

Mapping co-production and co-distribution relations in the Brazilian cinema: an analysis under the light of the network theory

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Daniela Torres da Rocha

Leandro Rodrigo Canto Bonfim

Michael William Citadin

(Universidade Federal do Paraná, Escola de Administração, Programa de Pós-Graduação em Administração. Curitiba – PR, Brasil)

<https://orcid.org/0000-0003-1541-4591>

<https://orcid.org/0000-0003-0323-7911>

<https://orcid.org/0000-0001-5358-3519>

Fernando Antonio Prado Gimenez

(Universidade Federal do Paraná, Escola de Administração, Departamento de Administração Geral e Aplicada. Curitiba – PR, Brasil)

<https://orcid.org/0000-0002-5143-9553>

Abstract

The formation of networks comprising firms and stakeholders from the communication industry with the environments of interest for this economic activity is noticed as a topic of interest in the area. Thus, this article proposes to map and analyse the social interactions in the Brazilian cinematographic production and distribution, presenting network relations as a way of management of the economic actors operating in the Brazilian cinema industry. Data were gathered through information available in the Brazilian Observatory for Cinema and Audio-visual about Brazilian movies released between 1995 and 2015. As results, it was verified that in this period were released 1,251 movies, being identified 613 producers and 218 distributors. Only 53 producers were involved in co-productions and only 137 movies were co-distributed. Through the analysis of the social network structural measures, it was possible to verify that the Brazilian cinematographic market is concentrated and has few relations of cooperation.

Keywords: Cinema. Social networks. Partnership. Cinematographic production.

Introduction

Social networks are established by autonomous actors in a given group, united by common values and interests, and uniting ideas and resources. Instead of valuing hierarchical structures, networks esteem informal links and interpersonal relationships, so that the interactions among organisations and among the individuals that compose

them are observed. Thus, each observed network presents a particular structure, being possible to indicate which actors are more powerful and have more influence in the group (MARTELETO, 2001; BORGATTI; HALGIN, 2011). In recent years, the growing interest in the study of social relations and the formation of networks in communication organisations by the Communication Sciences has been noticeable (LEE, MONGE, 2011), among which are companies from the audio-visual sector.

The audio-visual sector plays a vital role in the cultural, social and economic spheres of nations. Its development is fundamental in the construction of cultural identity and in the expression of citizenship since, through its channels, a society can be represented. In this sense, cinema has a unique role, because it is the most international audio-visual product, and it is responsible for the highest revenues of the media conglomerates that dominate the sector at the international level (PANGARKER; SMIT, 2013). The production and distribution of films require technical skills, articulation with suppliers, government, service providers, sponsors, and the establishment of partnerships among the companies within the same industry.

According to Gimenez, Rocha and Santos (2015), the period from 2009 to 2015 is marked by the increase in co-production and co-distribution of Brazilian films, specifically considering 2013 and 2014. These two years represent 75,3% of the Brazilian co-production films released in the cinema, evidencing the increase of interactions among the companies of the sector. However, there is still a lack of studies that empirically investigate the structure of network relations of coproduction and co-distribution in the Brazilian film industry.

Thus, the purpose of this research is to map and analyse the social interactions in cinematographic production and distribution in Brazil, presenting network relationships as a way of managing the economic actors in the Brazilian film industry. In order to do so, we analysed information provided by the *Observatório Brasileiro do Cinema e do Audiovisual* (Brazilian Observatory of Cinema and Audio-visual – OCA), of the Agência Nacional do Cinema (Brazilian Film Agency – Ancine), about the Brazilian films released from 1995 to 2015.

This article is structured in four additional sections besides this introduction. The next one approaches conceptual aspects of network theory and the social network analysis (SNA) and presents a brief overview of the Brazilian cinema industry. Next, the third section describes the methodological procedures followed in the study. The fourth section is dedicated to the presentation and analysis of the research results. Finally, the article concludes with the final considerations.

Theoretical framework

The purpose of this section is to establish the theoretical relationships between the main themes of the research, including the general and specific perspective of the network

theory and social network analysis, as well as the Brazilian audio-visual sector. In this sense, the theoretical approach regarding social networks presents the network as a tool of analysis, which aims to understand the social relations among a set of actors with different objectives (MARTES et al, 2008), besides presenting the network as a way of managing relations between economic actors. In relation to the audio-visual sector, definitions and more specific characteristics of the sector are presented.

Network theory and analysis of social networks

Networks are, according to Brass (2012), a set of nodes and ties that represent some relation or absence of a relationship between social actors. In social sciences, nodes or actors represent people, groups, organisations and societies embedded in relational networks.

The beginning of network theory was in the 1970s when Granovetter (1973) drew attention to the lack of studies investigating the influence of social micro-interactions on the diffusion of influence and information, since, at the time, social theories were focused on macrostructural explanations. In this study, the author turned to the science of sociometry to argue that the way an actor (ego) is embedded in a social network and the content of this actor's social relations may affect the way he works, exchange information, or is organized in the community. In this sense, the number of acquaintances (close ties) or close friends and relatives (strong ties), and the density of their network of contacts (how connected are ego-related people) are likely to determine the outcome of the actor's efforts to influence the decision and behaviour of other people. Since Granovetter's proposals, several researchers have contributed to the understanding of how the structure of social networks of actors influences the economic outcomes and social behaviours of individuals, organisations, or societies (BURT, 1980; BORGATTI, EVERETT, 1992; UZZI, 1996; HAUSMAN; HIDALGO, 2011).

