long list of potential impacts to points raised during the six consultation interviews and collated further feedback from the UK video games industry experts from the BFI and the Creative PEC. This review process determined that several of the impacts in our long list were not relevant to the UK video games industry.

The resulting short list is presented in Fig. 4. We have categorised impacts into expected benefits and costs across three types of stakeholders: the target firm, the acquirer, and third parties (e.g. consumers and firms in the video games sector's supply chain). Several impacts are represented on both the benefits and costs side, indicating that the evidence reviewed provides a mixed picture on the direction of impact.

Fig. 4. Impact shortlist showing potential benefits and costs across three stakeholder groups

	Target firm	Acquirer firm	Third parties
Benefit	Improvement in conditions for employees via increased wages, and improved job security	Access to established video game brands and their fans	Changes in output and quality of output (e.g. proxied using reviewer scores) due to changes in competition and/or innovation
	Increases in productivity driven by access to new skills and services; access to better sales, marketing and distribution; increased capital expenditure	Increase in revenue due to growth from increased production capacity, and access to established game brands and their fans.	Growth in supporting companies / industries via increased use of outsourcing (e.g. art)
	Improved financial security implying lower probability that firm ceases trading	Increases in productivity driven by access to higher quality development studios and access to new technology (e.g. proprietary game engines)	Spillovers on other firms' productivity via innovation, and knowledge sharing
	Access to established player bases and data	Access to new platforms (e.g. virtual reality or mobile) and revenue models (e.g. Free-to-play, or F2P)	Dynamic effects of talent exit from acquired firms
	Increased investment in R&D and increases in firm's knowledge and innovation	Increased investment in R&D and increases in firm's knowledge, innovation	
	Increase in employment due to growth and investment	Prevent royalty pay-outs (to third party studio partners brought in-house)	
	Increase in revenue due to growth (e.g. from access to established player bases) and investment	Increase in firm value and/or share price (reflecting improvements in other financial metrics)	
	Higher quality output	Higher quality output	
	Increases in profitability	Increases in profitability	
	Expansion into foreign markets		
	Increases in firm value and/or share price (reflecting improvements in other financial metrics)		
	Better up- and downstream supply chain connections		
Cost	Loss of intellectual property ownership overseas	Failure to leverage target's expertise or intellectual property	Negative investment spillovers (acquisitions may reduce intellectual property investment)
	Decrease in revenue (and profitability) due to revenue being recognised by the acquirer with the studio acting only as a cost base		Wage inflation in acquired studios reduces profitability and/or employee retention at competing UK studios
	Negative impacts on employee relationships resulting in existing employees exiting the business		Acquirers move previously outsourced services in-house (i.e. outside of UK) implying negative growth in supporting companies / industries
	Loss of productivity due to loss of creative / decision-making autonomy, less creative-risk rating and de-prioritisation in the acquirer's wider portfolio		

3. EMPIRICAL EVIDENCE FROM THE UK VIDEO GAMES INDUSTRY

3.1 INTRODUCTION

In this section we present empirical data from the UK video games M&A database compiled for this scoping study (hereafter referred to as the video games M&A database). This has been supplemented by relevant external industry and games company data. We provide a brief overview of UK games studio M&A history and tie the history and data, where possible, to the M&A theory presented in Section 2.

3.2 DATA COLLATION AND REPORTING METHODOLOGY

Data relating to the acquisition of UK video games development studios by overseas companies come from several sources:

- GIC's proprietary global video games corporate finance database: GIC maintained a detailed database of video games industry investment and acquisition transactions from 1991 to 2015. For this scoping study, GIC separated out and updated the M&A part of this database to create the basis of the video games M&A database. The update included verifying each existing UK studio transaction entry and adding transactions conducted over the last eight years.[9]
- GIC's proprietary video games company database (hereafter referred to as the GIC games company database): GIC maintains a live database of video games development, publishing and service companies in the UK which GIC updates through the year with information on key company announcements, including acquisitions.
- To address remaining gaps in the video games M&A database, GIC used several specialist video games corporate finance data sources[10], most notably a decade's worth of weekly M&A transactions updates from specialist UK-based video games-focused investment bank Agnitio Capital.
- Crunchbase Pro: Crunchbase is considered one of the most comprehensive databases of global corporate finance transactions and was used to supplement and verify the video games M&A database data.[11]

The video games M&A database for this study (see Appendix 2 for a complete transaction list) has therefore been compiled by cross-referencing and blending these data sources to create a comprehensive dataset. We note that it may not capture all relevant transactions in the 1990s (or

[9] Transactions were verified using a combination of official buyer and/or seller press releases, stock market filings and quarterly/interim/annual reports, and trade press coverage. The overwhelming majority of transactions were publicly announced and widely reported.

[10] https://agnitiocapital.com, https://investgame.net/, https://naavik.co/, https://www.drakestar.com/, https://www.ddmagency.com/

[11] https://www.crunchbase.com/

earlier), due to a lack of publicly reported information about some earlier transactions (often where both target and acquirer no longer exist) and for some transactions which may well not have ever been made public. There are several transactions recorded in the video games M&A database that were never announced formally and are only known about due to brief mentions in financial filings overseas.

It is also worth noting that all dates ascribed to transactions refer to announcement dates rather than completion dates as the former are far more readily available than the latter. However, most transaction announcements take place after completion with typically only the acquisitions of stock market listed companies necessitating an offer announcement that takes places months before completion.

Finally, while most transactions in the database comprise development company acquisition targets incorporated and situated solely in the UK there are several that fit into adjacent categories such as:

- Overseas companies with one or more UK studios, such as Germany-headquartered Koch Media which owned UK-based Dambuster Studios and was acquired by THQ Nordic.
- UK incorporated development companies with either no UK-based studio or most of their development resources located outside the UK, such as Masomo acquired by Tencent (via its subsidiary Miniclip).
- UK incorporated and UK-headquartered video games publishers with some UK development resources that have been acquired primarily for their non-development activities and assets namely third-party publishing and distribution and existing video games intellectual property, such as Eidos' acquisition by Square Enix.

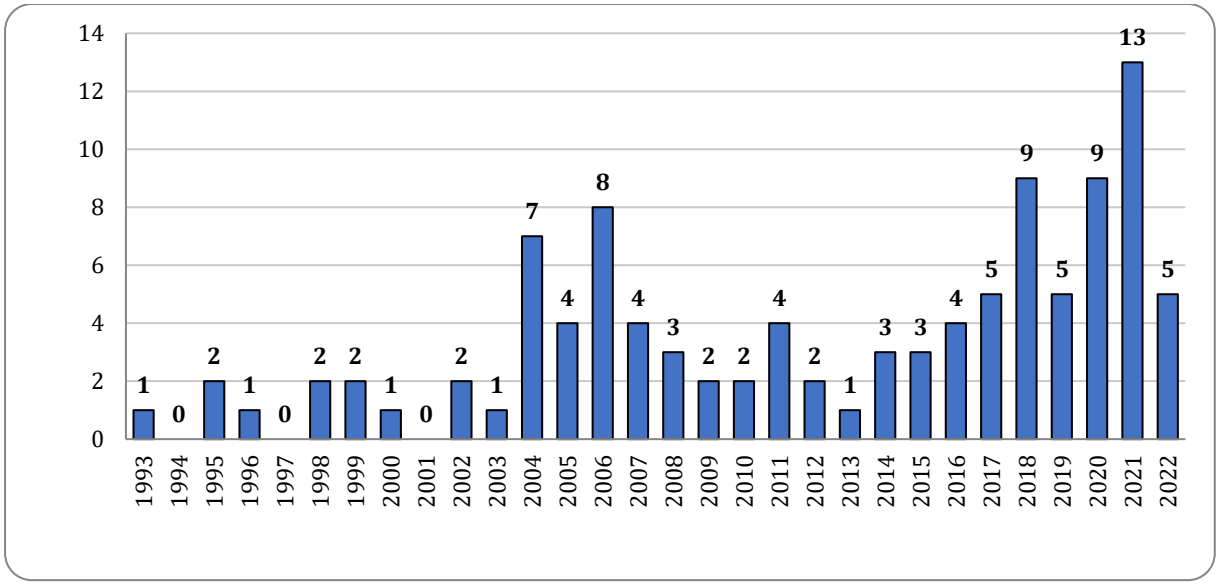
3.3 KEY FINDINGS FROM THE VIDEO GAMES M&A DATABASE[12]

3.3.1 Transaction volume and value data

The video games M&A database compiled for this research comprises 118 transactions in total from 1993 to 2022 of which 105 involve targets headquartered in the UK and/or with most or all its development operations in the UK at the time of the acquisition. The remaining 13 relate to target companies such as Zynga, a USA-headquartered games company with some UK development operations but the majority of its studios located outside the UK. Fig. 5 shows the distribution of the 105 transactions involving predominantly UK-based studios:

[12] The data in this section are derived from the video games M&A database unless otherwise stated.

Fig. 5. Volume of overseas M&A of predominantly UK-based targets by year



Source: UK video games M&A database

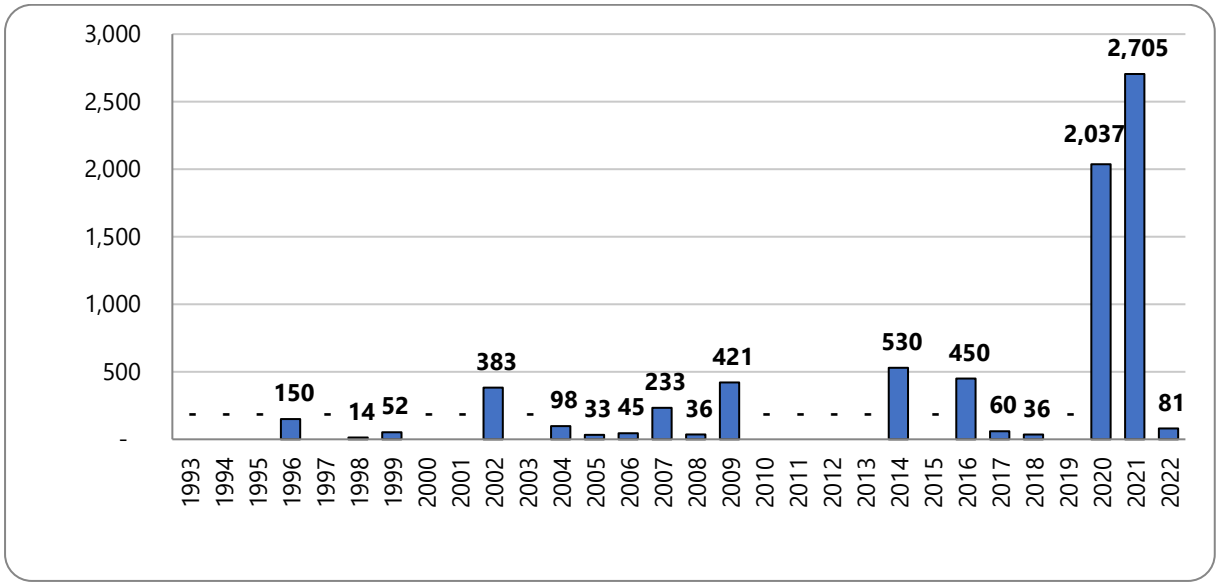
Globally, games M&A transaction volume increased from 187 announced deals in 2020 to 295 announced deals in 2021 and 314 announced deals in 2022 although this includes all games company categories not just games development studios.[13]

Transaction values for 40% (42) of the 105 deals involving predominantly UK-based studios were made public and this data shows a sharp uptick in 2020 and 2021 when a number of leading UK games companies were acquired including Codemasters, Sumo Group and Playdemic, each of which was bought for sums in excess of US$1 billion (Fig. 6).[14]

[13] Source: Drake Star Global Gaming Report 2021 and 2022

[14] The transaction value comprises the publicly stated up-front purchase price at the announcement date, so excludes earn-out payments made in later years (which are almost never disclosed). Deferred but guaranteed payments are included in the up-front purchase price figures. US Dollars are used as it was the most commonly reported currency used in transaction announcements. Where other currencies were reported, these have been converted to US Dollars using exchange rates at the time of announcement to keep the data consistent.

Fig. 6. Published value of overseas M&A of predominantly UK-based targets by year (USD, million)



Source: UK video games M&A database

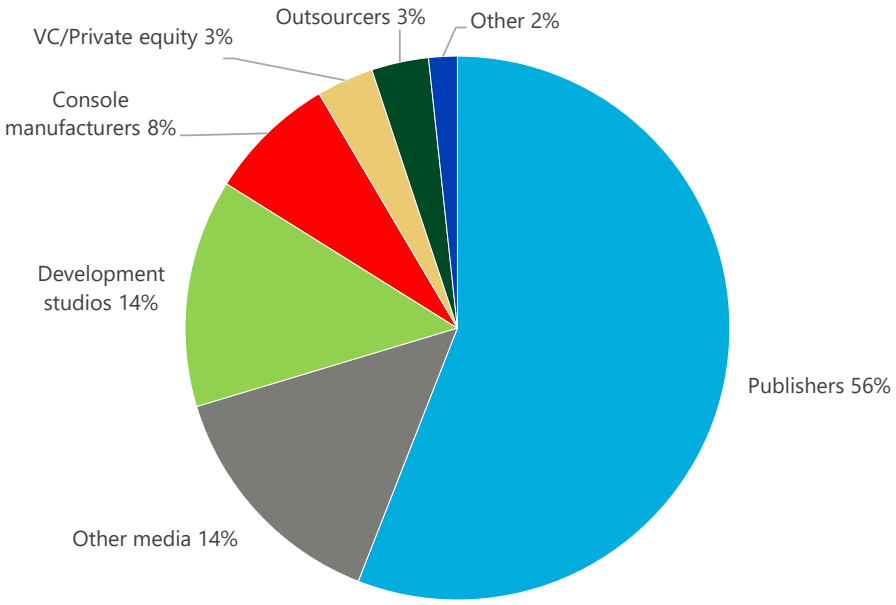
The combined total of transaction values for all 42 of these acquisitions is US$7.4 billion of which US$4.7 billion occurred in 2020 and 2021.

Compared with 2021, 2022 saw a decline in both volume and value of transactions with five transactions involving predominantly UK-based studios with announced values for three of them totalling US$81 million vs 2021's 13 transactions representing US$2.7 billion in announced transaction value.

3.3.2 Acquirer data

The vast majority of the overseas acquirers of UK incorporated studios have been existing games companies, most notably games publishers who alone represented 56% of all transactions. Purchases by overseas games development studios, console manufacturers and other media companies (primarily focused on non-games media such as TV and movies) represented 36% of all transactions as shown in Fig. 7.

Fig. 7. All M&A transactions by acquirer category 1993-2022

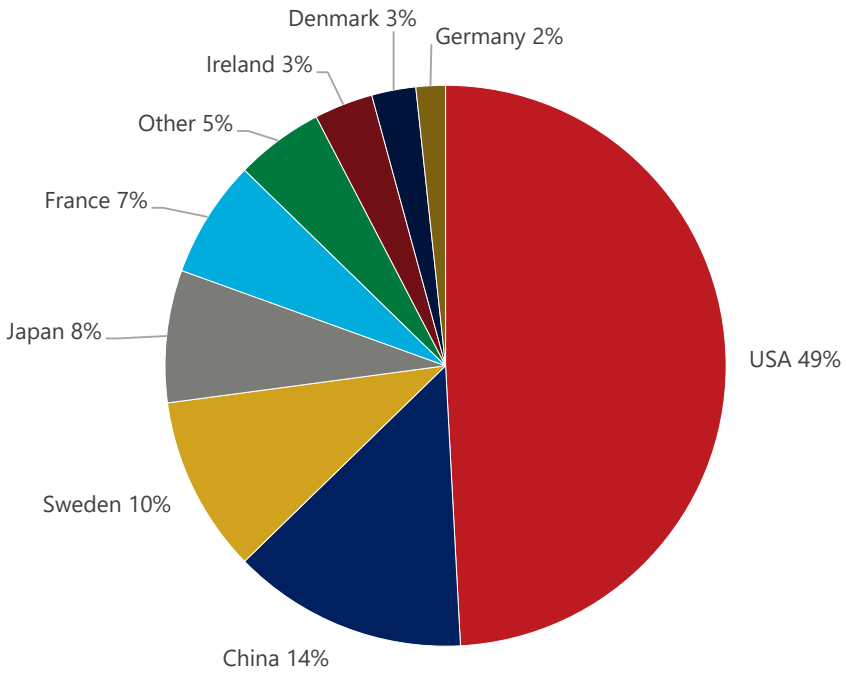


Source: UK video games M&A database

The most acquisitive company in the database by far is China-based Tencent which is the acquirer's ultimate parent company in 14 transactions. Its transactions were conducted via a number of different subsidiary games companies such as Miniclip, Supercell and Riot Games (all three of which are headquartered outside the UK in Switzerland, Finland and the USA respectively). Electronic Arts (six) and Take-Two (six) are the next most prolific acquirers. 80% (94) of all transactions have involved listed buyers while only seven transactions involved listed targets with operations primarily in the UK.

49% of all UK incorporated studio sales have been to companies ultimately based in the USA as shown in Fig. 8. The next largest are China (14%) and Sweden (10%) both being relatively recent additions to the UK studio acquirer list with their first acquisitions having been announced in 2015.

Fig. 8. All M&A transactions by acquirer location 1993-2022



Source: UK video games M&A database

3.4 UK VIDEO GAMES M&A HISTORY

The UK's video games development industry was one of the first to be established within the global market, emerging as a major commercial force in the early 1980s when the success of amateur "bedroom coders" transformed into rapidly growing professional development companies. This early momentum helped the UK to maintain a position as one of the leading video games development territories alongside Japan and the USA, the two other major initial global video games development centres. The increasing globalisation of video games development and the rise of relatively new development powerhouses such as Canada, China and South Korea (often aided by strong government support policies) have challenged the UK development sector's top three status but the UK remains a leading games development territory and some of the sector's biggest grossing titles are developed here, not least the Grand Theft Auto series which continues to be developed in Scotland.

The UK video games development sector's growth has been remarkable, in particular in the last decade. From November 2011 to December 2021, the UK's video games development industry went from 8,888 development professionals employed at 329 studios to 20,975 development professionals employed at 1,528 studios, increases of 236% and 464% respectively.[15]

The early UK video games industry was comparatively insular, revolving around the creation of video games for UK-originated video games hardware such as the Acorn BBC and Sinclair Spectrum

[15] Making Games In The UK Today 2012 and 2022, TIGA / GIC

computer ranges. As such, the UK video games market at the outset evolved along a somewhat different path to Japan and America where dedicated video games consoles from Nintendo and Atari drove their indigenous development industry growth. UK video games development studios did not therefore generally become potential acquisition targets for overseas companies until the early 1990s when the UK consumer market's focus had shifted to international video games hardware platforms.

The first major UK studio acquisition by an overseas company took place in 1993 when Liverpool-based Psygnosis was acquired by Japan's Sony. Sony, at that stage, had yet to enter the console market, but the acquisition of Psygnosis was a strategic coup designed to bring proven, high-quality development in-house and provide it with established and new intellectual property that it could sell exclusively for its PlayStation console when it launched in late 1994 (Japan) and 1995 (USA and Europe). This proved to be so successful an acquisition that Sony even considered cashing-in by selling the studio in 1996 when a formal sale process had reportedly elicited bids of US$300m, substantially more than the £20m it was rumoured to have paid for the company just three years earlier.[16] Despite this potential return on investment, Sony decided to retain Psygnosis, and the UK became a critical video games development territory for Sony and its hugely successful PlayStation brand.

