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The economic contribution of the UK Games Development industry

Oxford Economics

Final report

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1. Executive Summary

There are around 10,000 games developers working in the UK...

- UK based game developers are highly skilled; 69% are educated to at least degree level compared with 20% of the UK working age population in 2008, making games development part of the UK's growing "knowledge economy".
- The high skills of games developers are reflected in above average earnings for those employed in the industry, at £30,316 p.a., more than a fifth above the UK average.

...directly contributing around £400 million to UK GDP in 2008...

- On a turnover of £625 million, the UK Games Development industry directly contributed £386 million to UK GDP in 2008. By comparison, this amounts to, for example, over a quarter of the direct contribution of the UK Film Industry to GDP.

...and £130 million to the Exchequer

- The UK Games Development industry is estimated to have directly contributed about £130 million to the Exchequer in 2008 in corporation tax, income tax, national insurance contributions and VAT (and other indirect taxes). This is equivalent to 20% of the turnover in the UK Games Development industry.

In total the UK Games Development industry supports 28,000 jobs and contributes over a billion pounds a year to GDP...

- The UK Games Development industry helps to support a total of 28,100 jobs in 2008, allowing for those directly employed and for the multiplier (knock-on) effects.
- In total, the UK Games Development industry contributes £1,016 million a year to UK GDP, taking into account direct, indirect and induced impacts.

...and £420 million to the Exchequer

- The UK Games Development industry and its employees overall contribution to UK tax revenues, including direct and multiplier impacts is an estimated £419 million in 2008.

But the overall economic impact is even greater...

- The UK Games Development industry contributes to the economy and Exchequer in a number of other ways not captured by the direct and multiplier analysis discussed above by stimulating the performance of other industries.

...with “spillover” effects deriving from R&D expenditure...

- The Games Development industry is an R&D intensive industry – estimated to invest 14% of its turnover on R&D. Academic research suggests that R&D spillover effects are very large, with R&D investment generating a social return of around 70% - i.e. every £100 million invested in R&D leads to an increase in GDP of £70 million in the long run.

...cluster effects...

- Cluster effects are efficiency gains arising from companies being located close to each other. There is clear evidence that clustering effects are present in the Games Development industry, with most companies located around 8 main hubs. This implies that if the industry would decline, and some companies would leave the cluster, there would be negative productivity effects on the remaining companies.

...and cultural spillovers

- Video games have a broad demographic reach - there are at least 26.5 million people in the UK playing games (48% of them are female) - and its penetration rate is increasing fast for the older age groups. Given its wide audience reach and the length of exposition (hours / week) in the younger age groups, there is a clear cultural dimension to games as a medium of entertainment that cannot be ignored.
- Video games also reflect the cultural values from the country where they have been made, reinforcing the country branding, and defining its cultural image, its technological reputation, or promoting tourism.

Future growth of the UK Games Development industry is far from certain...

- Despite rapid growth of the global games retail market (10% a year for 2004-2011), and the substantial expansion of Games Development in other territories (especially China, Korea, and Canada), long term decline in the UK based industry is a real possibility - this year has seen the loss of development jobs from global publisher studios. If the trend of global publishers downsizing in the UK continues - exacerbated by the relocation of the most threatened low level jobs (QA and testing) by global publishers to other territories-, then these losses will no longer be absorbed by existing studios and the industry will suffer.

...and 10,000 jobs could be lost in the UK

- If the lower growth path materialised, the total value added contribution to GDP of the Games Development industry would be £350 million lower in 2013 and it would support 10,000 fewer jobs.
- Many of these losses are likely to be permanent, as the highly skilled and specialised games developers are actively recruited by foreign companies as UK based opportunities disappear.

2. Introduction

This report, prepared by Oxford Economics¹, provides an evaluation of the economic contribution of the UK Games Development industry.

The video games industry value chain is organized around the production and distribution of digital content. Games Developers are the primary creative force in the video games industry, responsible for transforming original and / or licensed IP into games on a variety of platforms (such as TV-based or handheld consoles, PCs and mobile phones).

The sector has seen a consolidation process in recent years, with many value chain functions vertically integrated within large publishing houses. The number of UK independent developers in 2008 is 166, down from 295 in 2000 – although the number of people employed during this period has actually increased.

The UK has traditionally been the third largest development territory in the world in terms of revenue generation, but has recently slipped to 5th place –behind Canada and Korea, including network games- due to, among other factors, increasing competition from subsidised territories. The amount of new IP made in the UK and reaching the market is decreasing, despite the size of both the global and UK retail market increasing at double digit figures, and the boom of online and mobile games, that have largely bypassed the UK.

2.1. The channels of economic impact

There are many channels through which the UK Games Development industry makes a contribution to the UK economy. This contribution includes the following standard economic impacts:

- **Direct impacts** – employment and activity in the UK Games Development industry itself.
- **Indirect impacts** – employment and activity supported down the supply chain to the UK Games Development industry, as a result of Games Development companies purchasing goods and services from UK suppliers. This includes, for example, jobs supported through the demand for property/rent, recruitment, and a variety of activities in the business services sector (legal, accountancy etc).
- **Induced impacts** – employment and activity supported by the spending of those directly or indirectly employed in the UK Games Development industry on goods and services in the wider UK economy. This helps to support jobs in the industries that supply these purchases, and includes jobs in retail outlets, companies producing consumer goods and in a range of service industries.

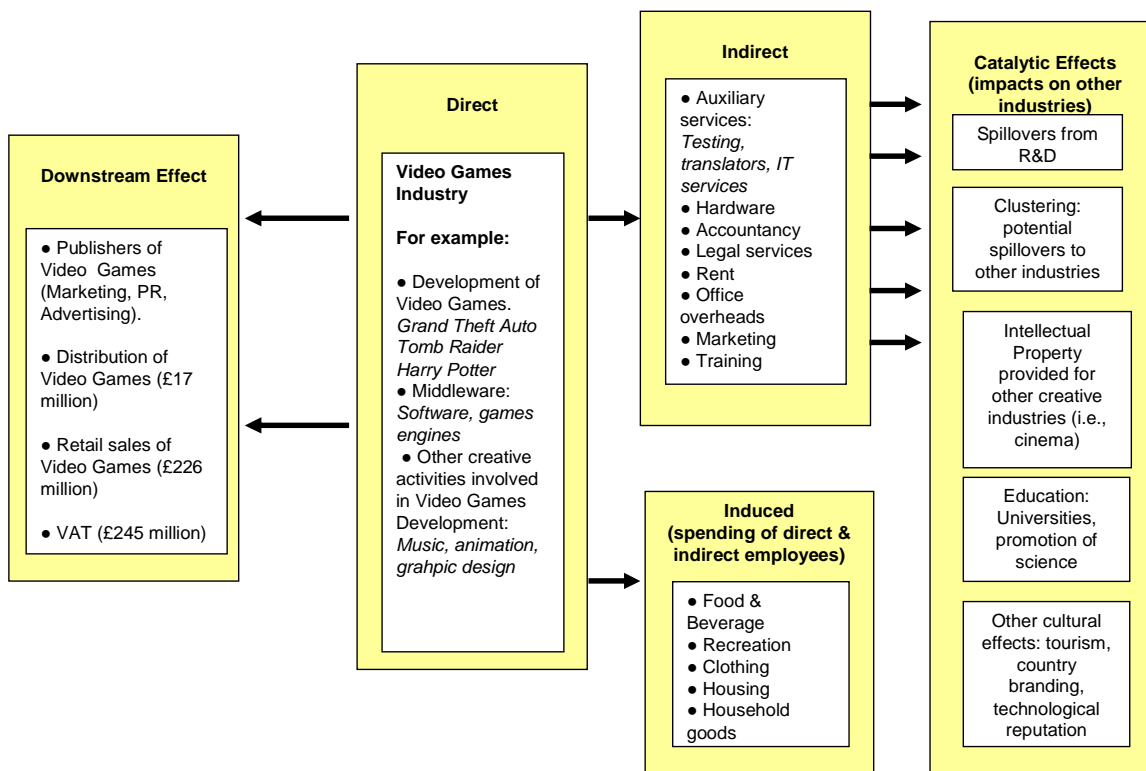
¹ www.oxfordeconomics.com.