Following the structural view of network theory, Borgatti and Halgin (2011) explain that the bonds that connect the actors constitute a pattern of interaction and produce a particular relational structure in which the actors occupy positions within the network structure. The positional differences between actors are interpreted based on the limitations and opportunities that arise from the way they are embedded in the network, being useful for understanding the behaviour and performance of social actors.

For Van Aken and Weggeman (2000), every organisation or individual is involved in some form of network, but some structural and managerial aspects determine the formation of networks in the environment, which can, according to Hutt et al (2000), present a higher density ratio from actors who engage in horizontal and vertical alliances in search of congruent goals. For Fensterseifer et al (1997), strong conceptual evidence of networks is presented in the identification of partnerships, cooperation, association and complementarity

between organisations and individuals, assuming that in the current business environment, no company, small or large, is independent and self-sufficient.

Thus, the study of networks can be considered a social theory, deriving from it its own methodological approach, the social network analysis (GROSSER; BORGATTI, 2013). This methodology, considered as a methodology applied to the study of the relations between actors with objects of any kind (BORGATTI; EVERETT; FREEMAN, 2004), has in its scope of investigation distinct but intrinsically related relational phenomena, in which can be highlighted the formation of social networks by means of: (a) similarity relations (actors living in the same place, being members of the same social group, or sharing the same values and even the same gender); (b) social relations, such as kinship or affinity, labour relations and even friendship; and (c) social interactions and transaction flows, in which it is analysed with whom the actors speak, exchange information, exchange resources, and trade or are involved in monetary transactions (BORGATTI; OFEM, 2010). Also, as highlighted by Wellman (1993), social network analysis as a method is originally structuralist.

In the field of social networks, the concepts of role and position have been essential for the development of the area. For this, measures of positional and structural equivalence are presented as a means of exploring the structure and role of the actor in a given network (SCOTT, 2000). There are several structural measures with the purpose of identifying the actors with a higher degree of influence and prestige in the network, as well as to characterize the structure of the network as a whole. In this context, some of them deserve special attention, such as degree centrality, closeness centrality, betweenness centrality, density, geodesic distance, among others (LORRAIN, WHITE, 1971), as follows:

- a. Degree centrality: demonstrates the number of ties an actor has with other actors in a network (FREEMAN, 1979). This measure is given by dividing the degree of the node by the maximum degree that any node can have;
- b. Closeness centrality: demonstrates the distance of an actor from other actors in the network (WASSERMAN; FAUST, 1994). For the calculation of the degree of proximity, one must add the geodesic distance of the node in relation to all other nodes of the network. Inverting the resultant, one obtains the distance and consequently the closeness centrality, since the higher the distance, the smaller the proximity and vice versa;
- c. Betweenness centrality: demonstrates the interaction between nonadjacent actors. An actor is considered an intermediary if he links several other actors that are not connected directly (DEGENNE; FORSÉ, 1999), measuring the sum of probabilities that the same node is in the path between all other nodes within the network;
- d. Centralization: the degree to which the structure and relations of the network are concentrated around few actors, expressed as a percentage and the higher the centralization of the network, the lower the number of central actors (QUIROGA et al, 2006).

- e. Density: calculating the proportion of existing lines in a graph, with respect to the maximum number of possible lines, represents the total network connectivity and is expressed as a percentage of existing relationships over the total number of possible relationships (SCOTT, 2000);
- f. Geodesic distance: it is the shortest possible distance between two nodes of the network (WASSERMAN; FAUST, 1994).

These concepts are used as a foundation for studies intending to establish a basis of the association between the positioning in the network and the behavior or performance of actors. Furthermore, social network analysis has already been used in other studies on the film industry.

For instance, Coe (2000) studied the Vancouver film industry by pointing out how the companies' strategies in the sector are based on networks that interconnect, but which are of different scales. At the international level, local business executives deal with Hollywood companies in terms of service offerings, but also as potential project partners. Co-productions are also being developed with companies from the UK and France. At the national level, the networks involve relationships with major Canadian companies based in Toronto and Quebec. These companies, in general, compete for the largest share of support from official development agencies to the Canadian film industry. Finally, at the local level, there are networks that have been developed over the course of twenty years, with different small companies in the sector, but also with union agents and service providers to the industry. Despite showing strong ties at the local level, companies face the competition from American companies that use the Vancouver region as lease space for their productions, inflating the resource market in general. The study exemplifies how the analysis of networks in a given field allows the understanding of the behavior of its actors.

In Brazil, the perspective of network analysis has not frequently been used for the understanding of the film industry. In a qualitative perspective of analysis, Carvalho and Fischer (2000) described the international strategic alliance between United Cinemas International (UCI) and the local organisation Orient Filmes dedicated to the exhibition market, of the city of Salvador, Bahia. In this study, based on the logic of social networks, the authors revealed how the centrality of Orient Filmes' entrepreneur, due to his reputation and leadership in the local context, associated with the creation of governance conditions allowed the insertion of this Brazilian company in a highly dynamic industry of the world economy, the cinema. In another study, also in *Bahia*, Loiola and Lima (2009) identified the central actors and information brokers of the network composed by the directors of 31 films produced in Bahia between 1994 and 2006, in the so-called New Wave of *Bahia*. The authors found that the actors with more central positions in the network had greater prestige given their ability to articulate and raise resources for audio-visual productions.

