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„Beyond Hollywood:
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Case studies from Denmark and France"

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Abstract

As Goldsmith & O'Reagan (2005: 1) mentioned in their book *The Film Studio: Film Production in the Global Economy*, contemporary film productions have the character of "hypermobility", and co-production by several countries is the common way adopted to mobilize the films during the production process in order to seize more funding and extend bigger market. Under this background, this paper aims to analyze the urban networks produced by the (trans)national co-production in films, taking France and Denmark 2005 and 2015 as case studies. France and Denmark represent 2 different types of countries in producing films in Europe. Comparison between these 2 countries and 2005, 2015 can provide interesting insight into the roles of those connected cities playing in the network and what contributes to make the nodes linked. This paper is structured into 2 dimensions. The first one analyzes the social network using the data of top 200 and top 250 films respectively in France and Denmark 2005 and 2015. The result shows the (trans)national co-production networks in France and Denmark. The second dimension is the qualitative in-depth analysis of both cases, conducted by policy analysis and empirical research.

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CHAPTER 1

1.1 Research background and context

To explain the necessity and prominence of this topic, firstly, the importance of urban network should be illustrated. Urban network has been a hot topic for years, based on which, the cities have become enrolled in global circuits of value, or inserted in the global economy. World city network approaches are a particular way in which some researchers (GaWC) set out to map the geographies of command and control over the global economy (Sassen, 2001, 2002). Besides what Sassen (2001, 2002) described the locational concentration of producer services and financial sectors as being limited in a few global cities, we can see sharp growth in participation in international production which makes more cities that are not even considered as global cities become part of the global network (Goldsmith & O'Regan, 2005: 1). There is a consensus that the importance of a particular city is not only about itself, but more dependent on their positions in the network (Alderson & Beckfield, 2004: 812). Alderson & Beckfield argued that cities have decoupled with the local and have power cover other cities through the key nodes or command points in “a system of cities and the world economy” (Alderson & Beckfield, 2004: 812). There have been many discussions about how to approach the analysis of urban networks, like advanced producer services, global commodities, global culture production circuits, global value chain and the industry clusters.

Films as an important part of the cultural production in global market have seen many changes in recent years. Globally, from 2005 to 2014, during these 10 years, the global box office revenue increased more than 50%, which shows the great potential of being an important drive for local economic.

Global box office revenue from 2005 to 2014 (in billion U.S. dollars)

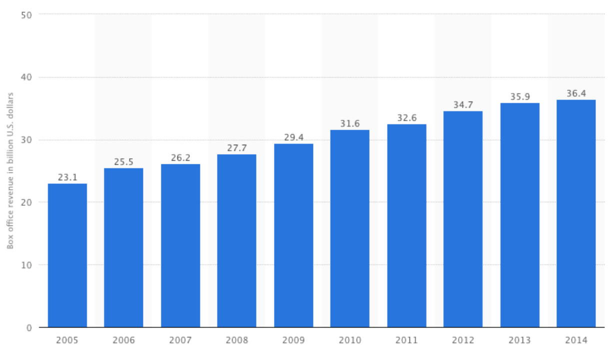
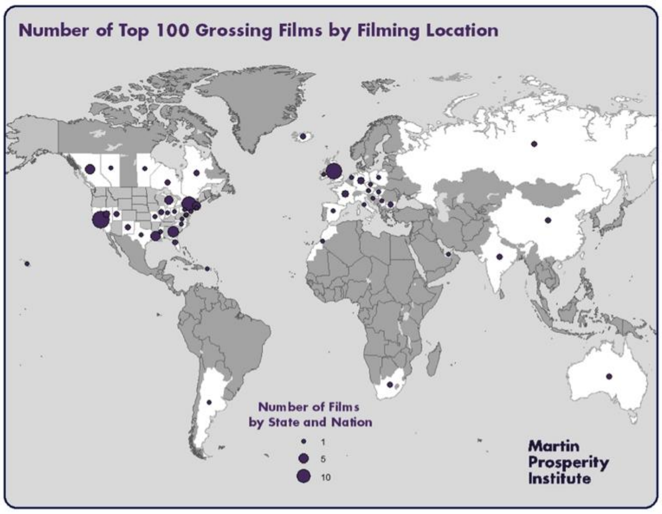


Figure 1. Global box office revenue from 2005 to 2014 (source: MPAA report 2015).

It is interesting to realize that actually some cities have integrated film supporting policies as part of the urban planning and economic strategy. To better position themselves in this global scenario, countries in Europe make more cooperation with other countries than before in order to defend themselves from the American film domination while trying to attract the international cooperation in their own territories to obtain the benefits for the local film industry (Pardo, 2007: 21). Through co-productions, we can pry on the economic and political relationships between different cities and countries.

We can see from the map below that it is dispersed in terms of the filming location for the top 100 global grossing films in 2014. This map only shows where the shooting activities (both outdoor and in studios) take place rather than where the money flows and stays, although the shooting activities do create value by catering and employing the local professionals. So it will be interesting to see how dispersal it is for the film production companies from a geographical perspective in order to see where the money flows to, and how the cities were connected and interacted with each other. In addition, the role and importance of the cultural and economic factors, as well as institutional/political incentives and barriers in the network, will be interesting to cover. The urban networks formed by the dispersal of film production processes opens up for a new approach to gather insights to the global cultural industry and city networks. When I did the literature review, I don't see enough empirical analysis in this realm, especially in describing the changes in the past 10 years in terms of how the film industry forms the urban network globally, which provides me an opportunity to work on it.