There are also a number of additional economic catalytic impacts ('spillovers') which result from the wider role of the Games Development industry, for example:

- **Spillovers from R&D in Games Development to other industries**
- **Clustering of Games Development companies leading to increased productivity, efficiency and benefits from R&D**
- **Intellectual Property provided for other creative industries (e.g. cinema)**
- **Education – universities and promotion of science**
- **Other cultural effects such as tourism, country branding and technological reputation**

The economic value of the direct, indirect and induced effects is related to the total revenues of the UK Games Development industry, while the catalytic impacts are 'spillover' benefits for other industries, consumers and the general economy (as shown in Figure 2-1).

Figure 2-1: The UK Games Development industry and its economic impacts



2.2. Report structure

The rest of this report is structured as follows:

- Chapter 3 focuses on the direct impact of the UK Games Development industry in terms of

employment, GDP, productivity and tax.

- Chapter 4 discusses the multiplier impacts of the UK Games Development industry – the so-called indirect and induced impacts.
- Chapter 5 covers the catalytic impacts of the UK Games Development industry.
- Chapter 6 discusses possible alternative future scenarios for the industry.
- Chapter 7 summarises the overall economic contribution of the UK Games Development industry.

3. Direct impact – Employment and GDP

This chapter details the jobs and GDP directly connected with the UK Games Development industry. It also quantifies the direct contribution of Game Development companies and employees to the Exchequer through income and other taxes.

Key Points

- The UK games development industry employs around 10,000 developers in 2008.
- Turnover in the UK Games Development industry in 2008 is estimated to be £625 million, with a direct contribution to UK GDP of around £400 million.
- UK video game developers are highly skilled: 69% are educated to at least degree level compared with 20% of the UK working age population in 2008.
- Games Development therefore forms a part of the UK's "knowledge economy". The high skills of games developers are reflected in above average earnings for those employed in the industry – with £30,316 p.a. for Games Development versus a UK average of £25,000 p.a.
- Labour productivity is similar to the economy average which reflects two opposing forces: the highly skilled workforce tending to increase productivity countered by the relatively low capital intensity of the industry.
- The direct contribution of UK Games Development to the Exchequer via income tax, national insurance contributions, corporation tax, council tax and other indirect taxes is an estimated £130 million in 2008.

3.1. Direct employment

Total direct employment in the UK Games Development industry is estimated to be around 9,900 employees in 2008, based on data from Games Investor Consulting². The data is comprehensive and covers all independent developers as well as those employed by publishing studios.

This means that there are about a third as many games developers in the UK as people working in film and video production and about a seventh as many as people working in radio and television activities³.

² This figure includes only those employed as developers.

³ Source Office for National Statistics – Annual Business Inquiry

3.2. Direct contribution to GDP

The standard method for calculating the direct contribution of an industry to GDP is to measure its so-called value added – that is, to calculate the difference between the industry's total pre-tax revenue and its total bought-in costs (i.e. costs excluding wages and salaries) adjusted for any changes in stocks.

In order to estimate GDP we have taken Games Investor Consulting's estimates for turnover associated with the games development activity, and subtracted from this the estimated bought-in, or intermediate, costs in the industry. Estimates of intermediate costs were derived from expenditure estimates of UK Games Development companies on various spend categories such as property/rent, recruitment, legal services etc. The publishing activities of vertically integrated companies, where development studios are owned by publishers, are not included in our analysis as we focus on the economic impact of games developers only. In such cases, we have estimated the turnover associated to the development activity by using their development expenditure as a proxy, and adding CAPEX and a profit margin.

Turnover in the UK Games Development industry is an estimated £625 million in 2008, while the direct contribution to UK GDP is expected to be £386 million. The difference between turnover and GDP reflects the costs of products and services purchased by the industry to develop games. The GDP estimate essentially represents the additional value created by the Games Development industry given the inputs purchased from other industries required to develop games.

3.3. Skills and productivity

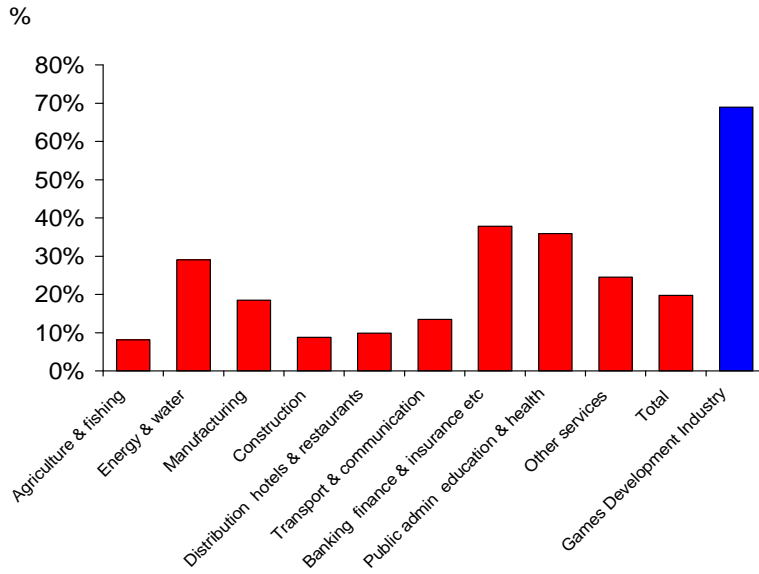
The UK Games Development industry is a highly skilled industry; 69% of UK video game developers are educated to degree level or above according to data from Skillset⁴. Chart 3-1 shows that by comparison only 20% of the UK working age population⁵ are educated to degree level. Of people employed in 'Banking, Finance, Insurance etc.' – an industry noted for the skills of its workforce - 38% are qualified to degree level or above in 2008. The high level of skills inherent to Games Development makes it a part of the UK's "knowledge economy".

Raising skills and productivity is a key component of the Government's long-term strategy for economic growth. The knowledge economy, representing those industries or parts of industries which employ large numbers of workers qualified to degree level or equivalent, plays a vital part to this strategy. As a highly skilled industry, Games Development helps to fulfill the Government's objective of increasing skills, productivity and the knowledge economy in the UK.

⁴ Skillset is the Sector Skills Council (SSC) for Creative Media; "Survey of the Audiovisual Industries' Workforce, 2005"

⁵ Labour Force Survey (LFS), 2008, Q2.

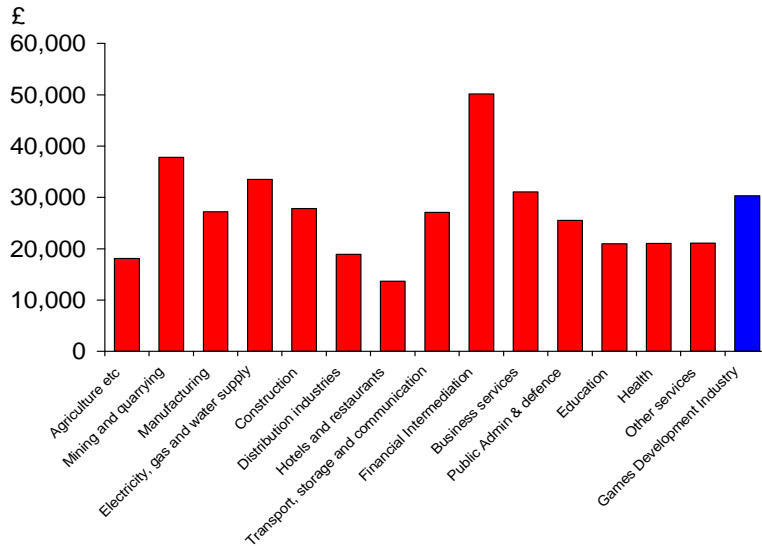
Chart 3-1: Percentage employed educated to degree level and above in each industry, 2008



Source : ONS, Oxford Economics, Skillset

The highly skilled nature of the Games Development industry is to some extent reflected in the earnings data. As can be seen in Chart 3-2, games developers earn on average £30,300 a year, compared with around £25,000 for the average UK employee. Financial Intermediation (Banking) has the highest average annual earnings of over £50,000 per employee.

