



2010

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John Sacranie, '10

Illinois Wesleyan University

Recommended Citation

Sacranie, '10, John (2010) "Consumer Perceptions & Video Game Sales: A Meeting of the Minds," *The Park Place Economist*: Vol. 18

Available at: <http://digitalcommons.iwu.edu/parkplace/vol18/iss1/12>

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Consumer Perceptions & Video Game Sales: A Meeting of the Minds

JOHN SACRANIE

I. Introduction

The video game industry is truly a success against all odds. Though the medium has grown in popularity since the late 1970s, the majority of consumers spent the next two decades decrying it as a fad. By the 1990s, violent content in games made the industry the target of both concerned parents and the government and it seemed that the industry was doomed to collapse under the weight of it all. Nevertheless, the last several years have seen the video game industry transform into a multi-billion dollar juggernaut that puts up sales figures that rival even the movie and music industries. With its newfound mainstream appeal, the video game marketplace has become increasingly competitive, with software publishers churning out titles designed to appeal to every taste and niche imaginable. But as prosperous as the industry has been, many companies have found it tough to survive the last few years. Video games are driven by an ever-changing technological landscape, and development costs for new games have skyrocketed since 2005 when the most recent generation of hardware was released. As a result, commercial failure is catastrophic for most companies and firms are now forced to rethink the way they produce and market games. Because companies within the video game industry live and die by these sales figures (now more than ever), this paper's goal is to address the determinants of video game sales in order to provide a greater understanding of the market's inner workings and discover the recipe for success in this newly-burgeoning industry.

II. Literature and Theory

In determining video game sales, consumer demand is unquestionably the most important issue that needs to be addressed. The factors that go into the demand side of the video game sales equation are both complicated and numerous, consisting of a series of different curve shifters. The supply side, by

contrast, hardly matters at all – should supply run out, the publisher can simply print more copies and have them in stores within a day or two, and there are not any shifts to take into consideration. Furthermore, the production cost for a unit of any given game is only a few cents, making the supply side even more negligible. As such, this research will treat the supply as fixed and focus exclusively on the demand for video games.

Determining the demand for video games is difficult, and one of the primary reasons is because the video game market is actually a two-sided market composed of both hardware and software. Hardware refers to the actual video game systems like the Nintendo Wii or the Sony Playstation 3, and software – the actual games – can only be played on the system for which they are designed. Because you can *only* play a game designed for the Wii on the Wii hardware, for example, software sales are limited by the install base for the hardware on which a game is released.

Literature from Clements & Ohashi (2005) takes this idea a step further and suggests that there are also network effects present in the market for video games. The way it works is relatively simple: if you have a platform that has a large number of games that consumers want to play, more people will buy that system instead of the other available platforms. As the install base – the number of hardware units sold to consumers - gets larger, software publishers want to release more and more titles on that platform since the potential for sales is increased thanks to the larger install base. It creates a cycle where systems with large install bases are the most lucrative for both the consumers and the producers of video game software, so it would logically seem that the platform on which a game is released can create a major shift in the demand curve for a newly-released title (Clements & Ohashi, 2005).

While it has not received as much attention in formal literature as the install base issue, one of the most significant considerations in releasing a new piece of software is platform exclusivity. Put simply, an exclusive game is one that is released only on a single platform. By contrast, a multiplatform title is one that is released on two or more systems. Historically, companies have released the majority of software on a single platform rather than multiple, because focusing on one system allows them to tailor the game to that hardware's advantages and the developers will not be forced to deal with the significantly different hardware architectures that other systems are equipped with (Corts & Lederman, 2009). This leads to quicker turnaround times and a (presumably) more polished final product. Thanks to skyrocketing development costs, however, more and more developers are going multiplatform with their games in order to squeeze ever last drop of income out of a new release. While logically it would seem that making a game available to more people would increase sales, there is little literature available right now to back this notion up, and one must also consider the huge increase in resource needs and increased costs involved in making a game multiplatform. Furthermore, games that are exclusive to a single system tend to see an amplified marketing push from the hardware manufacturer, as they can use these increasingly rare exclusive titles to drive sales of their platform. Thus, the effect that exclusivity has on a game's sales seems ambiguous, but should create some sort of demand curve shift.