Map 1. Number of top 100 grossing films by filming location (source: Florida, 2015).

1.2 urban network and cultural economics in relevant literature

In recent years, the Globalization and World Cities (GaWC) did a lot of research in the networks within global cities. Some authors contributed quite a lot in the empirical experience connecting different economic activities with city networks. In Alderson & Beckfield's (2004) research, they examined the power of the cities with the methodology of social network analysis through multinational enterprises (MNEs) and their subsidiaries. For Allan Watson (2008, 2009, 2012, 2013), he made ample empirical analysis in the spaces and urban networks connected by the recorded music industry in London and other world cities. In 2012, he mapped the urban networks with the dataset of Apple's iTunes Music to find the centrality, power and betweenness in the network. He argued that the power of the city was based not on capacity but on its interrelations with other cities. In 2013, Hoyler and Watson brought up the concept of the global media cities based on the methodology of the world cities research (Taylor 2004; Hoyler et al. 2008; Taylor et al. 2011).

To better understand how the urban nodes are connected, it is also very important to understand how the international circuits of capital, skillful labors and knowledge are performing to formulate the networking. To understand it, the needed theory foundation is the global commodity chain (GCC) and global value chain (GVC). Hopkins and Wallerstein (1986: 159) were the first to define "commodity chain", which they defined as "a network of labor and production processes whose end result is a finished commodity". In 1994, Gereffi firstly described a framework to study the GCC. Bair and Gereffi (2001) analyzed the fabric cluster in Mexico in the perspective of GCC, followed by Gereffi's (2005) research on the GVC. He gave different empirical examples from bicycle industry to US electronic industry to describe different types of GVC. Peter Gibbon, Bair & Ponte (2008: 318) mentioned that the economic globalization "is associated with not only a disintegration of production, but also changing patterns of ownership", indicating how the city networks are built on the GVC. In Gereffi's research, he developed the frameworks from GCC TO GVC. For Bair (2005), she elaborated the historical development and comparisons towards GCC and GVC, and the practical meanings of the GVC for the firms that they can improve their position within these chains.

In the urban network, it is not only how the links are connected that is important, but also the nodes, which are embedded as the important clusters to create the global networks. The cluster theories are needed to explain the significance of cultural and economic factors in these global nodes. Cultural agglomeration or cultural clusters like film clusters (Scott, 2000; Scott, 2005; Van Heur, 2009a) are hot topics studied by many authors in the previous 20 years. Scott (1996) pointed out that cultural production has been concentrated in great global cities like New York, Los Angeles, Paris, London or Tokyo, further of which, he discussed the interdependence of the cultural economy and cities. Empirically, he published several articles to elaborate the different cultural clusters including the craft, fashion and cultural products in Los Angles (Scott, 1996), US recorded music industry (Scott, 2004), the film cluster in Hollywood (Scott, 2005) and film industry in France (Scott, 2000). Several of typologies of significant cluster types were introduced in Coe's work, while film clusters belong to the typologies of flexible production hub-and-spoke cluster and production satellite clusters (Coe et al, 2007). Van Heur also discussed the internally spatial distribution of the selected clusters (Van Heur, 2007).

During the development of the cultural agglomerations or clusters, the effects of the clusters were discussed in the aspects of geographical proximity (Bathelt, Malmberg, & Maskell, 2004), place-making, spatial development and formation of the cities (Durmaz, B., Platt, S., & Yigitcanlar, T., 2010). Apart from the internal factors driving the development of the clusters, some authors also discussed how the cultural clusters interplay with the regional development from the perspective of the local authorities (Picard, 2009). The other external factors like global capital are intertwined with the configuration of the clusters (Zademach, 2009).

When it comes to film industry, in the early 21st century, many research discussed about how the film production was disperse geographically. Coe et al (2000a, 2000b) illustrated that it was expressed in the formation of alternative clusters or satellite production locations like the film companies in Toronto, Vancouver, and Sydney to serve film production companies in Hollywood. This description is well consistent to the situation today, which will be discussed in my analysis as well. In the framework of globalization, the emerging of different cultural clusters globally has arisen attention since the end of 20th century. As mentioned in Scott (2004: 475)'s article, "a much more polycentric and polyphonic global audiovisual production system" was well aware of at that time. Van Heur argued that electronic music production of cultural industry is best understood to be shaped by the intertwinement of "spatially concentrated clusters and spatially distributed creative networks" (Van Heur, 2009b: 115). About how the companies from media clusters engage in the global network, Bassett et al (2002) explained it with the example of film-making in Bristol, UK. He found that the smaller production companies which are originally separated from the BBC have diversified their outputs and are often more closely tied with the commissions from US distributors and channel outlets. There is no doubt that successful clusters are considered to fruitfully combine external and internal sources of knowledge in complementary local and global networks (Zademach, 2009). Clusters are very well located into a variety of important national and global connections with partners, suppliers, and customers (Coe et al, 2007). However, some authors also suggest that clusters themselves can function as important as before the global industry networks have formed (Epstein, 2006; Currah, 2007). Besides, how they connect with each other and how the clusters as global nodes in the value chains play their roles are not fully empirically discussed, which provides the research possibility for my thesis.