Chart 3-2: Average annual earnings by industry, 2007⁶, current prices

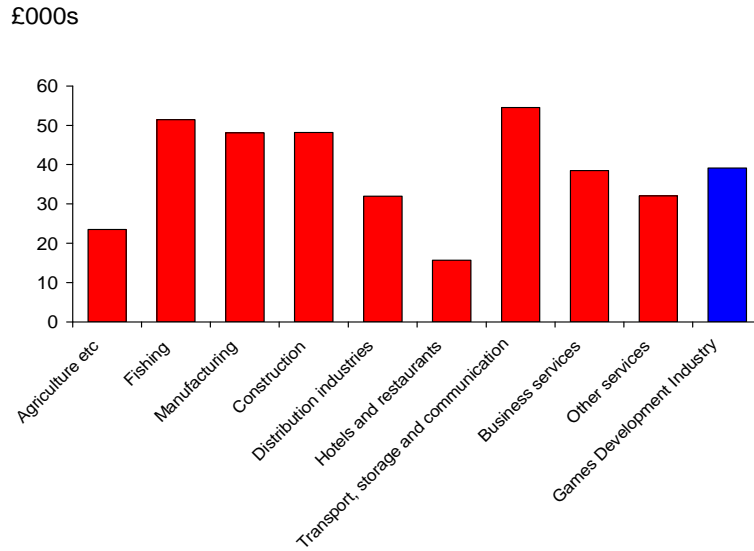


Source : ONS, Oxford Economics, Games Investor Consulting

Chart 3-3 compares labour productivity in the UK Games Development industry with other industries in the economy. Labour productivity measures GDP per unit of employment. It can be seen that labour productivity in UK Games Development industry is £39,000 in 2008. This is similar to the UK average but lower than, for example, UK manufacturing. However, this is to be expected given the relatively low amount of capital used in the industry (the measure of labour productivity does not account for the amount of capital used in production). Chart 3-4 shows that the IT industry uses relatively little capital to produce games. This contributes to lower profitability and GDP than would be found in a similarly skilled but highly capital intensive industry. Since there is no data available for the capital stock in the Games Development industry, we have, for illustrative purposes, used the data for the broader activity group “IT”.

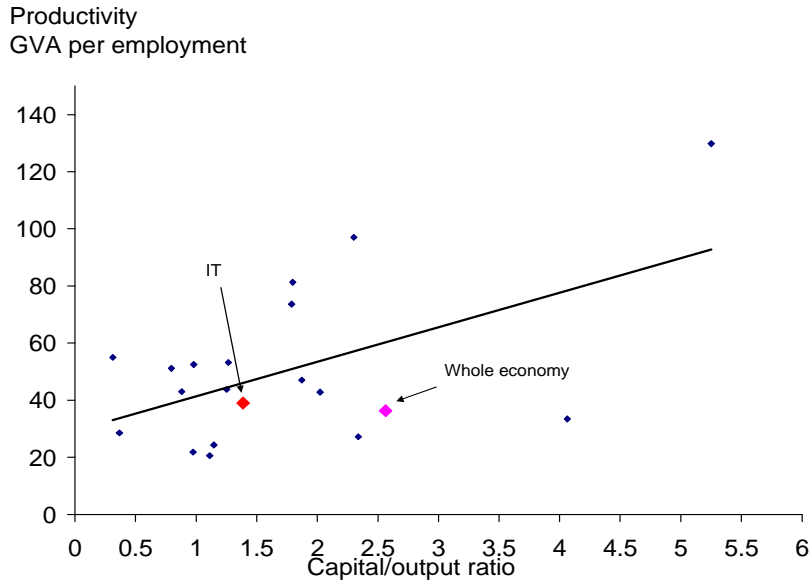
⁶ Games Development industry figure refers to 2008.

Chart 3-3: Labour productivity by industry, 2006⁷, current prices



Source : ONS, Oxford Economics, Games Investor Consulting

Chart 3-4: Capital intensity and labour productivity



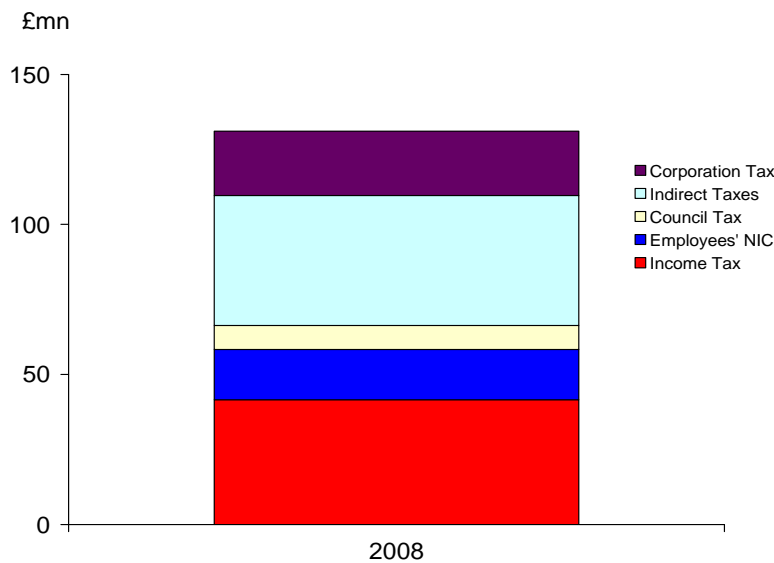
Source : Oxford Economics, ONS

⁷ Games Development industry figure refers to 2008

3.4. Direct tax revenues

The UK Games Development industry is estimated to contribute around £130 million to the Exchequer in 2008. This is equivalent to around a third of the value added in UK Games Development. About 36% of the tax revenues raised for the Exchequer arise from income taxes with a similar share (37%) from indirect taxes.

Chart 3-5: The direct contribution of the UK Games Development industry to the Exchequer



Source ONS, Oxford Economics

In order to calculate the contribution of the UK Games Development industry to the Exchequer we have made use of average earnings data, profits estimates and ONS data on average tax payments by individuals in various income bands⁸.

⁸ This excludes the Income Tax accrued by the owners of companies being sold. In 2007, £176 million of UK Games Development company disposals took place.

4. Multipliers and linkages with UK industries

As well as the direct contribution of the UK Games Development industry to the economy, there are indirect impacts on employment and output through the supply chain of the Games Development industry and induced impacts from those directly and indirectly employed in UK Games Development industry spending their earnings on other goods and services in the UK. The indirect and induced impacts are termed knock-on or 'multiplier' impacts. This chapter describes these different multiplier effects.

Key Points

- The UK Games Development industry helps to support 28,000 jobs. This accounts for those *directly* employed as games developers, those *indirectly* employed in industries supplying the Games Development industry, and for the *induced* jobs dependent on the spending of the direct and indirect workers.
- In total, the UK Games Development industry contributes over a £1 billion a year to UK GDP, taking into account direct, indirect and induced impacts.
- Every job in the UK Games Development industry supports an additional 1.8 jobs in the UK economy. 0.6 are *indirect* jobs through supply chain purchases by the Games Development industry, 1.2 are *induced* jobs from consumer spending by direct and indirect workers.
- The UK Games Development industry contributed £420 million to UK tax revenues in 2008 allowing for direct and multiplier effects from the industry.