The video games M&A database shows that from 1993 to 2003 an additional 11 transactions involving targets headquartered in the UK and/or with most or all its development operations in the UK took place. This included the sale of Rare to Microsoft in 2002 for what was a record sum for a UK studio of US$375m in cash and the sale by French publisher Infogrames of DMA Design (which it had acquired less than a year earlier as part of its acquisition of UK publisher Gremlin) to US publisher Take-Two for a nominal £1 plus the assumption of US$12.3m in debt. DMA Design would produce Grand Theft Auto III just two years later, a title that became the highest selling game of 2001 and would sell 8 million units within its first year.[17]

As Fig. 5 shows, the volume of UK games development studio sales increased sharply from 2004 and there have been two clear spikes in M&A volume since then, during the periods 2004-2006 and 2018-2021. The latter is particularly notable due to the massive increase in deal value for predominantly UK-based studio targets in 2020 (US$2.0 billion in combined published value) and 2021 (US$2.7 billion in combined published value). This was driven primarily by three acquisitions: Electronic Arts' purchases of Codemasters (for US$1.2 billion) and Playdemic (for US$1.4 billion) and Tencent's purchase of Sumo Group (for US$1.3 billion). These three transactions alone represent 52% of all published transaction values in the UK video games database.

The sale of UK games development studios to overseas buyers over the last 30 years has contributed to a radical change in the complexion of the UK games development industry. TIGA/GIC's Making Games In The UK Today 2023 report showed that 51.9% of the UK studio sector's headcount were employed in overseas-owned video games development studios in December 2021 - although it should be noted that this includes studios established organically by overseas companies as well as

[16] Next Generation magazine, issue 23, November 1996

[17] Take-Two Interactive 2002 annual report

acquired studios.[18] The same research showed that overseas-owned studios grew their development headcount 35% between April 2020 and December 2021, twice the level of indigenous studios.

3.5 POTENTIAL MOTIVATIONS FOR PURCHASING GAMES DEVELOPMENT STUDIOS

Linking back to the theoretical framework underpinning M&A presented in Section 2, the fundamental economic drivers of games development studio M&A are likely a combination of one or more of the following:

- The expected value of future cash flows from acquisitions exceeding their initial cost which, in practical terms, means that the acquired studio's performance and the value derived from the use of its assets are ultimately sufficient to produce a positive return on the acquirer's investment. This can be achieved in multiple ways whether through a broader and higher quality development base yielding incremental revenues and cumulative profit contribution, through greater cost efficiencies from utilising targets' assets such as technology IP and existing player bases to reduce development and publishing costs, or possibly from a subsequent sale of all or part of the acquired studio.
- Increased access to capital for acquirers due to broadening investor interest, growing balance sheet and share price strength and decreased costs of capital.
- Initial investment costs decreasing due to potentially systemic undervaluation of studios, itself a possible product of lack of access to capital by studios.

It should be noted that the latter two points are not necessarily contradictory. Access to capital is not uniform, with differences likely to be based on geography, company type (studio vs publisher for example), scale, business model and private vs listed status. Privately held development studios with a single game in development may well be less attractive an investment proposition compared with a major stock market-listed publisher with a portfolio of titles in its roster. A report by specialist games investment company Digi-Capital in 2011 highlighted how difficult it was for development studios and other smaller games companies to access capital at the time, even those with extremely high growth rates and profit margins.[19] In four of the six interviews conducted by GIC with senior figures from the UK video games industry whose development companies were acquired by overseas buyers, the lack of access to capital at the time of their company's sale was cited as a major reason for their decision to sell. For three of them it was access to growth capital in particular that was lacking. For another one of the interviewees there was a strong belief that their company would not be able to raise sufficient capital to survive as an independent company in the long term.

While limited access to capital does not, in itself, give rise to undervaluation of development studios, it does reduce the strategic options available to them to continue or accelerate their growth. Furthermore, for all three of the interviewees seeking growth capital, acquisition by their existing publishing partners was said to be the only viable option in practice. This was mainly due to the fact that other potential acquirers stood to gain less from the acquisition of these studios while they were under contract with another publisher that was likely to have commercial exploitation rights to the

[18] Source: Making games In The UK 2022, TIGA / GIC

[19] https://www.gamesindustry.biz/digi-capital-review-says-investment-demand-still-exceeds-supply

game(s) the studios had created or were creating. The absence of any effective competition or viable growth funding alternatives in these sorts of scenarios is therefore more likely to lead to undervaluation. As undervaluation reduces initial costs relative to expected future cash flows for acquirers, this is a potentially attractive scenario for acquirers. With both parties being drawn strongly into such deals, one through necessity and the other for compelling economic reasons, it is not surprising that an acquisition may result. Access to capital has changed materially over the last two decades during which time the industry has grown and evolved, and investor interest has expanded.[20] However, any future research into impacts will need to take into account the historic circumstances of acquisition where possible and attempt to assess whether undervaluation has taken place and, if so, whether there has been systemic undervaluation of UK games development studios (in particular those acquired by their publishing partners).

The impacts list in Fig. 4 combined with the six interviews conducted by GIC have led us to suggest six potential strategic motivations for companies acquiring games development studios:

- **Bring talent in-house:** Building new games development teams organically from scratch may well prove a lower cost option vs acquisition but it usually takes months or even years to build the team to scale and a high-level working efficiency due to endemic difficulties in hiring experienced and high-quality development staff. Acquisition delivers new development resource instantly, allowing the acquirer to get products to market more quickly. It also delivers proven talent, which is scarce, and proven development teams, whose tempo of production is optimised. Having high-quality teams in turn improves the chances of hiring additional high-quality staff because experienced development studios are more likely to be drawn to working with similarly experienced staff. As a result, an acquired studio's growth can be faster and more effective than building from scratch for the acquirer. Almost every interviewee we spoke to mentioned the acquirer's desire to access the target's experienced development teams as one of the primary motivations for approaching the target in the first place. In the context of the theoretical framework, bringing talent in-house via acquisition may have higher initial costs vs the organic establishment of a new studio, but it may also be able to deliver revenues in a rapidly growing market sooner and potentially at a higher level.
- **Bring games IP in-house:** Video games are a hits-driven business with the top grossing games capable of generating billions of dollars in revenue. Creating a hit from an original IP is incredibly difficult, costly and commercially risky which is why 19 out of the 20 best-selling console and PC games in the UK in 2022 were based on existing IP.[21] Acquiring established IP helps mitigate this risk. Not all of the interviewees' companies had generated successful IP by the time they were sold, but two said they had been acquired primarily to bring established hit IP and future cash

[20] Four of the top five most prolific VC investors in games companies between 2020-2022 were formed between 2017 and 2020. The fifth was formed in 2014 (see https://investgame.net/investors/). There are now at least 20 games-focused VC funds in operation (see https://blog.paperstreet.vc/top-vc-investors-investing-in-gaming/), up from just one in 2010 (London Venture Partners).

[21] https://twitter.com/Chris_Dring/status/1633054370433576960

flows in-house by the acquirer. Given that some games can take three to five years (or more) to develop, even unproven titles already in development can make for attractive acquisition opportunities if the titles are potential hits. In addition, acquirers may well be able to extract greater value from the games IP than the studio, for example, due to their greater distribution reach or marketing resources. In the context of the theoretical framework, the expected value of future cash flows associated with the IP is higher for the acquiring firm due to the synergies identified. IP acquisition also acts as a means of de-risking future cash flows, particularly when compared with the alternative of developing original IP. Indeed, almost all the most valuable transactions in the video games M&A database involve studios that own high value games IP acquired by games publishers.

- **Bring technology IP in-house:** Games development, particularly for major console and PC titles and games developed as ongoing services such as massively multiplayer online role-playing games, is incredibly complex, costly and fraught with an array of technical and development execution risks. Some studios have proprietary technology often built over many years that can help mitigate that risk and is worth acquiring the studio for. Technology IP and development talent typically go hand in hand and several interviewees mentioned the acquirer's interest in accessing both the development staff and the games development technology they had created. In the context of the theoretical framework, acquiring technology IP can deliver future cash flow benefits by reducing costs and risk. This can be realised synergistically not just within the acquired firm but more widely if the acquirer owns other studios into which this technology can be integrated.
- **Access an existing player base:** Games companies do not necessarily need hit games to build large or valuable player bases because the aggregation of multiple titles or the nurturing of high value niche player bases such as those for the most successful Web 3 games (i.e. games built using blockchain technology) can result in highly attractive audiences that an acquirer can tap into for cross-promotional purposes or usage data insights. Building such player bases from scratch can be a costly and difficult process requiring potentially substantial marketing resources, costs and risks that can be mitigated via acquisition. As with the acquisition of technology IP, the acquisition of player bases can yield future cash flow benefits via marketing cost savings although it also has the potential to deliver improved cash flow via any revenue uplift that comes from accessing this new, potentially high value audience.
- **Bring studio partner revenue/profit in-house:** A number of UK studios including three of the interviewees' companies have been acquired by existing publishing partners. For two of these interviewees this happened before the game they were creating for the publishing partner had launched. A clear motivation for the acquirer's purchase was said to be the desire to obviate the need for revenue and royalties to be paid out to the development studio when the game did eventually launch as the publisher was sufficiently confident of its success. Even after launch, as was the case with the third interviewee, it reportedly made more sense for the publisher to buy the development studio to stop the continued royalty outflow and therefore bolster the publisher's own bottom line.

- **Gain strategic diversification:** Acquirers may see the acquisition of a development studio as a route to establishing a presence in a new geographic territory or accessing particular platforms, revenue models or target demographics that a studio may specialise in. Some may acquire studios simply to enter the games industry. One interviewee talked about his company's acquirer specifically wanting to gain a foothold in the UK games development market in part because of challenges it faced in its indigenous market. In these scenarios, the acquirer is arguably less interested in the profit contribution of the acquisition (at least in the short term) and more in diversifying its risk profile. As such, strategic diversification may not always fit into the theoretical framework although the long-term goal of strategic diversification is still likely to be cost savings and/or future cash flow uplift leading to an eventual return on investment.

While most acquisitions are made with the expectation of a positive financial return, we believe few of the transactions in the video games M&A database will have been with no additional strategic rationale as almost all the acquirers were games companies of some description or at least active in games-adjacent industries such as outsourcing. If the upstream market failure of undervaluation is endemic in UK games studios and a studio represents particularly good value as a result, then the financial motive may become a decisive factor in concluding an acquisition. The few private equity companies involved in games acquisitions have little or no strategic motive for acquiring games development studios beyond the purely financial.

Of all the strategic motivations above, we believe that the two main drivers for acquisitions of UK studios throughout UK video games industry history to date have been access to intellectual property and top-tier video games development talent. In addition to interviewees highlighting these as primary drivers, the database also shows that most acquirers have been existing video games publishers (55%), development studios (14%) or console manufacturers (8%).[22] These buyers can exploit the potential to add proven video games brands and technology to their existing portfolio, leverage their sales-enhancing processes and infrastructure (such as a global distribution network, marketing muscle or a large, existing player base) to increase sales of future titles based on that IP and to immediately access ready-made development teams to enhance existing and new IP. These commercial and strategic synergies are expected to yield a positive return on the cost of acquisition for the trade buyer and with a level of risk that is well understood by the more experienced acquirers such as Sony and Electronic Arts with large numbers of studio acquisitions conducted throughout their history.

The view that IP and talent are the primary drivers of development studio M&A is further reinforced by the fact that the proportion of buyers from publisher, development studio and console manufacturer categories has not changed materially during the three decades of M&A activity recorded in the database. These three company categories represented 80% of buyers for the first 50 transactions (from 1993 to 2013) compared with 77% overall (from 1993 to 2022).

[22] UK video games M&A database

Gaining access to development talent and games brand IPs is less compelling for other categories of acquirer such as Venture Capital (VC) and private equity firms, who represent 3% of all transactions in the database. It is also interesting to note that 14% of all UK studio acquisitions in the database were conducted by organisations that fit into the "other media" category. This broadly comprises two types: organisations looking to diversify into the video games space via acquisition (such as publishing giant Lagardere Group's purchase of Neon Play) and those with existing video games assets looking for additional video games resources (such as Warner Bros' purchase of TT Games). The games industry's consistently high historic growth rates have often outpaced that of other entertainment content categories, including during the COVID19 pandemic when some categories such as cinema plummeted due to the forced closure of their venues.[23] In the UK, games represented the largest entertainment content market in 2022 generating £4.7 billion, ahead of both video (£4.3 billion) and music (£2.0 billion).[24] In addition to accessing the potentially higher rates of growth offered by the games industry, other media companies are increasingly turning to games for IP to exploit outside of games,[25] which makes games studio acquisitions, in particular those involving established games IP, more attractive.

3.6 M&A WAVES

There have been two periods of noticeably increased M&A activity involving UK games development studio targets: 2004-2006 and 2018-2021. Fig. 5, which shows only those transactions involving predominantly UK-based studio targets, reflects these trends.

The 2004-2006 wave comprised 19 acquisitions in total, all of which involved predominantly UK-based studio targets. Of these, 15 were conducted by publishers, three by other media companies (two of which were already active in games at the time) and one by a console manufacturer.

The 2018-2021 wave saw 42 acquisitions overall, of which 36 involved predominantly UK-based studios and an additional six involved UK studio subsidiaries of target companies whose development activity was predominantly outside of the UK. Of the 42 overall acquisitions, just 23 were publishers, four were other media and four were console manufacturers. The remaining 11 acquirers comprised categories absent from the 2004-2006 period namely other development studios (six), outsourcers (three) and VCs/private equity (two).

The differences between the two waves are likely to reflect a combination of the increased scale of the games industry, the evolution of new business categories such as outsourcing and improved access to capital via public and private funding sources. The games industry grew from US$29 billion in global revenues in 2005 to US$182 billion in 2020, a six-fold increase.[26] The amount of funding for stock

[23] https://venturebeat.com/games/pwc-games-grew-10-in-2020-and-will-grow-4-4-per-year-through-2025/

[24] https://eraltd.org/news-events/press-releases/2023/top-gun-maverick-harry-styles-and-fifa-23-drive-uk-entertainment-sales-to-record-111bn/

[25] https://www.wired.com/story/the-last-of-us-transmedia-video-games-tv-movies/

[26] Source: DFC Intelligence 2006, Ampere Analysis 2022

market-listed games companies in 2021 alone (US$24.5 billion) comfortably exceeded the total amount raised by stock market listed games companies between 2000 and 2015 (US$13.9 billion).[27]

This increased availability of funding for stock market listed companies has helped fuel the emergence of video games publishers with business models predicated on building talent pools and intellectual property portfolios rapidly via acquisition as opposed to using organic means. Many of the most prolific acquirers globally are listed games publishers that are relatively new to the games industry such as Tencent Games (founded 2003) and Embracer Group (founded 2011). The latter, which is based in Sweden and currently listed on Sweden's Nasdaq Stockholm stock exchange, has in the last six years built up a portfolio of 134 internal video games development studios mainly in Europe and North America with over 16,000 staff, a feat it has achieved almost entirely by acquisition.[28] Given that a single top tier console and PC game can take an established studio 3-5 years to develop, acquisition will have been the only practical method available to Embracer to grow its business at this pace. Embracer's acquisition spree has undoubtedly been helped by low interest rates which has made debt cheaper and more accessible. Its short- and long-term "liabilities to financial institutions" (i.e. debt) grew from SEK1.3 billion (£104m) in March 2020 to SEK20.5 billion (£1.6 billion) in December 2022.[29]

Numerous other firms have gone on studio acquisition sprees, although none quite as extensive as Embracer Group. Many of these firms have been based in Sweden and benefited from Swedish investors' seemingly voracious appetite for video games stocks in the 2018-2021 period. Even though the first Swedish acquisition of a UK studio only took place in 2015, Sweden represents the ultimate parent company location of 10% of all UK studio acquisitions in the video games M&A database.

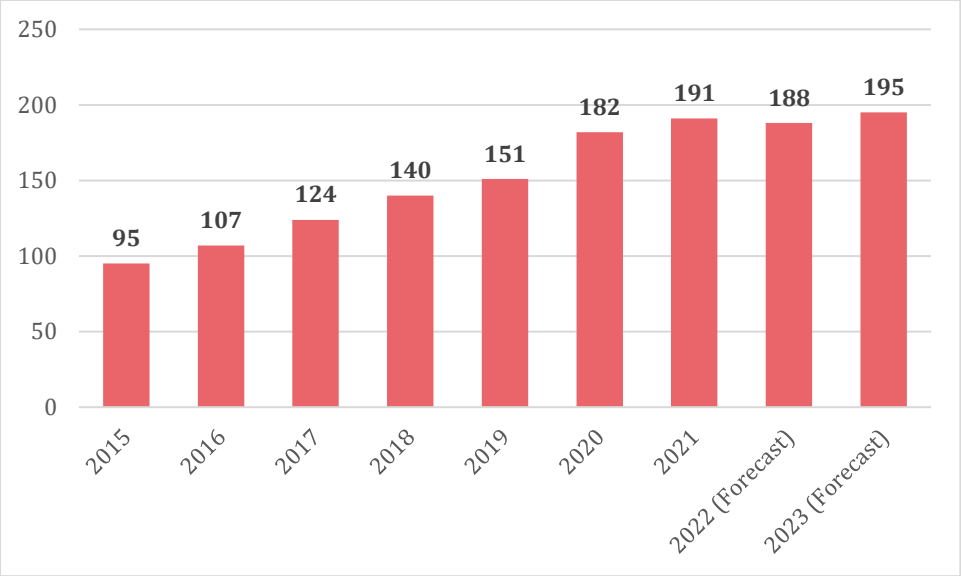
One of the other factors behind the increased rate of acquisitions is likely to have been the rapid rate at which the consumer video games market grew until 2021, with 2020 and 2021 seeing substantial rates of growth as shown in the following chart.

[27] Source: GIC, 2015 & InvestGame, 2023

[28] Source: Embracer Group Q3 2022/23 results

[29] Source: Company financials

Fig. 9. Global games content and services revenue (USD, billion)



Source: Ampere Analysis, 2022

The video games industry was a major beneficiary of COVID-19-related lockdowns along with other digital categories of home entertainment and in stark contrast to many other which saw significant declines [30] . Investor and acquirer interest grew as games companies experienced record growth and profitability. [31]

One factor that has underpinned the overall games market growth over the last 15 years or so, and we believe also contributed to the broad increase in UK games development studio M&A during the period, has been the growing use of commercial models such as free-to-play and video games designs such as live service video games. This could be seen as an example of an "industry level shock" as outlined in the theoretical framework because it has resulted in a sea change in industry economics. These models yield revenue streams that are both longer-lasting (in the most successful cases generating revenue that continues to grow over many years) and also, as a result, more predictable than the one-off, up-front revenue models of product-oriented video games of old. Video games companies of the 1990s and early 2000s were highly dependent on release timetables leading to lumpy sales and profit profiles that made both forecasting and achieving future sales levels incredibly challenging. This made studios comparatively unattractive as standalone acquisition targets. This dramatically changed with the advent of free-to-play revenue models that offered players free access to video games along with the option to make (often unlimited) purchases within the game. This model originated on PC but took off on more accessible smartphone devices and has driven the phenomenal growth of the mobile games market demonstrated in the chart above. The most commercially successful companies in this space not only are making billions of dollars per annum

[30] https://www.theguardian.com/media/2021/jan/08/uk-lockdowns-fuel-record-year-for-home-entertainment-spending

[31] https://www.bbc.co.uk/news/business-54813841

from their mobile games year-in and year-out but are often doing so at consistently large profit margins.

