An Economic Perspective to Independent Cinema

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Abstract

This paper investigates the economic patterns related to independent cinema, which seems to be an understudied perspective in the literature. Using the classification in The Movie Database, we delve into basic features of movies and make comparisons of mainstream and independent cinema. Applying count regression models to alternative classifications of independent movies, we investigate the temporal patterns of independent movie creation and the linkages between independent and mainstream production volumes. We find that increasing number of independent films may be partially an outcome of increase in mainstream movie releases, showing a case of positive externality. In addition, increasing production budget for a movie has a positive impact on independent movie releases, in which the independent movies are more financed by the foundations such as United Artists over years.

Keywords: cinema; movies; independent movies; economics of art; count regressions

1. Introduction

> Independent film is really a way of thinking. I used to think it was where the money comes from, but now it's clearly about having a vision and a point of view when you want to tell a story.
> –Nancy Savoca, film director

After the Lumiere Brothers gave cinema industry a start, it would not be too late to accept cinema as a branch of art; more precisely, cinema has been categorized as the seventh art by Ricciotto Canudo (Bordwell, 1997). Cinema has been reshaping the lifestyle and overall habits of people worldwide. At first, anthropological aspects of visual arts did not change with motion picture, motion picture was used as means of modern art expression of "speaking and knowing" (Grimshaw and Ravetz, 2009). In other words, "the narrative potential of film is so marked that it has developed its strongest bond with the novel… Both film and novels tell long stories with a wealth of detail and they do it from the perspective of a narrator, who often interposes a resonant level of irony between the story and the observer" (Monaco, 1981: 27). After that, cinema, as a giant industry, became a significant economic activity that with the advancements in technology, it turned to be a mass production material with higher demands for motion pictures even in 1907 (Balio, 1985). Although technological ease of production and screening a movie is far behind the digital era of today, Stead (1982) states that 20 million tickets, which corresponded to 40% of population, were sold every week in the UK, by 1938. Furthermore, in some cases, cinema industry also turned to be a propaganda device, imposing political or

power-related entities in order to convince people for the legitimacy of existing ideology or political stance of administration. To exemplify, according to Margry (1992), *Theresienstandt* (1944) is one of the essential Nazi propaganda films which is about one of the concentration camps that "depicting as paradise".

Independent cinema, on the other hand, has been an important venue especially for the intellectual. According to Tzioumakis (2006), studio era (mid-1920s to late 1940s) of the cinema industry was dominated by the major companies of Hollywood and independent cinema was considered for the low budget movie production companies. Within the post-studio era (late 1940s to late 1960s) and cont., with the decline in material cost of producing a movie, more oligopolization of Hollywood-based major production companies, and transformation of cinema from an art form to as a means of entertainment made the way of "independent cinema" having relatively late notion. Independent cinema no longer limited to just one economic definition, but various descriptions made it valuable.

Ergo, there is no commonly agreed and solid definition of independent cinema. Levy (1999) states that independent films are mostly qualified by anti-Hollywood bias. While it can be defined as "the position of individual films, or filmmakers, in terms of (1) their industrial location, (2) the kinds of formal/aesthetic strategies they adopt and (3) their relationship to the broader social, cultural, political or ideological landscape" (King, 2005: 1-2) from a perspective, it can also be defined as "any film that has not been financed, produced and/or distributed by a major entertainment conglomerate" (Tzioumakis, 2006: 2) of Hollywood from another. Moreover, it is argued for independent movies that "the abundance of dialogue – especially, intelligent dialogue–" and valuable preoccupations, methods and sensibilities that mainstream films do not consider in general (Insdorf, 2005).

Figure 1. Evolution of Movie Releases According to TMDB Viewer Pool, 1948-2007
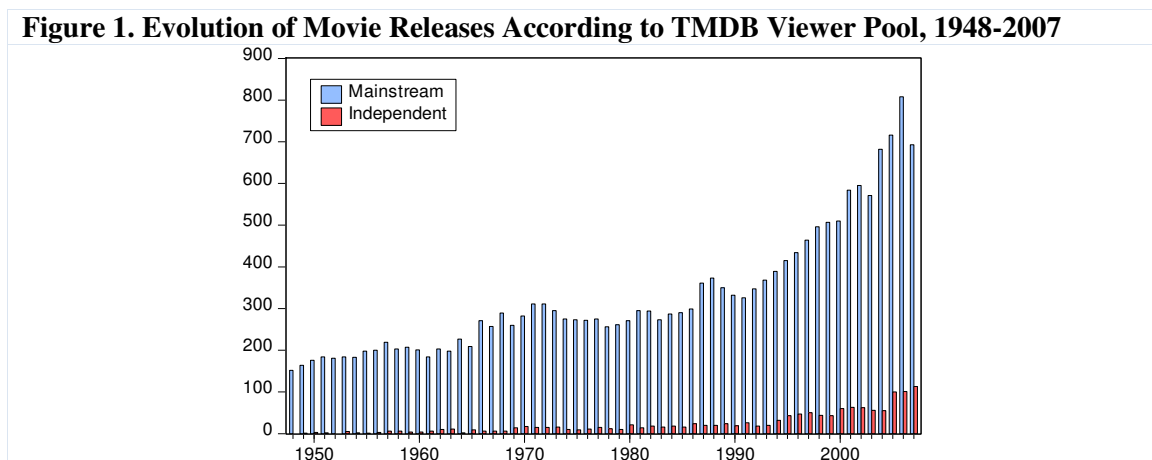
Tracking the progress of mainstream and independent movie releases on a yearly basis (Figure 1), we see an increasing trend in the total movie releases. Especially after 1992, the trend became steeper and this means that more releases occur every coming year. From 1948, independent movies also started to show an increasing trend until 2007; from 1993, the number of independent movies started to increase with a more rapid fashion. Furthermore, the distribution of independent movies follows a similar path with the total number of movies. We observed a decline in total number of movies in 2007, but an increase in independent movies.

Against this background, we believe that independent cinema has been discussed in the literature of cinema and art; yet, it deserves some statistical analysis which remains to be an understudied topic in the earlier work. What we specifically do in this paper is to reveal economic patterns of released and classified independent movies, their fundamental similarities and differences from mainstream movies, and driving forces of releasing an independent movie.

The remainder of the paper is as follows: The next section includes a literature review. Section 3 involves the data and our preliminary observations on distribution of language, genre, runtimes, and monthly releases of movies over years. Section 4 presents the empirical work of the paper by firstly giving the statistical framework we employ, then revealing our main estimates together with Levy (1999)'s classification of independent movies. We discuss the data and findings in Section 5 before concluding the paper in the last section.