4.1. Indirect effects of the UK Games Development industry

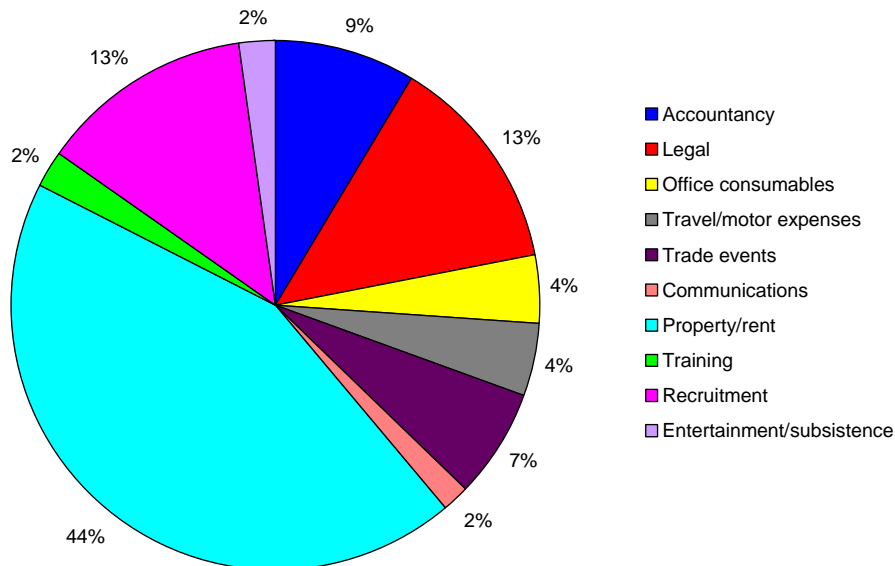
The indirect multiplier for the UK Games Development industry is estimated to be around 1.54. This means that for every £1 million of output generated by the UK Games Development, another £0.54 million of output is generated indirectly in the UK supply chain. On this basis, the total indirect effect on GDP of the Games Development industry is £209 million in 2008, which supports indirect employment of 6,031 people. This is the boost the Games Development industry gives to the rest of the economy by buying products and services from other UK based industries. These suppliers in turn purchase inputs from other industries necessary for them to produce their own products, and so on. In this way the Games Development industry supports output and employment in the wider economy through supply chain effects.

UK input-output tables published by the ONS form the basis for the indirect multiplier estimates. Input-output tables report the value of purchases made by each industry from every other industry in the economy (including own-industry purchases). Given a definition of the Games Development industry it is

possible to trace the impact of its purchases throughout the supply chain. The input-output tables were refined using supply chain data provided by Games Investor Consulting to better reflect the actual purchases made by the Games Development industry.

Chart 4-1 details the key UK based sectors that supply the UK Games Development industry. The largest category of purchases is property/rent which makes up 44% of all purchases. Legal services and recruitment both account for 13% of purchases, while 9% of expenditure is on accountancy services.

Chart 4-1: The UK Games Development industry supply chain



Source : Games Investor Consulting

4.2. Induced effects of the UK games development industry

The induced impact on GDP reflects the purchases of the direct employees in the Games Development industry and employees whose jobs are indirectly linked to the industry through the supply chain. Therefore, the size of the induced impact will be directly related to employment in the wider industry and the wages earned by these workers. The effect on GDP will be less than overall spending because some of the purchases will be on imports from outside the UK.

The estimated contribution to GDP arising from the induced impact is £421 million which in turn supports a further 12,173 jobs. As discussed in section 2, direct employment in Games Development is about 9,900 in 2008 which means each person directly employed in Games Development supports roughly 1.2 more jobs in the wider economy through induced spending effects.

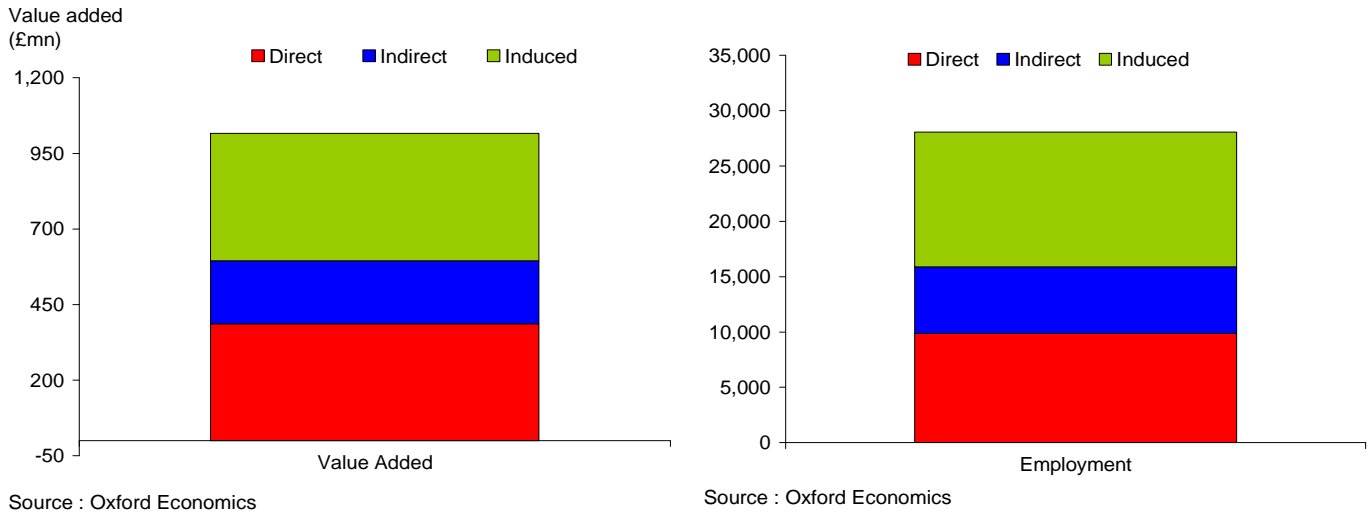
The induced employment impact from the Games Development industry (12,173 jobs) is more than twice the size of the indirect impact (6,031). The induced impacts are large in employment terms for two main reasons:

- industries which consumers spend money on and support are generally more labour intensive; and
- the high wages earned by game developers.

4.3. Total direct and multiplier effects of the UK games development industry

Figure 4-2 summarises the total effect of the Games Development industry on GDP and employment accounting for direct, indirect and induced economic impacts. In total, the Games Development industry is estimated to have made a value added contribution to UK GDP in 2008 of over £1 billion and to have supporting more than 28,000 UK jobs.

Chart 4-2: The total direct, indirect and induced impact of the Games Development industry



4.4. Direct and multiplier tax contributions

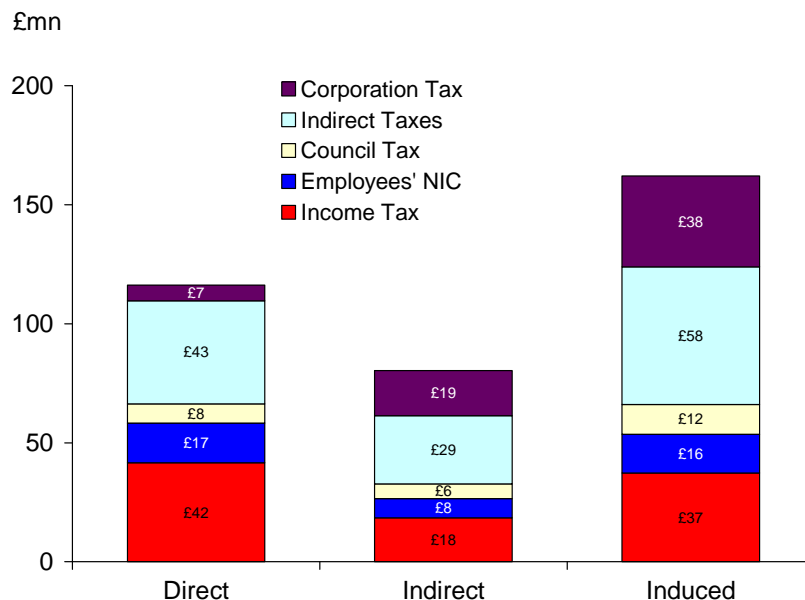
To the extent that the Games Development industry supports the employment and value added activities of other firms in its supply chain and from induced spending, it will also support tax contributions from these firms and their employees. In calculating the contribution through payments of corporation tax, we have used data on the profitability of typical companies in the UK Games Development industry's supply chain along with current thresholds and tax rates. A similar approach to that used for the direct employee

tax payments has been used to calculate the tax payments of the non direct employees supported by the Games Development industry.