Regarding to the national intervention in film industry, some articles are very insightful, especially in the cases of France and Denmark. Jäckel (2007) defends France as a country with profound film-related supporting policies and very internationalized in terms of transnational coproduction. He argued that French international film policy is to resist American dominance in the global market and also to develop the diversity in culture which goes beyond French films and co-production (Jäckel, 2007). Bermek (2007) analyzed the history and development of the French tax incentives for films and audiovisual works.

As to the methodology of calculating and visualizing urban network, social network analysis is a widely approved approach. Watson (2012) used the network analysis tools like Commetrix, UCINET and NetDraw to calculate and visualize the social network in different cities, which is the well acknowledged way to analyze social network. Alderson & Beckfield's (2004) also showed a good example by employing these 3 measures: outdegree, closeness, and betweenness to examine the ranking of the world cities through social network analysis.

Besides, I have noticed that in the 1st cohort of 4Cites, Cazzetta (2010) have accomplished her master thesis mainly in the aspect of the interplay of urban development strategies in film and media (or audiovisual) industries clusters, inspired by which, but will not overlapped in the research dominance of my thesis.

1.3 Research question

To aim at formulating the research question for this thesis, it is useful to look at the top 200 films in Denmark and France respectively according to the box office data in 2005 and 2015. Every domestic film is based on the cultural setting of the specific film production countries, while more and more consists of part of the production process made in different countries. The reason why I chose Denmark and France is due to the consideration of the convergence and divergence of the European film market. France is traditionally the biggest film production country and market in Europe, engaging in the global film production, while Denmark shows divergence compared with the rest of Europe representing the Nordic countries model. I finally formulate the research question as follows:

How cities go beyond the limit of clusters and link together through (trans)national co-productions - Case studies from Denmark and France.

To answer this question, three sub-questions need to be answered:

1) How do the film production processes (mainly production and post production) create city network in Denmark and France in 2005 and 2015?
2) What roles of those connected cities play in European film industry?
3) How is the significance of cultural and economic elements, as well as institutional/political ones as barriers or incentives when connecting economic industries to city network?

Therefore, in this thesis, my aim is to analyze the city network based on the social network analysis occurring through film co-production in respectively Denmark and France, namely relational data-linking cities with other cities. The changes in chronological comparison in 2005 and 2015, and difference between these 2 countries will be analyzed. I suppose the most important nodes in France and Denmark are Paris and Copenhagen. The geographical distribution of production companies in both countries and both cities (Paris and Copenhagen) should be shown as well in order to glance on how the film industry is connected to the urban development agenda.

My hypothesis includes 2 aspects:

- For the city connections, during these 10 years, different cities in film industry become more interactive with each other from a global perspective; more multinational cooperation happens in film production, especially, the film production processes are gradually divided based on the different geographical advantages. I assume that for French films, many European cities, North American cities and Asian cities will be connected with French cities, especially Paris through the transnational film production. However, in Denmark, it shows another typology. Danish film production keeps a very tight tie with Nordic area, rather than any other cities in the world. I assume that Danish film production takes its own alternative compared with other European countries. It is even a bit isolated with the other part of the world in terms of transnational film production.
- For the film clusters in both countries, within Paris and Copenhagen, as the most important film production clusters in their own countries, I expect to see the following changes during these 10 years: My hypothesis is, more and more production and post production companies have seen to escape from the clusters. The post productions tend to be outsourced to other low-cost cities while film productions go more and more internationally instead of limited within the clusters.

1.4 Research Design Methodologies

I implement the research by analyzing the data available from IMDb and Statistic Denmark, looking in where the production locations take place, and where the post production companies are located of every film selected as quantitative analysis. I am well aware that many transnational film companies have branches all over the world, to see where the value flows to, only the city of the headquarter will be chosen. For a complete value chain of film production, it should include shooting location, production companies, post production companies, distribution companies. In an ideal situation, even the geographical information of scripts production should be included. However, realistically, shooting locations sometimes can be rural areas instead of cities, while the location of script production can be multiple and of opacity, which make it very difficult to trace. For distribution companies, more than half of the business in Europe are concentrated by 5 big distributors: 20th Century Fox, UIP, Warners Bros, Buena Vista and Sony/Columbia TriStar (Pardo, 2007). It means one distributor can cover the distribution of many cities, which makes the tracing of geographical settlement of the distribution companies lose its sense. Therefore, this paper only focuses on how the production and post production are organized in a network of cities, most importantly the (trans)national co-productions.

First, I pick 200 top films according to the rankings of the global box office data (available at Box Office information provided by IMDb, which is known as the world's most popular and authoritative source for film) for France in 2005 and 2015. I realize that the French data I found in IMDB includes the periphery countries like Algeria, Monaco, Morocco and Tunisia. However, those 4 countries' market share are too small to affect the data, so the data of France market is still reliable. Since for the data of Denmark is not available punctually on IMDb, it is collected on Statistic Denmark according to the ranking of the admissions. I realized the scale of Danish film production is significantly less than French film production. In order to insure the robustness of the network, the data of Denmark is enlarged to 233 and 256 top films respectively in 2005 and 2015, which is the total amount recorded in Statistic Denmark.