Network analysis can also be helpful for understanding the performance of organisations that make up a given field. A study of this type was carried out by Kirschbaum (2006), who analysed the role of key individuals (actors, directors and producers) in the production of Brazilian films between 1994 and 2002. The author found that success in previous productions was a significant predictor of performance of the films produced between 1994 and 1996. On the other hand, in the later periods, other aspects took on more significant relevance, such as individual recognition, the centrality in the network and the structural equivalence. For Kirschbaum (2006), the results of his study indicated that in a networked industry, collective success proved to be more important than individual success.

Considering that a network perspective can help to comprehend the strategic choices made by the production and distribution firms in this industry, the next section presents an overview of Brazilian cinema production in the last twenty years.

The Brazilian audio-visual sector

The film industry, given its broader international reach (PANGARKER; SMIT, 2013) has stood out in terms of economic relevance worldwide. The growing academic interest in studies related to the film industry may be associated with its high economic importance for the global economy; to its central role in the entertainment industry; and its cultural relevance (ELIASHBERG; ELBERSE; LEENDERS, 2006).

In the case of Brazilian cinema, since 1995, the year of the Resumption of Brazilian Cinema (NAGIB, 2002), cinematographic production has been on the rise. The market went from an average of 21 films released on the cinema market per year between 1995 and 2000 to 85 between 2011 and 2014, representing a growth of over 300% in two decades. In addition to the launches, the distributors have made efforts to continue the exhibition of films released in previous years. In relation to the distribution, there was a 15.7% increase in the number of titles exhibited in Brazil between 2013 and 2014. Finally, in relation to the exhibition market, the number of cinemas in Brazil continued to increase, reaching the mark of 2,830 in 2014 (GIMENEZ; ROCHA; SANTOS, 2015).

Information on the behaviour of the Brazilian film market in 2015, also available on the website of OCA¹, confirms the growth trend of this sector. In 2015, with the release of 128 films, there was a reversal in the number of films observed in 2014 (from 129 films released in 2013 to 114 films in the following year).

Finalizing this brief panorama of the production of cinema in Brazil between 1995 and 2015, we mention the measurement of concentration degree of this market as measured by Gimenez, Rocha and Santos (2015). Table 1 shows the measures of market concentration according to the revenue of feature films for each period.

1 Available at: <http://oca.ancine.gov.br/notas_informes.php>. Accessed on: 21 jan. 2017.

Table 1 – Cinema production market concentration in Brazil (participation in box office)

Períod	CR4*	CR8**
1995/1998	57,67%	76,16%
1999/2003	51,58%	73,72%
2004/2008	49,89%	69,73%
2009/2014	32,69%	50,28%

* Participation of the 4 largest producers in terms of box office; ** Participation of the 8 largest producers in terms of box office

Source: Adapted from Gimenez, Rocha and Santos (2015, p.214).

As shown in Table 1, in these two decades there was a dynamic of deconcentration of the film production market in Brazil. For both the indicators of the participation of the four largest producers and for the eight largest producers, there was a change from a concentrated market to a low concentrated one according to the criteria of George, Joll and Lynk (1991). When calculating this data for the year 2015, we noticed a return to a situation of market concentration, with CR4 indicators equal to 56.79% and CR8 of 83.95%. These data seem to indicate a return to the market concentration found twenty years ago, perhaps caused by the disadvantageous economic situation experienced in Brazil in the last two years.

Methodological approach of the research

The empirical research was carried out through a census study in which 613 producers and 218 film distributors located in Brazil with films released between 1995 and 2015 were identified. The data collection was based on secondary data research, while the temporal perspective comprised longitudinal observations. The list of films analysed was created through electronic searches conducted at the OCA. Data of Brazilian films released between 1995 and 2015 were analysed and categorized into animation, documentary, fiction and video-musical.

The data gathered include release year, movie title, director, proponent/producer, home state, distributor, genre, maximum exhibition rooms, public and revenue. After data tabulation, the names of producers and distributors were spelt out, leaving aside the possibility of including names with different spellings, but not the incidence of homonyms, as pointed out by Silva et al (2006).

Regarding data analysis, the present study comprises two distinct forms of analysis. 1) Descriptive analysis carried out by means of frequencies, averages and other measures with the purpose of presenting characteristics of the Brazilian audio-visual sector and its main actors (producers and distributors). 2) Social network analysis (SNA) using Ucinet and Netdraw (BORGATTI; EVERETT; FREEMAN, 2004), in which measures of cohesion (e.g. density, centralization) and centrality (e.g. degree, betweenness, and closeness) were

extracted. By means of such measures, it is possible to identify the position of each actor and the overall structure of the network (QUIROGA et al, 2006).

For analysing relational data, two different matrices were elaborated: (i) the interaction patterns between producers, and (ii) the interaction patterns between producers and distributors. Assuming that producer *i* has a bond with producer *j*, then producer *j* will also have a tie with producer *i* (*i* and *j* are sociometric notations, the first for the focal actor or ego and the second for immediate contact or alter ego), the data of the first matrix were symmetrized in order to calculate the sociometric measures. For the calculation of the centrality measures from the matrix of interaction patterns between producers and distributors, we used 2-mode centrality measures, since this matrix is not a square one.

