WHAT ARE THE ABSOLUTE FACTORS INFLUENCING THE SUCCESS OF ANIMATED FILM BASED ON THE BOX OFFICE REVENUE?

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Abstract

Motion picture business is a multi-billion dollar industry and becomes a significant part of the economy. Likewise, animated movie has constantly taken credit for that success. Normally, movie industry intends to entertain the majority of viewers in an attempt to certainly earn huge revenue or at least to cover a break-even point. However, forecasting box office revenue before its cinematic release is a challenging activity. The paper is aiming to investigate what really determines the box office revenue based on the impact of critic rating, studio ranking, academy award, production cost, star ranking, animation type, and month of release. The OLS linear regression is adopted to analyze the qualified one hundred and ninety-four animated film samples since 1989 to 2015. As a result, five factors, namely critic rating, production cost, studio distributor, month of release, and type of animation, show a positive significant relationship towards the box office revenue of animated film.

I. INTRODUCTION

The worldwide animation industry has continually grown over years, yet, thanks to a huge technological advancement, the market size had been rapidly jumping over the past recent years. The impact of cinematic animation is formidable. Nowadays, it could create global phenomenal fever or enormous deficit to one country's industry. The global animation market value was about USD 222 billion in 2013. In addition, most of the segments in the animation industry are also abruptly growing at the rate of 7% Year over Year (Global Animation Industry Report: Strategies, Trends & Opportunities, 2014). While, the animation-

related derivatives market did better, it exceeded USD 500 billion in 2013 (Global and China Animation Industry Report, 2012-2015).

Apparently, the animation industry gradually becomes economic driven and even a pillar of national economy in some countries, especially in the United States and some countries in Asia. The major animation markets cover the United States, Canada, Japan, China, France, Britain, Korea and Germany. However, the expanding market and improving production quality are not a guarantee ticket to the box office revenue success. There are also numerous internal and external factors that affect the revenue outcome. Some of them are able to speculate, while the rest is not. Mostly, unpredictable factors are based upon the personal movie-goers' preference.

The fact that making one animated movie the studios have to bare high cost and also high risk in return of one successful animation. Evidently, the most and the best way for the producer to decrease the cost-benefit gap is to reduce the internal cost of the production through pre-production to distribution process. In particular, the multinational studios choose to leverage in various forms including partnership, coproduction, government subsidization, and joint ventures with global partners. Even though, the studio is able to control a solid cost, yet the unpredictable box office revenue still remains. Thus, the ability to forecast the feedback becomes necessary as a premium cheat code in this competitive game.

In order to effectively exploit the gigantic opportunity of increasing in global demand and supply, many previous papers have investigated the movie industry regarding what are the absolute factors influencing on the box office revenue. Even though, a lot of papers had been conducted in the scope of movie industry, but there is none, focusing on animation market in specific. Therefore, this paper is aiming to investigate what are the absolute