2. The Literature

Considering our context, i.e. independent cinema and economic analysis of motion picture industry, the literature lacks a study with the perspective of ours. Most of the independent movie literature analyzes the artistic and technical aspects of cinema, which can be said there were not enough studies with an economic or statistical perspective. Looking under this, we limited our review to fields out of artistic and technical aspects. In the first strand of literature as we view, Bordwell (1997) gives the historical development of cinema and emphasizes that cinema from its early years could be named as a distinct art that it mostly comprised of a narrative style of film screening. According to Vogel (2007) motion picture industry was shaped and improved by several essential factors and structures as follows: (1) Technological advances in film production, (2) need for high amounts of capital to employ motion pictures, (3) the appearance of complex theater chains in suburbs, (4) increase in the number of independent productions. While Staiger (1990) examines the historical roots of Hollywood-based movie advertisements, she emphasizes that the film industry enhanced its ways of commercializing movies for an expanded marketplace and higher profits. Further, Grainge (2007) discusses branding side of Hollywood and adds that Hollywood became an entertainment sector, more precisely, a global supplier of media entertainment. Additionally, Cook (2016) discusses the rise of the Hollywood dominance and finds out World War I had a critical impact on it to become a dominant movie supplier, even the effect of the war was temporary in terms of movie production. Although the only reason of rising Hollywood dominance was not the impact of the war, he exemplifies 90% of all movies released in Europe, in 1919 were imported from the US.

For the independent movie production, most of the studies were comprised of American independent cinema. Holmlund (2005) underlines that the disengagement of movie production from studio system paved the way for independent movie production by 1960s. Mekas (2005) differs the notional definitions of independent cinema that while the term "independent" was used to refer to those low budget productions before the 1950s, the terms *avant-garde* and experimental films were used for movies that bear the characteristics of independent movies after the 1950s. Levy (1999) looks for human-driven factors of making an independent movie and describes independent cinema as something belonging to "outsiders" of the sector, meaning that firstly the characters of movies were reflected as not protagonists but "deviant" ones; secondly, the filmmakers are actually from minorities or majorities which deviated from mainstream culture. While placing independent movies in a layout, King (2005) states the grounds of American independent cinema to be between very low level of budget use to "the margins of Hollywood". To be clearer, he emphasizes that "the term 'independent' encompasses a wide range of activities in the broad territory located between Hollywood and the outer reaches of 'non-industrial' experimental or *avant-garde* cinema". As being a scanty definition of independent cinema, Tzioumakis (2006) underlines the classification of independent cinema should not be restricted to financial side of film production and he remarks that independent films fill some gaps of the mainstream cinema such as important social issues as well as unorthodox visual styles and narrative structures. Furthermore, Berra (2008) expresses the consumer side of the cinema; he differentiates the audience of mainstream and independent movies, and represents independent cinema as "a cinema that is made for an audience that appreciates and absorbs, rather than one that simply consumes and forgets". He

also touches upon the market side of the story and places independent cinema as subordinate to Hollywood majors and states the fact that independent productions, in general, cannot threaten the majors due to their economic weakness. Independent movies, yet, "are more valued by the critical establishment as they address serious themes and issues, making them intellectually prominent examples of America's cinematic output" (Berra, 2008: 19).

In the second strand, the absence of empirical studies on independent movies in the literature pushes us to view the literature of statistical studies on the overall cinema industry. Firstly, Basuroy et al. (2006) use 175 films to see if there is an interaction between box office successes and the two signals they consider: Sequels and advertising expenditures. They found a positive relationship between sequels and advertisement expenditures, suggesting that producers should advertise more on new movies than sequels. Pokorny and Sedgwick (2010) analyze the profitability trends of Hollywood movies between 1929 and 1999. What they emphasize was a difference in demand between the early and late years of their sample. Yet, after the 1950s, film producers became more successful at earning higher revenues from a smaller number of movies. They also concluded that while the theatrical releases generated almost all the revenue before the 1960s, by 2000 it generated around 30% of all revenues of a movie release. Moreover, Chen (2018) finds a strong correlation between movie budgets and revenues, but a smaller correlation between runtimes and revenues.

Secondly, within the globalization process, movie trade has also become a significant item that Jayakard and Waterman (2000) discuss the impacts of Hollywood movie exports across countries. According to their study, countries which purchase relatively large portion of movies than others had higher shares of domestic box office. Moreover, they revealed smaller market shares for countries having higher spending on cinema. On the other hand, Walls and McKenzie (2012) look for answers to whether Hollywood makes movies for their domestic consumers or international demand. Their results are affirmative, indicating a declining domestic market share in the US. While the movie trade has taken its place, Scott (2004) analyzes the distribution of motion picture to the globe by Hollywood. He divides production and distribution activities in Hollywood as majors and independents, where he suggests that Hollywood hegemony is sustained and there were increasing amount of movie exports in recent years. He also states that the situation is the result of the trade initiatives provided by the US government.
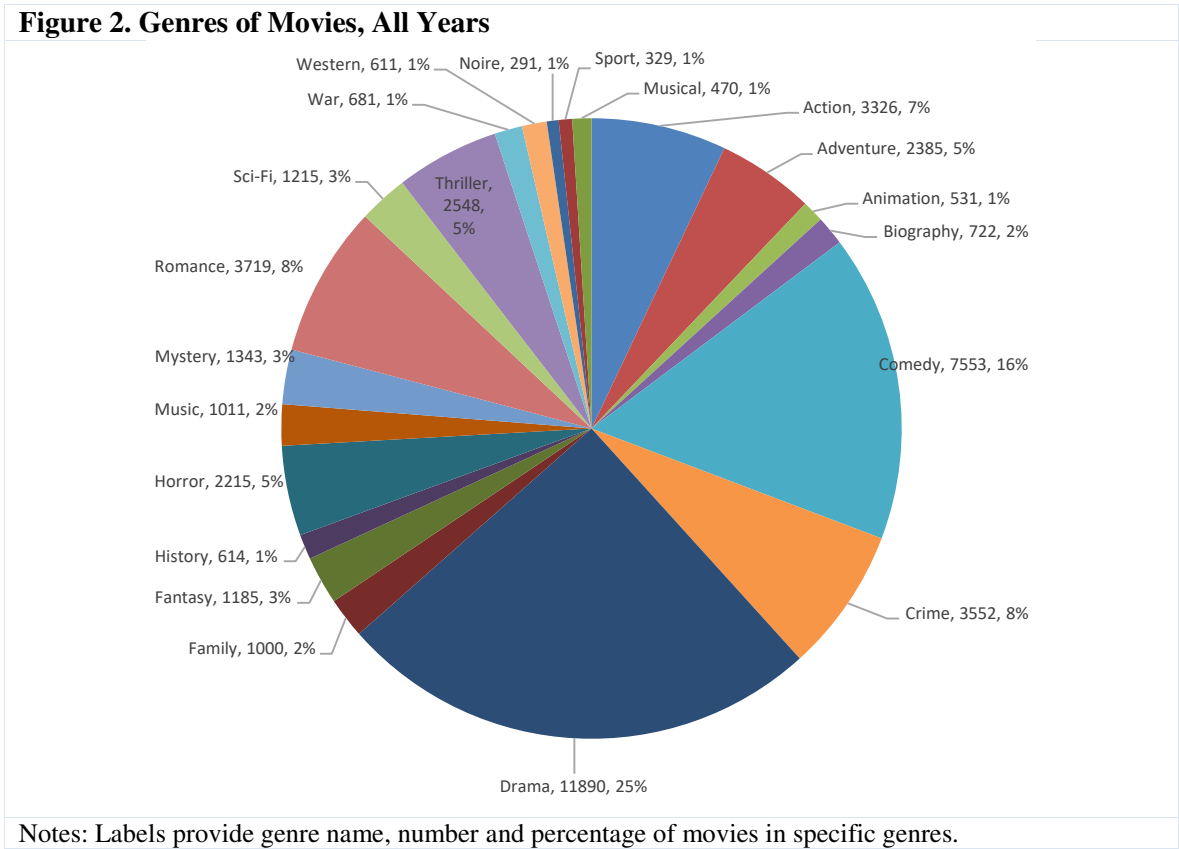
Thirdly, to look at regional studies in the literature, Blanco and Pino (1997) study the cinema demand in Spain between 1968 and 1992. The findings show that there was a declining cinema attendance owing to the fact that cinema was categorized as luxury. Yet, the results are also driven by increasing ticket prices and increasing demand for television programming. Alternatively, Lee (2002) made a comparison of movie industries of the US and Japan and found there was a decrease in Japanese box office. The author states that the ratio of movie spending rate became higher in the US and this caused relatively less box office revenues for Japan. Moreover, because the US has rapidly improved its movie technology than Japan, there were more American-exported movies than domestically produced.