When considered in the context of the theoretical framework, the free-to-play phenomenon, which is underpinned by more consistent and predictable revenue flow (and higher margins for the top studios compared with traditional games development), may in part explain why the cost of capital might have fallen for games companies. To understand why this, in turn, might have given rise to acquirers' preference for M&A vs organic growth, we would refer to our list of strategic motivations for games studio M&A in section 3.5. Successful free-to-play games development and publishing requires a radically different approach to games design, monetisation and marketing. For much of the last 15 years, these skills have been both scarce and in considerable demand. Many of the most successful free-to-play games development studios self-publish their own titles which increases the scope for both easier integration into an acquiring publisher and presents increased scope for synergies between the two organisations. Most successful free-to-play games development studios tend to have both strong technology IP and an established player base, both developed over a timeframe of many years. As such, the buy vs build decision for potential acquirers becomes much easier to take, because organic growth options are comparatively slower and much higher risk.

3.7 2022: A CHANGED MACROECONOMIC ENVIRONMENT

The decline in the games market in 2022 (as shown in Fig. 9) was attributed by Ampere Analysis to a combination of the less favourable macroeconomic backdrop in 2022, the return to pre-pandemic consumption patterns and supply chain constraints for games consoles.[32] As previously mentioned, global games M&A deal volume increased in 2022 as did private games company funding deal volume (increasing from 723 deals in 2021 and 938 in 2022) but private games company funding deal value decreased moderately from US$13.5 billion to US$11 billion.[33] In stark contrast, funding for publicly traded games companies collapsed 82% from 2021 to 2022 falling from an all-time high of US$24.5 billion in 2021 to just US$4.6 billion in 2022.[34] Many stock market-listed games companies saw their share prices fall during 2022 as investor interest appeared to wane. The highly acquisitive Embracer Group, for example, saw its share price more than halve during calendar 2022, a period where it made 17 announced acquisitions (versus 29 in 2021 and 24 in 2020).[35]

It is too early to tell if the decrease in UK games development studio M&A transaction volume during 2022 marks the start of a less prolific phase for video games M&A although we note that the first three months of 2023 has seen only one UK studio transaction.

The full UK studio acquisition timeline is provided in Appendix 1.

[32] https://www.ampereanalysis.com/insight/global-games-market-forecast-to-decline-in-2022
[33] Source: Drake Star Global Gaming Report 2022
[34] Source: InvestGame, 2023
[35] https://en.wikipedia.org/wiki/List_of_mergers_and_acquisitions_by_Embracer_Group

4. MEASURING IMPACT: POTENTIAL METHODOLOGIES

In section 2.3 we identified a range of potential impacts which could result from overseas M&A in the video games industry. In this section we consider potential methodologies that could be adopted to quantify the extent to which those impacts have arisen in response to M&A transactions.

This section is again informed by our review of prior research into the impacts of M&A. Across the studies we reviewed, two main methodological approaches were adopted, namely:

- event studies, which use data on share prices to study the impact of the announcement of an M&A transaction; and
- accounting studies, which look at financial performance metrics from firms' accounts to investigate the impact of M&A after it has occurred.

4.1 EVENT STUDIES[36]

Event studies are used to measure the effect of an economic event, such as the announcement of a merger or acquisition, on the value of a firm using financial market data, typically share prices.

The event study approach has several analytical steps. Firstly, an "event window" is defined which is the period immediately prior to and after the announcement of a merger or acquisition over which the impact is assumed to be realised. Secondly, to quantify the impact of the event (in this case, the announcement of the acquisition) a measure of "abnormal return" is needed, which is the actual return observed minus the expected return for the firm over the event window.

The expected return can be defined in a number of ways. Typically, an "estimation window" is used which is a separate period prior to the announcement to which the impact observed during the event window is compared. During this period, the "normal return" is observed and can be measured most simplistically as the average return for the firm during that period.

The approach requires daily share price data of ideally both the target and acquirer firms for the defined event and estimation windows to assess whether the M&A is net value-creating or destroying. It does this by comparing the combined value of both the acquirer and the target pre- and post-acquisition.

As an example of an event study of overseas M&A, Harris & Ravenscraft assess the share price impacts of acquisition announcements of US firms.[37] They compare the impact of overseas acquisitions to domestic acquisitions and find that share price gains for target firms are significantly higher in

[36] The discussion of methodology in this section is drawn from A. Craig, MacKinlay, "Event Studies in Economics and Finance", Journal of Economic Literature, (1997), pp. 13-39.

[37] Robert S. Harris and David Ravenscraft, "The Role of Acquisitions in Foreign Direct Investment: Evidence from the U.S. Stock Market", Journal of Finance, Vol 46, No. 3, (1991).

cross-border acquisitions compared with domestic acquisitions. Jensen & Ruback also show, without differentiating by the acquirer location, that target firm share prices are higher following an acquisition.[38]

The main strengths of this approach are that it is forward-looking and captures financial markets' assessment of the long-run outlook for a firm, and hence the change in this outlook following a merger or acquisition. Moreover, the market's perceptions of the impact on the acquirer and the target can be considered both separately and combined. This allows for an assessment of who benefits from overseas M&A: the target shareholders, acquirer shareholders, both, or neither. In the context of overseas M&A in the UK video games industry, we would be most interested in the impact for domestic shareholders.

There are several weaknesses associated with the event study methodology, however. Firstly, the announcement may be an imperfect proxy for the point at which the market prices in the acquisition, and therefore a comparison of share price before and after the announcement may understate or overstate the true effect. For example, if an acquisition is already rumoured to be taking place with a certain probability prior to the announcement, some of the potential value uplift will be priced in. Careful definition of the estimation windows may help partially or even fully overcome this potential source of bias. For example, some researchers use an estimation window which can be as many as several hundred days prior to the announcement to attempt to remove the "rumour effect".[39] Nevertheless, this phenomenon may make concluding whether an acquisition is value-creating difficult.

Secondly, if markets are not able to accurately price the impact of the announcement on the target or acquiring firm's value, any changes may reflect this market inefficiency rather than a change in the fundamental value of the acquiring or target firm.[40] They also require that both firms are listed on a stock exchange, which is less likely if, for example, one or both parties are relatively small in size, and cannot be used to assess potential wider impacts of overseas M&A.

4.2 ACCOUNTING STUDIES

Accounting studies look at whether the accounting performance of one or more of the parties involved in an acquisition improves after an acquisition, in terms of metrics such as profitability. As with event studies, financial performance can be looked at through the lens of the acquirer, target, or the combined entity.

A simple before and after comparison of the financial performance of a target may be biased if, for example, an acquirer targets development studios who are particularly capable, and therefore would have achieved better outcomes even without the acquisition. As such, the approach typically uses data on both the acquired firm's financial performance pre- and post-acquisition, and a comparison (or "control") group of firms not subject to an acquisition with which to compare acquired firm's post

[38] Michael Jensen, & Richard Ruback, "The market for corporate control: The scientific evidence", *Journal of Financial Economics*, (1983), pp.5-50, accessed September 2022

[39] For example Harbir Singh and Cynthia A. Montgomery, "Corporate acquisition strategies and economic performance", *Strategic Management Journal, Vol 8, Issue 4,* (1987), pp. 377-386.

[40] In other words, the "Efficient Markets hypothesis" that new information is immediately reflected in stock prices may not hold.

acquisition financial performance to. Alternatively, firms subject to overseas acquisitions may be compared to firms subject to domestic acquisitions as an alternative comparison group. In this case, the hypothesis being tested is whether domestic acquisitions differ to overseas acquisitions in their impact. The comparison group of firms are used as a "counterfactual" to simulate what would have happened to the target firm in the absence of an acquisition (or had it been acquired domestically).

Healy, Palepu & Ruback undertook one of the seminal studies using this approach to test for changes in operating performance of companies in the US after a merger or acquisition.[41] They compare the post-merger performance of the target and acquirer combined to its performance prior to the merger or acquisition whilst adjusting for the performance of the industry as a whole. They find that the combined firm has significantly improved returns to equity after the transaction, which occurs due to increases in productivity.

In an example from the literature which looks specifically at overseas M&A, Chen compares the effect of overseas acquisitions to domestic acquisitions on the financial performance of US firms for the first five years after an acquisition.[42] The study finds that firms subject to overseas acquisition experience increases in profitability relative to targets acquired by domestic firms, which is driven by increases in sales and productivity. In contrast, Bertrand & Zitouna do not find evidence of increased profitability on the target firm following an overseas takeover despite improvements in productivity, which they suggest may be because efficiency gains are distributed back to the parent company through transfer-pricing mechanisms.[43]

The strengths of the accounting returns approach are that well-developed causal methods can be used to attribute impact. Moreover, they represent actual financial returns, unlike event studies which may be affected by market inefficiencies in forecasting what an M&A transaction means for the expected future returns of a firm. The econometric approach used for accounting studies can also be adapted to test, econometrically, for the existence of non-financial impacts of overseas M&A (e.g. number of employees, wages etc.). The weaknesses of the approach include the data requirements for assessing medium to long-run profitability. For example, this method would be less informative for assessing long-run impacts of the most recent set of acquisitions in the video games industry as insufficient time has passed to see this borne out in firms' accounts. Moreover, whilst causal methods do exist to attribute impacts on financial performance to the acquisition, doing so with a high degree of certainty can be challenging.

[41] Paul M. Healy, et al, "Does corporate performance improve after mergers?", *Journal of Financial Economics, Volume 31, Issue 2,* (1992), pp. 135-175.

[42] Wenjie Chen, "The effect of investor origin on firm performance: Domestic and foreign direct investment in the United States", *Journal of International Economics 83,* (2011), pp. 219-228.

[43] Olivier Bertrand, & Habib Zitouna, "Domestic versus cross-border acquisitions: which impact on the target firms' performance?", *Applied Economics*, (2008), pp.2221-2238, accessed November 2022.

5. REVIEW OF DATA SOURCES TO APPLY THE METHODOLOGIES

In order to conduct a quantitative assessment of the historic and future impact of M&A of UK video games studios by overseas companies, data are needed in three core areas:

- M&A deal flow: Information about when a transaction takes place, which parties are involved, the geographic location of the parties, the types of company being acquired and the nature of their operations, and the type and value of transaction conducted. Historic data for this has already been compiled for this research project.
- Comprehensive UK studios database: As complete a list of UK studios as possible including sufficient company data such as type, location, ownership, scale and platform focus will be optimal.
- Financial and other performance data for UK studios: Data relating to the studios such as their financial performance or their headcount measured before and after acquisition.

5.1 GENERIC DATA SOURCES

5.1.1 Companies House and Companies House-derived data providers

All companies incorporated in the UK must file annual accounts with Companies House as well as supply additional data such as incorporation and dissolution documents, company and director names and addresses and Confirmation Statements detailing, among other data, share capital and share ownership information. Companies are also obligated to select a standard industry classification code (SIC) which theoretically indicates the area of business the company is primarily involved in. While there is a legal obligation to provide much of the above information at Companies House, not all of it is actively verified (such as SIC codes and director details) and some of it can be misleading (most notably registered addresses which may reflect the location of the company secretary or their accountants and be very different to the actual site of the company's offices).

Companies House has the most complete set of financial data for UK video games studios of any data sources. Most of the major third-party commercial company databases tap into this repository to some extent. Some supplement it with additional data gleaned directly from companies or their employees, scraped via automated searching tools from the web or via links to other data sources such as LinkedIn. A sample of these are reviewed later although it should be noted that many of these sources are inaccessible without payment and that their inclusion here does not equate to a recommendation for their use.

The SIC problem

A key problem inherent to Companies House data for many of these data providers is their reliance on SIC codes to identify, categorise and group video games companies. As these are allocated by the

companies themselves but not policed by Companies House, the "accuracy rate" of this data are in practice extremely low.[44]

There are several UK company research services that rely predominately on Companies House data, repackaging this data into a more accessible and searchable format. Bureau van Dijk's widely used Fame UK company research service for example makes Companies House data more easily downloaded, compared and analysed. However, the database still revolves around SIC codes and this may well make it similarly unreliable for identifying an accurate and comprehensive list of video games development studios.

M&A deal flow

UK companies are obligated to register when majority ownership changes hands within 28 days of the change taking place; so, Companies House data could theoretically be used to monitor studios for changes to their Persons with Significant Control entries. However, this would require accurate identification of all UK video games development studios (i.e. avoiding using SICs), which none of these data providers can provide.

Financial and other performance data for UK studios

Companies House provides the richest source of financial data on UK video games development studios where such studios have already been identified. Without such a list, manual investigation would be required to accurately identify active video games development studios, determine the actual incorporated entity for the studio and differentiate it from any parent and sister incorporations, special purpose vehicles and subsidiaries, a considerable task given their frequency. Companies must, de minimis, provide current and prior year balance sheet information and most UK studios, by virtue of their small size, tend to provide no more financial information than this in unaudited and abridged form. Larger studios provide Profit and Loss (P&L) information in full accounts. A small number of studios provide average headcount over the financial period and a subset break their headcount down by role within the company (typically development staff and admin). Therefore, at best Companies House (and those deriving data from it) can yield revenue, profit, net asset and headcount growth over multiple years but for only a small number of studios. At worst, it will yield only net asset figures but for all studios. It should be pointed out that acquired companies tend to provide greater financial and headcount reporting detail to Companies House post-acquisition, and this will include prior year data (i.e. pre-acquisition).

[44] In late 2021, GIC conducted an analysis of over 3,300 UK companies formed in 2020 and the first nine months of 2021 that utilised one or both of the most video games-oriented SIC codes (62011 – "Ready-made interactive leisure and entertainment software development", and 58210 – "Publishing of computer video games"). A detailed investigation of these companies' online presence found that just 18% (605 companies) could be confirmed to be active in either video games development or publishing in any capacity with the majority of companies either functionally dormant and non-trading or demonstrably engaged in non-video games business. An illustration of this inaccuracy level can be found within a list of "top 50 largest video games companies by revenue" in the UK which the data provider claims to have derived from Companies House, Thomson Directory and Dun & Bradstreet . While the list includes some video games companies, it also includes several property companies, a post office, and a fishmonger.

An analysis by Oxford Economics of a sample of studios featured in the video games M&A database (Appendix 2) revealed that the vast majority provided P&L data immediately pre- and post-acquisition but only a minority provided other impact data such as headcounts, wage and R&D data.

Comprehensive UK studios database

Given the SIC problem discussed above, we judge there are no reliable ways to identify video games development studios from Companies House data alone so building a database of such companies using this data source will be impossible.

5.1.2 IDBR

The Inter-Departmental Business Register (IDBR) is a near comprehensive list of UK businesses used by the UK Government for statistical purposes. The IDBR is derived using several administrative sources, including His Majesty's Revenue and Customs (HMRC) Value Added Tax (VAT) and Pay-As-You-Earn (PAYE) data, and the Office for National Statistics (ONS)'s Business Register Employment Survey.

It contains basic financial and firmographic data on UK businesses except those without employees, or with turnover below the VAT threshold. Variables in the IDBR include:

- Name
- Postcode
- Birth date
- Number of employees
- Turnover
- Country of ownership
- Company registration number (CRN)

Given the size of development studios subject to overseas M&A, it is expected that all will be included in the IDBR. The IDBR can be used for longitudinal analysis, but some employment and turnover data may update with a lag of up to two years. IDBR microdata can be accessed using the ONS' Secure Research Service, and data linking with other sources is possible using business name and/or CRN.

The IDBR's primary use would be as an additional source of financial data on businesses (turnover and employment). It would not be able to identify video games development studios with complete accuracy due to the SIC problem discussed above but could be used to validate other records of overseas M&A given that it records country of ownership.[45]

5.1.3 National and international company databases

We accessed a number of international company data services that included UK businesses as well as several UK-specific services. We were able to explore the quality of their company categorisation and search systems and the extent and quality of data profiles for a randomly selected sample of UK video games studios for whom we already had detailed information retrieved from Companies House and

[45] The IDBR takes its industrial classification directly from administrative sources and the ONS does not update an information received from these sources. The priority ordering used is: 1) ONS surveys, predominantly the Business Register and Employment Survey (BRES), 2) VAT, 3) Companies House and 4) PAYE. As such, where these sources are unable to address the "SIC problem" identified, it will also be present in the IDBR.

via direct contact with the studios in question. We reviewed Dun & Bradstreet/Hoovers, ZoomInfo, LexisNexis, CoRepo and Endole.[46] The primary use of these services tends to be sales lead generation and/or credit checking. All of them take data feeds from Companies House, repackaging the data in a searchable database format. The bigger data providers such as Dun & Bradstreet and ZoomInfo supplement this data using a variety of methods including manual input, proprietary automated data harvesting technology and estimation algorithms where verified data is lacking.

M&A deal flow

Some providers supply detailed company ownership structures, but smaller UK company acquisitions are often missed. Dedicated acquisition search functions are rare.

Financial and other performance data for UK studios

The data for UK studios we accessed generally reflect the actual data reported at Companies House, albeit sometimes with a notable lag between Companies House upload and the data provider's profile being updated. Where estimates are provided, some entries look plausible, others less so and some are occasionally used in place of actual Companies House data and are demonstrably incorrect (i.e. differ from the company-supplied Companies House data) in these cases. The data providers generally supply vague answers to questions about the estimation methodology, although one indicated they were based on 'industry averages'.

Comprehensive UK studios database

The data providers tend to employ one of two company categorisation methodologies: SIC-code categorisation and categorisation based on a proprietary system. Most rely on the former which makes them unreliable for identifying genuine video games companies, let alone video games development studios. The proprietary categorisation systems vary widely in quality. Even those offering a video games category are filled with false positives such as gambling and physical video games/toy companies. Most large databases will tolerate a degree of false positive or false negative data often the result of automation in return for lower costs and greater breadth of data coverage. Some allow a degree of keyword searching for company profiles so it might be possible to hone these lists to produce a more accurate UK video games development studio list, but this would require dedicated manual intervention by researchers familiar with the UK video games development industry.

5.1.4 International M&A databases

We assessed dedicated M&A databases Pitchbook, Crunchbase Pro, M&A Monitor, and Mergr.[47] All contain varying degrees of UK studio acquisition information, often employing similar company profiling methodologies to the general company database suppliers reviewed above by using Companies House data combined with web-scraping tools, manual data input and estimation

[46] https://www.dnb.co.uk/, https://www.zoominfo.com/, https://www.lexisnexis.co.uk/, https://corepo.org/, https://www.endole.co.uk/

[47] https://pitchbook.com/, https://www.crunchbase.com/, https://www.ma-monitor.co.uk/, https://mergr.com/

technology. Their databases typically revolve around companies that have been involved in some form of corporate finance transaction and most exclude other companies.

M&A deal flow

These providers yielded a surprisingly mixed set of results with one database omitting Codemasters' $1.2bn sale to Electronic Arts in 2020 with another omitting scores of smaller transactions in the UK video games studio acquisitions database compiled for this research. Pitchbook stands out as having comprehensive deal flow and deal data, but its video games industry categorisation includes numerous gambling company acquisitions.