In total, the UK Games Development industry contributes - directly, indirectly and through induced spending - £421 million to the Exchequer (Chart 4-3). This is comprised of:

- Tax payments by the direct UK Games Development industry - estimated to be around £131 million with income and indirect tax payments being the largest component.
- Tax payments by companies and employees engaged in the supply chain of the UK Games Development industry – indirect taxes, corporation tax and income tax make up the most significant components of the overall total of £95 million.
- Tax payments by companies or employees that are supported by the spending of employees employed in UK Games Development and its supply chain. This forms the largest component of the direct and multiplier tax revenue. Within this, indirect taxes are the largest contributor, followed by corporation tax and income tax.

Chart 4-3: The total direct, indirect and induced contribution of the Games Development industry to the Exchequer



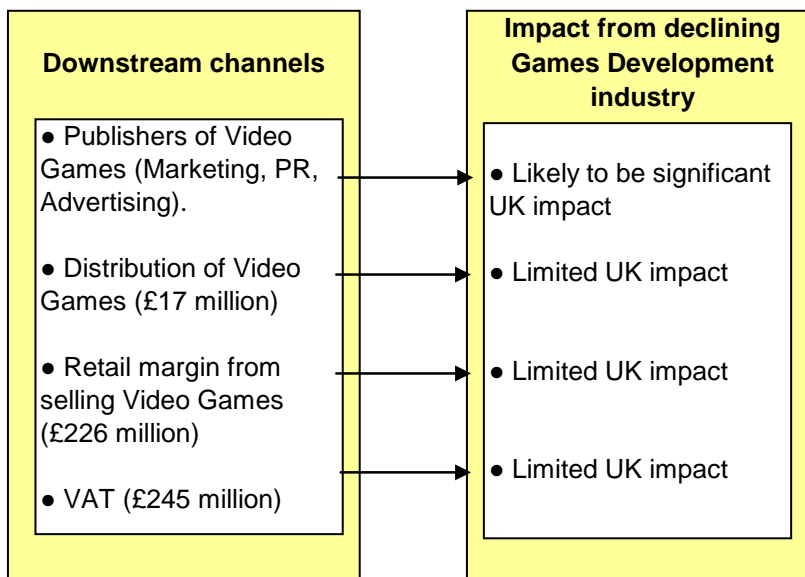
Source : ONS, Oxford Economics

4.5. Downstream Impacts

Downstream impacts from the Games Development industry are the effects on those industries or parts of the economy dependent on the supply of products (i.e. games) from the Games Development industry. Downstream impacts may be significant to the extent that if the Games Development industry did not exist or was in decline, then this would reduce or restrict the activities of those industries requiring UK games as an input. For instance, international publishers have traditionally based their European Headquarters in the UK because of their development ties to the UK - being the UK the largest development market in Europe. If the development activity would decrease in the UK, it is likely that these activities would decline too, as the publishers would likely be based in other development territories, or in the largest consumer markets.

Figure 4-4 summarises the downstream impacts that are likely to occur in the event of a decline in the UK Games Development industry. In the event of a decline in the UK Games Development industry, we expect there to be significant impact on Video Games Publishing (Marketing, PR and Advertising) as these activities move abroad. However, there should be a limited impact on the distribution and retail as it is likely that most of the lost UK made games would be replaced by foreign made games.

Figure 4-4: Downstream impacts of the UK Games Development industry



5. Catalytic impacts

Key Points

- The contribution of the UK Games Development industry is wider than direct and multiplier effects discussed so far. There are a number of ways in which it facilitates the performance of other sectors of economy.
- The Games Development industry is an R&D intensive industry – estimated to invest 14% of its turnover on R&D. The technological advances that come about as a result of this R&D investment can be transferred to firms in other sectors in the form of ‘spillover’ effects. Academic research (although focussed on the manufacturing sector) suggests that such spillover effects are very large, with R&D investment generating a social return of around 70% - i.e. every £100 million invested in R&D leads to an increase in GDP of £70 million in the long run.
- Cluster effects are efficiency gains arising from companies being located close to each other. There is clear evidence that clustering effects are present in the Games Development industry, with most companies located around 8 main hubs. This implies that if the industry would decline, and some companies would leave the cluster, there would be negative productivity effects on the remaining companies.
- The magnitude of these clusters effects are difficult to quantify, but research for the broad IT services sector suggest that for every additional 1% in employment in the cluster, productivity increases by 0.25%.
- Video games have a broad demographic reach - there are at least 26.5 million people in the UK playing games (48% of them are female) - and its penetration rate is increasing fast for the older age groups. Given its wide audience reach and the length of exposition (hours / week) in the younger age groups, there is a clear cultural dimension to games as a medium of entertainment that cannot be ignored.
- Video games also reflect the cultural values from the country where they have been made, reinforcing the country branding, and defining its cultural image, its technological reputation, or promoting tourism.

The previous chapters discussed the direct and multiplier contribution that the UK Games Development industry makes to the UK economy, in terms of GDP, employment and tax. However, the overall contribution that the industry makes to the UK economy is far wider than this, as a consequence of the Games Development industry having spillover effects on other sectors of the economy. This chapter explores some of these spillovers which include: R&D, clustering, and other cultural benefits arising from the Games Development industry.

5.1. The wider benefits of R&D investment

R&D investment enhances the productivity performance of the firm or sector that invests in it. But not all of the returns to R&D spending are 'private' – ie captured by the firm or sector that makes the investment. Some of the technological advances and innovations that come from R&D spill over into other firms, both in its own and other sectors, boosting their productivity as well..

Academic studies and previous research by Oxford Economics (although focussed on manufacturing R&D) suggest that the 'spillover benefits' of R&D can be very large, with R&D investment generating a social return of around 50%-100% - ie every £100 million invested in R&D leads to an increase in GDP of £50-100 million in the long run (see Figure 5-1).

Figure 5-1: Estimates of returns to R&D

Author (year)	Estimated private rate of return (%)	Estimated social rate of return (%)
Nadiri (1993)	20-30	50
Mansfield (1977)	25	56
Terleckyj (1974)	29	48-78
Sveikauskas (1981)	10-25	50
Goto-Suzuki (1989)	26	80
Bernstein & Nadiri (1988)	9-27	10-160
Scherer (1984)	29-43	64-147
Bernstein & Nadiri (1991)	14-28	20-110
Average	25	70

Source : DTI 'Prosperity for all'

Estimations by Oxford Economics suggest that the R&D expenditure in Games Development industry is around 14% of turnover, that is, around £90 million in 2008. Assuming a social return of 70% (and private return of 25%), this would imply that expenditure undertaken by the video games industry would have a positive impact in the long run of £45 million elsewhere in the economy every year, that is not directly accounted for. Therefore, the stock of R&D built up by the Games Development industry over the last decade could be adding as much as £290 million to GDP.

The benefits of R&D investment by one sector spill over to the wider economy in a number of ways. For example, it may be through knowledge sharing or imitation; it may occur as new techniques and products are passed onto the next stage of the production process; or it may happen as workers move from one company to another. Figure 5-3 summarises the channels by which R&D spillovers may occur.

The development of video games rely to an important extent upon technology, and as video games become more technologically complex, it becomes more R&D intensive. R&D spillovers take place:

- Into the ICT sector: R&D undertaken in the games industry drives the demand and acts as a catalyst for technological innovation in the ICT sector, such as middleware (games engines), graphic design, or hardware.
- Into other sectors: technology originally devised for games, especially in computer imaging, graphics resolution, high-speed interactivity, and touch feedback, have found application into other sectors, such as medical imaging, architecture, design, defence, and engineering. Some examples of these applications are discussed further in Figure 5.2.

