The UK Video-game Industry in 2009 – 2014: Companies' Survival Rates and Population Analysis from an Organisational Ecology Perspective

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Abstract

Since its first development in early 1970, the video-game industry has experienced a considerable growth in terms of economic and societal impact. Video-games are regarded as an integral part of the broader creative industries. Similarly to other entertainment industries, such as film and music, video-games are frequently characterised by project-based production processes and face some market-related risks that affect their level of competitiveness and survival in the market. The study presented in this paper aims to explore and examine the UK video-game industry through the prism of Organisational Ecology and Industrial Organisation. Using hierarchical logistic models, the authors investigate UK-based video-game companies in relation to a range of traditional explanatory variables related to market survival rates. Findings from the analysis suggest that predictions related to companies' success of failure can be further enhanced with the introduction of variables related to the location and type of organisation the companies, captured with information gathered from their corresponding postcodes and SIC codes respectively.

Keywords: *Video-game industry, Survivability, Logistic Regression, Organisational Ecology, Industrial Organisation*

1. Introduction

As many creative industries, the video-game industry is characterised by intensive process and product innovation (Mirva Peltoniemi & Box, 2008). Since its first development in early 1970, numerous emerging and disruptive technologies have shaped and continue to cast a fundamental weight on the industry's evolutionary trajectory. These advances affect not only the quality and nature of the output of the industry's production processes, but also almost every aspects of the video-game companies, and consequently the risks and opportunities in the market (Development et al., 2003; Johns, 2006).

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The foundation year of the video-game industry can be identified in 1971, when Nolan Bushnell and Ted Dabney developed the first commercially released video-game named *Computer Space* (Kent, 2010)**.** Due to the technological limitations at that time, the two components of the final product, *software* and *hardware*, were highly embedded into a device called "*booth*". High manufacturing and distributions costs limited customers' accessibility to the game, hence the business model adopted by companies for this innovative product was very similar to the one used for other arcade games, such as flippers and slot machines. The game was activated via coin-operated machines, thus their name "*coin-ops*". In collaboration with Nutting Associates, *Computer Space* was distributed mainly to public houses, bars and entertainment parks. Although 500,000 units of the game were sold, the game's producers did not consider it as a success.

The following year, in 1972, a newly founded company named Atari developed and launched a new video-game called *Pong*. The game proved to be extremely successful, and enabled Atari to lay the cornerstone of what would later become a global industry. The dramatic decrease of both size and costs of Central Process Units (CPUs) provided an incentive for Atari to launch, in 1973, the first successful console in the industry's history, called "Atari 2600". Consoles were revolutionary devices that enabled players to use and experience a number of video-games instead of a single title, introducing video-gaming to a broader demographic group and making this leisure activity family friendly. The raise of consoles introduced the possibility for video-game titles to be developed by third independent parties, placing de facto console manufacturers at the centre of a two-sided market.

Since their origin, console manufacturers have never being able to maintain their devices at the same pace of new technological developments and advancements shown of many products distributed in the market. Consequently, the videogame-market was and is still characterised by cyclical periods of boost and rest, with a new generation of consoles being produced approximately every five years (Balland, De Vaan, & Boschma, 2011; Mirva Peltoniemi & Box, 2008), with the 7th generation of consoles arriving in 2014. Regardless the fast technological changes, production and distribution costs of platform manufacturing raise market entry barriers, limiting the number of industry's players to a handful of large multinational companies such as Sony, Microsoft and Nintendo. In recent years, several attempts of introducing and launching low cost gaming platforms have been made by smaller competitors. One notable example is the crowdfunded console "Ouya", which took advantage of the digital distribution channels focusing on cost minimisation (Goumagias, Cabras, & Fernandes, 2014). However, most of these attempts can be considered as niche approaches, given the forbidding costs required to enter the market.