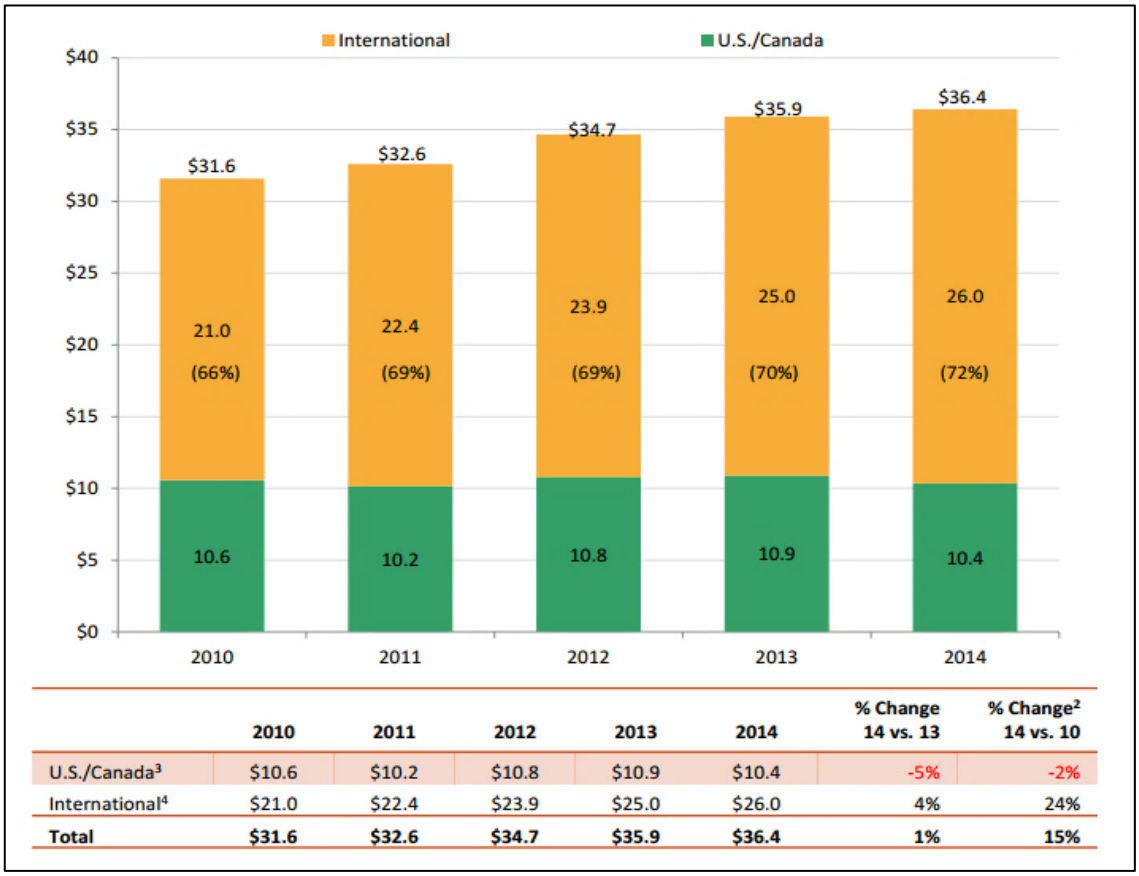
determinant factors influencing on an animated movie's success in term of the box office revenue.

II. THEATRICAL STATISTICS TREND

The trend of global theatrical movie has gradually increased over the past few years. According to the figure-1, the global movies box office revenue accounted for USD 36.4 billion in 2014, which increased for 1% over 2013's total. The increase mainly came from an effect of international box office (USD 26.0 billion), which was up 4% from 2013 and accounted for 72% of global box office in 2014. Over the past five year's trend, the International box office and the global box office in U.S. dollars had risen up 24% and 15%, respectively. In the contrary with international box office trend, U.S. and Canada as the biggest movie market in the world had a negative box office trend comparing with 2010 and 2013 trend, which were
-2% and -5%, respectively.

According to table1 regarding on the Top yearly highest grossing movie in 2010-Oct 2015, two out of six on top grossing films are animated movie, which are Frozen in 2013 and Toy Story3 in 2010. Toy Story3 and Frozen earned USD 1,063.2 and 1,276.5 million respectively and became the number one in yearly box office revenue in their release year.

Figure-1: Global box office revenue of all films during 2010-2014 (USD Billions)



	2010	2011	2012	2013	2014	% Change 14 vs. 13	% Change[2] 14 vs. 10
U.S./Canada[3]	$10.6	$10.2	$10.8	$10.9	$10.4	-5%	-2%
International[4]	$21.0	$22.4	$23.9	$25.0	$26.0	4%	24%
Total	**$31.6**	**$32.6**	**$34.7**	**$35.9**	**$36.4**	**1%**	**15%**

Note: 1) Values in the report include all films released, regardless of distributor or country of origin, except where specified as a subset. 2) Percentage value change is calculated using table values before rounding. 3) Source: Rentrak Corporation – Box Office Essentials, calendar year from January 1-December 31. 4) MPAA calculates international box office country-by-country based on a variety of primary and secondary data sources.