By employing rational addiction theory of Becker and Murphy (1988), Sisto and Zanola (2010) study 12 European countries' cinema consumption. They found that cinema demand is in line with the theory, meaning that past and future consumption is very related for cinema consumption in European countries. Finally, Chuu et al. (2009) differentiate the art and mainstream movie audiences and seek different patterns of movie consumption. Their results show that art film audience considers movies not only as a means of entertainment but as an integral part of culture. They regularly and frequently go movies and are more tolerant to theater conditions.

3. Data and Preliminary Observations

In this study, we use a data set by Banik (2017) with some essential alterations. Original data set contains 45,000 movies retrieved from MovieLens Datasets, affiliated to Social Computing Research at the University of Minnesota, and involves various features taken from The Movie Database (TMDB) for movies produced until July 2017. The data set includes IDs for TMDB and Internet Movie Database (IMDB), release date, main spoken language, runtime, and genres of each movie. Moreover, we classified independent movies according to plot keywords determined by the TMDB users, e.g. "independent film" and "indie". After the identification of the independent movies, we eliminated from the original data set the TV series, documentaries, and movies which were not released and those including adult content from the original data set. Furthermore, we added yearly movie production budgets from The Numbers (https://www.the-numbers.com) to the data set after deflating the figures with the US CPI. Eventually, our data set covers 21,071 movies starting from January 1948 to December 2007. From the keywords, 1,381 movies were determined as independent movie; the first and last movie were dated to September 1949 and December 2007, respectively.

Then, it is possible to produce an array of observations. Firstly, English is the most spoken language in both the whole movie pool and independent movies, followed by French, Italian, Japanese and German. Secondly, drama was the most popular genre, appeared on 11,890 movies, corresponding to 25% of all; comedy was the second most popular by 7,553 movies and 16%; and noire was the least popular by appearing 291 movies and corresponding to 1% of all movies (Figure 2).

Figure 2. Genres of Movies, All Years

Notes: Labels provide genre name, number and percentage of movies in specific genres.

Interestingly, Figure 3 demonstrates that both independent films and mainstream films track a similar pattern for the most popular four genres; drama, comedy, romance, and crime. There are also diversions that while action is the 5th most popular genre for mainstream movies,

it is the 8ᵗʰ for independent movies. Lastly, for the independent movies, the least popular genre was noire, as for mainstreams.

Figure 3. Comparison of Genres by Mainstream and Independent Movies, All Years
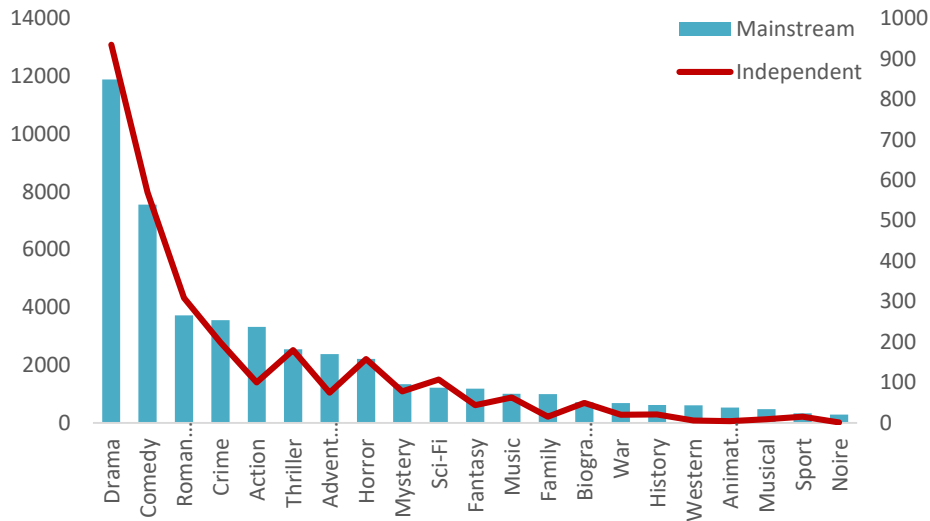
Notes: The genres are sorted in decreasing order of mainstream production (left axis).