The advent of the smartphones in 2005 saw the processing power of mobile devices such as phones and tables has exponentially increased, transforming smartphones themselves in portable gaming platforms. Nowadays, mobile and tablet based games represent the fastest growing market segment (Feijoo, Gómez-Barroso, Aguado, & Ramos, 2012)**,** with their expansion supported by free-to-play or freemium business models. Mobile gaming has also expanded the reach for game-developers to a much wider demographic group than the one comprising console-users. Interestingly, more than 40% of the player-base today consists of female customers, with an average age of the typical game-player increased to above 30 years in many countries (Srinivasan & Venkatraman, 2010). The recent expansion of cloud computing is challenging the cyclicality that characterises the video-game industry,

and could potentially change the industry again. In 2015 Nvidia, announced the release of a new console that will focus solely on real-time streaming of video-games.

While many industries attracted considerable attention on behalf or Organisational Ecology and Industrial Organisation researchers (C. Boone, Meuwissen, & van Witteloostuijn, 2009; Christophe Boone, Brouwer, Jacobs, Van Witteloostuijn, & De Zwaan, 2012; Christophe Boone, Wezel, & van Witteloostuijn, 2013); the video-game industry remained, until recently, significantly under-researched. We aim to amend this vacuum in the current literature, by analysing the progress of the UK video-game industry between 2009 and 2014.

In particular, by using an original dataset comprising information collected from a number of sources, we aim to investigate survival rates of companies operating within the industry by developing an econometric analysis based on hierarchical logistic regressions. A number of variables are modelled in order to generate predictive models which could explain survival rates of British video-game companies.

The paper is structured as follows: in Section two, we position our approach against the literature and provide the theoretical foundations of our methodology. In section 3, we provide a brief description of the Video-game Industry's economic impact and market on a global and UK-focused scale. In Section 4 we describe our data collection process and the variables of our model, along with the applied methodology and its corresponding rationale. In Section 5, we present the results of our analysis. Finally, we discuss and summarise the findings of our analysis in Section 6.

2. Theoretical background

Both Industrial Organisation (IO) and Organisational Ecology (OE) place performance as focal points of analysis in order to investigate and understand any economic market, and the behaviour of companies operating in a given context or situation (C. Boone & van Witteloostuijn, 1995)**.** However, these two fields of research address behavioural and performance issues from different angles, and many researchers advocate a cross-fertilisation between IO and OE. More specifically, IO research focuses on the theoretical aspects characterising market structures in relation to organisations' financial performances and levels of profitability, with profitability used as the main criterion to predict rates of survival and/or success of a company. According to IO, three types of market structures can have an impact on a given industry's performance in different ways: i) a concentrated market, ii) a fragmented market and iii) a dual-market. The type of the market structure is determined by the concentration and population of the firms within a given industry (Christophe Boone & van Witteloostuijn, 1996). A concentrated market is characterised by high density and low population in terms of companies operating in it; in the video-game industry, this is the case of the hardware side of the market. A fragmented market represents exactly the opposite case of a concentrated market, with many companies and low density population. Finally, a dual market is characterised by both high concentration and high density of the firm population.

Although IO emphasises on the flexibility of an organisation to change and adapt to the environment in order to maximise its profitability and consequently its chances of survival, there is a significant paucity of mortality rate-based studies within IO literature. Instead, there are a number of OE studies conducted on this specific theme, which tend to apply an empirical approach by focusing on market population densities to investigate companies' survival rates.

Companies are examined through time starting from their foundation, in order to identify opportunities and challenges that may affect companies' conduct and behaviour and threat their own existence.

Opposite to the dual-market structure approach in OE is the resource partitioning theory, which sees companies' competitive conduct dictated by their market shares, with survival rates affected by age (*liability of newness*) and size (*liability of smallness*), with new and small companies facing increased mortality rates. However, empirically supported arguments state that the positive effect of age and size can be easily reversed, especially in changing environments, due to the inertia that the companies nourish through their growing and aging process (Carroll, 1984).

3. The global video game industry: a brief overview

The annual turnover of the global video-game industry was estimated to be £37.56bn in 2013 and is expected to increase to £42.04bn by 2014. Generally, the industry experienced an average annual growth rate of more than 8% since 1999, well above both the global economy and other related creative industries. The six largest national markets, in 2013, controlled about 67% of the global market. USA industry's turnover was $11.68bn, followed by Japan (£4.47bn), United Kingdom (£2.9bn), Germany (£2.43bn), France (£2.34bn), South Korea (£1.7bn) and China (£1.47bn)[2].