Among those top films, only films produced or coproduced by selected countries (Denmark and France) are selected in order to avoid the Hollywood films. Further desk research is conducted to identify the locations of the production companies (see figure 2). A matrix is formed in order to find the connections between the located cities. For France 2005, there are 41 cities participating in the (trans)national productions, and 49 in 2015. For Denmark 2005, there are in total 32 cities involved in the (trans)national film production, 41 in 2015. The matrixes (number of the cities * number of the cities) to identify their relations are made, as well as the tie strength is calculated according to the number of the times of the cooperation. On the whole, the data are coded as undirectional (e.g. not distinguishing between senders and receivers) and weighted (e.g. calculating the weight of ties between cities). Since in the co-production projects, it is difficult to figure out which one is sender and which one is receiver, then the matrix should be a symmetric one due to the information is assumed to flow equally in both directions through the ties between 2 nodes. The matrix is then imported into Ucinet to calculate the degree, Betweenness and Eigenvector Centrality. Visualisation tool NetDraw will show the social network of the selected country in the selected year.

	Film name	Producing country	Production company	City of the headquarter of production company
1	FAR TIL FIRE GIR ALDRIG OP	Denmark	ASA Film Produktion	Hellerup, Denmark
			Easy Film	Copenhagen, Denmark
			Scanbox Entertainment	Copenhagen, Denmark
2	NYNNE	Denmark	Angel Films	Kongens Lyngby, Denmark
			Cirkel Film	Kongens Lyngby, Denmark
3	DRABET	Denmark	Zentropa Entertainments	Hvidovre, Denmark
		Norway	Spillefilmkompaniet 4 1/2	Oslo, Norway
		Sweden	Memfis Film	Stockholm, Sweden
		UK	Sigma Films	Glasgow, UK
4	ADAMS ÆBLER (Adam's apple)	Denmark	M&M Productions	Copenhagen, Denmark
		Germany	August Film & TV GmbH	Hamburg, Germany
5	SOLKONGEN	Denmark	Obel Film	Hellerup, Denmark

Figure 2. A glimpse of the data analysis, taking top 5 films in 2005 Denmark as examples. Source: box office mojo.

In order to better illustrate social network analysis, figure 3 explains how social network is organized. There are 3 types of social network: whole networks, partial networks and ego networks (Liu, 2015). Whole networks include every node and their connections in a group, so city networks formed by the film industry can be seen as a whole network. Partial networks are formed by nodes which have connections with each other, which can be less than the whole networks, while more than ego networks. Ego networks is used to describe one “star” node and its connected nodes. The focus of this thesis is ego networks. I will take France and Denmark as case studies to analyze how the French film and Danish film industries produce the urban networks, what kind of patterns of the ties they produce and how the individual cities function in the network. Respectively, Paris and Copenhagen is the “star” nodes in the ego networks.

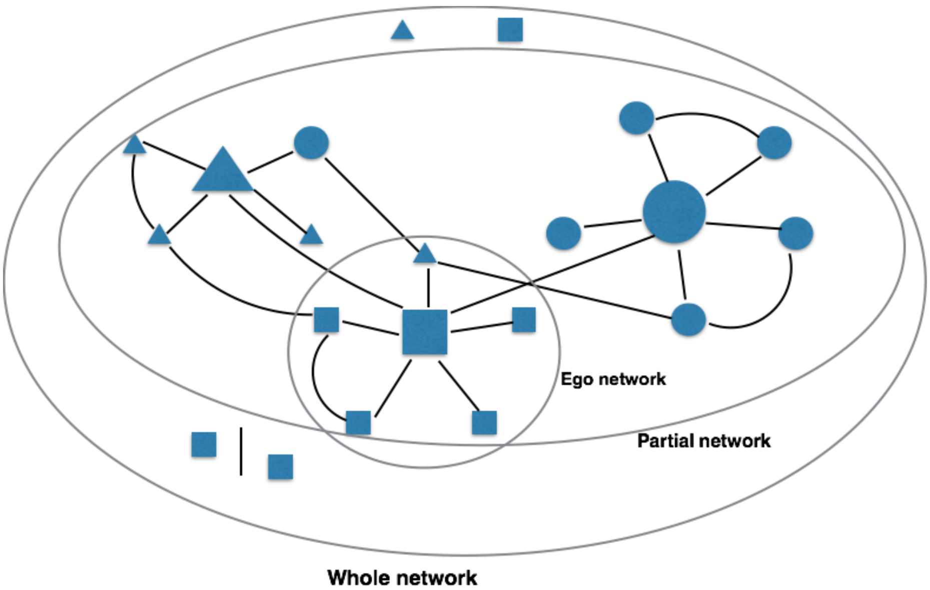


Figure 3, the graphic of 3 types of networks (source: Liu, 2015, and own visualization).

To better understand the position of the cities in the network, three centrality measures are necessary to be calculated: degree, flow betweenness and Eigenvector centrality.
Degree is a very direct concept to show how many nodes are connected directly to one specific node. The more “friends” it has, the higher centrality it has.