Figure 5-2: Examples of R&D spillovers into other sectors

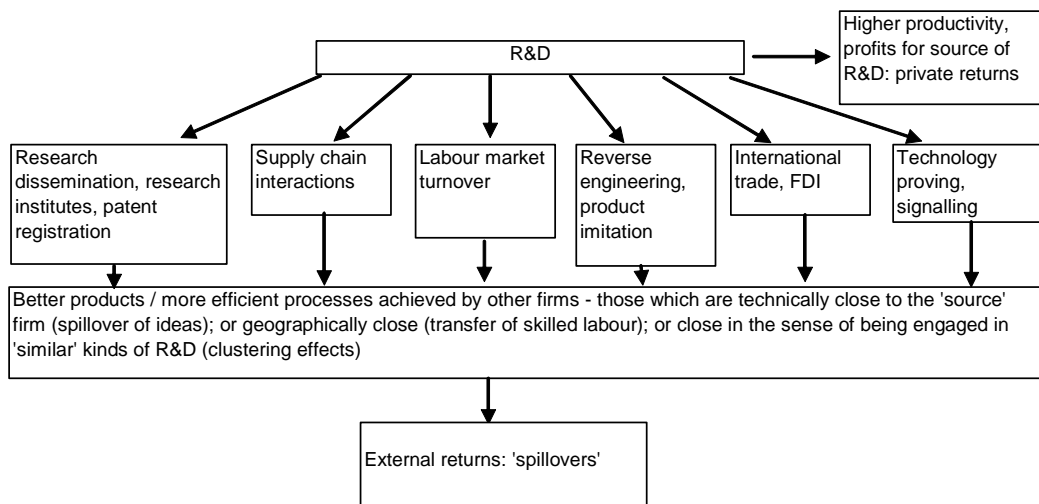
Immune Attack (<http://www.fas.org/immuneattack/>) is a new generation video game that engages students and teaches complex biology and immunology topics in a manner different from the traditional classroom approach. The goal is to immerse the student in immunology concepts to make learning fun and exciting.

Medical imaging requires the same high-speed processing that entertainment software uses to create 3D images in real time. Using traditional processors, reconstructing an image takes two seconds per slice, or over five minutes for a full image. The CELL processor can process the same image in seconds, not minutes. The massive amounts of data resulting from these scans can result in delays, discomfort for patients, and a strain on hospital data processing.

In 2004, the U.S. Army established its own video game studio to develop software to use in training. For example, Full Spectrum Warrior, a realistic game developed for the U.S. Army to simulate combat has a modified version available to the general public.

The Center for Advanced Research in Technology for Education (CARTE) trains military recruits on how to respond to a crisis in a virtual Bosnia. The game relies on sophisticated artificial intelligence to mimic peace keeping operations, and the trainee uses normal speech to interact with the game

Figure 5-3: Channels of diffusion for R&D spillover effects



5.2. Cluster effects.

The “knowledge spillovers” referred to in the previous section, are more likely to propagate if the industries are located close to each other, since there are greater possibilities to interact and watch and learn new ideas or technologies. Therefore, the lower the distance, the lower the transaction costs.

Clusters form because of the efficiencies arising from the physical proximity. There are two types of clusters:

- Intra-industry clustering; and,
- Inter-industry clustering (or Marshallian clustering).

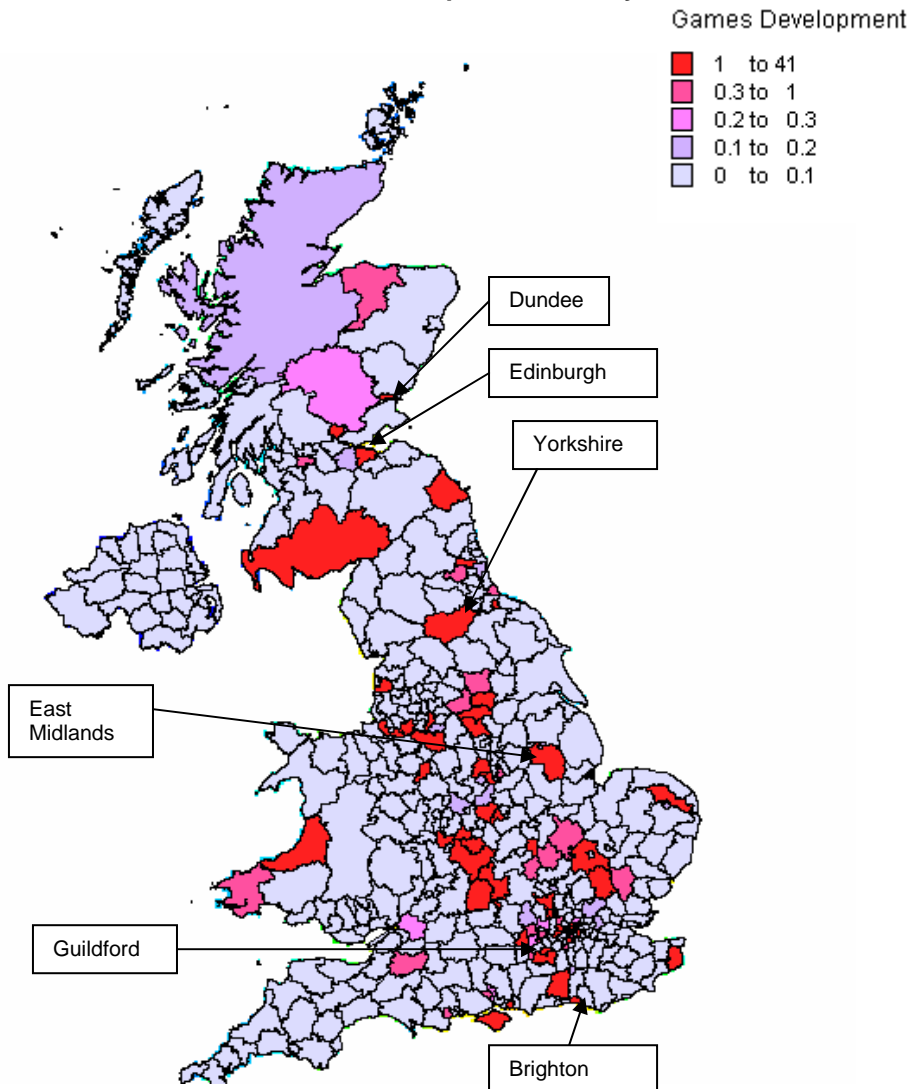
Although no conclusive evidence of intra-industry clustering has been found between the Games Development industry and other creative sectors, there is clear evidence of intra-industry clustering of Games Development companies locating next to each other.

A geographical analysis using Location Quotients for the video games industry by Local Authority District (LAD), are presented in figure 5.4 and show clear evidence of intra-industry clusters. An index above 1 (red), indicates a concentration of video games industry above the national average, and show clusters to exist in Guildford, Brighton, East Midlands, Yorkshire, Edinburgh, and Dundee.

Clustering implies that if the industry would decline, and some companies would move out of the cluster, there would be a loss of efficiency for the companies that would stay, and at the margin, would reduce overall national productivity. Therefore, clustering has positive productivity effects within the industry, and ultimately, in the whole economy.

Although the magnitude of these effects for the games development cannot be estimated due to the lack of data, recent work has been conducted on the benefits of intra-industry clustering at the two digit SIC code. The results indicated that the IT services (ISIC 72), that includes video games development, have a “localisation” elasticity of 0.253. This means that a 1 per cent increase in IT clustering (measured by employment), will result in a 0.253 increase in productivity⁹.

Figure 5-4: Clusters on the Video Games Development industry.



Source: Oxford Economics, Games Investor Consulting

⁹ 9 Graham, D., (2006) *Wider economic benefits of transport improvements: link between agglomeration and productivity. Stage 2 Report*, Imperial College London. Note that Graham also finds negative effects of IT industry location within urban areas which are almost as large. However, this is a distinct issue from that of inter-industry clustering and may relate to the diseconomies associated with major centers such as London. Smaller intra industry benefits are also recorded when employment bands are used in the specification rather than density.

5.3. Cultural benefits.

Contrary to the perception of some people, the most popular games are quiz and board games, rather than shooters or racing games (Figure 5-5).

Figure 5-5: Market share of video games in the UK, by type of game.

The UK's most popular games genres	
Puzzle/Board Games/Quizzes	63%
Action Adventure	43%
Racing	40%
Simulations	39%
Classic	37%
Strategy	32%
Sports	30%
First Person Shooters	29%
Role Playing Games	26%
Music (inc singing, dancing)	13%
Children's	11%
Massively Multiplayer Online Games	8%

Source: "State of Play", BBC / MC&A, 2005.