Figure 4. Runtime of Movies by Years
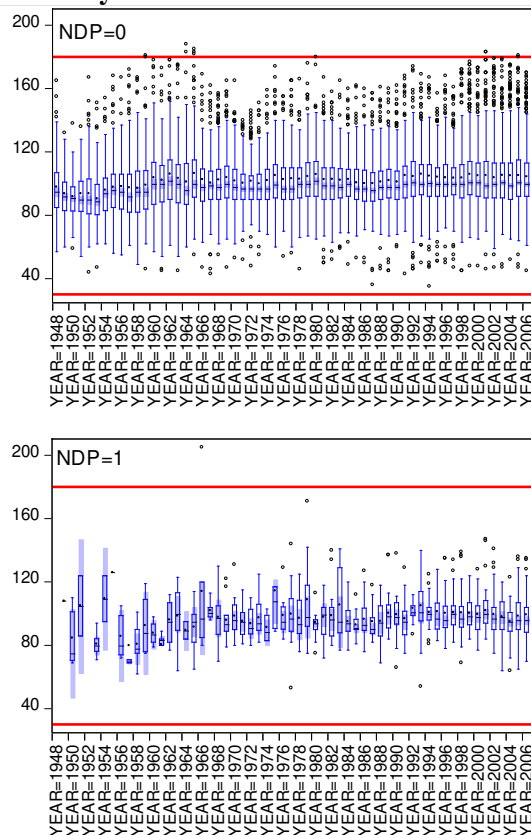
Notes: NDP=0 and NDP=1 correspond to mainstream and independent movies respectively.

Thirdly, Figure 4 displays the categorical box plot of the runtimes of mainstream and independent movies by years. After eliminating the extreme values higher than 180 minutes

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and lower than 30 minutes, we observed an increase in means of runtime over years for mainstream movies by the early 1960s. From then on until the late 2000s, it tracks a similar and stable trend. While 50% of mainstream movies' runtimes found between 80 to 100 minutes, 25% can expand to 140 minutes and 25% can decrease to 40 minutes runtime. Moreover, although runtime averages of independent movies show an increasing trend by 1968, it also attains a stable trend until 2007. The plot also indicates that independent movies' runtimes have less dispersion.

Lastly, we examined the monthly distribution of movie releases to see whether there were different patterns for both mainstream and independent movies (Figure 5). Because the data has gaps for many months for independent movies before 1971, we started to examine from this year to 2007. We observed that both types of movies were usually released in January. Despite the case, mainstream movie releases followed more frequent releases than independent movies in Januaries at least before the 2000s. Once again, September is important for mainstream movie releases that from the early 1990s, mainstream movie release became more frequent in Januaries, and it seems release date was chosen either one of these two months. More precisely, from 1984, either one of these months shows an exact dominance over other months.

Figure 5. Release of Movies by Months

Mainstream Movies | Independent Movies
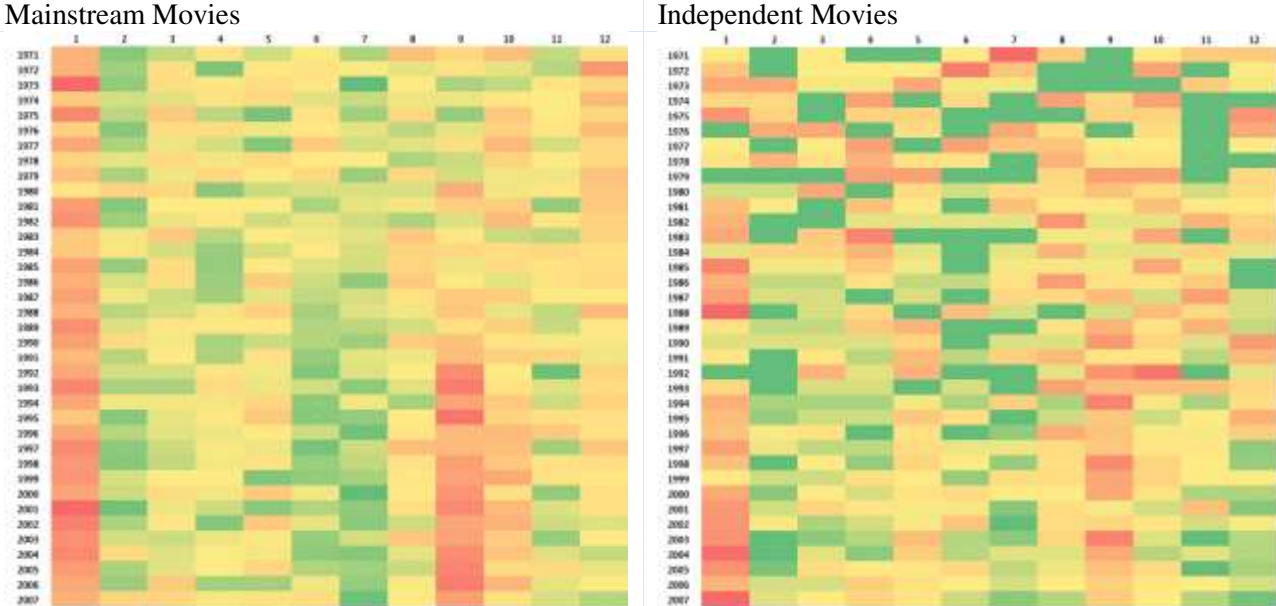
Notes: (1) Months are in columns. (2) Density increases from green to red and light to dark.

For the independent movies, even Septembers could be seen as the second most preferred release month, it does not show significant number of releases as mainstream movie releases. Particularly before the end of the 1990s, chart shows more dispersion over different months which can be considered as the insignificance of a release month for an independent movie. Nevertheless, with the 2000s, independent movie releases show a similar pattern as mainstream movies, as we further discuss in Section 5.

4. Empirical Analysis

Statistical Framework

While studying the temporal patterns of movie production/release, we employ count models by

Hausman et al. (1984) owing to their good fit to our context. Count models represent the number of occurrences in specific and fixed time period of an event, over a non-negative domain. For the estimation, count data require to use Poisson regression for the distribution and coefficients, and negative binomial model for testing with overdispersion of data. A model is estimated by the methods of maximum likelihood (ML) and quasi-maximum likelihood (QML) estimators. In our case, as being discrete variables, we took the number of both independent and mainstream movies according to their release year between 1948 and 2007.

Poisson model should be employed when expected number of and independently occurring events are to be examined (Hausman et al., 1984: 911-914). Poisson process emphasizes the importance of series of discrete events without exact specification of timing; yet, average time of occurrences of events is known. On the other hand, Poisson distribution leads us to probability of a number of events in a time period. With maximizing the log likelihood function, ML estimator can be obtained. A good specification of Poisson model necessitates the equality of conditional mean and variance.