Financial and other performance data for UK studios

Data on acquired companies generally comprises snapshots and rarely includes detailed history. Again, Pitchbook is the stand-out in having detailed financial histories (derived from Companies House) but its non-acquired comparable company base data is limited to that provided via Companies House.

Comprehensive UK studios database

For most databases this is not available as their databases primarily revolve around companies that have conducted corporate finance transactions of some sort. Again, of the sources reviewed only Pitchbook appears to contain details for companies that have not conducted corporate finance transactions.

5.1.5 LinkedIn

LinkedIn is a user-populated work-related social network and company employee database that contains substantial amounts of information about UK video games companies and their staff. It is primarily used commercially for recruitment and sales lead generation. As its core data are reliant on users contributing information about themselves and their companies, it is only as accurate as the data the users provide.

M&A deal flow

LinkedIn does not provide this information.

Financial and other performance data for UK studios:

LinkedIn provides a snapshot of current headcount for many UK video games development studios. The accuracy of this snapshot relies on all those studios' employees being registered on LinkedIn and keeping their profiles updated. GIC company data derived from surveys indicate that neither can be relied upon, so the headcount number is useful as indicative data only.

Comprehensive UK studios database:

Company metatags and keyword searching on LinkedIn allow for the identification of a large number of UK video games development studios. However, these lists include numerous studios that have been closed down with no indication on the site that the company no longer exists.

5.2 VIDEO GAMES INDUSTRY SPECIFIC DATA SOURCES

5.2.1 Games Investor Consulting's UK video games company database[48]

The UK video games company database compiled by GIC is a longitudinal dataset of all known video games development studios in the UK containing a number of fields including company name, type, location, and development studio headcount. The data cover the period from 2008 to the present.

Data are collected at a frequency of every one to two years. Development studio headcounts are derived primarily from surveys and interviews which are then supplemented with data from Companies Housing filings (where available), company websites, press materials and multiple video games industry sources. For a minority of development studios (ca. 20-30%), reasonable estimates are made using other sources of data on the development studio.

In contrast with the problems of using SIC codes to identify development studios, GIC's dataset is an authoritative expert-based source of the list of all development studios in the UK, and their size and growth over time.

The dataset does not, however, presently contain Company Registration Number (a unique identification used by Companies House, which helps to link data on companies across sources) meaning that data linking with other sources would need to be done based on company name.

5.2.2 UK Games Map

Ukie, one of the UK's video games trade bodies, launched its original UK Games Map in partnership with NESTA in 2016 but has recently replaced this with a new version that launched in January 2023.[49] This version was supported by the BFI using National Lottery funds. It comprises a database of video games organisations including development studios as well as location information which allow the entries to be presented geographically as well as in list format. The UK Games Map company list was harvested from Companies House data to which machine learning technology has been applied to filter out entries seen to be invalid. The utility of the database to this research project is limited to providing another list of UK video games companies by location as it contains no performance data for the studios it has in the database.

5.2.3 Regional video games company lists

The UK houses a number of regional video games industry trade organisations, some of which maintain either member lists or lists of video games companies in their region. Examples include Game Republic, Scottish Games Network, NI Game Dev Network and Games Wales. The data from these sources comprise company lists that may not be kept up to date and some location information but no impact data.

[48] To avoid a conflict of interest, the review of GIC's UK video games company database was conducted by Oxford Economics

[49] https://map.gamesmap.uk

5.2.4 Sales data

One potential source of supplementary data that might be used to measure impact is to analyse sales performance for video games produced by studios pre- and post-acquisition. Unfortunately, there is no single source of data for all video games' sales. Instead, there are separate sources of data for different platforms and geographic regions. While some of these sources (such as GfK) track point-of-sale performance for retail (i.e. boxed) products, many use estimates to gross this data up to full market scale. Almost all digital sales data sources tend to use a combination of actual sales data supplied by video games publishers and estimates to calculate sales for video games whose publishers have not contributed data. To this highly fragmented and estimate-heavy data sources landscape additional complications are added, such as the complete lack of any per-title data on in-game advertising revenue or video games revenue generated from subscription services and streaming to cite a few examples. Finally, access to a sufficient number of sources to paint even a representative picture of individual title performance is likely to be prohibitively expensive.

5.3 SUMMARY

Consistent, reliable and accessible source data that covers the last decade of UK video games development industry history is largely non-existent. Companies House filings provide some information on every UK incorporation throughout their history, but this information is inconsistent in its usefulness for measuring impacts as most smaller companies provide little more than summary balance sheet information. Acquired companies tend to provide full accounts which include profit and loss accounts and often some headcount data. This is supported by research conducted by Oxford Economics into a sample of 15 acquired studios' historic filings which found a wide variance between the types of information supplied by companies. IDBR can help supply some data consistency but is limited to turnover and headcount data.

Identifying video games development companies from Companies House data and other company data providers is another significant challenge primarily because they all provide no reliable methods of categorisation that allow video games development companies to be differentiated from non-video games development companies. SIC-based categorisation is particularly ineffective given its 82% inaccuracy rate.

GIC's UK video games company database provides a video games development studio list as well as development studio headcount data for a period of over a decade. Its comprehensive coverage allows in principle for the creation of different types of control groups to which the acquired company data can be compared, for example UK or regional development studio groups, groups with specific development studio headcount ranges or mobile and console video games development studio groups. Although the GIC UK video games company database is proprietary, it is licensable. While the headcount data are effectively unverified and includes some estimates, it is largely comprised of data supplied by the studios themselves.

As an alternative to GIC's UK games company database, other data sources such as general business databases might be combined to provide some impact data, but not without potentially considerable additional investment in augmenting the data set, for example adding and verifying game studio categorisation meta data, and sourcing and appending historic impact data.

6. RECOMMENDED APPROACH

In this section, we investigate how the data sources identified might be used to assess the potential impacts of overseas M&A in the UK video games industry. We then assess the feasibility of undertaking quantitative analysis for each of the impacts using the methodological approaches identified in Section 4.

Following the assessment of data sources in the previous section, we believe the most promising source of data to identify UK games development studios and their ownership history is GIC's UK video games company database. That is, whether they have been subject to an overseas acquisition; domestically acquired; or whether they have not been subject to any acquisitions. It would then be possible to link these development studios to company financial data over time using a matching process. Financial information would primarily come from Companies House (accessed via a platform such as Fame) and the IDBR. Whilst we expect this linking exercise to be feasible, there would be caveats associated with particular fields within it, which are discussed in this section.

6.1 MAPPING DATA TO IMPACTS

We compared the datasets discussed in Section 5 (and the variables they capture) with the shortlist of impacts in section 2.3 to identify impacts that it may be possible to quantify using the available data and one of the methods set out in Section 4. We did this for each of the three stakeholder groups (target, acquirer, others), since the data sources differ for each type of stakeholder. A summary of this mapping exercise is presented in Fig. 10, which provides metrics for each impact and records whether the metric is captured in Companies House, the Interdepartmental Business Register (IDBR), or another dataset.

We found that 12 of the 18 metrics associated with the impacts identified are captured in at least one dataset. Companies House is likely to be the main source of data for financial impacts, with the IDBR providing further information.

This summary mapping does not consider data quality or coverage, which are discussed in section 5.1 and 5.2. In the following sections, we review our findings for impacts relating to each stakeholder group in turn.

Fig. 10. Overview of impact to dataset mapping

Impact	Metrics	Companies House (or equivalent for acquirers)	IDBR	Other[50]
Business survival	Firm exit	✓	✓	
Change in demand for upstream services	Intermediate consumption	✓		
Employment	No. of employees	✓	✓	✓
Firm value	Share price			✓
Innovation and R&D (and spillovers)	R&D expenditure (absolute / relative intensity)	✓		
Investment in (intangible) capital	Changes in intangible / fixed assets	✓	✓	
Loss of IP ownership overseas	Changes in intangible assets	✓		
Productivity	GVA or turnover per employee	✓	✓	
Profitability	Gross or net profit	✓	✓	
Quantity and quality of output	User/reviewer scores		✓	
Revenue	Turnover	✓	✓	
Wages	Average wage	✓		
Access to established game brands and their fans	N/A			
Access to established player bases and data	N/A			
Access to new platforms and revenue models	N/A			
Better up- and downstream supply chain connections	N/A			
Dynamic effects of talent exit	N/A			
Expansion and /or access into foreign markets	N/A			
Prevent royalty pay-outs to third party studio partners	N/A			
Wage growth causes retention issues in smaller indie studios.	N/A			

[50] "Other" includes commercial providers of share price data, and the GIC UK video games company database, which could be used as a longitudinal source for the number of developers employed at each studio.

6.1.1 Impacts on target firms

Fig. 11 contains a more detailed mapping of potential impacts on target firms to metrics in the data sources.

Data on firm-level financial performance such as revenue and profitability can be obtained from Companies House or the IDBR. To capture daily share price data as a proxy for firm value, there are many commercial options from which data can be web-scraped. Lastly, data on the quality of output can be obtained from a combination of Metacritic expert and user reviews (covering consoles and PC video games), and commercial mobile application stores (covering mobile video games).

There are several caveats associated with this mapping:

- **Limited reporting in Companies House.** Companies House is incomplete in its coverage of financial data as reporting requirements differ depending on the size of the firm. Our analysis of a sample of acquired studios suggests Companies House data will have limited sample sizes outside of the balance sheet and profit and loss metrics. As such, any analysis of employment and turnover would draw on the IDBR.
- **Limited number of listed companies.** There are fewer than 10 development studios in the UK which have been subject to an acquisition, and which are listed. This would not permit rigorous statistical analysis using an event study approach.
- **Development studios as cost bases.** Some development studios are treated as cost bases by the acquirer and do not book sales of video games produced in-house. For these businesses, revenue, profit and productivity will be understated after an acquisition. Our working assumption for the purposes of assessing feasibility is that 50% of acquisitions operate in this way. This follows from an assessment of the types of acquirers and their assumed behaviours based on industry expert views. Further granular analysis would need to be undertaken to test this assumption.
- **Additional data collection for quality of output.** To the project team's knowledge, there is no structured dataset on the quality of output for PC, console and mobile video games produced by UK studios. To construct such a dataset would be a resource intensive undertaking.

Data on targets would also need to be linked across datasets. In the absence of Company Registration Numbers in some datasets, data would need to be linked based on company names. This may be resource intensive, but we would not expect it to result in a substantive reduction in the number of observations available for analysis.

Fig. 11. Mapping target firm impacts to data sources

Impact	Metrics	Data source(s)	Notes
Business survival	Firm ceases trading	Companies House IDBR	
Employment	No. of employees	Companies House (global) IDBR (UK only) GIC Data (only development staff)	
Firm value	Share price	Datastream daily market cap	Very few target companies were listed (<10)
Innovation and R&D	R&D expenditure (absolute and as a share, e.g., of turnover, gross profits etc.)	Companies House	
Investment in capital	Changes in fixed assets	Companies house – balance sheet	
Loss of IP ownership overseas	Changes in intangible assets	Companies House – balance sheet	
Productivity	Labour productivity – GVA or Turnover per employee	Companies House – GVA / Turnover per employee IDBR – Turnover per employee	Overseas acquirers may use the development studio as a cost-base and recognise sales abroad, meaning sales/turnover are imperfectly measured. Separate research would be needed to identify where this is the case
Profitability	Gross / net profit	Companies House – profit & loss	See productivity
Quantity and quality of output	User/reviewer scores	Metacritic (web-scraped with manual corrections) App stores (manual collation of data on development studios)	Requires additional studio output research
Revenue	Turnover	Companies House IDBR	See productivity
Wages	Average wage	Companies House – Total wages and no. employees on financial statement	
Access to established player bases and data		No datasets identified	
Better up- and downstream supply chain connections		No datasets identified	
Expansion into foreign markets		No datasets identified	

6.1.2 Acquirer firm impacts

Fig. 12 maps impacts relevant to acquirer firms to metrics contained in the data sources.

Acquirer impacts are broadly similar to target impacts, but there are likely to be greater challenges in accessing appropriate data. For example, the multinational context means that an administrative dataset such as the IDBR cannot be drawn on and we would instead need to rely on international equivalents of Fame such as the Bureau Van Dijk Orbis database, for which coverage of certain metrics may not be as comprehensive.

Fig. 12. Mapping acquirer impacts to data sources

Impact	Metrics	Data source(s)
Innovation and R&D	R&D expenditure (absolute and as a share, e.g., of turnover, gross profits etc.)	BvD Orbis
Productivity	Labour productivity – GVA or Turnover per employee	BvD Orbis – GVA / Turnover per employee
Profitability	Gross / net profit	BvD Orbis – profit & loss
Quality of output	User/reviewer scores	Metacritic / app store game ratings
Revenue	Turnover	BvD Orbis
Share price	Changes in market capitalisation	Datastream
Access to established game brands and their fans		No datasets identified
Access to foreign markets		No datasets identified
Access to new platforms and revenue models		No datasets identified
Prevent royalty pay-outs to third party studio partners brought in-house		No datasets identified

6.1.3 Third party impacts

Fig. 13 maps impacts on third parties to metrics contained in data sources.

The quantity and quality of output are measured as for target firms, but with the focus on implications for consumers, who would be made better off by having access to higher quality video games. Similarly, innovation is measured using R&D expenditure, but the focus is on how R&D spending may "spill over" to other companies. The change in demand for upstream services in the UK can be proxied using intermediate consumption.

Caveats around data collection for quality of output, and data coverage for R&D spending apply for measuring third-party impacts as well. Measuring change in demand for upstream services is also constrained by limited data coverage at a sufficiently detailed level, and the inability to differentiate between domestic consumption and imports, which may change following an acquisition.

Fig. 13. Mapping third-party impacts to data sources

Impact	Metrics	Data source(s)	Notes
Change in demand for upstream services (e.g. outsourced art and quality assurance)	Intermediate consumption (Cost of Goods Sold – Wages) as a proxy for UK supply chain expenditure	Companies House	Development studio growth may stimulate demand for upstream services, or these may be outsourced outside of the UK (e.g. to suppliers of the publisher, or the publisher itself)
Knowledge spillovers from R&D and innovation	Productivity gains in wider video games industry / related industries	Companies House–R&D expenditure (as a proxy for innovation) GVA / Turnover per employee (as a proxy for productivity) IDBR – Turnover per employee (as a proxy for productivity)	Specifically interested in a firm's exposure to innovation spillovers depending on the nature of the business (see section 6.3.2)
Quantity and quality of output	User/reviewer scores	Metacritic (web-scraped with manual corrections) App stores (manual collation of data on development studios)	Requires additional studio output research
Dynamic effects of talent exit from acquired firms		No datasets identified	
Wage growth in acquired firms creates retention issues in smaller independent studios		No datasets identified	

6.2 FEASIBILITY OF ASSESSING IMPACTS USING AVAILABLE DATA

6.2.1 Suitability of the available data for econometric analysis

Having identified which impacts could potentially be analysed using the datasets outlined above, the next step is to assess whether the data sources might be suitable for use in econometric analysis. To consider this we investigated the available sample sizes for each data set. We also considered whether

extensive additional data collection might be required, and the other caveats outlined above. Our findings are summarised in the feasibility continuum in Fig. 14 which can be interpreted as follows:

- **Red**: no quantitative analysis is feasible. Any investigation of impacts would rely on qualitative or descriptive evidence.
- **Red amber:** quantitative analysis may be feasible, but with a limited sample size or other substantial data caveats which would limit the generalisability of findings,[51] and expected robustness of any statistical results.[52]
- **Amber green:** quantitative analysis is feasible, but will require data enrichment (revenue, profits, productivity)[53] or substantial additional data collection (quality of output). If these challenges are able to be overcome, then it may be possible to obtain robust and generalisable results.
- **Green**: quantitative analysis is feasible, with no additional data manipulation required, beyond accessing the information from the respective data sources. For these variables there is the best chance of obtaining statistically robust and generalisable results.

Financial performance and business size measures including revenue, profits, profitability, business survival and employment all fall into the green or amber-green categories. Thus, we expect that an empirical analysis of the impact of overseas video games M&A on acquired firm financial performance using the accounting approach described in section 4.2 should be feasible. We cannot be certain what any econometric analysis may reveal, but sample sizes are such that we anticipate there is a reasonable chance of obtaining statistically robust results with sufficient credibility to draw generalisable conclusions.

A number of impacts fall into the 'red', or 'amber-red' categories. Of particular interest in the 'red' category are share price, and loss of IP ownership. A robust analysis of share price impacts given the limited number of listed firms would not be possible. Similarly, loss of IP ownership would not be measurable due to the limited number of firms reporting data on intangibles, and complications in how intangibles are valued in cases where they are measured.

The relevance of missing or inadequate data for the assessment of market failures is discussed further in Section 7. Where data is not necessarily relevant to assessing the existence of market failures, it may also be instructive in understanding whether certain drivers of M&A activity are present. For example, access to - and possible transfer of - IP is identified in section 3.5 as a potential key driver of M&A, but

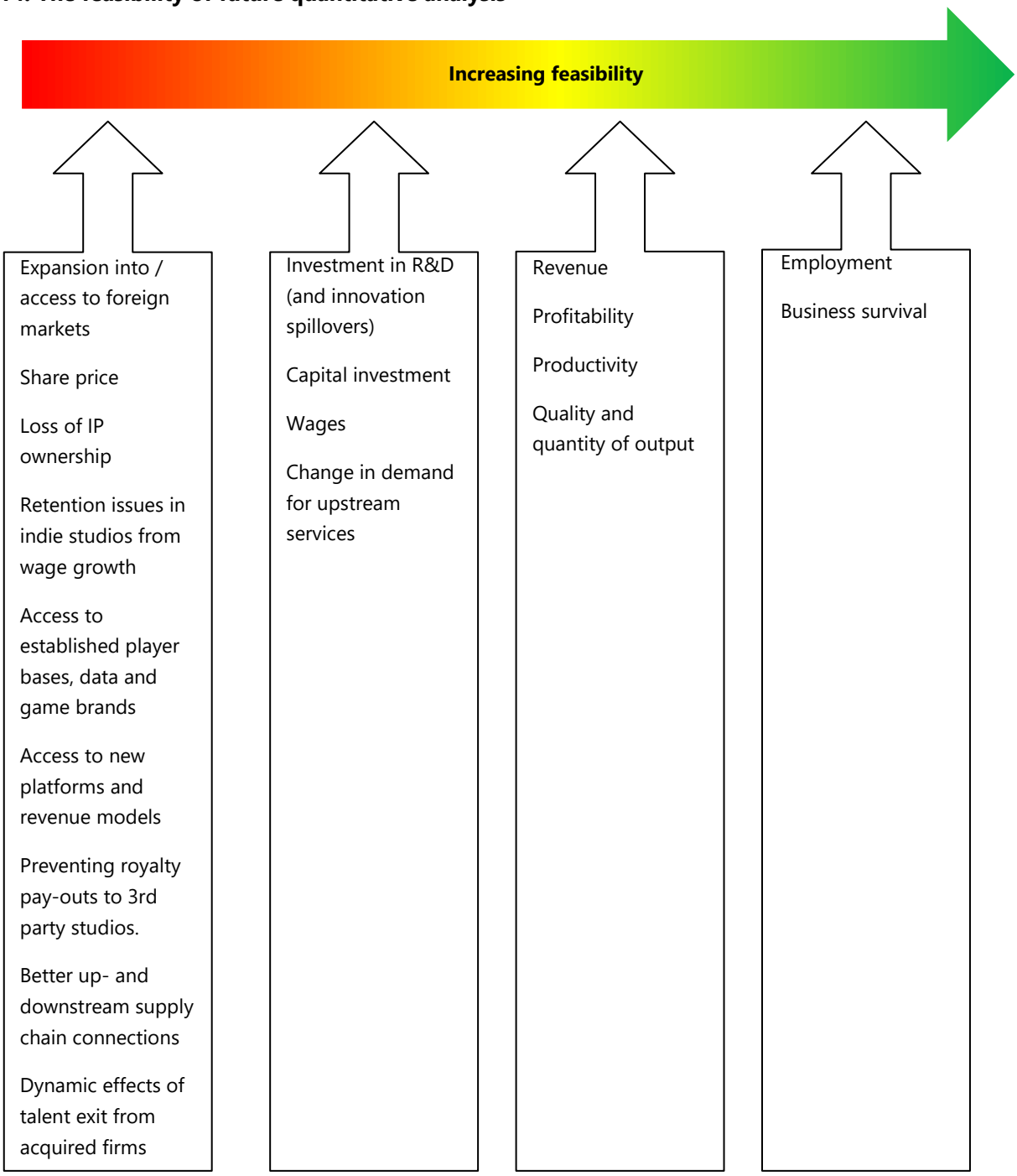
[51] Some Companies House metrics are only available for larger companies as reporting requirements depend on various turnover thresholds. Any analysis conducted on these metrics may not be generalisable to the wider population of development studios as outcomes may vary by firm size.