Presentation and analysis of results

The purpose of this section is to establish the theoretical and practical relationship of the central themes of the research, including the network theory perspective and social network analysis of film producers and distributors, as well as the specific description of the main characteristics of the Brazilian audio-visual sector, object of this study, identified through the Brazilian films launched from 1995 to 2015.

Object of the study and temporal perspectives of released Brazilian films

According to OCA, 1,251 Brazilian films were released from 1995 to 2015. As of 2006, there was a considerable increase in the number of films produced in the country, and in 2013 were launched 129 films. Regarding the genre of the films released, there is a predominance of fiction films (805), totalling 64.35%, followed by documentaries (428), totalling 34.21% of the total films released in the period.

In relation to the number of films per producer, it is verified that 613 producers were responsible for the production of 1,251 films in the period. Of these, 1,198 films were produced by only one producer and 53 were produced in the form of co-production, that is, involving two or more producers. The production company *Videofilmes* stands out for the production of 31 films, followed by the producers *Conspiração Filmes* and *Diler & Associados*, both with 29 films produced each (Table 2).

Table 2 – Number of films produced by producer (producers with 10 or more films)

N.	Producer	Number of Films
1	Videofilmes Produções Artísticas	31
2	Conspiração Filmes	29
3	Diler & Associados	29
4	Gullane Filmes	18
5	O2 Cinema	18
6	Filmes do Equador	16
7	Dezenove Som e Imagens Produções	14
8	Tambellini Filmes e Produções Audiovisuais	13
9	Total Entertainment	13
10	Taiga Filmes e Vídeo	11
11	Casa de Cinema de Porto Alegre	10
12	Cinematográfica Superfilmes LTDA	10
13	TV Zero	10

Source: Research data, 2016.

Thirteen producers were responsible for the production of 10 or more films, while 357 producers, representing 58.23% of the total production, were responsible for the production of only one film. In addition, 53 producers were involved only in co-productions, not doing any work individually. Thus, the data suggest that, despite having many actors, the Brazilian film market is still very concentrated in certain producers and presents few cooperative relations.

Regarding the audience, it is verified that the year 2013, with more than 26 million spectators, presented a record audience. This year, two films stood out: *Minha mãe é uma Peça*, by Migdal Produções (São Paulo – SP), with an audience of 4,600,145 spectators (407 rooms); and *Até que a Sorte Nos Separe 2* by Gullane Filmes (Rio de Janeiro – RJ), with an audience of 3,978,191 spectators (778 rooms). The year 2010, with 74 titles, presented the second largest annual audience in the last two decades (24,464,112 spectators). The year 2003 obtained the third largest public annual despite presenting the launch of only 30 titles, totalling 22,291,806 spectators. This year, five titles were responsible for the amount of 15,412,317 spectators, especially the film *Carandiru*, produced by HB Filmes (SP), which was responsible for bringing 4,693,853 spectators to 298 theatres.

The distribution of the 1,251 films produced in the period was made by 218 distribution companies. 1,114 films (89.05%) were distributed by only one isolated distributor. As shown in Table 3, it stands out that *RioFilme*, alone, distributed 143 films, representing 11.43% of the total of films produced in the period. On the other hand, 137 titles were distributed by two or more distributors, evidencing a distribution market more concentrated than the producer market, but also showing few cooperative relations.

Table 3 – Number of movies distributed by distributor (distributor with more than 30 films)

Distributor	Number of Films
Riofilme	143
Vitrine Filmes	53
Pandora	48
Imovision	48
Espaço Filmes	46
Fox	38
Imagem	38
Columbia	37
Warner	33
Downtown	31
Videofilmes	31

Source: Research data, 2016.