As an alternative to Poisson model, negative binomial can also be used for count data (Hausman et al., 1984: 921-928). It again produces probabilities of the number of events in time periods as in Poisson model. Nevertheless, it is a more generalized version of Poisson model that it relaxed the conditional mean and variance equality restriction. Negative binomial is often employed when the data displays overdispersion. We can alternatively use QML estimator rather than ML estimators for incorrectly specified distributions with only one requirement, i.e. a correctly specified mean. QML estimators for negative binomial provide consistent and robust estimates.

Estimates

By employing the data set described before, we applied count regression models to explore the relationship between independent and mainstream movies. In addition, we included the yearly average production budgets from The Numbers (https://www.the-numbers.com) and inflation-adjusted series to observe how the production budgets are affecting the number of independent movie releases. Thus, number of independent movies are regressed on firstly number of mainstream movies, secondly number of mainstream movies and average production budget. Lastly, time trends are added to specifications.

Table 1. Estimates for Independent Movies, 1948-2007, Poisson (ML/QML)

Dependent variable: Count of independent movies

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Constant	3.1354*** (0.0000)	-1.9703*** (0.0000)	0.4719 (0.5348)	-1.1375*** (0.0000)	-1.9834*** (0.0000)	-1.9726*** (0.0000)	-5.0964*** (0.0079)	-3.6342* (0.0618)	-3.6504* (0.0603)	-7.8884*** (0.0014)	-1.7640 (0.3767)	-1.7837 (0.3711)
Trend		0.0637*** (0.0000)	-0.0006 (0.9722)	0.0458*** (0.0000)	0.0640*** (0.0000)	0.0639*** (0.0000)	0.0425*** (0.0000)	0.0634*** (0.0000)	0.0633*** (0.0000)	0.1000*** (0.0019)	-0.0028 (0.8880)	-0.0025 (0.9001)
Trend²			0.0004*** (0.0011)							-0.0004* (0.0696)	0.0004*** (0.0010)	0.0004*** (0.0011)
Number of Mainstream Movies				0.0015*** (0.0000)			0.0016*** (0.0000)			0.0025*** (0.0000)		
Δ Number of Mainstream Movies					-0.0007 (0.1452)			-0.0008 (0.1335)			-0.0007 (0.1737)	
Δ Log Number of Mainstream Movies						-0.5563* (0.0883)			-0.5731* (0.0803)			-0.5108 (0.1122)
Log Real APB							0.2428** (0.0366)	0.0992 (0.3934)	0.1008 (0.3851)	0.2842** (0.0158)	0.1372 (0.2356)	0.1382 (0.2317)
Sample size	60	60	60	60	60	60	60	60	60	60	60	60
R²	0.0000	0.9118	0.9349	0.9416	0.9176	0.9185	0.9415	0.9147	0.9157	0.9331	0.9367	0.9373
Adjusted R²	0.0000	0.9103	0.9326	0.9396	0.9147	0.9156	0.9384	0.9102	0.9112	0.9283	0.9321	0.9327
LR		1238.2*** (0.0000)	1248.4*** (0.0000)	1262.2*** (0.0000)	1240.3*** (0.0000)	1241.1*** (0.0000)	1266.5*** (0.0000)	1241.1*** (0.0000)	1241.9*** (0.0000)	1269.9*** (0.0000)	1251.5*** (0.0000)	1252.2*** (0.0000)

Notes: p-values are given in parentheses. (***), (**) and (*) indicate statistical significance at $\alpha = 0.01, 0.05$ and 0.10.

We initiated the estimation process by testing the Poisson regression. Using both ML and QML estimators, we obtained estimates (Table 1) for various specifications. First observation shows there is a general tendency for specifications III, XI, XII that if the model involves *Trend²* variable, all others become non-significant coefficients, except for Specification X. Secondly, the coefficients of *Δ Number of Mainstream Movies* are not significant in any specification, which implies the growth of mainstream movies does not have a significant impact on independent movie releases.

Before adding *Log Real APB*, most significant specification is IV with 1262.2 likelihood ratio, and all coefficients are significant at 0.01. It implies a positive relation that increasing number of mainstream movies has an explanatory effect on independent movies, even if the effect is small. Adding the average production budgets to the estimation, Specification X becomes the most significant estimate, with 1269.9 likelihood ratio. The estimate shows increasing number of mainstream movies, which is significant at 0.01, and production budget, which is significant at 0.05, have positive impact on independent movies. Furthermore, statistically significant *Trend²* at 0.1 produces a small negative effect that we believe it is the reflection of decreasing number of movies in 2007. The same regression yet without *Trend²*, Specification VII, shows very similar results in terms of coefficients and exact results in terms of significance levels. Thus, we may say that *Trend²* has explanatory power to describe the decreasing number of movies in the last year.

Cameron and Trivedi (1990) represent regression tests for Poisson restrictions and overdispersion. According to the tests, even though Poisson estimates give statistically significant results, we rejected the Poisson restrictions and found out overdispersion in our data. To handle the issue, we secondly estimated negative binomial model by QML estimator, employing a fixed variance parameter in each specification.

Table 2. Estimates for Independent Movies, 1948-2007, Negative Binomial (QML)

Dependent variable: Count of independent movies

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Constant	3.1354*** (0.0000)	-1.7607*** (0.0000)	-0.1988 (0.8213)	-1.1372*** (0.0000)	-1.7844*** (0.0000)	-1.7779*** (0.0000)	-6.2745 (0.4428)	-4.8081** (0.0346)	-4.7707** (0.0353)	-9.4911*** (0.0007)	-3.0036 (0.1831)	-2.9661 (0.1874)
Trend		0.0611*** (0.0000)	0.0182 (0.4336)	0.0458*** (0.0000)	0.0615*** (0.0000)	0.0615*** (0.0000)	0.0509** (0.0435)	0.0604*** (0.0000)	0.0604*** (0.0000)	0.1310*** (0.0005)	0.0148 (0.5272)	0.0145 (0.5325)
Trend²			0.0002* (0.0621)							-0.0006** (0.0173)	0.0002** (0.0472)	0.0003** (0.0459)
Number of Mainstream Movies				0.0015*** (0.0001)			0.0011 (0.6735)			0.0031*** (0.0000)		
Δ Number of Mainstream Movies					-0.0006 (0.4516)			-0.0007 (0.4413)			-0.0007 (0.3527)	
Δ Log Number of Mainstream Movies						-0.4942 (0.3121)			-0.5001 (0.3122)			-0.5072 (0.2433)
Log Real APB							0.2852 (0.5635)	0.1819 (0.1803)	0.1801 (0.1832)	0.3128** (0.0165)	0.1737 (0.1728)	0.1723 (0.1748)
Sample size	60	60	60	60	60	60	60	60	60	60	60	60
R²	0.0000	0.9021	0.9267	0.9416	0.9083	0.9094	0.9363	0.9021	0.9033	0.9246	0.9283	0.9293
Adjusted R²	0.0000	0.9004	0.9241	0.9396	0.9050	0.9062	0.9329	0.8968	0.8982	0.9191	0.9231	0.9241
LR		9990.7*** (0.0000)	22707.4*** (0.0000)	33101.9*** (0.0000)	11758.8*** (0.0000)	12102.4*** (0.0000)	100.9*** (0.0000)	10851.6*** (0.0000)	11166.9*** (0.0000)	21848.1*** (0.0000)	24754.9*** (0.0000)	25493.0*** (0.0000)