[52] A smaller sample size implies that any statistical estimates of impact will have a greater degree of uncertainty associated with them. For example, it may be difficult to conclude that the impact of overseas M&A is not zero, even when the true impact is positive or negative.

[53] For these impacts, an analysis of company accounts may be possible to identify which acquired firms are affected by offshoring of sales and profits. Subsequent analysis could look at the impact of overseas M&A on these firms separately, assuming this leaves sufficient sample amongst both types of firms.

the lack of appropriate data would not permit a quantitative analysis of whether acquired studios have realised systematic losses in IP ownership in practice.

Fig. 14. The feasibility of future quantitative analysis



6.2.2 The feasibility of event studies

Fewer than 10 of the transactions in the video games M&A database involve UK games development studios that are listed. This means there would be an insufficient sample size for rigorous econometric analysis. As such, any assessment of share price impacts on development studios subject to an overseas acquisition would be limited to descriptive analysis.

To increase the sample size available for event study analysis, the scope of the analysis could be expanded to include games studios subject to overseas M&A internationally. Alternatively, UK analysis could be expanded to include "similar" sectors to video games (e.g. animation and film). It is beyond the scope of this study to assess whether data are available for these types of wider study, but any such exercise would need to consider the extent to which broader findings might be expected to be reflective of the situation in the UK video games industry.

6.2.3 The feasibility of an accounting-based approach

From the analysis above we can conclude that an accounting-based approach to quantify the impact of overseas M&A on the financial performance would, subject to certain caveats, be feasible.

There are sufficient data to identify development studios, including those subject to an acquisition. Longitudinal data exist on accounting metrics of interest pre- and post-acquisition, though data coverage is limited for some metrics, and the approach would not permit an examination of medium-to long-term impacts for the most recent wave of acquisitions in the UK until sufficient time has passed for these to be observable.

A suitable econometric approach can be used to identify the causal impact of being subject to an overseas acquisition.

6.3 ECONOMETRIC APPROACHES TO ESTIMATE IMPACTS

Following the assessment that an accounting-based approach is the most feasible methodology to assess the impact of overseas M&A on UK development studios, and as this approach can be adapted to examine the wider impacts of overseas M&A, we set out in more detail what the econometric approach to do so would look like.

6.3.1 Impacts on firm performance

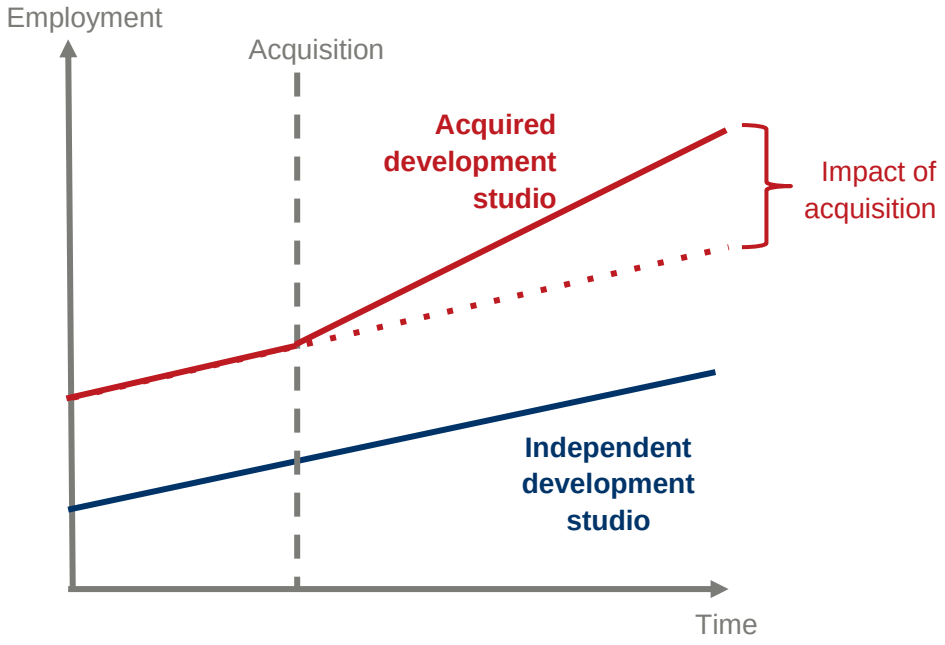
The objective of any future econometric analysis would be to quantify the impact of an overseas acquisition on the performance of the acquired firms. To do this, we need to estimate what would have happened to the acquired firm in the absence of the acquisition (the "counterfactual"). As this cannot be observed directly, one way of simulating this is by comparing acquired firms with other firms which were not acquired before and after the acquisition. However, a simple before and after comparison may be biased if, for example, an acquirer targets development studios that are particularly capable, and therefore would have achieved better outcomes even without the acquisition.

There are a number of ways to mitigate such sources of bias. Arguably the most suitable method to do this in the context of overseas M&A in the UK video games industry is known as "difference-in-

difference".[54] In this method, acquired firms are compared to a set of non-acquired firms before and after the acquisition (shown graphically in Fig. 15). This method "differences out" any factors which are constant over time, including those which cannot be observed and controlled for directly (e.g. firm culture).

It relies on the assumption of "parallel trends", which requires that acquired and non-acquired firms would have evolved according to the same trajectory in the absence of the acquisition, controlling for other factors (the dotted line in Fig. 15). Under this assumption, any differences from this trend can be inferred as being due to the acquisition. To increase the plausibility of the assumption, we would compare the acquired studios to a set of studios that, prior to the acquisition, were as similar as possible across a range of characteristics (e.g. firm size, age, location, pre-acquisition growth).[55]

Fig. 15. Difference-in-difference: an example depicting the impact of an overseas acquisition on employment



Given that we would expect to have access to longitudinal data for several periods prior to any acquisition, we can also test empirically whether, pre-acquisition, the parallel trends assumption holds. This can be done by comparing pre-acquisition trends in outcomes (e.g. revenue growth) for firms that were eventually acquired with those that were not.

[54] As the M&A transactions take place at different times, a method known as "staggered difference-in-differences" would be used to account for this, as described in Callaway & Sant'Anna, "Difference-in-Differences with multiple time periods", Journal of Econometrics, (2021), accessed December 2022.

[55] This could be implemented using difference-in-differences in a multivariate regression framework, or by matching the acquired firms to a set of similar non-acquired firms using a matching algorithm (e.g., "propensity score matching").

It may also be possible to go beyond looking at the average impact of overseas M&A to consider how different types of acquisition impact firms differently. For example, it may be possible to test how the acquisition size, or acquirer origin play a role in determining the impact an acquisition has.[56]

6.3.2 Spillover impacts

As per the impact shortlist (Fig. 4), levels of innovation may change in acquired firms, leading to possible sector-wide changes in knowledge spillovers. A different approach is required to estimate the impact of any changes in spillovers, as these would also accrue to third-party firms not subject to an acquisition.

If it can be established that investment in innovation (as measured by R&D spending) is impacted by M&A activity, a next step would be to understand the size (if any) of knowledge spillovers in the video games industry. Combining the two could allow for an assessment of the extent to which overseas M&A activity leads to a reduction in the spillover effect of innovation on productivity.

To understand the extent to which knowledge spillovers occur, we would split the sector into clusters of similar firms in which spillovers might be expected to occur. For example, we could define these clusters by platform as innovation in the mobile video games sector is less relevant (or not relevant at all) for PC video games development studios. This would allow us to see how a varying degree of exposure to innovation across sets of companies in different clusters impacts on productivity.

[56] It will likely only be possible to segment such analysis in two or three dimensions (e.g. US vs. non-US acquisitions)

7. MARKET FAILURES

HM Treasury's Green Book defines a market failure as occurring when it is possible to make UK society better off by changing the amount of a good or service provided by the market.[57] Or more formally, the market fails to maximise "social welfare". Instances of market failure are of interest to policymakers since they may present a case for intervention to improve social welfare.

Three examples of market failures relevant to this study are as follows:

- Externalities, which occur when an activity undertaken, for example by a business, imposes costs (or benefits) on another business, or group of individuals in a way that is not reflected in market prices. An example of a positive activity undertaken by business which creates benefits for a third party could be innovation. Innovation in this scenario is undersupplied as the innovating business does not account for the positive spillover benefits on other businesses in its decision on how much to innovate.
- Market power, which occurs when there is insufficient competition in a market such that one or more firms are able to influence the price at which goods and services are sold to the detriment of consumers.
- Asymmetric information, which occurs when one party in a transaction or relationship is better informed than the other. An example of this could be the management of a corporation making an acquisition to further its own interests at the expense of shareholders.

7.1 POTENTIAL SOURCES OF MARKET FAILURE RESULTING FROM OVERSEAS M&A IN THE UK VIDEO GAMES INDUSTRY

7.1.1 Potential mechanisms leading to market failure

For this study, the project team was asked to identify which impacts of overseas M&A in the UK video games industry may lead to a market failure. To do this we need to identify the mechanism through which the market outcome fails to maximise welfare. We considered various hypothetical scenarios through which a market failure could occur. Subject to feasibility, these could be tested at the full assessment stage. In the team's view, overseas M&A in the UK video games industry is most likely to result in market failure when one of the following four mechanisms is present:

- **Reduced innovative activity.** Innovation increases the productivity of the innovating firm and also has a positive externality in the form of higher productivity for other firms that may benefit from the innovation and spillovers of knowledge. We would not expect the wider impact of innovation on other firms to be considered by the parties in an M&A transaction—they will focus only on the expected costs and

[57] This definition is in accordance with HM Treasury's Green Book (2022), which defines a market failure as occurring when the "market is unable to provide satisfactory levels of welfare efficiency" (p.128). The Green Book defines social welfare, or social value, as being from "the perspective of UK society as a whole" (p. 40), where society includes UK residents, but not potential residents or visitors.

benefits to their own organisations. Acquisitions may also lead to a reduction in the number of small, independent studios. To the extent that smaller firms are better "innovators", this may reduce the total amount of innovation in the sector and reduce the long-run productive capacity of the UK economy.[58] This is particularly important in the UK video games sector as it is highly innovative, has many relatively small firms, and has seen a rapid increase in the number of acquisitions by large firms.

- **Overseas relocation of production and intangibles**. Acquirers may choose to consolidate valuable intangible capital in their home market (e.g., the intellectual property of a game franchise). This has the potential to reduce productivity and output in the UK video games industry if the acquired development studio is no longer contracted to work with that intellectual property.[59] At the level of the acquired firm, this should be reflected in its valuation; however, it may also lead to fewer opportunities for other UK firms to collaborate with development studios, for example as suppliers or subcontractors. This could reduce the scope for knowledge and productivity spillovers to these related industries. These potential "spillover" impacts are not considered in the theoretical framework described in section 2.1, since it seeks to explain why M&A occurs through the lens of private returns to the target and acquirer.
- **Value-reducing M&As**. Information asymmetry between the acquirer and the target may lead to over-optimistic expectations of the value of a development studio once it has been acquired. This may be compounded by misaligned incentives between senior managers and shareholders (e.g. short-run managerial pay-outs for successfully completed acquisitions) which mean that certain acquisitions may proceed even if they result in dis-synergies between the acquirer and target. These are often referred to as "agency costs" and may mean the combined value of the acquirer and acquiree falls following an acquisition. Interview evidence suggested dis-synergies may occur in the video games industry, for example due to staff motivational issues if the development studio's business model changes after an acquisition. This could lead to reduced productivity and output in development studios post-acquisition, which could be detrimental to social welfare.
- **Overseas profit transfers**. Interview evidence from senior stakeholders in acquired studios indicated that some studios' video games sales (and therefore profits) are recognised by the acquirer following an acquisition. As such, any profits previously realised in the UK are instead logged abroad, implying lower corporation tax receipts for the UK Exchequer. Welfare losses to society stem from the ensuing reduction in government expenditure (or increase in debt and debt servicing costs to maintain levels of expenditure). These considerations would not be reflected under the

[58] For example, Acs & Audretsch (1987) find that smaller firms tend to innovate more in industries which have a large share of skilled labour, and which are highly innovative. Zoltan J. Acs and David B. Audretsch, "Innovation, Market Structure, and Firm Size", The Review of Economics and Statistics, Vol 69, No. 4, (1987), pp. 567-574.

[59] Tomb Raider is a high profile example of this. It was moved, post-acquisition, by its acquirer from its original UK development team to a US development team and has never returned.

acquirer's decision to buy, or target's decision to sell as described in section 2.1 which are driven by profit maximisation.

A further common source of market failure resulting from M&A is market concentration, which leads to firms being able to exert market power, raising prices and/or reducing choice at the expense of consumers. The video games industry is highly globalised and transactions involving overseas acquisitions of UK games development are typically small in relation to the size of the market. For example, the median transaction value for predominantly UK-based studio sales in the video games M&A database is US$35 million vs a global market value of US$195 billion forecast.[60, 61] For these reasons, the project team judged that it is unlikely that overseas acquisitions of UK games development studios would result in a firm having market power.

7.1.2 Lack of access to finance leading to undervaluation of acquired firms

Interview evidence suggested that some UK studios may be undervalued (or feel pressured to sell prematurely) due to lack of access to domestic sources of finance. That is, some UK studio owners are unable to raise the capital required to continue running their company independently, or to realise their growth plans, meaning they choose to sell to overseas acquirers under disadvantageous circumstances. This may result in a sale at a price below the present value of expected future profits (or at an earlier stage in their companies' development than they would otherwise have liked) in order to access growth capital. In extreme cases, this can lead to fire-sales (i.e. at a deeply discounted valuation) and even acquihires in place of equity acquisitions (i.e. where the employees of a company are transferred en-masse into the employment of the acquirer to avoid the cost and complexity of an equity acquisition). These scenarios represent a welfare transfer from the UK owners to the foreign shareholders of the acquiring company. In the theoretical framework described in section 2.1 this phenomenon would show up as a deflated initial investment cost, implying a higher NPV and greater number of acquisitions above the breakeven criteria vs a scenario where there was access to external finance. This fifth, potential "upstream" market failure occurs in financial markets so is distinct from those described above.

7.2 FEASIBILITY OF A QUANTITATIVE ASSESSMENT OF THE SIZE OF MARKET FAILURE

We were asked to consider not only the feasibility of assessing the impacts of overseas M&A, but also the existence (and size) of any market failure associated with the phenomenon of overseas M&A. In

[60] Ampere Analysis (2022), https://www.ampereanalysis.com/insight/global-games-market-forecast-to-decline-in-2022

[61] The recent investigation of Microsoft's proposed acquisition of USA-based games publisher Activision Blizzard by competition authorities around the world is a rare example of a games industry acquisition being considered potentially anti-competitive. In this case, the UK's Competition & Markets Authority provisionally concluded in April 2023 that the proposed acquisition by Microsoft "will substantially weaken competition" in "the market for cloud gaming services" and had decided to prevent the merger proceeding. The CMA reopened its consultation on the acquisition in early August 2023 with a final decision yet to be made. Competition & Markets Authority "Microsoft / Activision Blizzard merger inquiry", accessed August 2023

other words, is the phenomenon of overseas M&A welfare-reducing from the perspective of UK society?

This requires an assessment of the impact of overseas M&A on the welfare of relevant stakeholders in the UK, in light of the potential sources of market failure described above compared with a counterfactual where these do not occur. This is conceptualised in Fig. 16. Under this framework, any welfare losses would need to be quantified, monetised and set against any welfare gains (e.g. increases in profitability due to synergies between the acquirer and target) to come to a view on the existence and significance of any market failure.

Fig. 16. Framework for assessing welfare implications of possible market failure resulting from overseas video games M&A

		Market failure channels				
		Reduced innovation spillovers	Value-reducing M&As	Overseas profit transfers	Overseas relocation of production and intangibles	Lack of access to finance leading to undervaluation
Stakeholder Groups	Target development studio		Profitability			Wealth transfer
	Other UK development studios and wider games ecosystem	Profitability and wages			Profitability, employment and wages	
	Employees of UK studios	Wages	Wages (and employee wellbeing)			
	Consumers	Price and quality of games output	Price and quality of games output			
	UK Government	Tax revenues	Tax revenues	Tax revenues	Tax revenues	

Below we describe how welfare changes resulting from each of the potential channels of market failure could potentially be assessed, and briefly consider the feasibility of doing so.

7.2.1 Reduced innovative activity

To assess the impact of reduced innovative activity, it would first be necessary to quantify the change in innovative activity resulting from overseas M&A activity. Investment in innovation can be proxied by expenditure on research and development (R&D). The next step would be to estimate the spillover

impact of any change in R&D expenditure on UK gross domestic product (GDP), which would give a measure of the change in welfare due to the market failure.

In practical terms this would be difficult to assess for the video games industry as we estimate that only 10-15% of acquired firms hold R&D data both before and after an acquisition, which means any analysis of the effect of M&A on innovation expenditure would rely on a very limited sample of firms. Analysis could instead focus on a broader set of industries beyond video games to permit a larger sample of firms to be examined. It is beyond the scope of the current study to determine precisely which industries such analysis may be feasible for, but there are existing academic studies on the economy-wide spillover impact of R&D spending on social welfare.[62] Nonetheless, it would not be possible to determine the degree to which such broader findings would apply to video games.

7.2.2 Overseas relocation of production and intangibles

At the level of the acquired firm, the impact of the relocation of production and intangibles (such as game and technology IP) on firms' profitability should be reflected in the cost of acquisition. However, it may also reduce opportunities for other UK firms to collaborate with development studios, reducing the scope for knowledge spillovers to related industries.

The approach to measuring the ensuing impact would be similar to that described in section 7.2.1 for innovation as it would represent a negative productivity shock to firms who may have benefited from working with development studios who own valuable IP. Any change in the value of IP in UK games development studios would need to be estimated econometrically, and then the spillover impact of changes in the stock of IP would need to be estimated in GDP terms.