Betweenness means the role of the node as an intermediary or connector. The higher it is, the more important it is in the network, which means if one node needs to reach another node, more possibility will go through that node with high betweenness. Since the size of the nodes in the network will be displayed by betweenness, we can easily identify the most important cities as intermediaries or connectors in French and Danish film production. In Ucinet, the most common betweenness is the freeman betweenness and the flow betweenness. For freeman betweenness, it is calculated based on the geodesic path, while the flow betweenness is calculated with "all of the pathways connecting them, rather than just geodesic paths" (Hanneman & Riddle, 2005). In this paper, since information is considered to flow on all pathways instead of just geodesic path in film production, flow betweenness will be adopted to measure the centrality of the nodes. The calculation of betweenness is as follow:

$$C_B(i) = \sum g_{jk}(i) / g_{jk} \quad (j \neq k)$$ (Freeman, 1977)

Eigenvector Centrality is to measure the proportion of the node to the sum of the neighbor's centralities. It is to see whether the specific node is connected with some "important friends". If a node's "friends" are important, then this node is important as well. In film production, if a city itself does not have many connections, but it has strong connection with some cities with high centrality in film industry, it will also have a high potential to have more information and resources, and thus high potential of opportunity to participate in the global urban network. The calculation of betweenness is as follow:

$$E(i) = a \sum_j g_{ij} C_j$$ (Bonacich, 2007)

Beside the data analysis, it's important to do the relative policy reviews in Denmark and France to find out the significance of cultural and economic factors, and institutional/political ones as barriers or incentives when connecting film industries to urban network. For the empirical research, the results of data analysis will be reflected and compared to the realistic world by having interviews with professionals in film industry and persons from film regulation authorities in Denmark and France.

CHAPTER 2

2.1 procedures in film production

In the following section, the production processes of the feature film, which accounts for the largest share of the film market, will be explained. In the pre-production, a film will start from an idea which either comes from a book, TV series, computer game or the idea of the director. For example, Harry Potter starts from J. K. Rowling's novel series. Under the supervision of the director, the writer will make the story into a film script. In the pre-production stage, all kinds of preparation like making budget, getting funding, attracting investors, deciding actors and choosing shooting place will have to be well planned. This phase will normally end when the shooting script is ready.

Then it goes to the production phase when the shooting activities actually happen. For a blockbuster, the number of staff can vary from hundreds to thousands. Most important players include directors, actors, photographers, technicians of stage setting and make-up. Some staff come from the production company, while some of them are employed temporarily in local shooting place. This is one of the reasons that many local governments are eager to invite shooting activities to their territories in order to create more job. According to the need of a film, the shooting team can mobilize around to different shooting locations. The common way to do so is to coproduce with local production companies. This phase normally costs the largest share of the budget, and is also widely supported by public funds in Europe. For the post production, the tasks include editing (largest part), making sound track, background music, sound effect and special visual effect. To ensure the quality of post production, skillful staff and advanced facilities are increasingly important and expensive.

London and Los Angeles have always had the reputation of housing many famous post production companies like The Mill, MPC, Framestore and Prime Focus. However, in the last decade, post production industry has faced big challenges because of the global severe competition and financial difficulty. The most symbolic story in post production industry is one of the top production in US Rhythm & Hues Studios went bankruptcy right after winning Oscar for Best Visual Effects for *Life of Pi* in 2013, although the blockbuster *Life of Pi* spent 120 million dollars in post production in that company. During 2003-2013, there are 21 top post production companies closed or filed for bankruptcy in Hollywood (Life After Pie, 2013). Later Rhythm & Hues Studios was acquired by an Indian animation and VFX company Prana Studios. John Hughes, the co-founder of VFX company Rhythm & Hues went to China and started a new visual effects company and visual arts center in Beijing (China Daily, 2016). All these facts reveal that in order to get cheaper labor, more public subsidies, and low cost, global post production has seen the trend that it start to move to developing countries, which helps cities in developing countries participate the global film circuits in a way. This will be discussed later in the chapter of urban network in Denmark and France.

When the post production part of a film is finished, it is ready to meet the audience, which links to distribution and exhibition. In Europe, the distribution market is very fragmented due to the country divisions. The distributors will consider the distributing way according to the films. For the blockbusters, theater and film festival are the main ways, while small and medium films can be TV, Video on Demand (VOD) and DVD. There is no doubt that since last 2 decades, the market share of DVD has shrunk to almost nothing while VOD as a new way to distribute has won increasing market share. This paper focuses on production and post production phases, with the reasons having been explained above.

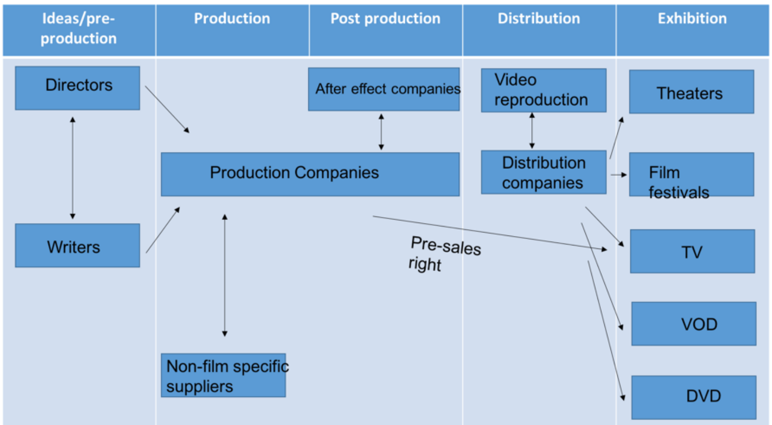


Figure 4, the value chain of feature films, source: Copenhagen Business School, 2005 and own visualization.