Notes: p-values are given in parentheses. (***), (**) and (*) indicate statistical significance at $\alpha = 0.01, 0.05$ *and* 0.10.

For all specifications, our estimates (Table 2) indicate higher likelihood ratios –except Specification VII in Table 1– which may validate the negative binomial regression against Poisson regression. Looking at Table 2, we encountered similar results, i.e. Specification IV for excluding *Log Real APB* and Specification X for including *Log Real APB* but stronger significance level of *Trend²* in negative binomial model. For Specification IV, both Table 1 and Table 2 give almost the same coefficients; the disparity is just 0.0003 difference between constants' coefficients and both gives similar significances in all other coefficients. For Specification VII, in negative binomial model, the majority of significant results disappear. For

Specification X, it becomes more statistically significant than the Poisson model. Though, Table 2 provides higher values for positive coefficients and smaller values for negative coefficients which mean higher effects of variables on number of independent movies, they display same pattern for significance levels but *Trend²* is more statistically significant than Poisson model at 0.05 rather than 0.10.

Clarifications through an Alternative Classification of Movies

As an alternative to our TMDB data, Levy (1999) provides an extensive list of independent movies (indies) between 1977-1998. Within the total of 452 independent movies in the list, we selected 425 movies which are compatible and can be found in our data set; we treated other movies, which were not listed as independent movies by Levy over the range of our primary data set, as mainstream movies. Thus, we obtained 7,558 mainstream movies between 1977 and 1998. On the other hand, in our primary TMDB data set, we have 528 independent and 7,455 mainstream movies to be estimated for the same time period. Furthermore, we have only 130 movies that were classified as independent movies by both Levy and TMDB users. For the sake of valid estimates, we rather used monthly distribution for movies by their release date owing to the restricted time period.

Looking at the distributions of independent movies by both classifications, there is an increasing trend for the total number of movies for both. According to Figure 6, the general view is that mainstream movies track an increasing trend for both classifications and there is an obvious concentration for the independent movies in the late 1990s.

For the differences, while Levy's classification is indicating an accelerating independent movie production until the 3rd quarter of 1995, TMDB user classification pictures more stable independent movie production by 1994. Even though these two classifications draw a similar picture in terms of rise of independent movie releases in the 1990s, we observed a higher dispersion over the 1990s in the TMDB classification, while the independent film releases were relatively more accumulated in the mid-1990s according to Levy's classification.

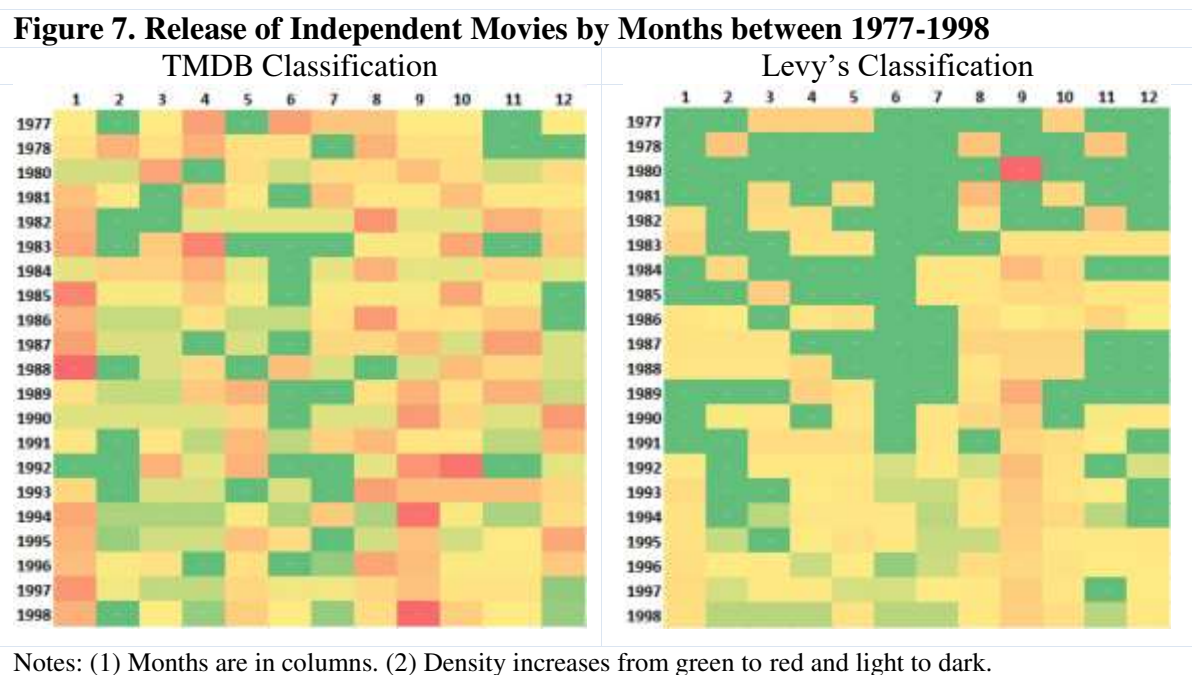**Figure 6. Evolution of Movie Releases, 1977-1998**
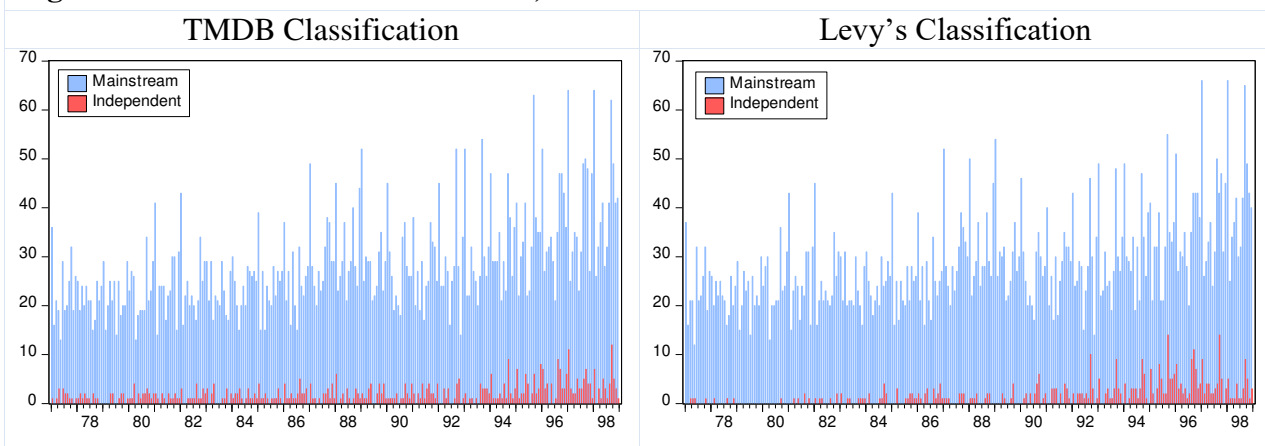
In order to distinguish these two classifications, Table 3 represents the fundamental estimates by count regression models for both classifications. We regressed the number of independent movies on firstly number of mainstream movies, and secondly number of mainstream movies and average production budget together. For the method, because L-I, L-II, L-III, and T-I classifications signalize the rejection of Poisson restrictions and overdispersion in the data, we employed QML estimator with fixed variance parameters. For T-II and T-III, we applied Poisson model with ensuring conditional mean and variance equality.