Up to this point, the study looks primarily at hardware's effect on software sales. Of course, there is easily just as much about the software itself that contributes to demand for video games. One of the most important elements is a very simple factor: genre. Put simply, every consumer has different tastes for games. Some want action games, others want adventure, and yet others want to try their hand at obscurities like dating simulations. And there is evidence supporting the importance of genre in monthly video game sales charts. Genres like first person shooters and casual games are the "in" game types as of late while others, like RPGs (role playing games), have been lagging behind. Tastes are constantly changing, which makes it particularly difficult to measure the impact that a game being in a given genre will have on sales. Furthermore, there is also the problem of certain genres becoming oversaturated. Consumers crave variety in market offerings, especially in the video game market – they are generally not content to simply play a single genre and nothing but. Offering a unique game in an underrepresented genre can result in enormous sales, as demonstrated by *Guitar Hero* galvanizing the then-ailing music genre in 2005. The genre problem

becomes even more complicated when you consider that video games are highly substitutable for most consumers. Some genres, like the first person shooters, are absolutely flooded with games. When a publisher releases a new first person shooter, there is a strong chance that it will be buried in the avalanche of substitutes out there. Between that and the ever-changing consumer tastes, publishers are faced with difficult decision of exactly what kind of game to produce, so while it is clear that genre choice will shift the demand curve, it's unclear in which direction that curve will move.

As the industry continues to evolve, one trend that is become increasingly pronounced is the importance of sequels and games based on licenses. As a result of the increased cost of game production, publishers are less and less willing to take risks, since the last few years have made it all too clear that it is too expensive for the majority of companies to weather a failure of a game. Companies want to stick to what they know will sell well, which oftentimes happens to be sequels to established franchises. The benefit to developers is that they can look at past years' sales charts to determine whether a franchise was a hit or a dud, and produce new games accordingly. The downside for the consumer is a dearth of innovation, but this so-called "sequelitis" is of massive importance in sustaining the industry right now. The decision to release more and more games based on licenses like movies or comic books is in the same vein – these games are near-guaranteed successes that can help keep a company stable and allow them to take risks in the future once production costs are not so unmanageable. This is all hinged on the Blockbuster Theory, which is most commonly applied to the movie industry (Vany A., 2004). It suggests that software publishers want to pour a large amount of resources into a single game in hopes of making a huge profit, and sequels and licenses are the best way to make sure that happens. Thus, if a game is part of an existing franchise, one can expect to see a considerable rightward shift in the demand curve.

A particularly important outcome of gaming going mainstream is that marketers now have a far broader audience to appeal to in order to maximize the potential sales for any given game. The sheer quantity of advertising that goes into a game can make or break its eventual sales, and the matter has become so important that some companies like Electronic Arts (the biggest software publisher in the industry) will actually spend as much as 60-75% of a game's budget on marketing alone. Research from Burrato & Viscolani illuminates that there's more to advertising than simply throwing money at random promotion. The timing of advertising is important – companies need to promote a new title well in

advance of release, but not so far in advance that people forget about a game by the time it's released. Furthermore, the *type* of advertising utilized matters. Magazine ads are easy to flip past without a second thought, but TV ads and internet ads tend to occupy a greater spot in consumers' minds (Burrato & Viscolani, 2002). Given that, it would seem that the more expensive the advertising, the more useful it should be in persuading consumers to shell out for a new game. It should not come as any surprise then that increases in advertising expenditure are expected to cause a rightward shift of the demand curve for a game.

It should be quite clear by now that that sales in the video game industry entail several considerations. The key factor to be addressed in this paper, though, is something that has gone thoroughly neglected by formal literature up to this point: aggregate review score. As the video game industry becomes more and more mainstream, there are an increasing number of people who are understandably uninformed regarding what constitutes a good game versus a bad one. Many of the consumers who have just recently entered the market have not had much experience with the medium, and thus, do not know any better than to purchase a title based on the cover alone, ignoring the possibility of the actual game being abject dreck. Of course, qualitative opinions of games have existed for almost as long as the medium itself, but the question to be answered is whether or not reviews still have an appreciable impact on consumers' buying decisions. Hypothetically, they still do, because with games being as expensive as they are, a rational person would not carelessly spend money on a game without first considering the product's quality.