Source: Theatrical Market Statistics 2014, Motion Picture Association of America (MPAA)

Table-1: Top yearly highest grossing movie in 2010-Oct, 2015 (USD Millions)

Year	#1 Movie	Worldwide Gross
2015	Jurassic World	$1,668.9
2014	Transformers: Age of Extinction	$1,104.1
2013	Frozen	$1,276.5
2012	Marvel's The Avengers	$1,519.6
2011	Harry Potter and the Deathly Hallows Part 2	$1,341.5
2010	Toy Story 3	$1,063.2

Source: http://www.boxofficemojo.com/yearly/?view2=worldwide&view=releasedate&p=.htm

Table-2: Top highest grossing movie of all time (USD Millions)

Rank	Title	Studio	Worldwide	Domestic / %		Overseas / %		Year^
1	Avatar	Fox	$2,788.0	$760.5	27.3%	$2,027.5	72.7%	2009^
2	Titanic	Par.	$2,186.8	$658.7	30.1%	$1,528.1	69.9%	1997^
3	Jurassic World	Uni.	$1,668.9	$652.2	39.1%	$1,016.7	60.9%	2015
4	Marvel's The Avengers	BV	$1,519.6	$623.4	41.0%	$896.2	59.0%	2012
5	Furious 7	Uni.	$1,514.8	$352.8	23.3%	$1,162.0	76.7%	2015
6	Avengers: Age of Ultron	BV	$1,405.0	$459.0	32.7%	$946.0	67.3%	2015
7	Harry Potter and the Deathly Hallows Part 2	WB	$1,341.5	$381.0	28.4%	$960.5	71.6%	2011
8	Frozen	BV	$1,276.5	$400.7	31.4%	$875.7	68.6%	2013
9	Iron Man 3	BV	$1,215.4	$409.0	33.7%	$806.4	66.3%	2013
10	Minions	Uni.	$1,156.9	$335.7	29.0%	$821.2	71.0%	2015

Note: ^ Indicates the movie made its gross over multiple releases.
Source:http://www.boxofficemojo.com/alltime/world/?pagenum=1&sort=rank&order=ASC&p=.htm

Otherwise, according to table2, the two animated films, namely Frozen and Minions, can occupy the top ten highest grossing movie of all time, where frozen is up to No.8 followed by Minions on No.10. Also, Disney's Oscar-winning *Frozen* has become the top-grossing animated film of all time, surpassing Toy Story3. The Frozen phenomenon is unable to overlook because its fever does not only affect movie industry, but it also enhance performance of other relevant businesses as well.

Movie industry's performance has expanded over years. However, empirically, cinematic animation as a subset of cinematic movie has continually taken responsible for the success at a significant level. It is no longer just an extra business, yet, it becomes a serious industry so far. Animated movie business is believed to grow along with the movie industry in the future.

III. LITERATURE REVIEW

According to a Walt Disney's quote "I never called my work an 'art'. It is part of show business, the business of building entertainment", in another word, art, science, and economy are considered as components of a one movie. To strengthen the idea, De Vany (2006) also suggested that movie is merchandise in art and art in merchandise. Movie history has been continuously developed over the last one hundred years and eventually becomes the great achievement of art and science during 20^{th} century (Zhang, 2008). According to the movie prosperity, the depth of the various paper researches has gone along with the movie's development. In fact, undeniably movie does not represent as entertainment channel only, yet it apparently illustrates as economic determinant and cultural exchanges as well (Zhang, 2008).