The industry consists of two separate but interlinked production processes: hardware and software. Hardware production focuses on the development of the platforms that support the software or game. Hardware market leaders are Sony (*PlayStation 4, PlayStation Vita*), Microsoft (*XboxOne*) and Nintendo (*WiiU, Nintendo DS*), which represent the 88% of the global market. The largest hardware market share is controlled by Sony (£5.14bn), followed by Microsoft (£4bn) and Nintendo (3.8bn).

The software market is dominated by big publishing companies, which own a portfolio of video-game titles. Their Intellectual Property is generated internally, through first-party studios, or externally through the acquisition of independent and third party studios. In 2013, the global concentration of the industry included seven big publishing companies (C7) that represented 64% of the global software market. The four largest companies (C4) on the other hand, owned just 49% of the global market. The consolidation in the market becomes evident by observing the evolution of the industry's concentration (C7) from 51% in 2008 to 64% in 2013. This resulted in an increased risk for many SMEs operating in the market, such as publishing and developing studios. Aspects related to product and process innovation, especially in the form of IP, are highly important for these companies in order to create and sustain their competitive advantages.

	2009	2010	2011	2012	2013	2014
Global Market (£ bn)	39,036.00	38,097.10	37,630.30	36,381.70	37,556.10	42,049.40
Growth rate	-0.02	-0.02	-0.01	-0.03	0.03	0.12

[2] Euromonitor Passport Database. URL: http://www.euromonitor.com. Accessed: 25/2/2014

Biggest national Markets						
USA	14,444.70	13,933.20	13,081.00	11,651.30	11,681.10	13,336.70
Japan	4,792.50	4,459.50	4,460.10	4,473.20	4,347.30	4,543.50
UK	3,670.80	3,266.30	3,062.60	2,713.50	2,899.40	3,284.30
Germany	2,046.80	2,267.30	2,368.50	2,380.00	2,439.40	2,600.80
France	2,710.50	2,547.90	2,469.30	2,354.40	2,344.30	2,583.90
Korea	1,079.00	1,220.90	1,401.30	1,573.80	1,690.70	1,889.10
China	715.20	835.80	1,021.00	1,233.00	1,475.30	1,772.50
Software (£ bn)	21,043.30	20,267.90	19,030.70	17,566.60	16,938.40	17,576.20
Hardware (£ bn)	18,316.90	17,065.30	15,652.50	14,226.00	14,691.10	17,077.40
Software Concentration (%)						
C4	44.30	46.00	46.60	48.20	49.10	44.30
C7	53.90	59.30	58.60	60.70	64.2	53.90

Table 3.1: The global and international video-game industry. Source: Euromonitor Passport Database

3.1 The UK video game industry

The UK video-game industry is ranked third in global scale just before the US and Japan with regard to annual turnover, which is estimated to be £2.1bn, of which £1.05bn stem from the software market and £1.04bn from hardware respectively. The growth rate between 2012 and 2013 was 15% for the software market, but the hardware registered a decline of 10.5% in the period considered, mainly due to a new console generation introduced in 2013. Predictions for 2014 forecast growth in the software market up to 16% compared to just 1.2% for the hardware market.

The level of concentration of the UK software market increased significantly between 2008 and 2013. The four largest companies shared 43.7% of the market in 2008, but this proportion increased to about 60% in 2013. Similarly, the concentration as represented by the market share of the big seven companies increased from 60.9% to 79.1% respectively. This implies a rapid consolidation process of the software market in the UK, which potentially affects the survival of many SMEs currently operating in the industry. Moreover, digital distribution channels continue to increase in importance compared to the more traditional physical distribution ones, providing a less costly alternative for the local developers and publishers.