A number of studies suggest that games may develop particular visual and motor skills, strategic thinking and relationship building, social integration, and some job-specific skills¹⁰, as depicted in the examples in Figure 5-6.

Video games have a broad demographic reach, and their penetration rate is increasing fast, especially older age groups, given that penetration for the younger age groups is already reaching saturation¹¹:

- There are at least 26.5 million people in the UK playing games (48% of them are female).
- The average age of the player is 28. Video games are very popular with young people (with 91% of the 6-24 year olds playing games), but not only: 51% of the 36-50 year olds and 18% of the 51-65 year olds also play games.
- Between 44-54% of gamers aged 6-24 consider gaming as a social activity.

Given their wide audience reach and the length of exposition (hours / week) in the younger age groups,

¹⁰ J. Skatsson, 'Video games "good for visual ability"', AAP, 29 May 2003; Kebritchi and Hirumi, 2008, "Examining the pedagogical foundations of modern educational computer games", *Computers & Education*. 51, 4 (Dec. 2008), 1729-1743; D. Kingsley, 'Action video games can boost cognitive skills', *ABC News in Science*, 29 May 2003; KPMG for the Danish Ministry of Culture, "The Interactive Culture Industry"; Gee, 2003, 'What Video Games Have to Teach Us About Learning and Literacy', Palgrave Macmillan, New York.

¹¹ 'State of Play', BBC / MC&A, 2005

there is a clear cultural dimension to games as a medium of entertainment that cannot be ignored.

Figure 5-6: Examples of games with a cultural dimension

Floodsim is a free online game produced to raise awareness around the issues surrounding flooding by allowing players to take control of all government spending on flooding and see the results of policy choices. The game was created by UK games developer Playgen funded by Norwich Union and has been played to date by nearly 29,000 players worldwide.

Eduteams was created by Team Play Learning Dynamics and funded by Dundee City Council to encourage young people to work in teams to overcome challenges. The game was distributed in 9 schools in Dundee, is designed to use multiplayer collaborative play to develop emotional intelligence skills amongst young people. The game utilised core curriculum content and was specifically designed for use by teachers in the classroom.

Buzz!, the Schools Quiz, was created by Relentless Studios and published by Sony Computer Entertainment Europe. The successful quiz game was adapted to create a series of curricular games in conjunction with the Department for Education and Skills, and was designed as a tool to assist learning and homework.

There is another aspect to video games that is exclusively restricted to the country where the video games is developed, which has to do with the cultural values embedded into the game. There are some distinctive British traits, such as the humour and the narrative, that are distinctive to British games. An evidence of this distinctive “Britishness” of the UK-made games is the fact the UK consumers perceive them differently than consumers in other markets (Figure 5-7).

Figure 5-7: Market shares of UK-made games in the UK and the US, 2007.

	Market Share of UK-made video games as % of the UK-retail market	Market Share of UK-made video games as % of the US-retail market
Independent Developers	6.74%	1.70%
Publisher Studios	9.33%	3.99%
Total	16.07%	5.67%

There are some cultural values associated to the video games that are characteristic to the country where they originate, and that reflect its cultural values. For example, if the industry in the UK was to decline, there would be a loss to society as these distinctive ‘British’ traits would not be found in the games made

somewhere else.

Further, the UK “country-branding” projected by the video games could serve to reinforce the image of the country as tourist destination (i.e. through images of landscape, landmark buildings), technological reputation, or cultural values. Moreover, this effect may be even stronger than other mediums such as film, given the longer exposure involved in video games, as a single title is consumed for a greater duration than a film or a TV.

6. Impact of alternative growth scenarios for the industry

This chapter explores two alternative projections for the Games Development industry and assesses the economic implications the industry following the lower growth path.

Key Points

- We have assessed two alternative growth paths that the Games Development industry may take. First, a scenario where the industry grows modestly with new IP being created. Second, a scenario where there is continuation of that trend of global publishers downsizing in the UK.
- If the industry were to follow the lower growth path rather than the higher growth, then the total value added contribution to GDP that the Games Development industry would be £350 million lower in 2013 and this would mean that it supported 10,000 fewer jobs. This fall in economic activity would lead to a fall in Exchequer revenues – estimated to be £145 million in 2013.
- Much of this impact may be a permanent loss to the UK economy as the highly skilled and specialised games developers are most likely to be actively recruited by foreign companies as UK based opportunities disappear

6.1. Future growth paths for the industry

Despite the rapid growth of the global retail market, and the rapid expansion of Games Development in other territories, the prospects for the UK are not as bright as could be expected. In conjunction with Games Investor Consulting we have prepared two alternative scenarios for the industry:

- **Long term growth scenario:** the UK's games industry is currently near the peak of its game in terms of its global prominence and sales power, its technical and creative ability, and its relationships with major global players. A tax credit implemented in early 2009 would protect the modest levels of growth experienced in past years (4% per annum) during the remaining year in the industry's up-cycle (2009), allow a lower level of growth during the industry down-cycle (2010-2011) as British studios begin to restructure to take advantage of online games and next generation console opportunities and then a return to the same modest growth levels as the cycle turns up in 2012-2013. Under these conditions, the UK could remain among the Top 5 development territories in the world, despite the meteoric rise of China.
- **Long term fall scenario:** projections are based on 2 indicators. First is the loss of

development jobs from global publisher studios in the current year (400 or 4% of the total workforce to October, of which an estimated 75% have been absorbed into existing studios still facing a recruitment crisis). Second is a continuation of that trend of global publishers downsizing in the UK but some re-absorption of redundant staff into other UK studios, exacerbated by the relocation of the most threatened low level jobs (QA and testing) by global publishers to other territories. This decline is exacerbated by the advent of the console down-cycle from 2010-2011, when global publishers have always reduced headcount, number of projects to focus investment on the next generation of console technology.

Some of the key factors driving growth (or decline) of the sector are outlined in Figure 6-1.

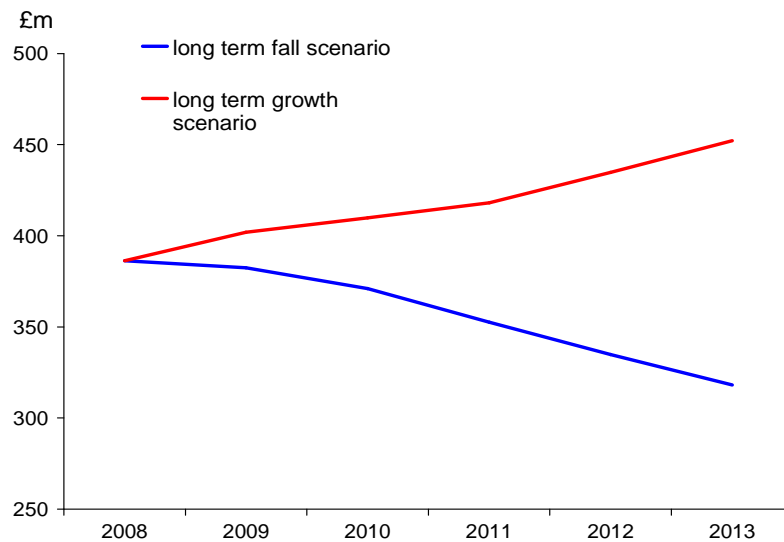
Figure 6-1: Assumptions underlying the high and low growth rate scenarios.