Various theoretical methods are generally amended and applied in order to resolving the problem of forecasting movie's success regarding on the box office revenue. Litman (1983) was claimed to be the famous pioneer who used a multiple regression model for the commercial movie's success prediction. In particular, the model was composed based on various endogenous variables namely, movie genre(science fiction, drama, action-adventure, comedy, and musical), Motion Picture Association of America(MPAA) rating (G, PG, R, and X), production cost, release company, superstar in the cast, Academy Awards, and release

date (Christmas, Memorial Day, Summer). Litman's model concludes that the endogenous of science fiction genre, critics' ratings, production costs, major distributor, Academy Award nomination, winning an Academy Award, and Christmas release are all significant in movie's success.

Afterwards, many researchers had adapted and enlarged the original Litman first model. Prag and Casavant (1994) confirmed the Litman summary that without market expenditure, critics' praise and Academy Award has positive impact towards revenue, while also added star power and movie sequels as a positive variables as well. Therefore , due to some aforementioned research results, a set of independent variables to be focused, including star power, critic review, season of film's release, MPAA rating, film genre, awards, and production cost, has become the main determinants of numerous papers.

The majority of the literatures insist that critics are matter towards movie's success (Deniz and Hasbrouck, 2011). Eliashberg and Shugan (1997) categorized critic into two groups, which are the influencer and the predictor. The influencer is those who manipulate people based on his review, while the predictor is a person who just forecasts the success of movie with unnecessary review. Aftermath of Eliashberg and Shugan suggests that critics play a significant role in the box office revenue found on their reviews, while the influencer review is statistically more effective than the predictor review. In addition, Reinstein and Snyder (2000) argues that only positive reviews are able to create large impact on film's success, also the critic power is not account for the abundance of critic population, yet only a few qualified critics create significant influence towards revenue.

Litman (1983) states that Christmas is the best time for movie release in a year, which is in contrary with Sochay (1994) who argues that summer is the perfect time instead. However, Sochay (1994) also clarified this conflict that it is because of a competition among

same timetable release movies in specific period. Avoiding strong competition seems to be better choice than specifies the exact season of film's release.

Normally, no matter how effective of MPAA rating impact is, the production companies often try their best to get a better rating, regardless of the number of reedit and reshoot scenes. The coveted PG or PG-13 ratings are considered to be the most wanted popularity of over all because it allows everyone to see their movies, supported by research of Ravid (1999). He asserts that G and PG ratings have a positive correlation with movie's success. Moreover, Teryy et al. (2004) speculated that R rating has negative impact with box office revenue at the amount of ten million dollar on average.

The relationship between movie's success and film genre are various in results. The first researcher, Anast (1967), claims that films with eroticism and violence have positive impact; in contrast with action-adventure film obtains a negative correlation with movie attendance. The next conclusion by Litman (1983) illustrates that science fiction genre is the only significant attribute towards box office revenue. However, Austin (1984) found no correlation between this determination and movie attendance at all.

Since awards are the most reachable and broadest variable via media channels, thus, practically some producers are willing to postpone the movie release towards the end of the year in order to increasing the chance of being nominated and receiving monetary rewards. First investigation by Litman (1983) discovered that just Academy Award nomination in the categories of best actor, best actress, and best picture generates about 7.34 million dollar in box office, while winning in any categories will increase the value around 2.5 times. Nelson et al (2001) also replies in the same pattern, by just a difference on calculated number result. While, Dodds and Holbrook (1988) conducted the paper in more specific detail by comparing award nomination period with after receiving awards period by focusing on best actor, best

actress, and best picture variables, which are worth for 6.5, 7, and 7.9 million dollar respectively. Compare with after receiving the award, best actor and best picture are worth 8.3 and 27 million dollar respectively, while best actress is not statistically significant.

In order to analyze production cost and star power, return-on-investment (ROI) and movie revenue are considered as a determinant for counting the value. Due to Ravid (1999), high production cost essentially affects movie revenue, but do not rise up the ROI. Regarding on star power, there is conflict results referencing on different methodologies which are univariate analysis and regression model. Regression model found no correlation, while univariate analysis found positive impact. The rent-capture hypothesis is used to explain the contrary that movie stars increase the movie revenue equivalent to their market value, but not to movie's profitability.