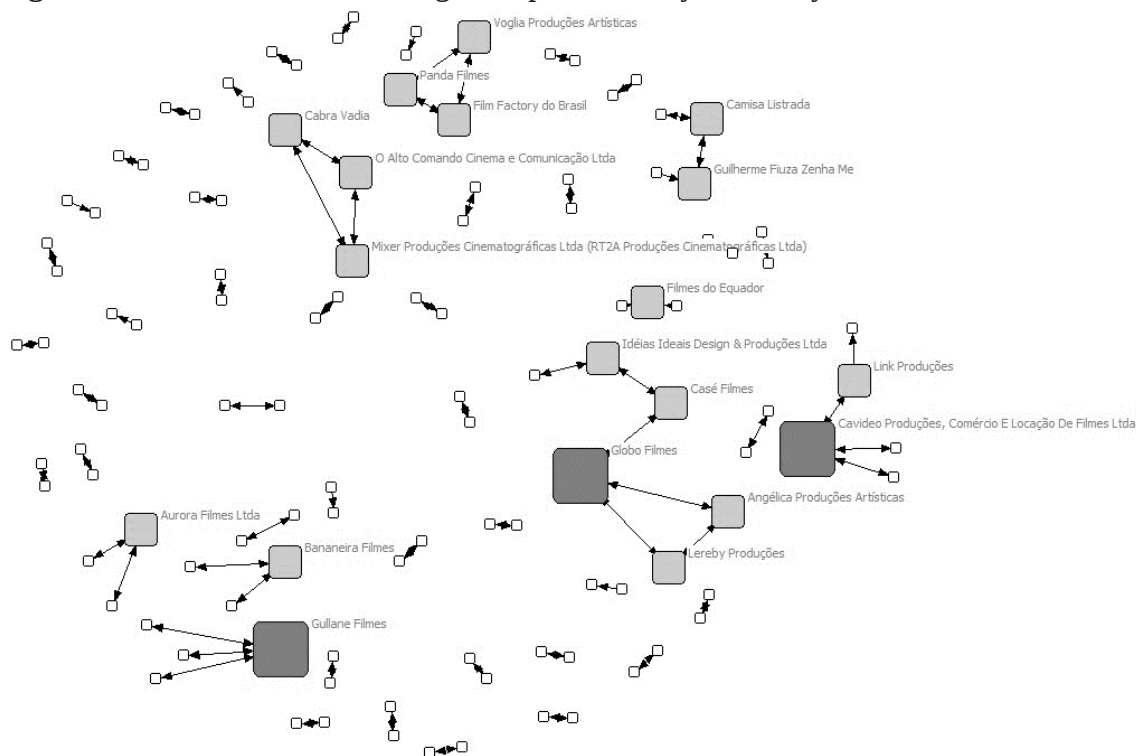
Profile of relational network links

Looking at the relational perspective among movie producers with films released during the period studied (1995-2015), the mapping of relational links between them is presented. This analysis makes it possible to highlight the partnerships in the Brazilian audio-visual sector regarding film production. In this sense, the producers were distributed in a square matrix with binary observations (0 and 1) according to the existence or not of relations between the cinematographic producers. In addition, the density of the network was calculated by means of the proportion of existing lines in a graph, with respect to the maximum of possible lines, being able to vary from 0 to 1. The purpose of this measure was to demonstrate the overall density of the relations in the period investigated.

It was verified that the overall network centralization of the 613 producers in the period of the investigation was 0.50% and the overall network density was 0.00%. These indexes indicate that the network of cooperation between producers in the Brazilian audio-visual market has a weak relationship of links, that is, cooperation in this sector is very restricted and dispersed. As pointed out by Sacomano-Neto and Truzzi (2009), low-density networks may have the advantage of access by actors to non-redundant information and contacts, which may have facilitated the strategic renewal that led to the revival of the film industry observed in the period studied. Likewise, less centralized networks tend to have a better distribution of power and control, as well as higher degrees of knowledge diffusion in the network (SACOMANO-NETO, TRUZZI, 2009).

Figure 1 shows the network graph from the perspective of degree centrality per producer (individual). Thus, the higher the size of the “node”, the higher producers’ degree centrality, that is, the higher the number of actors directly connected to it.

Figure 1 – Overall network sociogram - producers by centrality



Note: Isolated actors were excluded from the sociogram.

Source: Research data, 2016.

Despite presenting 613 companies that have released films during the investigated period, the Brazilian audio-visual production industry presents only a few cooperative relations between these companies. It is possible to observe the formation of some clusters within the network, like the one formed by 6 firms, including *Globo Filmes*, *Lereby Produções*, *Angélica Produções Artísticas*, *Casé Filmes*, and *Idéias Ideais Design & Produções*. Still, it is noticeable the cluster formed by 5 companies, concentrated around the *Cavideo Produções*; and two additional clusters formed by three companies, one between *Cabra Vadia*, *O Alto Comando Cinema*, and *Mixer Produções Cinematográficas*, and another one formed by *Panda Filmes*, *Film Factory do Brasil* and *Voglia Produções Artísticas*. Furthermore, it is observable other producers that have co-produced films with other companies; standing out *Gullane Filmes (3 partners)*, *Bananeira Filmes (2 partners)* and *Aurora Filmes (2 partners)*.

When observing the indicators from the producers' individual perspective (egocentric), it is suggested that the perception of centrality by producer shows its interrelationship degree. In this context, the higher the producer's degree centrality in the network, the higher its importance in the relational structure among the producers in the area (Table 4). The degree centrality aims to reveal the number of bonds an actor has with other actors in a network, considering only the adjacent relationships, resulting in the local centrality of the actors (ROSSONI; HOCAYEN-DA-SILVA; FERREIRA-JÚNIOR, 2006). The degree centrality also indicates the prestige, prominence and power that the actor possesses in the network (BORGATTI, 1995; FREEMAN, 1979). The more connections an actor has in the network, the higher his opportunity to influence and be influenced by other actors, and also the higher their chances of accessing information that circulates in the network (QUIROGA et al, 2006).

Table 4 – Degree Centrality per producer (more central actors - degree)

Producers	Degree	nDegree	Producers	Degree	nDegree
Cavideo Produções	3	0.49%	Filmes do Equador	2	0.33%
Globo Filmes	3	0.49%	Guilherme Fiuza Zenha Me	2	0.33%
Gullane Filmes	3	0,49%	Idéias Ideais Design & Produções Ltda	2	0.33%
Angélica Produções Artísticas	2	0.33%	Lereby Produções	2	0.33%
Aurora Filmes Ltda	2	0.33%	Link Produções	2	0.33%
Bananeira Filmes	2	0.33%	Mixer Produções Cinematográficas	2	0.33%
Cabra Vadia	2	0.33%	O Alto Comando Cinema e Comunicação	2	0.33%
Camisa Listrada	2	0.33%	Panda Filmes	2	0.33%
Casé Filmes	2	0.33%	Voglia Produções Artísticas	2	0.33%
Film Factory do Brasil	2	0.33%			

Source: Research data, 2016.