2.2 History of international co-production in films

Film co-production means 2 or more than 2 production companies work together to produce a film, either partly or entirely, sharing local resources and risk. When these companies are from the same countries, then it is national co-production. When they are from different countries, we call it international or transnational co-production. The history of film co-production can be traced back to the Second World War. Because of Marshall Plan, US started to co-produced with European producers in order to undertake the European Market. France was the first country in the world to have the inter- governmental co-production agreement with Italy in 1949, in order to welcome the foreign artists to cooperate with France (Jäckel, 2007).

Instead of staying within a cluster and a national context, nowadays, international co-productions have been increasingly significant to produce films, especially for European countries. In most European countries, international co-productions can account for over 30% of the total productions (Morawetz, Hardy, Haslam, & Randle, 2007). The cluster paradigm has been broken in this sense. The advantages of co-production are obvious: getting more local film fund in every co-production location; extending international market; making the shooting easier regarding to the local legislation and culture; making full use of the local advantages in technology and staff by joint efforts. Mainly, the contemporary co-production of film is driven by a search for and an abundance of financial capital, which will be elaborated in the following chapters.

2.3 An overview of the film industry in Europe

Before going to the data analysis part, it is necessary to have the general information of film industry in Europe in mind. For the film market, similar to global market, US film production has seen the dominance in European market – 69.1% of the total share is taken by US films, 1.1% co-produced by US-EU, while European films hold only 26% in 2014 (European Audiovisual Observatory, 2014). But it varies a lot in different countries in Europe. UK and France being the best performing country, 44.5% and 35.2% respectively of national share was (co)produced by domestic companies in 2015. Danish films account for 29.8% of the national market share, positioning as higher than average in Europe (European Audiovisual Observatory, 2016, see figure 5 below). Within Europe, the biggest film market and production countries are United Kingdom (UK), France, Germany, Italy and Spain - account for around 80% of European releases, industry turnover, and staff employed (Katsarova, 2014).

Country	France	UK	Italy	Lithuania	Czech Republic	Germany	Denmark	Netherlands	Spain	Finland	Poland	Sweden	Norway
2014	44.4%	26.8%	27.8%	23.1%	23.8%	26.7%	27.4%	20.9%	25.5%	28.1%	27.5%	26.4%	24.4%
2015	35.2%	44.5%	21.3%	13.8%	18.4%	27.5%	29.8%	18.7%	19.2%	29.9%	18.7%	20.7%	20.5%

Figure 5, national market shares in European countries 2014 – 2015, showing top 13 countries (source: European Audiovisual Observatory, 2016).

CHAPTER 3

The data analysis is implemented with the case studies of France and Denmark in 2005 and 2015 respectively. France as traditional big film producing country, it used to be the most important one in the world before 1914, followed by the Italian and the Danish (Pardo, 2007: 16). As the biggest film market in Europe (European Audiovisual Observatory, 2016), France's model can present those traditionally large film markets like UK, Germany, Spain and Italy. Moreover, French films are among the most popular ones in the world with big fame, dominating Europe market after Hollywood films and UK films, cooperating with other film production companies all over the world. It will be interesting to take France as a representative country among the traditional big film markets to understand the developing trajectory and specialty of its urban network.

3.1 Urban networks of film production of French films in 2005 and 2015

	Transnational multi-city film productions (share of French produced/co-produced films)	National multi-city film productions (share of French produced/co-produced films)	National single-city film productions (share of French produced/co-produced films)	Total French produced/co-produced films (share of all top 200 films)
France 2005	31(36%)	41(48%)	14(16%)	86(43%)
France 2015	46(51%)	33(37%)	11(12%)	90(45%)

Figure 6, top 200 films of (trans)nationality in French market in 2005 and 2015 (source: own analysis).

In 2005, there are 86 films involved in French production out 200 top films in France market, while 98 (co)produced by US. In 2015, there are 90 films involved in French production out of top 200 that year, with 109 (co)produced by US. Although the Hollywood films dominance is still prominent, French production is also very mighty in both years. Within the French production involved films (at least one French production company participated), the number of transnational multi-city film productions which involved French production companies is seen to increase, from 31 to 46 films, while the number of national multi-city film productions decreases from 41 to 33 during these 10 years. This indicates the degree of internalization of French films is higher than 10 years ago. National single-city film productions remain relatively stable, 14 in 2005 and 11 in 2015, being the minority in these 3 categories. One interesting fact is that all the single-city film productions (14 in 2005, 11 in 2015) were produced in Paris city, which concentrates large number of film production companies as the most influential film production node in France.

The further analysis drills down to discover which cities are involved in the French film production. The cities are identified by the location of the production companies who are engaged in the productions. In 2005, we found 41 unique cites participated in French film co-productions, with 11 French cities, 19 other European cities, 7 North American cities, 2 Asian cities, 1 African city and 1 middle east city. It shows that French co-productions are mostly limited in Europe, while North America especially US have a frequent cooperation with France. With these 41 cities, a symmetric matrix (41*41) is made to find the urban network of them (see figure 7).