Since there are numerous previous researches regarding on forecasting box office revenue of movies industry, yet, the research covering cinematic animation in specific is barely to find in contrast with the rapid expansion of animation market. It has induced the attention from all over the world. The higher value of the market comes with the higher risk in return. Thus, the ability to forecast whether the movie would be blob or bloom becomes a privilege. Therefore, this paper is conducted in order to answer the key factors that affect the cinematic animation's box office revenue specifically, referencing on the previous researches as a guideline.

To summarize, according to the previous researches, the factors that could influence the animated movie's box office revenue are critic rating, production cost, release studio, star cast, academy award, and month of release. However, in order to explain cinematic animation in specific, Type of animation is added to completely fulfill the gap of the researches. Then,

the paper would test the aforementioned seven factors via regression model to solve the research question.

IV. RESEARCH HYPOTHESIS

This section sets some possible hypotheses to answer the research question of this paper. The hypotheses themselves are based on the various factors that are capable of influencing the box office revenue of animated film and obtained from the previous literature review and the author's opinion.

According to the literature reviews, the key factors to be concerned are critic rating, the main actor or actress power, movie genre, Motion Picture Association of America(MPAA) rating, production cost, release company, Academy Awards, and season of film's release. However, this paper would eliminate and add some considerations ground on the extent of animated film's nature rather than on the broad extent of movie industry like the previous researches. In particular, the difference of movie genre and MPAA rating are found out to be insignificant to the result because cinematic animations generally target for children at every ages, thus, almost of the movies are normally rated at the same type, namely 'PG', to be categorized as a family movie. Besides, the difference of the movie genres are not matter too, since no matter what type of the movie is, the storyline in overall is still be 'animation' anyway. In addition, the type of animation would be set up as a new factor influencing the box office revenue based on the animated film extent.

Thus, in conclusion, the independent variables of the regression model would be critic rating, the main actor or actress power, production cost, studio distributor, Academy

Awards, the type of animation and season of film's release. While, the dependent variable is the box office revenue of each animated films.

Generally, those factors could be categorized as the effect from both of the consumer side and the producer side. All of star power, critic rating, Academy Awards, the type of animation and season of film's release factors are considered as the consumer impact in the way that it affects consumer's perception and decision towards the animated movie. Receiving academy awards and the higher star power and critic rating follow by the higher movie expectation and interesting of consumer. When, the month of film's release could imply the customer budget and the amount of theatre attendance in the specific period. Lastly, animation type is a subjective factor based on the consumer's preference. However, the higher quality of animation tends to induce more of customer's attention.

For the producer impact, production cost and studio distributor are determined by the producer decision itself. The higher production cost and the more famous of the studio could imply the better quality of the movie, which eventually results in consumer's purchasing decision and box office revenue of the film.

Since, the possible factors tend to be highly involved with the preference issue of individual, whether the preference on impressive storyline, memorable music, and substantial character etc. Therefore, transforming abstract data to concrete data is the earnest challenge on this paper. However, the quantitative outcome would be capable of clearly illustrate the inclusive significant factors toward the box office revenue.

V. DATA

The movie samples include a range of the first establishing animated movie released on November, 1989 until the current release on September, 2015. The data set consists of

cross-sectional observations. In addition, the paper filters out some data based on the specific criterion that the movie must be widely screen across many countries and the number of theaters screening the movie must exceeds fifty theaters throughout movie's lifetime. As a result, one hundred and ninety four animated films have been considered as the data set in this paper.

Moreover, all the collected data comes from the various trustable sources only, which are 'imdb' website and the Box office Mojo website. The 'imdb' website and Box office Mojo website are widely famous as, the biggest internet movie database in current day and the official website of box office chart over time, respectively. Each factor derives from the sources as the following table.