Table 4 shows that the producers *Cavideo*, *Globo Filmes* and *Gullane Filmes* are the most central producers in the Brazilian cinematographic production network. This means that these actors have more relationships with other actors, having the opportunity to influence or be influenced, as well as higher chances of obtaining information that circulates in the medium in which they are inserted. However, it is observed that there is not a significant discrepancy between the most central actors and the other actors in the

network, which is aligned with the low values found for overall network centralization (0.50%) and density (0.00 %).

The betweenness centrality indicates the probability that an actor has to connect two other actors through the shortest (geodesic) path. These actors may also be termed as bridges. Actors with a high betweenness centrality occupy strategic positions in the network since they are more likely to exert the connection between two distinct groups (QUIROGA et al, 2006). Table 5 shows the producers that have the highest betweenness centrality, including the producers *Casé Filmes (6)* and *Globo Filmes (6)*, which are more likely to exert a connection between two different groups. In the sequence appear *Cavideo (5)*, *Idéias Ideais Design & Produções (4)*, *Gullane Filmes (3)* and *Link Produções (3)*.

Table 5 – Betweenness Centrality by producer (more central actors - betweenness)

Producers	Between	nBetween	Producers	Between	nBetween
Casé Filmes	6	0.32%	Camisa Listrada	2	0.11%
Globo Filmes	6	0.32%	Guilherme Fiuza Zenha Me	2	0.11%
Cavideo Produções, Comércio E Locação De Filmes Ltda	5	0.27%	Aurora Filmes Ltda	1	0.05%
Idéias Ideais Design & Produções Ltda	4	0.21%	Bananeira Filmes	1	0.05%
Gullane Filmes	3	0.16%	Filmes do Equador	1	0.05%
Link Produções	3	0.16%			

Source: Research data, 2016.

The actors' capability to connect and access all other actors in the network is measured by means of closeness centrality. This measure indicates the inverse of the sum of the geodetic distances that an actor must go through to connect all other actors in the network (FREEMAN, 1979). Thus, the higher the closeness centrality of an actor, the higher his ability to access the other actors in the network and to transmit information to them (BORGATTI; EVERETT; JOHNSON, 2013). Contrary to what happens in the case of degree and betweenness centrality measures, in the closeness centrality it is essential to observe with whom the ego is connected to in the network. This is because, even if an actor presents low degree and betweenness centrality, he can present high indexes of closeness centrality if he is connected to a relevant actor in the network (MOLINA, 2001).

Furthermore, in addition to the traditional Freeman's closeness centrality, this study also analyses the Valente-Foreman's closeness centrality. This centrality measure is relevant for measuring the integration of an actor (ego) and its partners (alter egos) in the network, as well as its radiality, that is, the ability of this actor's alter egos to access the

network as a whole (VALENTE; FOREMAN, 1998). Table 6 shows the producers with the highest closeness degree by Freeman (1979) and Valente and Foreman (1998). The results show that the producers *Casé Filmes*, *Globo Filmes*, *Idéias Ideais Design & Produções*, *Angélica Produções Artísticas*, *Lereby Produções* and *José Augusto Costa Henriques* are the producers with higher capacity to access the other actors of the network, as well as to influence and to pass information to the other producers, and also the actors with higher integration and radiality of the ties in the network.

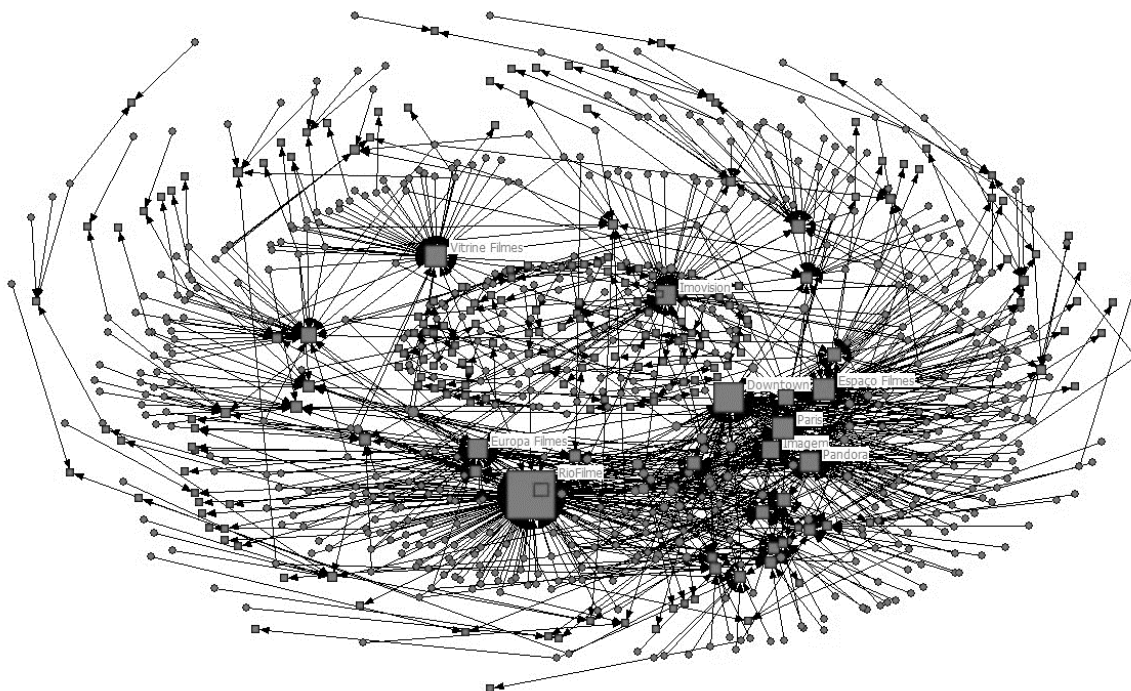
Table 6 – Closeness Centrality by producer (more central actors - closeness)