As a first step, it would be necessary to systematically observe the transfer of IP overseas in companies' accounts and to value this IP. In practice, this is not likely to be possible, meaning quantifying this market failure is not likely to be feasible.

7.2.3 Value-reducing M&As

Post-acquisition dis-synergies (such as those identified in section 7.1) could reduce productivity in the target firm. This could lead to a range of negative welfare impacts including lower profits for shareholders; lower wages (and wellbeing) for workers; higher prices; lower quality and quantity of games for consumers; and lower tax revenues for the Exchequer. The existence of such impacts could potentially be assessed through econometric analysis, as set out in section 6.3, to quantify any reduction in productivity and impacts on profits, wages, employment, and the quantity and quality of games.

This would require construction of a suitable counterfactual to disentangle the potential negative impact of the dis-synergistic M&A from other factors related to the merger or acquisition. Where negative impacts occur, qualitative research such as surveys or interviews may shed light on what this is driven by, and whether and in what percentage of cases these represent dis-synergies relating to the acquisition.

[62] For example, Lucking, Bloom & Reenen find that the social return to spending on R&D is about four times that of the private return. Brain Lucking, et al, "Have R&D Spillovers Declined in the 21st Century?", *Fiscal Studies, Vol 40, No. 4,* (2019), pp. 561-590.

7.2.4 Overseas profit transfers

Understanding whether the transfer of profit overseas occurs would require additional data collection using acquired companies' accounts to identify whether studios' games sales are booked domestically by the development studio or overseas. For the subset of development studios whose sales are booked overseas, changes in profits versus the counterfactual would be assumed to now be booked overseas. The corporation tax rate can be applied to this to estimate the loss of Exchequer revenue.

The data requirements for this mean such an exercise would be difficult. It would require an examination of development studio's accounts pre- and post-acquisition and the use of an algorithm which assigns a "profit transfer" status to development studios if certain changes are observed (e.g. zero net profit for several years after an acquisition, where previously positive or negative net profits were observed, which would be consistent with the development studio being used as a cost base). This is complicated by the unevenness of studio revenues due to the development and release cycles of games.

Given these complexities, we would have a low degree of confidence that sufficiently robust data could be collected for rigorous statistical analysis.

7.2.5 Lack of access to finance leading to undervaluation

To assess whether a firm is undervalued at acquisition, it would be necessary to estimate the risk-adjusted Net Present Value of future cash flows of the acquired company at the point of sale and compare this to the price paid for the business. The difference in value represents the welfare gain or loss resulting from the sale of the business for the original shareholders.

Ideally, the NPV forecast carried out at the time of the acquisition would be compared to the purchase price to infer whether the target was significantly over- or under-valued.[63] In practice, accessing such data is not likely to be feasible. As such, quantifying whether acquired firms were undervalued at acquisition would likely not be possible.

7.2.6 Concluding remarks

In summary, it would be feasible to undertake analysis to identify whether the five potential causes of market failure are present. This would take the form of econometric analysis on the impact of M&As on R&D spending, wages, employment, profits, productivity, and game quality and quantity to understand how businesses and their output perform relative to non-acquired businesses.[64] The methodology used to do this would take the form set out in section 6.3.

This could be supplemented by qualitative research to investigate whether the M&A transaction led to market failures, for example by creating dis-synergies between UK development studios and their acquirer, or by reducing innovation within the UK. The six interviews conducted for this scoping study

[63] Research could be undertaken to estimate NPV forecasts ex-post, however any differences may then be due either to an under- or over-valuation or differences in the forecasting approach taken. This is particularly relevant as forecasting the NPV of future cash flows of acquired firms would require strong assumptions on, for example, industry growth.

[64] Subject to the feasibility of assessing each of the impacts, as set out in Fig. 14. Each of the impacts listed are at least "Red amber".

provided anecdotal evidence of potential dis-synergies (section 7.1.1) resulting from overseas M&A. Analysis from a larger sample of firms, including acquirers, could yield further insights and explanation for any impacts observed in the econometric analysis, and whether these may constitute market failures.

However, we do not believe it would be feasible to fully quantify the potential welfare changes resulting from overseas M&A in the UK video games sector to reach robust conclusions with regard to the size of any market failures. Doing so would require extensive additional data collection. As shown in Section 6.2, the nature of data sources available and the relatively limited sample of acquired UK video games development studios means that, in our view, it is unlikely that the extensive data requirements could be fulfilled.

APPENDIX 1: DEFINITIONS

For the purposes of this research project, we used the following definitions:

Video games industry: The production, promotion, distribution and sale of interactive entertainment aimed at consumers on digital platforms. The primary digital platforms covered by the scope of this research are dedicated video games consoles, personal computers (PCs) and mobile devices because the value generated by these three markets represents the vast majority of video games industry revenues worldwide. Secondary digital platforms such as virtual and augmented reality devices, interactive TV and video games streaming services are also within the scope of this research. Video games which are not subject to gambling regulations that employ elements of gambling systems such as social casino video games and video games with loot box monetisation are included in this research.

There are several adjacent industries that share similarities with the video games industry, but which are excluded from this research:

- Gambling and video games of chance that are subject to UK gambling regulations
- Fantasy sports and sports betting whether regulated or not
- Educational video games/edutainment that is primarily targeted at educational establishments
- Simulation software (which is not designed for entertainment use)
- Non-commercial gaming such as charities' video games and museums exhibits/installations
- Board or table top gaming, card gaming or other primarily non-digital gaming
- Gamification and similar systems that employ elements of video games in non-game digital products and sectors to incentivise interaction and/or learning
- Esports event management companies and teams.

Video games development studio: UK based video games development companies that create (i.e. design and programme) video games or parts of video games (as one of a group of entities collaborating on a single game). Such companies comprise one or more studios and can work on multiple projects at any given time. We include UK-incorporated video games development studios which operate virtually with staff working remotely, including those with staff working from multiple countries. The video games development landscape is complex, incorporating differing business models, ownership and organisational structures and levels of autonomy. To keep the definitions simple for the purposes of this research, video games development companies can be broadly split into two categories:

- Development studios: Autonomous studios that can choose between self-publishing or using a third-party publisher for the video games they produce. This category mostly comprises "indie" or independent studios (one example being Rebellion) that are privately held and operate with a high degree of autonomy. It also includes studios that are subsidiaries of entities that are themselves indie development studios, which offer no publishing services or that grant them the freedom to self-

publish or work with other publishers (one example being Sumo Group, part of Tencent).

- Publisher studios: Those development companies that are internal operations or subsidiaries of publishers (one example being Electronic Arts). Video games produced by publisher studios are only ever published by their parent companies. As such, a formerly independent development studio that has been acquired by a publisher and its video games published by that publisher would move into the publisher studio category (one example being Firesprite).

Video games publisher: Video games publishers are responsible for the promotion, sale and distribution of video games. Some (but not all) publishers have internal studios that develop video games for them (see Publisher Studios above). Most publishers also publish video games developed by third parties and these video games' production can sometimes be partially or wholly funded by the publisher. Development studios that self-publish their own video games (one example being Outplay Entertainment) are not included in this category but those that may have begun as development studios and expanded their core business to publish third party video games (one example being Team 17) would be included.

Service companies: Largely excluded from this research are video games development service companies that facilitate the video games development process by working closely with independent studios and publisher studios. These include art and animation specialists, music and audio companies, quality assurance and testing companies, commercial optimisation specialists, acting and performance capture companies, programming support specialists, and tools and middleware providers. Unless these companies design and code entire video games or material proportions of video games (one example being Dlala Studios), they are excluded from the development studio and publisher studio categories and therefore the focus of this research.

Mergers and acquisitions (M&A): This project is focused on specifying what data sources and research methods are needed to assess the impact of overseas acquisitions of UK development studios and to establish if there are market failures. The majority of video games M&A comprises the outright acquisition of 100% of the share capital of the target company. However we define an acquisition as any transaction in which over 50% of the share capital of the target company is acquired thereby providing the acquirer with a controlling interest. For the purposes of this research we exclude intellectual property acquisitions, "acquihires" (the mass hiring of an entire studio's staff) or other asset transfers and purchases where the share capital in the underlying development studio target is not involved.

Overseas acquirer: An overseas acquirer is defined as one where the ultimate owner is head quartered outside of the UK. Almost all larger M&A involves acquirers that are subsidiaries of the ultimate owners so even if the legal entity making the acquisition is based in the UK it is still counted as an overseas acquirer if an overseas company ultimately owns the acquiring entity. In some situations multiple levels of subsidiaries may be involved. For example China-based Tencent is the ultimate owner in a dozen M&A transactions involving UK studios. However, many of these acquisitions have been made via subsidiaries including Supercell, Miniclip and Riot Games and in several situations UK-based subsidiaries of these companies are the acquiring entity. All of them count as overseas acquisitions for this research.

Acquired firms: Domestic targets comprise video games development studios and video games publisher studios with an incorporation in the UK that have been acquired by overseas buyers. Most domestic targets in this study are incorporated in the UK only and their studios are based in the UK only too. However, the study also includes UK registered companies where either the majority or even the entirety of development operations exist outside of the UK such as Turkey headquartered Gram Games which had a UK studio and subsidiary incorporation when USA-based Zynga acquired it.

APPENDIX 2: M&A TIME SEQUENCE

Video games mergers and acquisitions between 1993 and 2022

Announcement Date	Target	Ultimate acquirer (acquiring entity)	Acquirer location	Transaction value (USD, million)	Majority of operations in UK
21/5/1993	Psygnosis	Sony	Japan	-	Yes
30/6/1994	Virgin Interactive Entertainment (75% stake)	Viacom (Spelling Entertainment)	USA	220.00	No
6/1/1995	Bullfrog Productions	Electronic Arts	USA	-	Yes
10/10/1995	Probe Entertainment	Acclaim	USA	-	Yes
12/4/1996	Ocean International	Infogrames	France	150.00	Yes
1/6/1998	Digital Integration Games	Titus Interactive	France	-	Yes
1/12/1998	Reflections Interactive	GT Interactive	USA	13.50	Yes
25/3/1999	Gremlin Group plc	Infogrames	France	40.00	Yes
29/9/1999	DMA Design (from Infogrames)	Take-Two	USA	12.30	Yes
1/2/2000	Neopets.com	Neopets Inc / private investors	USA	-	Yes
1/5/2002	Ignition Entertainment	IVP Technology Corporation	USA	7.75	Yes
24/9/2002	Rare	Microsoft	USA	375.00	Yes

Announcement Date	Target	Ultimate acquirer (acquiring entity)	Acquirer location	Transaction value (USD, millions)	Majority of operations in UK
16/10/2003	Studio33	Electronic Arts	USA	-	Yes
18/2/2004	Vis Entertainment plc	BAM! Entertainment	USA	7.00	Yes
8/4/2004	Mobius Entertainment	Take-Two	USA	6.60	Yes
28/7/2004	Criterion	Electronic Arts	USA	68.00	Yes
26/8/2004	Blue Beck	Mforma	USA	-	Yes
1/9/2004	Venom Games	Take-Two	USA	1.20	Yes
1/12/2004	Macrospace	Sorrent	USA	-	Yes
2/12/2004	IOMO	InfoSpace	USA	15.00	Yes
9/3/2005	The Creative Assembly	Sega	Japan	30.00	Yes
8/6/2005	Mind's Eye Productions	The Walt Disney Internet Group	USA	-	Yes
15/6/2005	Swordfish Studios	Vivendi Universal Games	France	-	Yes
4/10/2005	Pitbull Syndicate	Midway	USA	3.10	Yes
2/2/2006	Blimey! Games (51% stake)	10Tacle Studios	Germany	-	Yes
6/3/2006	Juice Games	THQ	USA	-	Yes

Announcement Date	Target	Ultimate acquirer (acquiring entity)	Acquirer location	Transaction value (USD, millions)	Majority of operations in UK
4/4/2006	iFone	Glu	USA	23.50	Yes
4/4/2006	Sports Interactive	Sega	Japan	-	Yes
6/4/2006	Lionhead	Microsoft	USA	-	Yes
28/9/2006	Climax Racing	Buena Vista Games / Disney	USA	-	Yes
14/12/2006	Ignition Entertainment (70% stake)	UTV Software Communication	India	13.00	Yes
15/12/2006	Kuju Plc	Catalis	Netherlands	8.50	Yes
17/8/2007	Sumo Digital	Foundation 9	USA	-	Yes
20/9/2007	Evolution Studios	SCE Worldwide	Japan	32.80	Yes
26/9/2007	Bizarre Creations	Activision	USA	67.40	Yes
8/11/2007	TT Games	Warner Bros.	USA	133.00	Yes
7/1/2008	Astraware	Handmark	USA	-	Yes
24/1/2008	Superscape Group plc	Glu Mobile	USA	36.00	Yes
12/9/2008	FreeStyleGames	Activision	USA	-	Yes
12/2/2009	Eidos plc	Square Enix	Japan	121.00	Yes
9/11/2009	Playfish	Electronic Arts	USA	300.00	Yes

Announcement Date	Target	Ultimate acquirer (acquiring entity)	Acquirer location	Transaction value (USD, millions)	Majority of operations in UK
23/2/2010	Rocksteady Studios (majority stake)	Warner Bros.	USA	-	Yes
2/3/2010	Media Molecule	SCE Worldwide	Japan	-	Yes
13/1/2011	Playdemic	Rockyou	USA	-	Yes
3/2/2011	Jagex (55% shareholding)	Insight Venture Partners	USA	-	Yes
27/4/2011	Wonderland Software	Zynga	USA	-	Yes
16/9/2011	Bossa Studios	News Corp (Shine Group)	USA	-	Yes
17/2/2012	LittleTextPeople	Linden Lab	USA	-	Yes
2/11/2012	Digital Goldfish	Ninja Kiwi	New Zealand	-	Yes
1/10/2013	Future Games of London	Ubisoft	France	-	Yes
30/1/2014	NaturalMotion	Zynga	USA	527.00	Yes
5/8/2014	Pitbull Studios	Epic Games	USA	-	Yes
12/9/2014	DR Studios	Digital Bros (505 Games)	Italy	2.60	Yes
19/2/2015	Miniclip	Tencent	China	-	Yes
13/5/2015	Engine Room Games	Unity	Denmark	-	Yes
1/7/2015	Delinquent Interactive	MAG Interactive	Sweden	-	Yes

Announcement Date	Target	Ultimate acquirer (acquiring entity)	Acquirer location	Transaction value (USD, millions)	Majority of operations in UK
2/11/2015	King Digital Entertainment	Activision Blizzard	USA	5,900.00	No
15/2/2016	Plumbee	GSN (Sony)	USA	-	Yes
14/3/2016	Jagex (from Insight Venture Partners)	Shanghai Hongtou Network Technology / Fukong Interactive Entertainment	China	300.00	Yes
17/6/2016	Neon Play	Lagardere Group (Hachette)	France	-	Yes
3/7/2016	Splash Damage	Radius Maxima (Leyou Technologies Holdings)	China	150.00	Yes
18/1/2017	FreeStyle Games (from Activision)	Ubisoft	France	-	Yes
8/2/2017	Playdemic	Warner Bros (TT Games)	USA	-	Yes
31/3/2017	Fuzzy Frog Ltd majority stake	Hugo Games	Denmark	-	Yes
23/5/2017	Space Ape Games (62% stake)	Tencent (Supercell)	China	55.80	Yes
19/10/2017	d3t	Keyword Studios	Ireland	3.90	Yes
14/2/2018	Koch Media/Deep Silver Dambuster Studios	THQ Nordic	Sweden	150.00	No

Announcement Date	Target	Ultimate acquirer (acquiring entity)	Acquirer location	Transaction value (USD, millions)	Majority of operations in UK
27/3/2018	Playsport Games	Tencent (Miniclip)	China	-	Yes
20/4/2018	Studio Gobo	Keyword Studios	Ireland	35.60	Yes
10/5/2018	GamersFirst/Reloaded Productions Ltd	Little Orbit	USA	-	Yes
15/5/2018	Yakuto	Tencent (Miniclip)	China	-	Yes
21/5/2018	Big Pixel Studios	Warner Bros. (Adult Swim)	USA	-	Yes
30/5/2018	Gram Games	Zynga	USA	250.00	No
10/6/2018	Ninja Theory	Microsoft	USA	-	Yes
10/6/2018	Playground Games	Microsoft	USA	-	Yes
10/7/2018	Skymoons Edinburgh (from Skymoons Digital Entertainment)	Little Orbit	USA	-	Yes
27/11/2018	Edge Case Games	Wargaming	Belarus	-	Yes
8/2/2019	Masomo	Tencent (Miniclip)	China	-	No
3/5/2019	Well Played Games	Phoenix Games	Germany	-	Yes
9/5/2019	Two Point Studios	Sega	Japan	-	Yes
18/6/2019	Sensible Object	Niantic	USA	-	Yes
18/6/2019	Antimatter Games	Toadman Interactive	Sweden	-	Yes

Announcement Date	Target	Ultimate acquirer (acquiring entity)	Acquirer location	Transaction value (USD, millions)	Majority of operations in UK
11/12/2019	Gumbug	Voodoo	France	-	Yes
17/3/2020	Eight Pixels Square (from Outplay Entertainment)	Tencent (Miniclip)	China	-	Yes
16/4/2020	Hypixel Studios Ltd	Tencent (Riot Games)	China	-	Yes
28/4/2020	Jagex (from Fukong Interactive Entertainment)	Macarthur Fortune	USA	530.00	Yes
26/6/2020	Coconut Lizard	Keyword Studios	Ireland	1.70	Yes
5/10/2020	Coatsink Software	Thunderful Group	Sweden	30.00	Yes
12/10/2020	Ruffian Games	Take-Two (Rockstar Games)	USA	-	Yes
28/10/2020	Everguild Ltd	Stillfront Group	Sweden	2.10	No
18/11/2020	Silent Games	Embracer Group	Sweden	-	Yes
8/12/2020	Hutch Games	Modern Times Group	Sweden	275.00	Yes
14/12/2020	Codemasters Group Holdings plc	Electronic Arts	USA	1,200.00	Yes
23/12/2020	Splash Damage (Radiius Maxima/Leyou)	Tencent	China	1,500.00	No
25/1/2021	Jagex (from Macarthur Fortune)	The Carlyle Group	USA	-	Yes

Announcement Date	Target	Ultimate acquirer (acquiring entity)	Acquirer location	Transaction value (USD, millions)	Majority of operations in UK
2/3/2021	Tonic Games Group	Epic Games	USA	-	Yes
8/3/2021	Six To Start	OliveX	Australia	6.65	Yes
24/3/2021	Ninja Kiwi Europe Ltd	Modern Times Group	Sweden	142.00	No
22/4/2021	Climax Studios	Keyword Studios	Ireland	37.30	Yes
25/5/2021	Supersonic Software	Tencent (Miniclip)	China	-	Yes
23/6/2021	Playdemic (from Warner Bros)	Electronic Arts	USA	1,400.00	Yes
19/7/2021	Sumo Group plc	Tencent	China	1,260.00	Yes
19/8/2021	Playright Digital Entertainment (63.75% stake)	Qiiwi Games	Sweden	0.90	Yes
8/9/2021	Firesprite Games	Sony	Japan	-	Yes
29/9/2021	Fabrik Games	Sony (Firesprite)	Japan	-	Yes
5/11/2021	Nerial	Devolver Digital	USA	-	Yes
5/11/2021	FireFly Studios	Devolver Digital	USA	-	Yes
15/11/2021	Roll7	Take-Two	USA	-	Yes
10/1/2022	NaturalMotion (Zynga)	Take-Two	USA	12,700.00	No
18/1/2022	Activision Blizzard Inc's UK companies	Microsoft	USA	68,000.00	No

Announcement Date	Target	Ultimate acquirer (acquiring entity)	Acquirer location	Transaction value (USD, millions)	Majority of operations in UK
24/2/2022	TutoTOONS	Aonic Group	Sweden	-	No
2/5/2022	Square Enix	Embracer Group	Sweden	300.00	No
30/5/2022	Trailmix (majority stake)	Tencent (Supercell)	China	60.00	Yes
24/6/2022	Sybo UK (Sybo)	Tencent (Miniclip)	China	-	No
12/7/2022	Supermassive Games	Egmont Group (Nordisk Games)	Denmark	-	Yes
19/7/2022	Paradyme Limited	Tencent (Miniclip)	China	13.40	Yes
15/11/2022	Jumpship	Thunderful Group	Sweden	7.10	Yes
9/12/2022	Bulkhead	Tencent (Splash Damage)	China	-	Yes

APPENDIX 3: EVIDENCE REVIEW TO IDENTIFY LONG LIST OF IMPACTS

EVIDENCE REVIEW APPROACH

Oxford Economics undertook a literature review to generate an initial list of the potential impacts of overseas M&A. To do this, we ran searches on a series of terms through literature databases. From this, we identified an initial list of relevant literature. We expanded this initial list by a "snowball approach" whereby we identified relevant literature cited by articles in the initial list, and within other articles that cited articles in the initial list. We filtered the resulting list of articles to, where possible, focus on articles with robust research designs which establish the causal impact of overseas M&A. We then reviewed the most relevant ones in greater detail. This review stage included published academic articles, books, and "grey literature" (e.g. white papers, government documentation, and working papers).