III. Data and Empirical Model

These disparate factors that contribute to video game sales are best accounted for by a simple demand model where video game sales are the dependent variable. Unfortunately, a lack of useful data for the purposes of this research has necessitated a self-compiled data set for analyzing video game sales. The sales numbers come from VGChartz (VGChartz), and this model will be looking at the weekly sales for 100 randomly selected US game releases over their first ten weeks of availability. While yes, there are long-tailed games that continue to sell well for years, the majority of titles see their sales taper off significantly after a couple of months. As a result, publishers are typically most concerned with those first several weeks. It is worth noting that this data only covers retail sales, so digitally distributed games (which make up a very small portion of game sales in a given year) are not accounted for.

Looking at the independent variables, aggregate review scores are easy to account for. There are a number of sites that average review scores that a game has received on a scale of 1-100. The aggregate scores used in this project come from MetaCritic. The rest of the variables will simply be observed, as there is no database that contains an array of information on the rest of the factors. The effect that platforms and platform exclusivity have can be measured through dummy variables. This paper will only examine the major console and portable systems, meaning that it will exclude the PC and iPhone. The primary reason behind this is that digitally distributed games are much more prominent on these platforms, and sales data on digitally distributed games cannot be tracked. The PC is also a platform that is far more prone to piracy, which is another factor that cannot be accounted for. Admittedly, this is an imperfect measure that does not fully account for all of the complexities that hardware introduces, but it should be adequate for getting a general idea of hardware's effect on software sales. Similarly, consumer preferences and whether a game is based on an existing franchise can also be observed through a dummy variable. Advertising is a little more complicated due to a lack of data on the actual advertising budgets devoted to a given title. Due to the complications involved, it is not possible to account for the effect that advertising has on sales in this equation. The variables to be used in the regression along with their expected signs are detailed in Table I.

Table I: Definitions & Expected Signs

Variable	Description	Expected Sign
SALES	Sales over first ten weeks	
REVIEW	Aggregate review score (0-100)	+
PS2	Game is on Playstation 2	?
PS3	Game is on Playstation 3	?
360	Game is on Xbox 360	?
WII	Game is on Wii	?
PSP	Game is on PSP	?
DS	Game is on DS	?
EXC	Game is exclusive	-
SEQUEL	Game is a sequel	+
LICENSE	Game is based on a license	+
ACTION	Genre = Action (NON-FPS)	?
FPS	Genre = FPS	?
ADV	Genre =	?

MUSIC	Adventure Genre = ?	?
SPORTS	Music/Rhythm Genre = Sports	?
OTHER	Genre = Other	?

The Equation:

$$SALES = \beta_0 + \beta_1(REVIEW) + \beta_2(PS3) + \beta_3(360) + \beta_4(WII) + \beta_5(DS) + \beta_6(PSP) + \beta_7(EXC) + \beta_8(SEQUEL) + \beta_9(LICENSE) + \beta_{10}(ACTION) + \beta_{11}(FPS) + \beta_{12}(ADV) + \beta_{13}(RPG) + \beta_{14}(MUSIC) + \beta_{15}(SPORTS) + \beta_{16}(OTHER)$$

The equation used is a simple demand model where review score is the only numerical independent

variable used. The rest of the variables are dummies. If a game falls into any of these categories, the expected number of units sold will increase by the corresponding coefficient. One of the platform variables needed to be dropped from the model, so I omitted the PS2 variable, as the Playstation 2 is the oldest and least relevant system at this point. The dependent variable, sales, is the number of units actually sold over the initial ten weeks of a game's release.

IV. Results

The results of the regression are detailed in Table II and Table III.

Table II: Regression Results

Variable	Unstandardized Beta	Standard Error	Standardized Beta	t-value	Sig.
(Constant)	-1397315.088	378111.658		-3.696	.000
REVIEW	17855.983	4237.826	.457	4.213	.000
PS3	-52806.159	249500.828	-.038	-.212	.833
X360	238193.167	234466.103	.196	1.016	.313
Wii	157680.622	244550.952	.119	.645	.521
DS	-190624.755	246704.180	-.136	-.773	.442
PSP	-9401.242	267354.636	-.005	-.035	.972
EXC	180791.008	126084.064	.164	1.434	.155
SEQUEL	145000.584	114038.408	.131	1.272	.207
LICENSE	62369.749	140797.147	.048	.443	.659
ACTION	348772.476	140093.025	.302	2.490	.015
FPS	125693.437	210647.453	.070	.597	.552
ADV	41893.730	139729.601	.033	.300	.765
RPG	35830.363	221646.300	.018	.162	.872
MUSIC	72364.220	218298.387	.034	.331	.741
SPORTS	-37094.115	172625.046	-.023	-.215	.830
OTHER	205819.104	150383.383	.156	1.369	.175