Producers	FreeClo	ValClo	Producers	FreeClo	ValClo
Casé Filmes	20.11%	0.82%	Ink Geração e Produção de Conteúdos	20.07%	0.65%
Globo Filmes	20.11%	0.82%	Gullane Filmes	20.08%	0.49%
Idéias Ideais Design & Produções Ltda	20.10%	0.82%	Camisa Listrada	20.07%	0.49%
Angélica Produções Artísticas	20.09%	0.82%	Guilherme Fiuza Zenha Me	20.07%	0.49%
Lereby Produções	20.09%	0.82%	África Filmes	20.07%	0.49%
José Augusto Costa Henriques	20.07%	0.81%	Buriti Filmes	20.07%	0.49%
Cavideo Produções, Comércio E Locação De Filmes Ltda	20.10%	0.65%	Olhos de Cão Produções Cinematográficas	20.07%	0.49%
Link Produções	20.09%	0.65%	Alê Abreu Produções	20.06%	0.49%
70 Filmes Produções Artísticas Ltda	20.08%	0.65%	Panorama Filmes	20.06%	0.49%
Berny Filmes Projetos Artísticos e Culturais	20.08%	0.65%			

Source: Research data, 2016.

Figure 2 shows the network sociogram generated by the relations between producers and distributors, evidencing the partnerships established in the films' distribution. It is emphasized that the larger the node size of a distributor, the higher its degree centrality.

Figure 2 – Overall network sociogram - producers and distributors



Note: The isolated actors were excluded from the sociogram; square format represents the distributors, and circular format represents the producers.

Source: Research data, 2016.

In the period between 1995 and 2015, 218 film distributors were identified, with an overall centralization of 20.80% and an overall network density of 1.00%. Through the analysis of the overall network centralization and density, it was possible to show that the network of cooperation between producers and distributors in the Brazilian audio-visual market is concentrated in some distributors, but it still presents a weak relation of links between these actors, that is, most producers work in isolation with small distributors.

Regarding the degree centrality of the distributors (Table 7), it can be seen that *RioFilme* is the most significant distributor in the relational network structure (21.04%), followed by the *Downtown* distributor (11.26 %). This data indicates that these distributors present more relations with producers and have higher chances of obtaining information that circulates in the environment in which they are embedded in. It is also worth noting that the calculations of the centrality measures were extracted by the 2-mode method, which provides the result of normalized degree centrality, presenting the percentage of the total centrality of the actor's degree in the network.

Table 7 – Degree Centrality per distributor (more central actors - degree)

Distributor	Degree	Distributor	Degree
RioFilme	21.04%	Europa Filmes	6.69%
Downtown	11.26%	Imovision	6.53%
Espaço Filmes	7.50%	Pandora	6.53%
Paris Filmes	7.50%	Imagem	5.38%
Vitrine Filmes	7.18%		

Source: Research data, 2016.

Regarding the betweenness centrality of distributors and producers (Table 8), *RioFilme* (22.39%), *Downtown* (8.12%) and *Vitrine Filmes* (8.07%) stand out as central actors. In this sense, the outstanding distributors are more likely to have a connection between two different groups of producers, being able to obtain advantages and information in the intermediation process.

Table 8 – Betweenness Centrality by distributor (Central actors - betweenness)

Distributor	Betweenness	Distributor	Betweenness
RioFilme	22.39%	Filmes do Estação	4.09%
Downtown	8.12%	Imagem	3.87%
Vitrine Filmes	8.07%	Pipa	3.78%
Espaço Filmes	6.94%	Paris	3.46%
Imovision	5.13%	Fox	2.14%
Pandora	4.67%	Elo Company	2.07%
Polifilmes	4.36%	ArtHouse	2.02%
Europa Filmes	4.35%		

Source: Research data, 2016.

Finally, the closeness centrality indexes demonstrate the distributors that are more likely to access the other actors in the network (producers and other distributors). Of these, *RioFilme* (25.99%), *Downtown* (25.47%), *Espaço Filmes* (25.35%), and *Europa Filmes* (25.23%) are the distributors with higher capacity to access the producers in the network. However, the data show that the most central players in the network do not have a substantial advantage over their peer distributors despite having the highest values of Freeman's centrality. This can be corroborated by the equality in Valente-Foreman's closeness centrality values (0.57%) among all network distributors.