We also drew on evidence from six interviews carried out by GIC with senior figures from the UK video games industry whose development companies were acquired by overseas buyers.

IMPACTS ON TARGET FIRMS ACQUIRED BY OVERSEAS ENTITIES

Our review identified that impacts on the target company typically fall into six themes: productivity, R&D and innovation, investment, financial performance, employment and wages, and firm survival. Below we discuss each of these in turn.

Productivity

M&A may create efficiency gains through several channels, resulting in productivity improvements. Efficiency gains may be driven by:[65]

- economies of scale that result from operating as part of a larger enterprise, e.g. in the form of greater bargaining power, or the increased specialisation of labour;
- economies of scope, e.g. by eliminating duplicative activities and coordinating R&D investments;
- the reallocation of production across firms to where it is most productive; and
- the reorganisation of managerial structures.

Productivity can be measured in terms of labour productivity (the amount of output per worker), or total factor productivity (TFP), which measures how efficiently labour and capital are used.

There is evidence that overseas M&A leads to increases in labour productivity post-takeover. Conyon et al. show an increase in labour productivity after an overseas acquisition in a sample of UK

[65] *Adapted from: Klaus Gugler & Ralph Siebert, "*Market Power versus Efficiency Effects of Mergers and Research Joint Ventures: Evidence from the Semiconductor Industry*", The Review of Economics and Statistics, (2007)*, pp.645-659, accessed November 2022

manufacturing firms.[66] Schiffbauer et al. find positive impacts on labour productivity for both manufacturing and services firms, with a particularly large effect for manufacturers.[67] They show that this is likely driven by manufacturing firms becoming more capital intensive over time, particularly relative to the services sector, which may explain the larger productivity impacts for manufacturing.

The evidence on total factor productivity is less clear. Harris & Robinson provide evidence that total factor productivity may have declined in the short-term after an acquisition, consistent with problems assimilating established plants into the new organisation.[68] Similarly, Schiffbauer et al. find no aggregate impact of foreign acquisitions on total factor productivity in a sample of UK firms.[69]

In contrast, Girma et al. look at the impact of overseas acquisitions on total factor productivity in manufacturing firms in the UK.[70] They find that there are productivity improvements for firms in industries which are less R&D intensive than the same industry in the acquirer's country, which they suggest may be evidence of productivity increasing due to technology imports by the target from the acquirer. Bertrand & Zitouna show that horizontal acquisitions by overseas firms in France also increase total factor productivity.[71]

R&D and innovation

R&D and innovation are valuable as long-term drivers of productivity, both within the innovating business and more widely as knowledge and know-how find applications in other firms and industries. M&A may allow firms to share risks associated with uncertain technologies and large sunk costs, which may lead to an increase in R&D investment (Gugler & Siebert). It may also lead to deduplication of activities, potentially shifting combined R&D expenditures towards the target or acquirer.

Evidence on the impact of M&A on R&D spending and innovation is mixed. In a cross-sector sample of Spanish firms which were the target of overseas acquisitions, Guadalupe et al. show that manufacturing firms conduct more product and process innovation after an acquisition and suggest this may be in part driven by the access to foreign markets provided by the parent firm.[72] Bandick et al. similarly find amongst Swedish firms subject to foreign takeovers that R&D intensity (the ratio of expenditures on R&D to sales) increased after foreign acquisition.[73] Bertrand also finds that French

[66] Martin Conyon, et al, "The Productivity and Wage Effects of Foreign Acquisition in the United Kingdom", *The Journal of Industrial Economics*, (2002a), pp.85-102, accessed September 2022

[67] Marc Schiffbauer, et al, "Do foreign mergers and acquisitions boost firm productivity", *International Business Review,* (2017), pp.1124-1140, accessed November 2022

[68] Richard Harris, & Catherine Robinson, "The Effect of Foreign Acquisitions on Total Factor Productivity: Plant Level Evidence from U.K. Manufacturing, 1987-1992", *The Review of Economics and Statistics*", (2002), pp.562-568, accessed September 2022

[69] Marc Schiffbauer, et al, "Do foreign mergers and acquisitions boost firm productivity", *International Business Review,* (2017), pp.1124-1140, accessed November 2022

[70] Sourafel Girma, et al, "International Acquisitions, Domestic Competition and Firm Performance", *International Journal of the Economics of Business*, (2006), pp.335-349, accessed October 2022

[71] Olivier Bertrand, & Habib Zitouna, "Domestic versus cross-border acquisitions: which impact on the target firms' performance?", *Applied Economics*, (2008), pp.2221-2238, accessed November 2022

[72] Maria Guadalupe, et al, "Innovation and Foreign Ownership", *American Economic Review*, (2012), pp.3594-3627, accessed November 2022

[73] Roger Bandick, et al, "Foreign acquisitions, domestic multinationals and R&D", *The Scandinavian Journal of Economics*, (2014), pp.1091-1115, accessed September 2022

manufacturing firms increased their R&D spending both in-house and externally (e.g. via local universities) following an overseas acquisition.[74]

However, Stiebale & Rieze find that overseas acquisitions have a negative impact on both the propensity to engage in R&D and the average amount of R&D expenditure in a representative sample of German firms.[75] That is, fewer firms subject to an overseas M&A transaction record any R&D spending, and those who do spend less on R&D. They suggest this may be due to relocation of existing R&D activities overseas and rationalisation of expenditures (e.g., through eliminating duplicated activities). As such, it may be that there is a transfer from acquirer to acquiree (or vice versa) depending on the context, rather than a net increase.

In the video games industry, Ishihara & Rietveld look at the impact of overseas acquisitions of development studios by publishers on product innovation.[76] They find that acquired development studios were less likely to release innovative video games than independents, where innovation is defined as the game being based on original rather than existing IP (i.e. precluding sequels, sports licenses, film adaptations etc.). In short, publishers acquire existing successful IP, but are less likely to leverage development studios' capabilities to produce video games based on new IP. They suggest this may be driven by a reduction in autonomy and increased financial controls that may arise after an overseas takeover.

Investment

There is some evidence that firms subject to an overseas acquisition increase capital investment expenditure post-acquisition.

McDougall finds that businesses in Canada increase their capital investment after being taken over by a foreign entity.[77] Liu et al. also observe a positive impact on fixed asset investment following foreign acquisitions of Chinese manufacturing firms.[78] Arnold & Javorcik find that foreign acquisitions of Indonesian manufacturing firms also lead to increases in investment outlays, but that this is not driven by easing of credit constraints.[79]

There was also some evidence for this from our interviews, where it was suggested that the capital from acquisitions allowed investment in areas such as business intelligence, original intellectual property, tools and technology. One interviewee stated that this level of investment would not have been possible as an independent development studio. This is consistent with recognised structural barriers in the UK which restrict SME access to external finance, and which overseas investment may

[74] Olivier Bertrand, "Effect of foreign acquisitions on R&D activity: Evidence from firm-level data for France", *Research Policy*, (2009), pp.1021-1031, accessed November 2022

[75] Joel Stiebale, & Frank Reize, "The impact of FDI through mergers and acquisitions on innovation in target firms", *International Journal of Industrial Organization*, (2011), pp.155-167, accessed September 2022

[76] Masakazu Ishihara, & Joost Rietveld, "The Effect of Acquisitions on Product Innovativeness, Quality and Sales Performance", *Academy of Management,* (2017), pp.1-48, accessed September 2022

[77] Giles Mcdougall, Industry Canada Working Paper, "The Economic Impact of Mergers and Acquisitions on Corporations", 1995

[78] Qing Liu, et al, "Foreign Acquisitions and Target Firms' Performance in China", *The World Economy*, (2016), pp.2-20, accessed November 2022

[79] Jens Arnold, & Beata Javorcik, "Gifted kids or pushy parents? Foreign direct investment and plant productivity in Indonesia", Journal of International Economics, (2009), pp.42-53, accessed November 2022

serve to alleviate as an alternate source. The difficulty in raising external finance may be particularly acute in the gaming industry, in which companies are likely to want to invest in intangible and high-risk assets (e.g. original IP and new game brands), which have been shown to be more difficult to finance.

Financial performance

An overseas merger or acquisition may impact on the revenue, profitability and share price of the acquired firm or merged entity. This may be driven by changes in productivity, investment, and R&D, as described above. Access to foreign markets may also play a role, particularly for larger acquisitions.[80]

Firstly, on revenue growth, Chen shows that US firms subject to an overseas acquisition by a firm based in an OECD country experience increases in sales relative to those subject to a domestic acquisition.[81] In contrast, US firms acquired by non-OECD firms experience a decrease in sales. The author frames these results in the context of a theoretical model, where OECD-country acquirers transplant their higher productivity to the acquired firm (e.g. via technology transfer), allowing them to reduce marginal costs and thereby grow their market share through competition on price. Liu et al. also find a positive impact of foreign acquisitions on sales in manufacturing firms in China which have been subject to an overseas acquisition.[82] They also find that the acquirer country of origin matters, with particularly strong effects observed when there is a notable (country-level) technology gap between the acquirer and target.

In the video games industry in the US, Gil and Warzynski show that video games produced by development studios integrated with publishers sell more units at higher prices than video games produced by independent studios.[83] They find that the increase in sales occurs due to better post-release marketing strategies (e.g. better targeted, or greater intensity of advertising), and release timing (i.e., softening competition by not releasing at the same time as other titles). This is suggestive of more effective vertical integration between suppliers and publishers in the video games' supply chain. Thus, any acquisition of a UK development studio by an overseas publisher may increase the sales of the development studios' video games through similar channels.

Interview evidence corroborates this narrative, with one interviewee noting that M&A led to substantial marketing investments which would otherwise not have been feasible. One interviewee also noted the importance of the acquirer's publishing skills in determining the success of their post-acquisition releases.

[80] Christoph Grimpe, & Katrin Hussinger, "Market and technology access through firm acquisitions: Beyond one size fits all", *New Perspectives in International Business Research*, (2008), pp.289-314, accessed November 2022

[81] Wenjie Chen, "The Effect of investor origin on firm performance: Domestic and foreign direct investment in the United States", *Journal of International Economics*, (2011), pp.219-228, accessed November 2022

[82] Qing Liu, et al, "Foreign Acquisitions and Target Firms' Performance in China", *The World Economy*, (2016), pp.2-20, accessed November 2022

[83] Richard Gill, & Frederic Warzynski, "Vertical Integration, Exclusivity, and Game Sales Performance in the US Video Game Industry", *The Journal of Law, Economics and Organization*, (2014), ppi143-i168, accessed September 2022

On profitability, Chen shows that the increase in sales observed among US firms also translates to an increase in profitability for firms regardless of the country of origin of the acquirer.[84] Harris finds that profitability impacts on firms acquired by an overseas buyer differed depending on whether the target was in manufacturing or services.[85] In manufacturing, post-acquisition profitability was higher, whereas in services it was generally lower.

In contrast, Bertrand & Zitouna do not find evidence of increased profitability on the target firm following an overseas takeover despite improvements in productivity, which they suggest may be because efficiency gains are distributed up or downstream (e.g. in the form of higher input prices, or a decrease in the price of final goods), or back to the parent company through transfer-pricing mechanisms.[86]

In the context of the video games industry, one interviewee cautioned that the structure of the relationship between the target firm and the acquirer can influence how and where profits accrue in a way that is consistent with a decrease in profitability. They cited the example of an acquiring firm receiving all the sales revenues and treating the target firm as a cost base. In this case, the acquired business would only grow as far as its cost base increases, meaning, for example, that the returns to a successful game would not be reflected in its profit.

An interviewee identified a further potential negative impact on financial performance, which may arise if the acquirer is risk averse. They mentioned not being permitted to take creative risks, which may in turn have harmed the business' growth potential.

Lastly, on share price, King et al. find in a meta-review of studies that firms that are the target of an acquisition exhibit abnormal returns[87] on the day of an announcement (i.e. returns over and above what would have otherwise been expected), though they do not differentiate between overseas and domestic acquisitions.[88] Jensen & Ruback also show, without differentiating by the acquirer location, that target firm shareholders benefit following an acquisition.[89]

Employment and wages

The impact on employment, wages and wider job conditions in the target company is again mixed and depends on the sector and origin of the acquirer.

On wages, Harris shows that the impact of foreign acquisitions of UK manufacturing and services firms differed depending on the sector and origin of the acquirer. The impact on wages was positive in the

[84] Wenjie Chen, "The Effect of investor origin on firm performance: Domestic and foreign direct investment in the United States", *Journal of International Economics*, (2011), pp.219-228, accessed November 2022

[85] Professor Richard Harris, UK Trade & Investment, "The Effect of Foreign Mergers and Acquisitions on UK Productivity and Employment", 2009

[86] Olivier Bertrand, & Habib Zitouna, "Domestic versus cross-border acquisitions: which impact on the target firms' performance?", *Applied Economics*, (2008), pp.2221-2238, accessed November 2022

[87] Abnormal returns are returns on a stock above or below what the expected returns on the stock are given the stock's level of risk.

[88] David King, et al, "Meta-analyses of Post-acquisition Performance: Indications of unidentified moderators", *Strategic Management Journal 25,* (2004), pp.187-200

[89] Michael Jensen, & Richard Ruback, "The market for corporate control: The scientific evidence", *Journal of Financial Economics*, (1983), pp.5-50, accessed September 2022

manufacturing sector but mixed for services.[90] Girma & Goerg look at the impacts of foreign acquisitions on wages in the food and electronics industries in the UK and find similarly that the impact differs by acquirer origin, with increases observed following acquisitions by US firms, but no change following an acquisition by EU firms.[91] Conyon et al. study the impact of foreign acquisitions of UK manufacturing firms on wages, finding that firms acquired by foreign companies pay more than firms acquired domestically, which they attribute to higher levels of productivity.[92] Conversely, Heyman et al. find no evidence of wage increases post-overseas acquisition in a representative sample of Swedish firms.[93]

On employment, Harris finds that changes in the level of employment after an overseas acquisition are sector dependent.[94] The manufacturing sector saw increases in employment for acquired firms, whereas employment in the services sector was comparable in acquired and non-acquired firms over the long run. Bandick & Goerg find evidence of positive employment growth in Swedish manufacturing plants acquired by an overseas firm, but only for instances of vertical integration.[95] Oberhofer also finds higher employment growth following an overseas acquisition in European firms, both for vertical and horizontal integration.[96] A separate study by Conyon et al. looked at the impact of mergers in the UK across all sectors but did not distinguish between whether one of the parties was incorporated overseas.[97] They found statistically significant decreases in employment after mergers and suggest this is consistent with attempts to increase labour efficiency (e.g. by making redundancies where roles are duplicated). As such, the impact on employment growth seems to differ by the nature of the transaction (merger vs. acquisition) and the type of firm being acquired.

Our interviews identified more nuanced effects on employees at the acquired firm. One interviewee suggested that employees appreciated, post-acquisition, being able to specialise towards their preferred competency (e.g. video games design) as other aspects of video games management (e.g. customer service and community management) were no longer done in-house. The interviewee suggested that this had had a positive effect on employee motivation. It is also consistent with increases in labour productivity observed in the literature being driven by economies of scale, which permit greater specialisation of the workforce.

[90] Professor Richard Harris, UK Trade & Investment, "The Effect of Foreign Mergers and Acquisitions on UK Productivity and Employment", 2009

[91] Sourafel Girma, & Holger Gorg, "Evaluating the foreign ownership wage premium using a difference-in-differences matching approach", *Journal of International Economics*, (2007), pp.97-112, accessed October 2022

[92] Martin Conyon, et al, "The Productivity and Wage Effects of Foreign Acquisition in the United Kingdom", *The Journal of Industrial Economics*, (2002a), pp.85-102, accessed September 2022

[93] Fredrik Heyman, et al, "Is there really a foreign ownership wage premium? Evidence from matched employer-employee data", *Journal of International Economics*, (2007), pp.355-376, accessed October 2022

[94] Professor Richard Harris, UK Trade & Investment, "The Effect of Foreign Mergers and Acquisitions on UK Productivity and Employment", 2009

[95] Roger Bandick, & Holger Gorg, "Foreign acquisition, plant survival, and employment growth", *Canadian Journal of Economics,* (2010), pp.547-573, accessed October 2022

[96] Harald Oberhofer, "Employment Effects of Acquisitions: Evidence from Acquired European Firms", *Review of Industrial Organization*, (2013), pp.345-363, accessed October 2022

[97] Martin Conyon, et al, "The impact of mergers and acquisitions on company employment in the United Kingdom", *European Economic Review*, (2002), pp.31-49, accessed September 2022

On the other hand, it was also suggested that there could be negative impacts on employer-employee relations. In one case it was suggested that staff may not always agree with the acquirer's approach to developing video games should this lead to a focus on mass market appeal, rather than producing a "quality" product. This is line with evidence, such as Ranft & Lord who find that autonomy is a key predictor of post-acquisition retention for high-tech firms.[98] Another interviewee indicated that studio staff may have a greater propensity to leave if they had a desire to work in a smaller studio where they can make more of an individual impact.

Firm survival

Access to capital and changes in financial performance and productivity may be expected to lead to better prospects for firm survival.