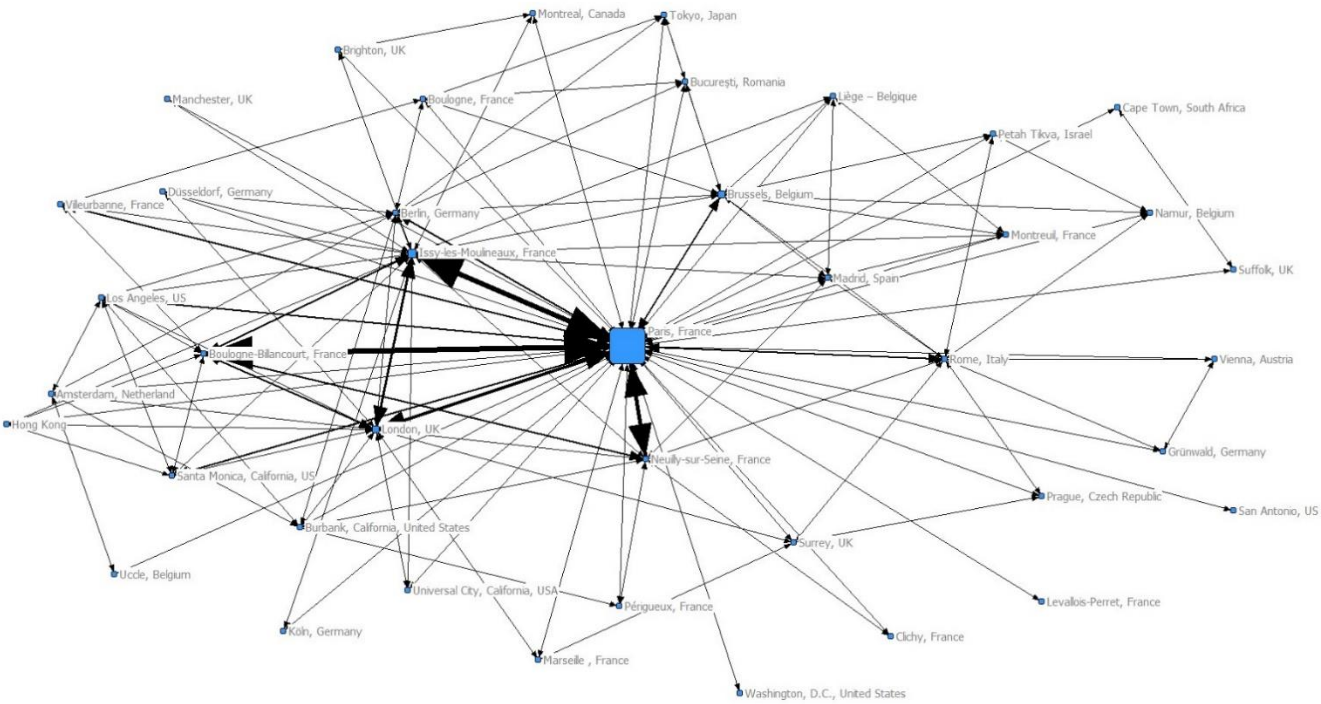


Figure 7. Urban networks of French film production in 2005, network within 41 cities (source: own visualistion).

The social network of French film production in 2005 shows that Paris as a central node has a wide connection with other cities. The size of the nodes means flow betweenness, and the size of the line refers the frequency of co-production. The most frequent cooperation is between Paris and Neully-sur-Seine, Paris and London, Paris and Boulogne-Billancourt, Paris and Issy-les-Moulneaux. It is not difficult to find that Neully-sur-Seine, Boulogne-Billancourt and Issy-les-Moulneaux are all municipalities around Paris city, belonging to Île-de-France. Rome, Brussels, Berlin, Los Angeles and Santa Monica are among the second important partners for Paris.

Rank	Degree	Flow betweenness	Eigenvector
1	Paris, France(118)	Paris, France(784.15)	Paris, France(0.742)
2	Issy-Les-Moulineux, France(46)	Issy-Les-Moulineux, France(168.05)	Issy-Les-Moulineux, France(0.359)
3	London, UK(34)	Rome, Italy(89.73)	Boulogne-Billancourt, France(0.355)
4	Boulogne-Billancourt, France(33)	London, UK(81.95)	London, UK(0.25)
5	Neuilly-sur-Seine, France(21)	Brussels, Belgium (65.84)	Neuilly-sur-Seine, France(0.218)

Figure 8, Centrality measures, top 5 French production network in 2005 (source: own calculation from Ucinet).

The results of centrality measures show that Paris's high centrality in the global urban network formed through French film productions. Paris ranks no. 1 in degree, flow betweenness and Eigenvector, which means firstly it has the largest number of nodes connecting with it. Secondly it is the mediator and gate-keeper in this urban network with largest number of influential partners connected. Beside, Issy-Les-Moulineux and London are always among top 5 in these 3 measures. Issy-Les-Moulineux, Boulogne-Billancourt and Neuilly-sur-Seine which are small “satellite cities” near Paris, show high degree of dependence on Paris. In the measures of Degree and Eigenvector, both of them have the same top 5 cities with different rankings, which refers to 5 of them are well connected to other cities of both high and low centrality. It is interesting to notice that London, Brussels and Rome are the most important foreign mediators to Paris, while Berlin also shows its prominent presence from the network.