Table-1: The sources of collected data

Source	Factor
• 'Imdb' website	➢ critic rating ➢ the star power ➢ the type of animation
• Box office Mojo website	➢ production cost ➢ studio distributor ➢ Academy Awards ➢ season of film's release

VI. METHODOLOGY

In an attempt to answer the research question, particularly what are the absolute factors influencing the success of animated film based on the box office revenue, both of the quantitative and qualitative researches are adopted in order to replying the question. The first step clearly defines and scopes down the research extent, following by quantitative method and qualitative method in order.

In order to seeking for the relationship between the mentioned hypotheses and the research's purpose, the linear regression model is conducted based on cross-sectional data set on aforementioned independent variables, including critic rating, the main actor or actress power, production cost, studio distributor, Academy Awards, the type of animation and season of film's release. Even though, several quantitative methods from the previous researches, including the multi- layer BP neural network (MLBP) and Neural Network etc., have been developed for answering the similar research question. These methods offer better performance in term of delivering more discrete result. However, due to time-limitation and limited access to resource, the qualitative part of this paper would essentially rely on the simple OLS regression model as a second best choice instead. After that the qualitative data is taken into account in case of clarifying and supporting some unexpected and irrational quantitative aftermaths.

The main regression equations in this paper regarding on the relationship between the box office revenue and hypothesis factors:

(1) $$Y_i = \beta_0 + \beta_1 studio\ ranking_i + \beta_2 production\ cost_i + \beta_3 critic\ rating_i + \beta_4 academy\ award_i + \beta_5 star\ ranking_i + \beta_6\ time\ of\ release_i + \varepsilon$$

(2) $$Y_i = \beta_0 + \beta_1 studio\ ranking_i + \beta_2 production\ cost_i + \beta_3 critic\ rating_i + \beta_4 academy\ award_i + \beta_5 star\ ranking_i + \beta_6 animation\ type_i + \beta_7 time\ of\ release_i + \varepsilon$$

Where subscript i denotes movie i, Y is box office revenue of each animated film during the its movie lifetime, studio ranking denote the rank of studio distributions across the world, production cost is net cost for production in one movie, critic rating refers to rating of movie given by public viewers, academy award captures dummy variable whether the movie

is received or nominated for Oscar award, star ranking denotes the rank of star value, animation type refers to the type of animated movie classified by production method, time of release is the month release, and ε is the error term.

The data of all the factors could be collected as an actual number (production cost), ranking (star power and studio distributor), rating (critic rating), and defining criterion in data (Academy awards, month of release, and type of animation). Precisely, besides the factors that could be collected as a number data, the criterion for transforming qualitative data into number would be set up in Table-2.

Table-2: qualitative factors as a dummy variable

Factor	Criterion
• Academy awards	1 if received or nominated for the award 0 if otherwise
• Month of release	1 if Jan, 0 if otherwise 1 if Feb, 0 if otherwise 1 if Mar, 0 if otherwise 1 if Apr, 0 if otherwise 1 if May, 0 if otherwise 1 if Jun, 0 if otherwise 1 if Jul, 0 if otherwise 1 if Aug, 0 if otherwise 1 if Sep, 0 if otherwise 1 if Oct, 0 if otherwise 1 if Nov, 0 if otherwise 1 if Dec, 0 if otherwise
• Type of animation	1 if anime, 0 if otherwise 1 if computer graphic, 0 if otherwise 1 if motion capture, 0 if otherwise 1 if stop motion, 0 if otherwise 1 if 2D, 0 if otherwise

Otherwise, month of release and animation's type variables appear to have more than two subset variables, thus, a baseline must be defined. In this case, January and Anime are the baseline for month of release and type of animation, respectively.

After analyzing the outcome of the regression model, eventually the qualitative researches would take an action in term of supporting and clarifying the reasons behind those numbers in more detail. The data would be collected from the internet news and articles.