Table III: Other Relevant Values

R ²	.35
Adjusted R ²	.215
F-score	2.598
Overall Sig.	.002
Standard Error	4.79747E5
Degrees of Freedom	82

Overall, the regression yielded some valuable results. The most important of these results was that review scores have a significant effect on sales, and quite a dramatic one given the relatively large standardized beta of .457. The unstandardized beta, which is 17855.983, indicates that an increase in review score by one point (out of 100) will increase sales on average by approximately 17,856 units. When interpreting this result, however, it is important to note that the average review score is 71.02 out of 100, with most games' review scores clustering around that area. If a game scores far lower than that, chances are that sales will not be as highly affected by a one point increase in review score.

Also of note was that none of the platform variables were significant. This outcome suggests that a game being released on a specific system will not have an effect on sales. Surprisingly, neither licenses nor sequels seemed to have better sales than titles that were not based on existing franchises. It is quite possible (and seems likely), however, that a different data set could yield a significant result that would indeed indicate that sequels have a positive effect on sales. Similarly, games that were platform exclusive came close to having a significant impact on sales.

Most of the genre variables were insignificant with the exception of the action (non-first person shooter) genre, which was highly significant. The results indicate that being an action game has a profound effect – the expected increase in sales from a new title being in this genre was a whopping 348772.476 units. This result would explain the increased emphasis on action games over the last few years.

As Table III shows, the regression's R² value was .35 while the adjusted R² was .215. This indicates that approximately 35 percent of the variance in the dependent variable can be explained by the model, which suggests that the model is a fairly good predictor of sales. The regression's overall significance was .002 with an F-score of 2.598, which means that as a whole, the model's results were significant. One concern with the results is the whether or not relatively low degrees of freedom of

82 adversely affected the model. A future model, could either add additional observations or eliminate some of the variables.

V. Conclusion

One of the more surprising outcomes from the regression was that the platform on which a game is released does not appear to have a significant effect on sales. Theory suggested that the opposite would be true since putting a game on a popular system should increase sales, yet the results indicate that platform alone isn't enough to drive sales. Perhaps more surprising was the finding that the only genre that significantly increased sales was the action genre. The meaning this holds for publishers is fairly obvious: make more action games. Meanwhile, first person shooters, the genre that has enjoyed massive success for the past decade, actually looks to be stagnating in the results as it had only a negligible effect on sales. If anything, this is a strong example of changing consumer tastes in action and it indicates that the types of games developed will shift towards more action-oriented fare in the near future. This finding could also be a clue for developers without deep pockets that the action genre might be one to avoid due to the inevitable increase in competition.

Despite the increased emphasis on licensed-based games and sequels over the past few years, it seems peculiar that these results were insignificant (although the sequel variable was close to being significant.) A possible explanation is that licensed-based games do not sell huge numbers, but these games are cheap enough to produce that they are able to sell enough copies for the producer to secure an easy profit. As for sequels, companies may focus on sequels simply because there is a lower risk involved – not because they expect particularly huge sales figures.

The most important finding to this paper is that indeed, review scores are still a major driver of video game sales. People still try to spend their money rationally by purchasing the titles that are qualitatively better. However, it is important to note that this does not necessarily mean that people read reviews. While there is certainly a good chance that many consumers do, it is also possible that people buy games based on positive word of mouth from people they know or some other source. The conclusion that can be drawn, however, is that video game sales are affected by quality, and the effect is a dramatic one. Thus, companies looking to maximize

sales have no better option than to simply make the best product possible.

This raises the question, however, of why companies do not simply produce great games all the time. One of the common problems in the industry today is the influx of low-quality games that are designed solely to make a quick buck. The answer why is fairly clear: cost. Not every company can afford to make a stellar game that dazzles audiences, and making a great game takes a considerable amount of development time. In the future then, it might be wise to weigh the amount of money a game makes against the production cost of that game – to analyze actual profits rather than mere sales. In future research, addressing this issue could make it possible to determine what sort of sales figures and production costs are required for video game production to be profitable and sustainable.

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