	2009	**2010**	**2011**	**2012**	**2013**	**2014**
Market size (£ bn)	3,392.80	2,884.40	2,525.90	2,025.90	2,090.20	2,331.60
Growth rate	-0.08	-0.15	-0.12	-0.19	0.03	0.11
Software (£ bn)	1,702.90	1,536.10	1,423.10	1,145.20	1,051.50	*1,089.30*
Hardware (£ bn)	1,689.90	1,348.30	1,102.80	880.70	1,038.70	*1,242.30*
Concentration (%)						
C4	47.60	48.60	51.50	59.20	60.00	47.60
C7	62.30	62.40	67.00	73.90	79.10	62.30
Distribution (%)						
Physical	74.40	71.10	66.00	58.00	60.20	N/A
Digital	25.60	28.90	34.00	42.00	39.80	N/A

Table 3.2: The UK Video-game Industry. Source: Euromonitor Passport Database

4. Methodology and Sample Selection

We perform an empirical investigation regarding the effect of the UK's dual-market structure in terms of both density and concentration, in order to investigate study the effect of density, concentration and national market size on survivability of software companies. We also explore organisational-centric factors derived from OE literature, such as the age and the size of the company. Due to the lack of information about levels of annual turnover or number of employees of the selected companies, we decide to use the number of directors in each company as a proxy for size.

One of our objectives is to evaluate the extent of the *liability of neweness* and *smallness* of the UK's video game industry. Hence, we introduce a new unit of analysis for the market's density by focusing on a specific region, as well as the national market. We also examine the effect of the local supply of under and postgraduate courses related to video-game design and production, in order to identify regional factors influencing the industry's mortality rate. Finally, we introduce a factorial (dummy) variable that classifies companies in three categories, namely developer, publisher or hybrid as reflected by the corresponding Standard Industrial Classification (SIC) code.

To perform our analysis, we investigate a dataset of 1,925 video-game companies founded between 2009 and 2013. Of these companies, 858 remained active until 2014, while 1067 dissolved, liquidated or stayed inactive in the same period. The dataset was extracted by FAME database[3]. The variables for each entry are company's name, postcode, foundation date, latest accounts date, number of directors, company's status (active, inactive, dissolved, liquidated and dormant) and company's SIC (2007) code, as shown in Table 2.1, along with their corresponding description.

For simplicity as well as consistency, we opted for a single-entry, single-exit model. In the Business Demography literature, several events described that constitute an entry or an exit from a given industry e.g. a company could migrate from another industry, produce a spinoff company or establish itself explicitly in a given industry. In addition, exiting the industry could take place either through liquidation, merger or acquisition. In our analysis, we do not differentiate among the different methods of entry or exit. Any company not active during the period considered was assumed as inactive when estimating the mortality rate in the industry. Furthermore, SIC codes were used as a proxy to identify different types of companies such developers, publishers and hybrid companies (publishers/developers), in order to examine the intrinsic factors associated with survival rates of companies in the video-game industry.

[3] Fame Database. URL: http://www.bvdinfo.com/en-gb/our-products/company-information/national-products/fame. Accessed: 17/1/2015

Variable Name	Description
STATUS	Binary (1,0). The status of the company: active (1), inactive, dissolved, liquidated, or dormant. For simplicity reasons, we consider all companies that are not active, as inactive (0).
NO_DIR	Number of directors. Used as a proxy for company size.
REG	Region of the company based on its postcode. There are 11 regions in the UK. (Factorial variable)
TYPE	Developer, publisher, hybrid (developer / publisher). The type is based on the company's registered SIC (2007) code. Companies are allowed to choose more than one SIC code to represent their economic activities: 6201/1 Leisure software production activities, and 5802 Video-game publishing activities
NO_COURSE	The number of undergraduate and postgraduate courses related to video-game creation, design, production etc., provided by universities or colleges in the region.
AGE	The age of the company
DEN_FD	The density of the population of video-game companies on national level on the day of the company's foundation.
DEN_FD_R	The density of the population of video-game companies on a subnational level, on the day of the company's foundation
CON_FD	The concentration of the 4 biggest video-game companies in the national market, on the day of the company's foundation.
MS_FD	The size of the national market on the day of the company's foundation.

Table 4.1: The description of the models' variables.