VII. EMPIRICAL RESULTS

To analyze the paper question, the OLS (ordinary least squared regression) model is conducted. There are two models with different number of independent variables and same dependent variable. The result is illustrated in Table-3. Precisely, Table-3 displays the correlation of hypothesis variables with box office revenue, F-test of animation's type and month of release, and R-squared of each equation.

1. SIGNIFICANT ANALYSIS

The paper defines the significant level at five percent. The coefficient of Studio ranking, production cost, and Critic rating are highly significant because they are significant in both of the initial equation (1) and the add-up equation (2). In contrast with Academy Award and Star ranking, they are insignificant in both equations (1) and (2).

However, for type of animation and month of release, they are dummy variable that are divided in many subsets. Thus, the F-test is required, which the result is shown in Table-3. As a result, even though, type of animation and month of release are not individually significant, but, they are jointly significant, according to table-3. The F values are below 0.05 level.

In conclusion, Studio ranking, production cost, Critic rating, Type of animation, and Month of release are significant to the result.

2. MAGNITUDE AND SIGN ANALYSIS

The initial model (1) is composed of six independent variables followed by literature review, including studio ranking, production cost, critic rating, academy award, star ranking, and month of release. Due to Table-3, the model can explain around fifty five percent of the variation in the box office revenue in both equations. In addition, the increasing of production cost can impel USD 2.2 million, while having better score of critic adds more USD 78 million. Receiving or being nominated for Academy Award contributes USD 35 million to the box office earning. When improving in Studio rank and Star rank rise up the box office revenue USD 0.9 million and USD 50 grand, respectively. In term of month of release, launching on May to August generates higher positive correlation with box office revenue comparing with launching on January, which releasing the movie on July adds the highest earning around USD 141 million. While, launching movie on the other months contributes lower box office revenue comparing to January, which releasing on December had the lowest negative effect among all of them.

Table-3: Coefficient of the box office revenue linear regression fed by different set of input variables, R-squared, F-test

dependent variable/	Equation(1)		Equation(2)	
independent variables/ R-squared/ F-test	Coef.	P>l t l	Coef.	P>l t l
Studio ranking	-0.9512	0.000*	-0.8979	0.000*
Production cost	(2.2194)	0.000*	(1.8012)	0.000*
Critic rating	(78.2299)	0.000*	(87.4854)	0.000*
Academy award	(35.2377)	0.290	(60.8652)	0.054

Star ranking	-0.0472	0.135	-0.0276	0.367
Animation type				
CG			(93.0711)	0.033*
2D			-28.3362	0.540
Motion capture			-145.9016	0.085
Stop motion			-100.2922	0.030*
Month of release				
Feb	-3.4868	0.922	(62.2658)	0.115
Mar	-47.8877	0.295	-22.1086	0.640
Apr	-12.3817	0.767	(60.1644)	0.146
May	(104.0459)	0.089	(132.5604)	0.029*
Jun	(32.6104)	0.503	(97.0703)	0.084
Jul	(141.5780)	0.105	(205.5697)	0.019*
Aug	(28.8698)	0.388	(80.4044)	0.014*
Sep	-60.3819	0.048*	-25.0061	0.442
Oct	-43.7433	0.327	(5.6798)	0.905
Nov	-44.1441	0.250	(16.1558)	0.710
Dec	-93.5837	0.006*	-21.6093	0.627
Adjusted R-squared	(0.5472)		(0.5472)	
F-test:				
Type of animation	F(4, 173) =	9.37		
	Prob > F =	0.0000		
Month of release	F(11,173) =	2.51		
	Prob > F =	0.0060		

Note: Coefficient significantly different from 0 at the 5% level *

According to the difference of the previous researches and this paper in term of studying scope, where this paper only focus on animated film market rather than movie market as a whole, so, the second model (2) is conducted by adding another independent factor, namely type of animation, to fulfill the studying gap. The later model is conducted with the same number of observation. Due to the Table-3, R-squared is improved. It can interpret that the model explains sixty percent of the variation in the box office revenue.