Table 3. Estimates for Independent Movies, 1977-1998

Dependent variable: Count of independent movies

	Levy Classification			TMDB Classification		
	L-I	L-II	L-III	T-I	T-II	T-III
Constant	-1.8342***	-2.8286***	-19.5647***	16.3345*	6.0445	-5.4048
	(0.0000)	(0.0000)	(0.0062)	(0.0982)	(0.4711)	(0.6950)
Trend	0.0166***	0.0189***	0.0222***	-0.0371*	-0.0155	-0.0027
	(0.0009)	(0.0001)	(0.0000)	(0.0637)	(0.3601)	(0.8959)
Trend²	-1.35E-05	-3.10E-05**	-4.92E-05***	2.13E-05**	9.01E-06	2.33E-06
	(0.4034)	(0.0388)	(0.0023)	(0.0343)	(0.2919)	(0.8270)
Number of Mainstream Movies		0.0363***	0.0381***		0.0358***	0.0362***
		(0.0000)	(0.0000)		(0.0000)	(0.0000)
Log Real APB			0.9713**			0.3127
			(0.0190)			(0.2939)
Sample size	264	264	264	264	264	264
R²	0.3288	0.4783	0.5158	0.2115	0.4297	0.4343
Adjusted R²	0.3236	0.4723	0.5083	0.2054	0.4231	0.4256
LR	209.8***	1408.0***	2143.6***	1890.9***	154.9***	156.0***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Notes: p-values are given in parentheses. (***), (**) and (*) indicate statistical significance at $\alpha = 0.01, 0.05$ *and* 0.10, respectively. (2) L-I, L-II, L-III and T-I were estimated by QML; T-II and T-III by Poisson method.

In Table 3, based on L-III specification, *Trend* shows the general increase in the independent movie releases over years; secondly, *Trend²* is interpreted as the decline in the number of independent movies after 1997. Both the mainstream movie releases and average production budget impact the independent movie production positively, the effects of the latter being more intense (0.9713 against 0.0381). On the other hand, TMDB classification presents non-significant results for right hand side variables except for the number of mainstream movies, indicating weak estimates against Levy's classification as seen in likelihood ratios. We believe that the reason for these differences lies above the professionalism on the field as Emanuel Levy is a professor of cinema studies, while TMDB classification is identified by various internet users.

Figure 7. Release of Independent Movies by Months between 1977-1998

Notes: (1) Months are in columns. (2) Density increases from green to red and light to dark.

Furthermore, we looked at the monthly distribution of movie releases for TMDB user-based and Levy's classifications (Figure 7). In Figure 5, we have already showed the differences in monthly releases of mainstream and independent movies and found out more irregular distribution of movie releases for independent movies across months; then we looked for these two independent movie classifications (Figure 7) if there was any contradiction in monthly movie releases. What we found is that Levy's classification provided relatively more homogenous distribution of movie releases across all 12 months, meaning that the independent movies were not released on Januaries and Septembers as TMDB user classification indicates although there was still a shade of concentration in these two months for independent movies.

5. Discussion

Starting from the preliminaries, we generated a series of observations that present main and significant knowledge about movies in our data set. Then we looked for genre distributions of the movies (Figure 2 and Figure 3) and found that drama and comedy were the most popular genres to screen a movie. We believe that some genres may create its own budget constraints, i.e. producing an action movie should have higher costs than a drama or comedy. From this point of view, we observed huge numbers of movies made in drama and comedy genres for both type of movies (Figure 3) and action genre was not as preferred in independent movies as in the mainstream. Moreover, it can be also interpreted that a general similarity in genres of both mainstream and independent movies may be explained by the correlation (Table 2) that increasing number of mainstream movies positively affect the number of independent movies.

For the runtime of movies (Figure 4), mainstream movies had on average longer durations than independent movies and while mainstream movies are sometimes longer up to 130 minutes, these also drop to 30 minutes with more extreme values than independent ones. However, independent movies generally were shot in more steady runtimes yet they sometimes behaved to lengthen the runtime rather than shorten it. This is in line with Ainslie et al. (2003) who state that "'art' movies tend to have longer runtimes than blockbusters".

Next, we aimed to figure out (Figure 5) whether movie release months follow a stable pattern. What we observed is interesting as especially mainstream movies have a tendency to release mostly in Januaries and Septembers. According to Chen et al. (2013), summer months, the New Year holiday and Memorial Day holidays have significant effect on movie demand. By contrasting, we may say high movie releases on Januaries might be the result of the New Year holiday effect; yet, our findings contradict with especially summer month effect due to relatively low level of movie releases. Furthermore, there is dump month phenomenon that Berg and Raddick (2017) explain as the months that least preferred to release a movie. It is believed that movies that released in dump months are generally of low-quality, get relatively bad reviews and less box office successes. Even though dump months may differ from one author to another, generally January is traditionally the most important dump month (Berg and Raddick, 2017). In a way, our findings contradict with this phenomenon. For the independent movies by the 2000s, even though some months display dominance over the others, it drew a relatively uniform picture than mainstream movies. Yet, since the 2000s, it became similar to mainstream movie releases. Though our findings did not exactly reflect what Berra (2008) states, i.e. independent producers were repressed to release their movies similar to Hollywood's schedule as being "cinema of the 'routine'". In this way, similitude of monthly movie releases after the 2000s for both types of movies can be reasoned to behavior of independent moviemakers.