The analysis of the dataset enabled us to generate a range of metadata, which were used to investigate companies' survivability. Information regarding market-based explanatory variables, such as concentration and market size, is provided by Euromonitor's Passport Database. The level of concentration for both C4 and C7 was estimated by using UK largest software companies' market shares. The number of higher-education programmes addressing video-game design, production and creation in different areas of the country were acquired through UCAS Online. The foundation dates of each company supplied by FAME were used to estimate companies' age. In particular, our sample comprised the entire population of companies founded, vanished or that exited the industry between 2009 and 2013 departing from data available at the end of 2008. This enabled us to generate accurate estimates of the industry's population, and consequently density, for both national and regional levels at any given time in the period considered.

We used a hierarchical form of logistic regression to estimate the effects of the exploratory variables on the odds associated with the UK video-game companies' survival rates, by defining the explanatory power associated with IO and OE variables (density, concentration, market size) at a first stage. The rest of the variables were inserted in the model gradually in order to evaluate any improvement of the model's goodness of fit. In the end, this exercise generated two models: a first model exploring the geographic dimension of the IO and OE using the location of the company and used as a factorial variable (dummy); and a second model examining the effects associated with the types of companies and used as a factorial variable (multivariate). The attempt of incorporating both factorial variables in a single model did not increase the predictive power of our model significantly. Hence we decided to focus our investigation by analysing the two models, which include the factorial variables addressing geographical location and type of company separately.

5. Results and Discussion

Table 3.1 report correlations between the dependent and independent variables used in the logistic models. Results suggest that the status of the company (active) is positively associated with the size of the company, represented by the company's number of directors. On one hand, and as expected, the traditional explanatory variables derived from OE and IO literature (concentration, density at foundation) adversely affect the survival rates of small and new companies, enhancing the effect of both newness and smallness liabilities. On the other hand, rates of market growth show a positive relationship with the company's status.

It can be argued that the availability of university programmes (undergraduate and postgraduate) at a local level, added to the explanatory variables and measured as a multi-level factorial, may have a positive relationship against the company's status. However, the type of company shows a very strong negative association with the status of the company, indicating that the intrinsic organisational structure for the video-game companies in the UK as important. Initially, global video-game market size, hardware market size was also included to the analysis but due to the very strong positive correlation between them and the national UK software market deemed them unnecessary the model construction.

	STATUS	**NO_DIR**	**REG**	**TYPE**	**NO_COURSE**	**AGE**	**DEN_FD**	**DEN_FD_R**	**VON_FD**	**MS_FD**
STATUS	1									
NO_DIR	0.220**	1								
Sig. 2-tailed	0.000									
REG	0.053*	0.045*	1							
Sig. 2-tailed	0.019	0.046								
TYPE	0.418**	0.330**	0.048*	1						
Sig. 2-tailed	0.000	0.000	0.037							
NO_COURSE	0.052*	0.041	0.329**	0.066**	1					
Sig. 2-tailed	0.024	0.074	0.000	0.004						
AGE	0.324**	0.020	-0.054*	-0.124**	-0.018	1				
Sig. 2-tailed	0.000	0.943	0.017	0.000	0.437					
DEN_FD	-0.294**	-0.051*	0.015	0.037	0.034	-0.696**	1			
Sig. 2-tailed	0.000	0.026	0.519	0.101	0.140	0.000				
DEN_FD_R	-0.036	0.022	0.028	0.098**	0.210**	-0.325**	0.236**	1		
Sig. 2-tailed	0.110	0.338	0.217	0.000	0.000	0.000	0.000			
CON_FD	-0.316**	0.020	0.048*	0.123**	0.018	-0.928**	0.603**	0.306**	1	
Sig. 2-tailed	0.000	0.381	0.035	0.000	0.419	0.000	0.000	0.000		
MS_FD	0.313**	-0.003	-0.050*	-0.119**	-0.021	0.965**	-0.686**	-0.321**	-0.997**	1
Sig. 2-tailed	0.00	0.903	0.027	0.000	0.368	0.000	0.000	0.000	0.000	

*Table 5.1: Correlation Table (**. Correlation is significant at the 0.01 level (2-tailed), *. Correlation is significant at the 0.05 level (2-tailed).)*

The first step performed in our hierarchical logistic regression analysis omits all the explanatory and factorial variables of the model, in order to estimate the net predictability in terms of percentage. Given that the population of inactive companies is larger in our sample compared to the active counterpart, we would expect the odd predictability related to inactive companies to be slightly above 50%. Indeed, as shown in Table 4.1, the net predictability of the model is 55.4%.