Besides, the second model (2) is considered as a complete equation to answer the research question.

Analyzing the result of the equation (2), firstly the increasing of production cost adds USD 1.8 million to the box office revenue. When receiving better Critic rating and Academy Award have higher impact on the box office earning, contributing USD 87.5 million and USD 61 million, respectively. Moreover, the coefficient of Production cost, Critic rating, and Academy Award display the same presumable sign, which is a positive relationship.

Since better ranking should displays negative coefficient sign in term of representing positive relationship to the box office revenue. According to Table-3, both of Studio rank and Star rank show a negative sign as same as presumable sign. Precisely, the better order of Studio rank and Star rank improves box office revenue USD 0.9 million and USD 30 grand, respectively.

After adding one independent variable, the correlation's sign of some released month change oppositely. Most of the previous researches collected Time of release in term of season, unlike this paper. To reiterate the result, each research had different conclusions regarding on what is the best season to launch the movie. Nevertheless, the final explanation was there is no exact answer, yet, it depended more on avoiding the competition rather than defining the specific period.[1] Even though, the data was collected differently and ambiguous final result, but, it is undeniable that Time does impact on box office revenue. Thus, the sign of the correlation coefficient should be positive.

Due to Table-3, sign is different between model (1) and (2). The negative coefficient of some month in model (1) transform oppositely in model (2). Eventually, nine out of twelve months shows a positive sign correlating with the hypothesis. Only three months, including

[1] "Predicting the Performance of Motion Pictures" Scott Sochay, 10/1994

March, September, and December reveal negative sign. It can interpret that launching movie on those three month contribute less revenue to box office than others.

So far, movie launched on March, September, or December get lower impact box office revenue, comparing to movie released on January. In particular, September is the worst month to launch the animated movie, followed by March and December. In contrast with movie released on July, it adds the highest value to the box office earning for USD 206 million on average. Otherwise, being computer graphic animated film is the best type of animation. It improves box office success by USD 93 million.

Since Type of animation has never been existed in any previous researches, so, the presumed sign is based on the writer's opinion referring to current qualitative information. As a result, animation's type should have positive sign. However, only CG animated film has positive correlation as shown in Table-3. In particular, being a CG animated film can generate higher revenue for USD 93 million than being an anime animation. In a contrary, being 2D, stop motion, or motion capture animated movie contribute lower box office earning compare to being an anime movie, which motion capture film generates the lowest among all of them.

VIII. CONCLUSION

There are many factors that can influence the success of animated movie in term of the box office revenue (Litman, 1983). As a result of this paper, the empirical result shows that critic rating, production cost, studio distributor, month of release, and type of animation have a positive impact on the box office revenue. The result of critic rating, production cost, studio distributor, and month of release variables are consistent with the literature review. Nevertheless, unlike the literature review, Academy Award and Star power are not significantly effect on the movie's earning. To analyze similarity and difference between

literature review's result and this paper's outcome, the different result probably comes from the different characteristic between movie and animated movie. Precisely, the super star as an actor or actress in the movie can contributes more revenue than the star as a voice actor only. Academy Award for Best Animated Feature itself has been recently presented for only fifteen years. Also, most of the animated film's movie goers are children who clearly don't care much about award, thus Academy Award has less influence on the box office revenue. On the other hand, launching movie on July, receiving better critic score, and being CG animated film are highly effective among all hypotheses.

IX. RESEARCH LIMITATION

There are some limitations in this paper. Firstly, according to literature review, various mathematic methods are implemented. Those methods were believed to show wider and deeper result. However, due to the time-limitation and limited economic knowledge, the OLS regression model becomes the second best method. Thus, the result in this paper could be more straightforward than the previous researches. Secondly, even though, the whole qualified samples were collected since the establishing of cinematic animation. The limited observations could bias the result. The last is information access limitation. Since the data set requires the past information, some data might be distorted.

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