In our estimates, we attended to reveal the economic reasons of increasing number of independent movies over years. Firstly, we employed Poisson count models comprised of number of independent movies as our dependent variable explained by the number of

mainstream movies and the percentage change in average production budgets. Our estimates provide significant results (Table 1) that both independent variables have a positive effect on the number of independent movies. Yet, owing to issues of conditional mean and variance equality did not hold and some overdispersion in our data set, we instead employed negative binomial count model as a remedy, the results of which confirm those of the Poisson specification. Hence, by applying an alternative method on estimation, LR statistics provide higher significance level for our estimates. We grounded our discussion on Specification X (in both Tables 1 and 2) that number of independent movies regressed on number of mainstream movies and percentage change in average production budget, with also *Constant, Trend,* and *Trend².* In this specification, two negative coefficients appeared: *Constant* and *Trend².* We basically ignored the effect of constant due to having other significant coefficients, and *Trend²* is significant indicator for the data. To be precise, even original data set contains movies by July 2017, because the number of movies radically decrease after 2006, we eliminated the movie releases after 2007. The purpose of keeping the movies released in 2007 was to investigate if there is any effect of emerging financial crisis on movie markets. Within our investigation, we found that total number of movies worldwide has increased even in crisis years.

Other coefficients of Specification X (Table 2) show that *Trend* is able to track increasing number of movies over years. The number of mainstream movies and *Log* Real *APB* both have a positive impact on number of independent movies, despite at different degrees. Levy (1999) discusses that there was an institutionalism of independent cinema in 1990s that both mainstream and independent productions have organizational structure. In his words, "indies now form an industry that runs not so much against Hollywood as parallel to Hollywood. American culture has two legitimate film industries, mainstream and independent" (Levy, 1999: 501). Hence, a reason appears with the consumer side of the story: Both sectors have own characteristic consumers for entertainment or intellectual purpose; nevertheless, there are also consumers that consume both according to Levy. Furthermore, King (2004) underlines that the acquisition of two important independent movie distributors by Disney and Time-Warner: Miramax and New Line. It may also point to increased competition –not entirely about monetary terms– between the film industries.

Secondly, higher coefficient of *Log Real APB* may lead us to an interesting story. In our regression analysis (Table 2), the highest positive effect was originated from the production budget indicator. We think that there might be two reason behind it: Firstly, increasing cost of producing a movie (it includes various elements from increasing cost of post-production to insurance of all labor) might increase the number of releases, and secondly, the budget should intentionally be increased for higher box office revenue returns or to produce better movies. In a way, *Log Real APB* measures the ability to produce movies. We believe the second reason is more sensible because there is no increasing trend of production budgets for all years as our monetary indicator shows that the 1960s has the highest production budgets than the other years in our data. To support the argument, we also observed that for the late 20th century, independent movies were allocated higher budgets than the early years. According to Tzioumakis (2006), The United Artists, which was established to prevent actors to be dependent on the commercial studios, had significant amount financial support on independent filmmakers so that they do not need to seek additional financial resources. As an example of relieving the financial concerns of independent filmmakers after the post-studio era, the author narrates that "independent production was in full swing with almost 70 per cent of the ex-studios' output being independently produced films, forcing industry officials like United Artists' vice president, Max E. Youngstein, to talk about 'an independent revolution' that had over thrown 'the one-man studio czar system'" (Tzioumakis, 2006: 120). Hence, we see that independent productions started to be considerably financed and our estimates can be harmonized with this

situation. Increased production budget has a significant effect on the number of independent movies.

The workings of the *Log Real APB*, we anticipate, is likely to reflect the dynamics of a "decreasing cost industry" from a microeconomic perspective. In that, as more budget is allocated to any single movie, more resources (physical and human capital) would be available for the whole sector. Such an availability is supposed to pull down the production costs in the long term.

Because the independent movies in our main data were classified by TMDB users alone, we subsequently tested if there would be differences in case an alternative classification (here Levy's) was employed. Due to the shorter time coverage of Levy's classification, we analyzed monthly distribution of independent movies between 1977-1998. Starting to contrast (Figure 7), in Levy's classification, there are fewer independent movies released in Januaries and Septembers than what TMDB user classification shows. Yet, while Berra (2008) also states that even the independent film releases are mirroring the Hollywood's schedule, these movies are also released throughout the year. Therewith, we clarify the minor densities in Januaries and Septembers and relatively more homogenous movie releases between other months in the Levy's classification by attributing the argument of Berra.

When the count models (Tables 1 and 2) are replicated with Levy's classification (Table 3) and at a monthly frequency, our initial outlook of estimates is preserved. Nevertheless, a monthly replication of the estimates using TMDB data restricted to Levy's time period seems not robust. The only correlation lies upon the number of mainstream and independent movies that (T-II and T-III specifications) it should be the same situation in every specification we would make because we observe a general hand in hand increase in both type of movies through years (Figure 1). Moreover, we got nearly the same coefficients for number of mainstream movies variable in the Levy's classification (L-II and L-III), which refer to the similar degree of the effect as within the TMDB classification (T-II and T-III). By looking at the regression specifications (L-III and T-III), we conclude that the Levy's classification better justifies the sources of number of independent movies over years.

6. Concluding Remarks

The purpose in this paper is to investigate the economic identifiers of independent movies. Our preliminary observations allow us to reveal the progress of independent movies in terms of their primary features and provide us some patterns to distinguish mainstream and independent movies. Our preliminaries show that some general features of films were similar in both mainstream and independent movies, e.g. main spoken language and genres; yet, some features were different, e.g. runtimes and release months. While most of our observations conformed with the literature, release month of movies contradicted with the dump month literature that movies releases become more frequent in summer months. Essentially, our regression analyses provide valid estimates for the literature of cinema that we found both increasing number of the mainstream movies and increasing production budget has positive and explanatory effect on the number of the independent movies. Lastly, we analyzed the different classifications of independent films and found out that Levy (1999) classification provided more appealing estimates for the period running from 1977 to 1998.

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