Bandick & Goerg investigate the effect of overseas acquisitions on the survival probability of manufacturing firms in Sweden.[99] They generally find no impact of acquisitions on plant survival probabilities, except for exporters, for whom the impact is positive, and particularly large if the firm and the acquirer are vertically integrated. In contrast, Girma & Goerg find that plant-level survival for the food and electronics sectors in the UK may decrease following an overseas acquisition, but do not provide evidence on the channel through which this occurs.[100]

Interview evidence also suggested that acquisitions provided financial stability for the target firm by, for example, alleviating cashflow concerns in lieu of access to alternative forms of finance, or a consideration that these alternatives (such as venture capital) may not have led to the same outcomes for the firm.

IMPACTS ON THE ACQUIRING FIRM

Our review identified that impacts on the acquiring firm typically fall into four themes: R&D and innovation, access to foreign markets, access to technology and financial performance. Below we discuss each of these in turn.

R&D and innovation

Literature on acquirer R&D and innovation is limited in scale. Stiebale studies a sample of German firms involved in cross-border M&A and shows that acquiring firms had a higher level of R&D activity after an acquisition compared to firms that did not make an overseas acquisition in the same period.[101] They suggest this may be driven by access to complementary foreign technologies and new markets which serve to increase returns to R&D.

[98] Annette Ranft, & Michael Lord, "Acquiring new knowledge: The role of retaining human capital in acquisitions of high-tech firms", *The Journal of High Technology Management Research*, (2000), pp.295-319, accessed September 2022

[99] Roger Bandick, & Holger Gorg, "Foreign acquisition, plant survival, and employment growth", *Canadian Journal of Economics,* (2010), pp.547-573, accessed October 2022

[100] Sourafel Girma, & Holger Gorg, "Evaluating the foreign ownership wage premium using a difference-in-differences matching approach", *Journal of International Economics*, (2007), pp.97-112, accessed October 2022

[101] Joel Stiebale, "The impact of cross-border mergers and acquisitions on the acquirers' R&D - Firm-level evidence", *International Journal of Industrial Organization*, (2013), pp.307-321, accessed September 2022

However, it may also simply represent a reallocation from the target to the acquirer. Stiebale also found in a sample of European mergers that innovation, measured by the level of patenting, increased in the merged entity after a cross-border merger.[102] They suggest that innovation activity is relocated from the target company country to the acquirer. This is mostly driven by multinational firms shifting activities to more efficient parts of their global operations which are often located in the acquirer's home country.

Access to foreign markets

Cross-border M&As may also be undertaken to gain access to the domestic market and operations of the target firm. Bertrand et al. show that market access is a key determinant for overseas M&A activity, with more M&A activity taking place between countries where existing bilateral market access is lower, suggestive of a "tariff-jumping" motive.[103]

There is also evidence that the acquirer may use the target to leverage its access to other foreign markets. Blonigen et al. find that overseas acquirers are more likely to choose target firms that have established export networks, as locational differences mean the target firm's export networks differ to that of the acquirer, thus unlocking access to new markets for the acquirer beyond just the domestic market of the target.[104]

Access to technology

Blonigen et al. also show that firms with substantial intangible assets (which includes forms of technology) are more likely to be the targets of overseas M&A.[105] This finding is refined by Lee who shows that firms are more likely to engage in technology-seeking versus market-seeking overseas M&A if the market they produce in is substantially larger than the target market. Technology-seeking M&As are motivated by unlocking synergies from accessing technologies new to the acquirer, whereas market-seeking M&As are motivated by market access.[106]

Financial performance

The impact channels described in the review of evidence for target firms, which lead to efficiency gains and potential improvements in financial performance may apply to acquirers as well. However, mergers which are unprofitable for the acquirer may also occur due to the misalignment of the interests of shareholders and managers when separation of ownership and control occurs (McKnight

[102] Joel Stiebale, "Cross-border M&As and innovative activity of acquiring and target firms", *Journal of International Economics,* (2014), pp.1-15, accessed November 2022

[103] Olivier Bertrand et al., "Location Choices of Multinational Firms: The Case of Mergers and Acquisitions", *Journal of Economic Integration,* (2007), pp. 181-209

[104] Bruce Blonigen et al., "Cherries for sale: The incidence and timing of cross-border M&A", *Journal of International Economics*, (2014), pp. 341-357

[105] ibid.

[106] Donghyun Lee, "Cross-border mergers and acquisitions with heterogeneous firms: Technology vs. market motives", *The North American Journal of Economics and Finance,* (2017), pp. 20-37

& Weir).[107] These are known as agency costs, and may, for example, include managers seeking to maximise their own income, prestige, or career opportunities at the expense of the company.

Looking first at share price impacts, Bruner finds in a meta-review of 130 studies of overseas and domestic M&A transactions that shareholders of acquired firms typically earn zero abnormal returns.[108] When comparing overseas M&A transactions to domestic ones, Danbolt & Maciver show that cross-border acquisitions lead to abnormal short-run returns that are significantly higher for the acquirer.[109] In contrast, Gregory & McCorriston study the short- and long-run impact of overseas acquisitions undertaken by UK companies on abnormal returns and find that there are no significant short-run impacts on abnormal returns.[110] They find that the long-run impacts may even be negative depending on the location of the acquired company. As such, evidence of both the short and long-run impact of overseas M&A on share price is mixed.

Looking specifically at the share price impacts of diversification, Gregory & McCorriston find that conglomerate acquisitions (defined as takeovers of a firm with a different 2-digit SIC) yield negative abnormal returns, which is not indicative of benefits resulting from the diversification of output.[111] Bodnar et al. however show that there is a value premium associated with international diversification within industry.[112]

Evidence of the wider financial impacts on acquirers of making an overseas acquisition is limited and inconclusive. Stiebale & Trax find that British and French acquirers in cross-border M&A transactions realised higher growth in sales, productivity and employment compared to other firms in their markets.[113] Acquisitions of firms in technology- and knowledge-intensive industries led to improvements in the acquiring firm's productivity suggesting that the acquirer benefits from access to overseas technology and knowledge. When studying Russian companies engaged in overseas M&A, Bertrand & Betschinger found they generally experienced reduced profitability, which was particularly strong for firms with little prior experience of overseas M&A.[114]

[107] Phillip McKnight & Charlie Wier, "Agency costs, corporate governance mechanisms and ownership structure in large UK publicly quoted companies: A panel data analysis", *The Quarterly Review of Economics and Finance*, (2009), pp.139-158, accessed December 2022

[108] Robert Bruner, "Does M&A Pay? A Survey of Evidence for the Decision-Maker", *Journal of Applied Finance,* 2004

[109] Jo Danbolt & Gillian Maciver, "Cross-Border versus Domestic Acquisitions and the Impact on Shareholder Wealth", *Journal of Business Finance & Accounting*, (2012), pp.1028-1067

[110] Alan Gregory & Steve McCorriston, "Foreign acquisitions by UK limited companies: short- and long-run performance", *Journal of Empirical Finance*, (2005), pp.99-125

[111] Ibid.

[112] Gordan Bodnar, Charles Tang & Joseph Weintrop, "The Value of Corporate International Diversification", NBER Working paper, 2003

[113] Joel Stiebale, & Michaela Trax, "The Effects of Cross-border M&As on the Acquirers' Domestic Performance - Firm-level Evidence", *Canadian Journal of Economics,* (2011), pp.957-990, accessed November 2022

[114] Olivier Bertrand, & Marie-Ann Betschinger, "Performance of domestic and cross-border acquisitions: Empirical evidence from Russian acquirers", *Journal of Comparative Economics*, (2012), pp.413-437, accessed November 2022

IMPACTS ON THIRD PARTIES

Overseas M&A can have wider impacts on third parties. The most important of these is on consumer welfare, but there may also be secondary impacts on firms within the same industry or connected industries, and dynamic effects on start-up creation by employees of acquired firms.

Consumer welfare

Changes in consumer welfare following an M&A transaction may arise from changes in the price, quality and variety of goods and services sold in affected markets.

M&A may lead to price increases if it results in a greater concentration of market power, or price decreases where efficiency gains are realised and passed onto consumers. Where both effects occur, the actual price change is determined by which of the two effects dominates. In a review of the impact of mergers (domestic and overseas) across several markets, Ashenfelter et al. find that price changes seem to depend on the characteristics of the market in question, with price increases observed, for example, in the banking industry but not in the petroleum industry.[115] They find that price increases are possible even without the creation of a monopoly or dominant position in oligopolistic markets. In a review of both domestic and overseas mergers, Tichy finds that only a quarter of mergers show evidence of increases in efficiency, necessary for a reduction in price to occur, with around a quarter resulting in increases in market power.[116] As such, the impact of M&A on prices is context dependent.

Brynjolfsson et al. show that product variety generates significant amounts of consumer surplus.[117] As such, if there is a link between overseas M&A and product variety, this may also have implications for consumer welfare. Berry & Waldfogel suggest that M&A may affect product variety if firms withdraw similar products or services following a merger to avoid inter-firm competition.[118] On the other hand, variety may increase if firms seek to differentiate similar products to avoid these competing with one another following a merger. In an applied setting, they find that a domestic merger of radio stations may have increased the variety of radio programmes, suggestive of a differentiation effect. Blundell & Wilson similarly find in a sample of brewery firms subject to a merger or acquisition that, in aggregate, transactions have a net positive effect on product variety.[119]

On quality, a consumer's willingness-to-pay may be expected to be higher for a higher quality product. Evidence on the impact of overseas M&A on product quality is limited. Stiebale & Vencappa find evidence that overseas acquisitions of firms in India may lead to increases in a proxy for product

[115] Orley Ashenfelter, et al., "Did Robert Bork Understate the Competitive Impact of Mergers? Evidence from Consummated Mergers", *The Journal of Law and Economics*, (2014), pp.S67-S100, accessed November 2022

[116] Gunther Tichy, "What Do We Know about Success and Failure of Mergers?" *Journal of Industry, Competition and Trade,* (2001), pp.347-394, accessed September 2022

[117] Erik Brynjolfsson, et al, "Consumer Surplus in the Digital Economy: Estimating the Value of Increased Product Variety at Online Booksellers", *Management Science*, (2003), pp.1580-1596, accessed November 2022

[118] Steven Berry, & Joel Waldfogel, "Do Mergers Increase Product Variety? Evidence from Radio Broadcasting", *The Quarterly Journal of Economics*, (2001), pp.1009-1025, accessed November 2022

[119] Wesley Blundell, & Kyle Wilson, SSRN, "Acquisitions, Product Variety, and Distribution in the U.S. Craft Beer Industry", 2022

quality, though this is also associated with an increase in price so the implication for consumer welfare is unclear.[120]

In the video games industry, Ishihara & Rietvald find that video games by acquired development studios are more likely to be high quality (defined as having a Metacritic metascore of greater than 75) than those by independent studios.[121] They suggest this is consistent with the "coordination hypothesis", wherein publishers exert greater direction and coordination to improve the game's appeal to external critics. Conversely, Gil & Warzynski find that video games produced by development studios acquired by publishers sell in greater quantity, but that this is not driven by improvements in quality.[122]

Spillovers on related industries

Changes in R&D and innovation may impact other firms via knowledge spillovers, which have been shown to filter through for third-party businesses to exploit.[123] To the extent that the target or acquirer firm grows (or declines), businesses who the target firm sources its inputs from may also benefit (or be disadvantaged).

Dynamic effects of talent exit from acquired firms

Staff turnover effects identified in the interviews carried out by GIC, which may harm productivity in the acquired firm in the short run, may have positive effects on wider industry productivity through the creation of productive start-ups by former staff of the acquired firm. Kim finds using matched employer-employee data for high-tech start-ups that start-up acquisitions substantially increase rates of entrepreneurship among the employees of the acquired firm, as they become more likely to leave the acquired firm to launch their own ventures.[124]

APPLICABILITY OF OUR FINDINGS TO THE UK VIDEO GAMES MARKET

Effects from the generic literature which are less relevant to the video games industry

Much of the evidence we have reviewed relates to overseas M&A in general, rather than the video games industry specifically. At this point we pause to consider whether any of the effects identified may be discounted as not relevant to our consideration of the UK video games industry.

To do this we compared the findings from the literature review to points raised during consultations and discussed our findings with other UK video games industry experts at the BFI and the PEC. This

[120] Joel Stiebale, & Dev Vencappa, "Acquisitions, markups, efficiency, and product quality: Evidence from India", *Journal of International Economics*, (2018), pp.70-87, accessed November 2022

[121] Masakazu Ishihara, & Joost Rietveld, "The Effect of Acquisitions on Product Innovativeness, Quality and Sales Performance", Academy of Management, (2017), pp.1-48, accessed September 2022

[122] Richard Gill, & Frederic Warzynski, "Vertical Integration, Exclusivity, and Game Sales Performance in the US Video Game Industry", The Journal of Law, Economics and Organization, (2014), ppi143-i168, accessed September 2022

[123] Zoltan Acs, & David Audretsch, "Innovation in Large and Small Firms: An Empirical Analysis", The American Economic Review, (1988), pp.678-690, accessed November 2022

[124] J. Daniel Kim, "Startup acquisitions, relocation and employee entrepreneurship", Strategic Management Journal, 2022, accessed March 2023

review process identified the following effects which were deemed as not relevant to our analysis of the UK video games industry:

- Access to foreign markets (acquirer benefit). We have removed this from our shortlist of impacts because video games development studios typically already sell their products directly, or through publishers, to global markets with the sole exception of China which maintains an extremely strict product approval process for which no acquirer can guarantee successful outcomes in particular for non-Chinese titles.
- Price mark-ups and price reductions via efficiency gains (consumer/wider cost, consumer/wider benefit). These impacts are not considered as price changes are unlikely to occur either for concentration or efficiency reasons, as platform recommended retail prices mean there is little variance in the initial prices at which video games are sold.[125] Moreover, for price mark-ups specifically to occur, market concentration needs to happen to the extent that market power can be exerted. Given the competitive nature of the video games market, material upward price changes following an M&A transaction are unlikely.[126]

Other video games specific effects

In addition to the effects identified in section 3.1, we expect there to be further video games specific effects of overseas M&A that are not widely considered in the more generic literature. We note these below with a brief explanation of the rationale for inclusion:

Target benefit—access to established player bases and data. Many acquirers have existing player bases for other video games and properties in their portfolio to which newly acquired studios can market their own titles. In some cases publishers maintain considerable user and usage data for these portfolio video games which can help guide not just newly acquired studios' video games' marketing but also their design and development.

Acquirer benefit—access to established game brands and their fans. Where an acquirer buys a mature studio, they can often do so to bring established video games brands and their player bases in-house and thus benefit from access to a new audience to market to and new player data to learn from.

Acquirer benefit—prevent royalty pay outs (to third party studio partners brought in-house). Many studio acquisitions involve targets and acquirers that are already working together, most commonly video games development studios creating video games which the acquirer is under contract to publish. In such circumstances and where the parties anticipate commercial success for the game(s) in question, the publisher will sometimes decide to try to bring the studio in-house rather

[125] Harikesh Nair, "Intertemporal price discrimination with forward-looking consumers: Application to the US market for console video-video games", Quantitative Marketing and Economics, (2007), pp.239-292, accessed November 2022

[126] An exception to this is where a platform holder acquires a development studio and its existing popular video games IP, after which it may decide to make the IP exclusive to its platform and thereby exert market power. In this case, there may be a role for a competition authority to play to prevent a situation where abuse of a dominant position may arise by imposing conditions on any proposed M&A

than pay out royalties to the studio. This can happen even if the intellectual property rights to the game(s) are already controlled by the publisher.

Acquirer benefit—higher quality output (ratings of product). Studio acquisitions tend to be driven primarily by the desire to access existing IP and/or to bring high quality development teams in-house. Acquired studios are therefore often established development teams with proven pedigree and strong future potential that are expected to not only fit within the acquirers' existing studio infrastructure but also enhance it with higher quality output.

Acquirer cost—failure to leverage target's expertise or IP. Acquiring a studio with a strong track record and high value IP does not guarantee that the track record can be maintained nor that the existing IP's is utilised effectively. For various reasons such as mismanagement, under-investment, loss of key staff or competitive pressure even high potential studio acquisitions can fail and this can lead to the studio being shuttered sometimes within a few years of acquisition.

Wider cost—wage inflation in acquired studios reduces profitability and/or employee retention at local indie studios. The vast majority of UK studios are small independent development companies with modest employee bases and limited financial strength. Their ability to attract and retain high quality staff is limited compared to larger as well as acquired studios of the same scale who can provide greater job security and afford higher wages. One of the interviewees talked about their sale allowing them to not only pay their staff competitive wages but also allowing them to hire staff they had never been able to afford as an independent studio.

Wider cost—acquirers move previously outsourced services in-house (i.e. outside of UK). Video games development is rarely conducted with no external assistance whether that is music composition, voice acting or quality assurance testing. The UK video games development industry is supported by a substantial Indigenous support industry of specialised outsourcers (as well as more generalised ones such as legal and financial service providers). Some acquirers maintain such support services in-house and often these are overseas which can result in the acquired studio making more limited use of UK companies.

Wider cost—studio acquisitions may reduce indie studio intellectual property investment. The majority of studio acquisitions are made by video games publishers, companies with finite budgets and capacity for video games production in any given period. It stands to reason that publishers acquiring studios may well as a result reduce their investment in independent studio projects and thus less independent intellectual property is funded overall. Certainly, many of the major video games publishers have reduced their publishing of third party developed and owned IP over the last decade focusing instead on internal/acquired studios' projects.

Shortlist of potential impacts for further analysis

Following the filtering process outlined above, we obtained a shortlist of potential impacts for further consideration and review in our analysis. These are summarised in the table below.

Impact shortlist

Benefits

Target	Acquirer	Consumer/wider
Increases in productivity (labour, capital and TFP) driven by access to new skills and services, access to better sales, marketing and distribution, increased capital expenditure	Increase in revenue due to growth from increased production capacity, and access to established game brands and their fans	Growth in supporting companies / industries via increased use of outsourcing (e.g. art)
Improved financial security and lower probability that firm ceases trading	Increases in productivity driven by access to higher quality development studios and access to new technology (e.g. proprietary game engines)	Spillovers on other firms' productivity via innovation, and knowledge sharing
Access to established player bases and data*	Access to new platforms (e.g. VR or mobile) and revenue models (e.g. Free-to-play, or F2P)*	Dynamic effects of talent exit from acquired firms leading to creation of new, highly productive firms
Increased investment on R&D and increases in firm's knowledge, innovation and organisation	Increased investment on R&D spending and increases in firm's knowledge, innovation, and organisation	
Increase in employment due to growth and investment	Prevent royalty pay-outs (to third party studio partners brought in-house)*	
Increase in revenue due to growth (e.g. from access to established player bases) and investment	Increase in firm value and/or share price (reflecting improvements in other financial metrics)	
Higher quality output (i.e. higher rating for video games)	Higher quality output (i.e. higher ratings for video games)	
Increases in profitability	Increases in profitability	
Help expansion into foreign markets		
Increases in firm value and/or share price (reflecting improvements in other financial metrics)		
Better up- and downstream supply chain connections		

Costs

Target	Acquirer
Loss of intellectual property ownership overseas	Failure to leverage target's expertise or intell property
Decrease in revenue (and profitability) due to revenue being recognised by the acquirer with the studio acting just as a cost base	
Negative impacts on employee relationships resulting in existing employees exiting the business	
Loss of productivity due to loss of creative / decision-making autonomy and less creative-risk rating and deprioritisation in the acquirer's wider portfolio	

Impacts with an asterisk were not identified in the literature, but were suggested either in consultations, or from expert input (or both).