	Growth factors	Decline factors
Strength of independent studios	New IP is being created. Although some companies rely on work-for-hire, an increasing number starts going direct to consumer online.	New IP continues to decline. Work for hire remains the mainstay of most independents revenue.
Strength of publisher studio sector	Will increasingly form the rump of a territory's studio sector, providing the best work opportunities with the latest technologies	Publisher studios start to decline, with the lowest value jobs being relocated. The remaining studios will be producers of key IP for publishers.
UK publishers	More and more publishers go direct to consumer. A greater availability of finance for network games imply that UK publishers reach the global top-tier of publishers.	UK publishers benefit mildly from the new opportunities, but fail to attract large rounds of finance.
Strenght of services sector	Technology companies are spun out of universities, specializing in games middleware. Services companies are mostly relocated to cheaper countries.	UK technology companies will remain world class, but development services are relocated to cheaper countries.
Exposure to console cycles.	More developers focus on low-end platforms such as mobile, handheld and online, and reduce their exposure to console cycles. Increasing presence in the network games markets	The studio sector will slowly adjust to the new opportunities on handheld, PC and online games, but no on mobile games. However, exposure to console cycles is reduced.
Creative strength of offline games	As games reach a wider audience, skills sets of traditional media such as narrative and scriptwriting are accumulated, providing for cross-fertilization opportunities with film and TV	These efficiencies will be confined to online and lower end platforms.
Skills availability for graduates.	As online games grow, more low-skilled staff is needed for customer support; however, the number of graduates for high-end console development will grow slowly.	Although the availability of games graduates improves, the improvements are not great as the number of science-trained graduates falls.
Skills availability of experienced staff.	Experienced staff will continue to be highly sought after.	There is a brain drain
Access to finance	The progression of online games allows more stability to self finance publish titles. Trade finance continues to be important, but access to global capital markets for finance increases.	Trade finance will decline under cost pressure from cheaper territories.

6.2. Economic impact of the low growth scenario

Chart 6-2 shows the implications for these two scenarios in terms of how the direct value added contribution to GDP made by the sector will change over the next five years. The key point to note is that in the low growth scenario the value added contribution to GDP is around £130 million lower in 2013

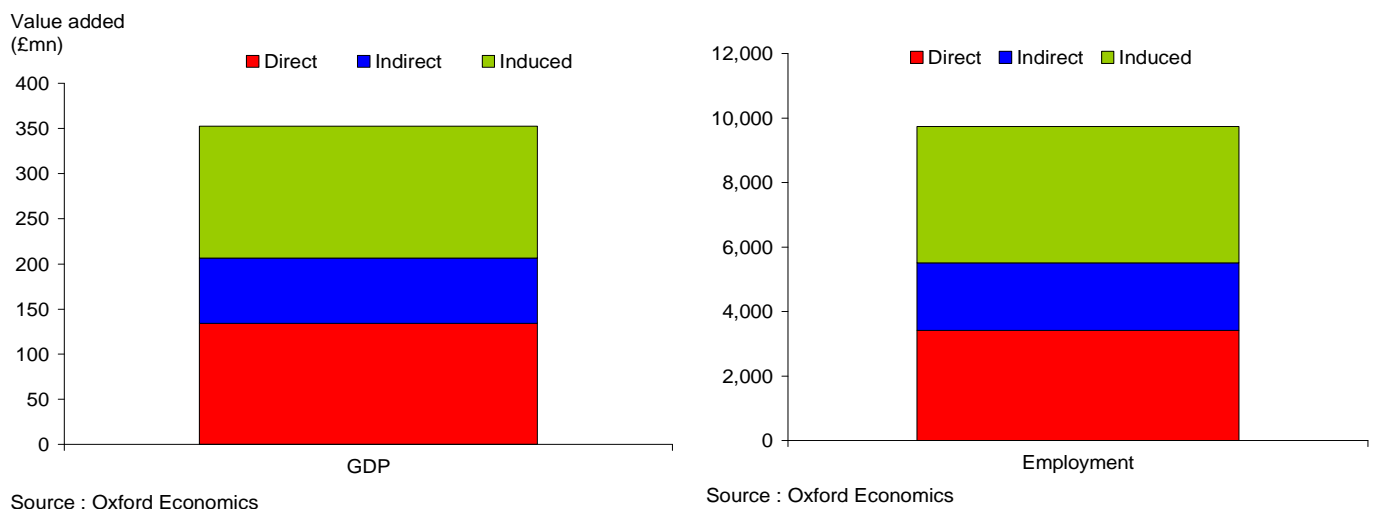
Chart 6-2: Value added contribution to GDP of the Games Development industry under two scenarios



Source : Oxford Economics, Games Investor Consulting

Chart 6-3 show the total impact, including the multiplier impacts, on the value added contribution to GDP and employment. The key points to note are that the value added contribution to GDP of the industry would be £350 million lower. This would mean that, in total, there would be 10,000 fewer workers supported by the Games Development industry in the low growth scenario compared to the growth scenario by 2013. This fall in economic activity would lead to a fall in Exchequer revenues – estimated to be £145 million in 2013.

Chart 6-3: Overall impact (lost GDP and jobs) of the two scenarios in 2013



Much of this impact would be a permanent loss to the UK economy as the highly skilled and specialised games developers are most likely to be actively recruited by foreign companies as UK based opportunities disappear. A number of territories such as Canada and Singapore have been actively and successfully targeting mature companies and individual staff in more expensive countries to relocate. Games staff are said to be a very dedicated, devoted labour force that have been attracted to the sector following a vocational motivation. This impression can be witnessed by the long working hours engaged by developers, and the start of the UK video games industry as “bedroom coders” that managed to become successful developers.

It is therefore very likely that, being a global industry, should the games development in the UK decline, the most skilled labour force made redundant would rather prefer to relocate to another country and continue working in the sector, rather than remain in the UK and find another occupation. This is a feature distinctive to the creative industries, where there is high vocational component in the path of career choice, and would imply that the UK would lose a pool of highly skilled workers, with a world-class reputation.

Further, many of the catalytic effects, discussed in Section 6, arising from the Games Development industry and potentially the downstream publishing activity, discussed in Section 4.5 would also be lost. The magnitude of these effects can be quite large, so a decline of the industry in the UK would have negative effects in other parts of the economy that are not accounted for in the numbers presented in this section.

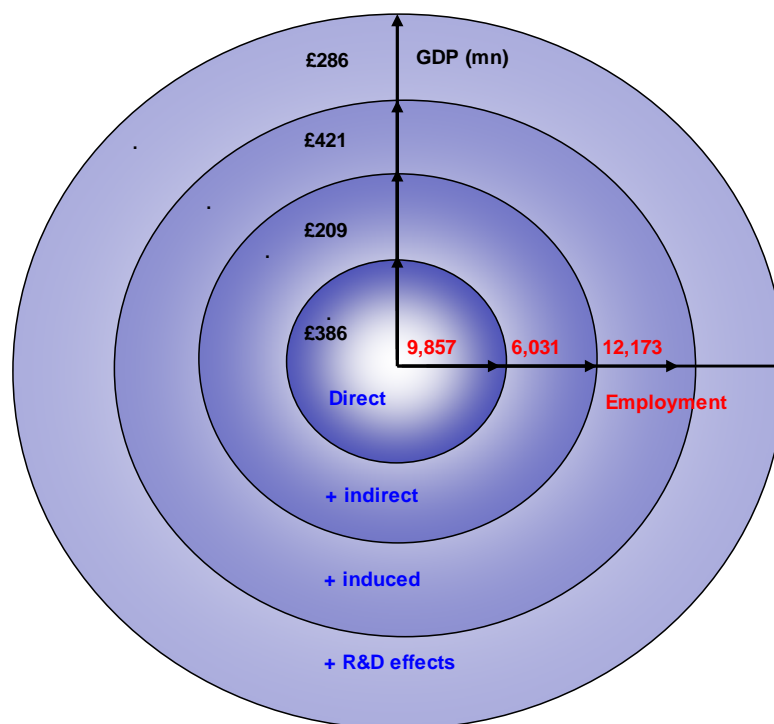
7. Conclusions – summary of overall impact

This report sets out the contribution of the UK Games Development industry to the UK economy. Taking into account the direct, indirect and induced impacts, we estimate that industry in 2008:

- Supported 28,000 UK jobs
- Contributed around £1 billion to GDP in the UK.
- Contributed £419 million to the UK Exchequer.

The breakdown of the value added and tax contribution to the UK economy is summarised in chart 7-1.

Chart 7-1: Summary of the contribution of the UK Games Development industry to the UK economy



The overall contribution of the UK Games Development industry is far wider through impacts such as:

- Spillover effects of Games Development R&D which improves products, productivity and efficiency in other industries;
- Geographic clustering of Games Development companies further encourages R&D
- Cultural impacts such as helping people to develop particular skills, for example, visual and motor skills, strategic thinking and relationship building, social integration, and some job-specific skills.