Table 9 – Closeness Centrality by distributor (more central actors - closeness)

Distributor	FreeClo	ValClo	Distributor	FreeClo	ValClo
RioFilme	25.99%	0.57%	Filmes do Estação	24.69%	0.57%
Downtown	25.47%	0.57%	Lumière	24.60%	0.57%
Espaço Filmes	25.35%	0.57%	Columbia	24.49%	0.57%
Europa Filmes	25.23%	0.57%	Polifilmes	24.44%	0.57%
Imagem	25.17%	0.57%	Sony	24.35%	0.57%
Paris	25.17%	0.57%	Mais Filmes	24.33%	0.57%
Imovision	25.14%	0.57%	Raiz Filmes	24.22%	0.57%
Disney	24.91%	0.57%	Elo Company	24.19%	0.57%
Vitrine Filmes	24.89%	0.57%	Califórnia	24.11%	0.57%
Warner	24.86%	0.57%	Paramount	24.06%	0.57%
Pandora	24.83%	0.57%	PlayArte	24.03%	0.57%
Fox	24.83%	0.57%	MovieMobz	24.03%	0.57%
Buena Vista	24.83%	0.57%	Videofilmes	24.00%	0.57%
MAM	24.77%	0.57%	Panda Filmes	24.00%	0.57%
S. Ribeiro	24.72%	0.57%			

Source: Research data, 2016.

Concluding remarks

The purpose of the present study was to map and analyse the social interactions in cinematographic production and distribution in Brazil, presenting network relationships as a mode of managing the economic actors in the Brazilian film industry. The development of this study is justified since the analysis of the relational capabilities between social actors has recently gained relevance. Such evidence is given by the apparent need for relationships between the most diverse stakeholders and their environments of interest. In addition, the business activity in the audio-visual sector has stood out in terms of economic relevance at a global level, playing a role of vital importance in the cultural, social and economic scope of nations.

Through the analysis of the network overall centralization and density, it was possible to show that the networks of cooperation between the producers, as well as between producers and distributors present in the Brazilian audio-visual industry, still presents weak links. Thus, the data suggest that cooperation in this sector is very restricted and dispersed, making a broader evolution of the Brazilian audio-visual industry in general, and film in specific, unlikely.

As for future studies, it is suggested to evaluate the relations of cooperation between producers and distributors considering the performance of productions in terms of revenue and box office. Likewise, it can be seen how the structure of the network of producers

and distributors can affect the possibility of access to private sponsorships, as well as government subsidies. In the same way, it is recommended to expand the analysis of the networks for the other levels of the film industry value chain in future studies, including the networks of directors, actors and producers of cinema, so that the films' success may be evaluated through the network structures in which they are embedded in.

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Daniela Torres da Rocha

Post-doctorate in Administration from the Federal University of Paraná. PhD in Administration from the Pontifical Catholic University of Paraná. Master in Business Administration from the Pontifical Catholic University of Paraná. Bachelor of Administration from the Pontifical Catholic University of Paraná. She acts as a consultant in business management and public management. Preferably studies the area of Organizational Strategy, Research Methodologies and Teaching in Administration and Accounting. It develops research using both quantitative methods (univariate, bivariate and multivariate techniques) and analysis of social networks, as well as qualitative with the use of ATLAS ti software. E-mail: danitorres.rocha@gmail.com.

Leandro Rodrigo Canto Bonfim

Doctorate of the Graduate Program in Administration of the Federal University of Paraná (PPGADM / UFPR) in the research line Innovation and Technology. Master in Administration by PPGADM / UFPR in the research line Strategy and Organizational Analysis, and bachelor in Business Administration from the State University of Paraná (Unespar). He is a member of the Group of Studies in Management of Innovation, Technology and Sustainability (EGITS), at UFPR and vice-leader of the Group of Research Entrepreneurship, Knowledge in Organizations and Institutions, at the *Universidade Tecnológica Federal do Paraná (UTFPR)*. analysis of social networks, interorganizational networks, organizational institutionalism, innovation and technology, social innovation, and organizational strategy. E-mail: lrcbonfim@ufpr.br.

Fernando Antonio Prado Gimenez

He holds a bachelor's degree in Business Administration from the State University of Londrina (1981), a Master's degree in Business Administration from the University of São Paulo (1983) and a PhD from Manchester Business School (1995) and specialization in Cinema (2014). He is currently professor of the Department of General and Applied Administration of the Federal University of Paraná. He has experience in the area of Administration, with emphasis in Business Administration, working mainly in the following subjects: entrepreneurship, strategy, small company, administration and creative leadership. E-mail: gimenez@ufpr.br.

Michael William Citadin

Doctor with a double degree, in Administration by the Postgraduate Program in Administration of the Pontifical Catholic University of Paraná (PPAD/PUCPR) and in Business Sciences by the Business Administration program of the School of Economics and Management of the University of Minho (Portugal). Master in Administration by the PPAD/PUCPR and bachelor in Administration by PUCPR. He is a member of the Research Group on Organizations and Social Relations at PUCPR. Evaluator of the National Association of Graduate Studies and Research in Administration (EnANPAD), the Meeting of Organizational Studies (EnEO) and the journal REBRAE, working in the area of social networks analysis. E-mail: michael.citadin@me.com.

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