In the second step of the hierarchical logistic regression analysis, we introduce the tradition explanatory variables of IO and OE literature: age, size, market concentration at foundation (C4), density at foundation, and market size. The results show a substantial increase of the model predictability (up to 67.8% of the variation explained). All explanatory variables have a statistically significant effect on the company's survivability (*p-value* < 0.01), as shown by the regression coefficients and the odd ratios. As expected, increased levels of concentration and density at foundation, along with small values for age and size, adversely affect the survivability odds of a company. In addition, market growth has a strong positive effect. The strongest effect on the survivability of the company has the market concentration at foundation, followed by the Market size and the Density on a company's foundation date. Due to the large sample size, we use Nagelkerke R Square and Cox & Snell tests in order to assess the model's goodness of fit (Chi Square is not appropriate in this case). R Square values are 0.18 and 0.25 respectively, and we use these values to explore any potential improvements in the model's fit.

In the third step of our analysis, we examine the impact of geographical location to the model's predictive power by introducing the region as a factorial (dummy) variable into the model, and by using two new variables: density per region (DEN_FD_R); and availability of undergraduate and postgraduate courses at a local level (NO_COURSE). The results of this exercise are related to Model 2 in Table 4.1. The introduction of geographic-related variables slightly increases the predictive power of the model (from 67.8% to 69.8%), with predictability related to inactive companies increased (72.4%) - as expected- in comparison to active ones (66.6%). Both explanatory and factorial variables are statistically significant (*p-value* < 0.01), implying that the location of a company affects its odds of survival, with the areas of London and Yorkshire characterised by increased mortality resilience. The fitness measures of the demographically-based models are slightly improved from the previous model, with the two R squares showing values equal to 0.21 and 0.28 respectively.

In the fourth and final step of our analysis, we introduce the type of the company as a factorial variable in the model developed in the second step. The type of the company is defined by the company's SIC (2007) code. This was feasible because the UK SIC system introduces a fifth digit to the standard 4-digit system of Europe's NACE allowing the differentiation between software developing companies and video-game developers (6201/1). Moreover, each company has the option to choose more than one SIC code to better reflect their economic activities. This enables us to identify hybrid (developing / publishing) companies.

As shown in Table 4.1, the predictive power of the model 3 increased from 67.8% to 78%. The model's predictive power of active companies is increased to 84%, while that of inactive companies, to 72.5%. However, after the introduction of the type-based factorial variable into the model, the geographically related variables of location, density and number of courses availability do not present a statistically significant effect in relation to companies' survival rates. Conversely, the effect of concentration on the survivability odd rates is increased, followed by market size, density at foundation date and age of the company. The goodness of fit of the model, as reflected by the R-square measures, substantially increased to 0.40 and 0.54 respectively, indicating a relatively good fit of this particular model. To further test the combined effect of geographically related variables and type-related variable, the former were omitted and we performed an extra step into our analysis. The result had a very small negative

impact on the predictability of the model (-0.02), with essentially no effect on the models fit and a very small negative change in the constant coefficient.

	Model 1			Model 2			Model 3		
Predictive Power	67.8%			69.8%			78.0%		
Active	63.6%			66.6%			84.7%		
Inactive	71.2%			72.4%			72.5%		
Explanatory Variables	B	Sig.	EXP(B)	B	Sig.	EXP (B)	B	Sig.	EXP (B)
Constant	-32.818	0.000	0.000	-22.673	0.000	0.000	-42.269	0.000	0.000
AGE	-0.683	0.000	0.505	-0.760	0.000	0.468	-1.121	0.000	0.326
NO_DIR	-0.354	0.000	0.702	-0.339	0.000	0.713	-0.033	0.429	0.968
DEN_FD	0.002	0.000	1.002	0.001	0.000	1.001	0.001	0.000	1.001
CON_FD	0.372	0.000	1.451	0.350	0.000	1.419	0.522	0.000	1.685
MS_FD	0.010	0.000	1.010	0.009	0.000	1.009	0.009	0.000	1.009
NO_COURSE				-0.087	0.000	0.917			
DEN_FD_R				-0.002	0.070	0.998			
Factorial Variables									
REG									
REG (1)				-4.699	0.000	0.009			
REG (2)				-5.574	0.000	0.004			
REG (3)				-1.635	0.000	0.195			
REG (4)				-4.934	0.000	0.007			
REG (5)				-3.215	0.000	0.040			
REG (6)				-7.740	0.000	0.000			
REG (7)				-5.696	0.000	0.003			
REG (8)				-3.088	0.000	0.046			
REG (9)				-5.226	0.000	0.005			
REG (10)				-1.808	0.001	0.164			
TYPE									
TYPE (1)							9.730	0.000	16816.049
TYPE (2)							8.153	0.000	3473.577
Fitness Tests									
Nagelkerke R Square	0.245			0.282			0.405		
Cox & Snell R Square	0.183			0.210			0.542		

Table 5.2: The models based on hierarchical logistic regression. Independent variable is the status of the company (active, inactive)

6. Concluding Remarks.

In this paper, we explored how certain attributes of the companies operating in the UK's video-game industry's market, such as geographical location and type of organisation, may affect these companies' survivability in the market. Using a dataset of the population of the UK's video-game companies (developers and publishers) founded between 2009 and 2013, we developed hierarchical logistic regressions to explore the effects of concentration, market size and density to investigate companies' survival rates. In particular, we focused on the geographic dimension of the density variable by introducing an extra regionally-related variable into the model, associated with the number of video-game university programmes available in the region. In addition, we also examined the type of the company as a factorial variable with regard to possible effects associated with the intrinsic organisational structure on the models' predictive powers.

Findings from the hierarchical logistic regression analysis confirm that the companies within the UK video-game industry operate in an increased globalised environment that consequently limits the effects of the geographic dimension of the market's density. In addition, the local supply of video-game creation graduates does not contribute significantly to the survivability of the local companies, implying potentially increased levels of mobility for employees in the industry. However, different locations seem to present different life expectancy, and may affect survival rates for British video-game companies at a sub-national level.

A possible development for this research would be to examine the underlying factors related to accessing sources of financing, other than further investigate the intrinsic organisational attributes of each company. Evidence gathered from other studies (Grantham & Kaplinsky, 2005; Readman & Grantham, 2006) suggests that developing companies face smaller challenges compared to publishers or hybrid companies. A plausible explanation may relate the smaller financial risk that these companies are exposed to. Publishing companies, acting also as the industry's main financial sources, face greater challenges in terms of survivability. Developing studios aim to create and sustain a competitive advantage through process and product innovation, while publishers have to sustain a portfolio of IP. That may be the reason behind the hit-driven strategy that most publishers appear to opt for, which may lead to investigate spinoffs of already successful titles instead of investing to the creation of new ones.

Within the existing literature, a significant number of scholars argue for the complementary nature between these two fields of research and highlight the merit of cross-fertilisation between these principles. On one hand, IO theoretically intensive approaches explore the effect of market structure in terms of concentration on a company's financial performance, which acts as the sole driver of survival rates. On the other hand, the OE empirically-based approaches focus on the market's density, by looking at foundation rates and companies conduct with regard to predicting companies' survival rates. Our results suggest that, by excluding company's type, regionally-based explanatory variables increase the predictability of an empirical investigation. However, organisational related variable bear more significance when it comes to the predictive power. Hence, a combination between IO and OE approaches seem optimal in investigating and examining video-game companies.

The UK video-game market is ranked third globally and it has a deep-rooted tradition when it comes to video-game design, creating and production. Given the paucity of studies addressing companies operating in the industry, further research is needed in order to sustain the local video-game creativity hubs within the UK, and to inform practitioners and policymakers about the significance of this industry for the British economy.

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