Surely every connection between 2 nodes has a story behind. It is worth to point out the network between Paris and Rome, which is seen to have strong connection in figure 7. Italy and France have signed the 1st European co-production agreement in 1949, and made some "golden days" in 1950s and 1960s, reaching its peak in 1960s. The high reputation films *La Beauté du diable (Beauty and the Devil)*, Le Château de verre (The Glass Castle) and *Blood and Roses* were all produced during those days. The co-productions declined due to the crisis of Italian cinema in 1970s, and revived in 2000s with a new co-production agreement in 2003 (Scoffier, 2014). That is why we can see the sizable connections between Rome and Paris, although they can't reach the glory of 1960s any more.

When the post production process is taken into consideration, the network of French film co-productions becomes more profound, unique cities enlarging from 41 to 52. From the network, we can see that these extra 11 nodes are all cities with post production happening there. In the middle, the important cities contain both production and post production activities are Paris, Brussels, Boulogne-Billancourt, Los Angeles, Burbank and London, while in total there are 13 cities having both functions. This fact suggests that during the production process of these films, both production and post production are organized in the same place, using the cluster advantage. However, those 11 post production cities also show the alternative out of the cluster paradigm. 2 out of 11 are eastern European cities, where the price of post production is known as much cheaper regarding to the labor cost and public subsidy, while 5 of 11 are North American cities, which are famous for high quality of post production.

It is also necessary to clarify that the color scheme of the network does not deny the production or post production activities happening in those location at all, while it only shows the data analysis of top 200 films in French markets.

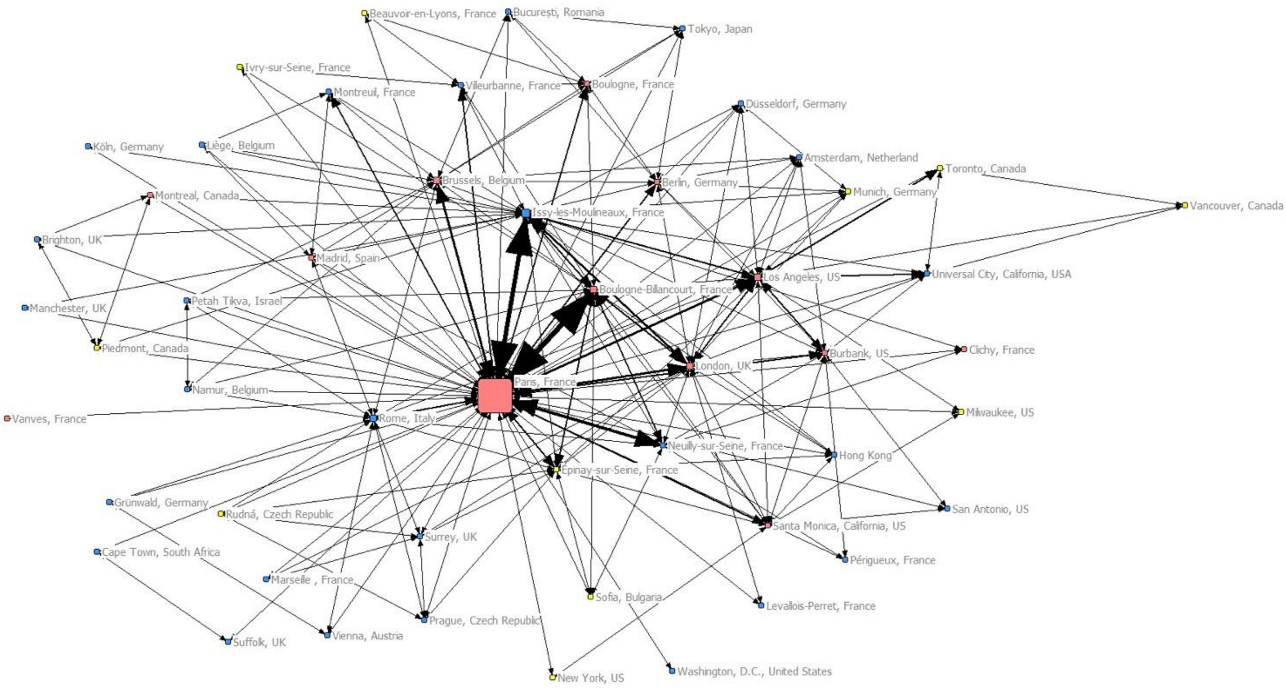


Figure 9. Urban networks of French film production and post production in 2005, network within 52 cities. Yellow means it is only post production location; blue means only production locations; red means both production and post production processes happen there.

In 2015, there are 49 unique cities involving in the co-production of French films, of which the number of European cities have increased greatly. As figure 10 shows, the number of French cities, North American cities, Asian cities, African city and middle east city keep a stable status, while European cities (except French one) see a soar, taking more cities in Northern Europe like Trollhättan (Sweden), Oslo (Norway), Göteborg (Sweden) and Frederiksberg (Denmark) into the network compared with 2005.

Cities based on geographical location	French city	European city (except French one)	North American city	Asian city	African city	middle east city	Total
2005	11	19	7	2	1	1	41
2015	12	25	7	3	1	1	49

Figure 10, comparison of unique cities in French film (co)productions in 2005 and 2015 (source: own calculation).

With these 49 cities in 2015, a symmetric matrix (49*49) is made to find the city network of them (see figure 11).

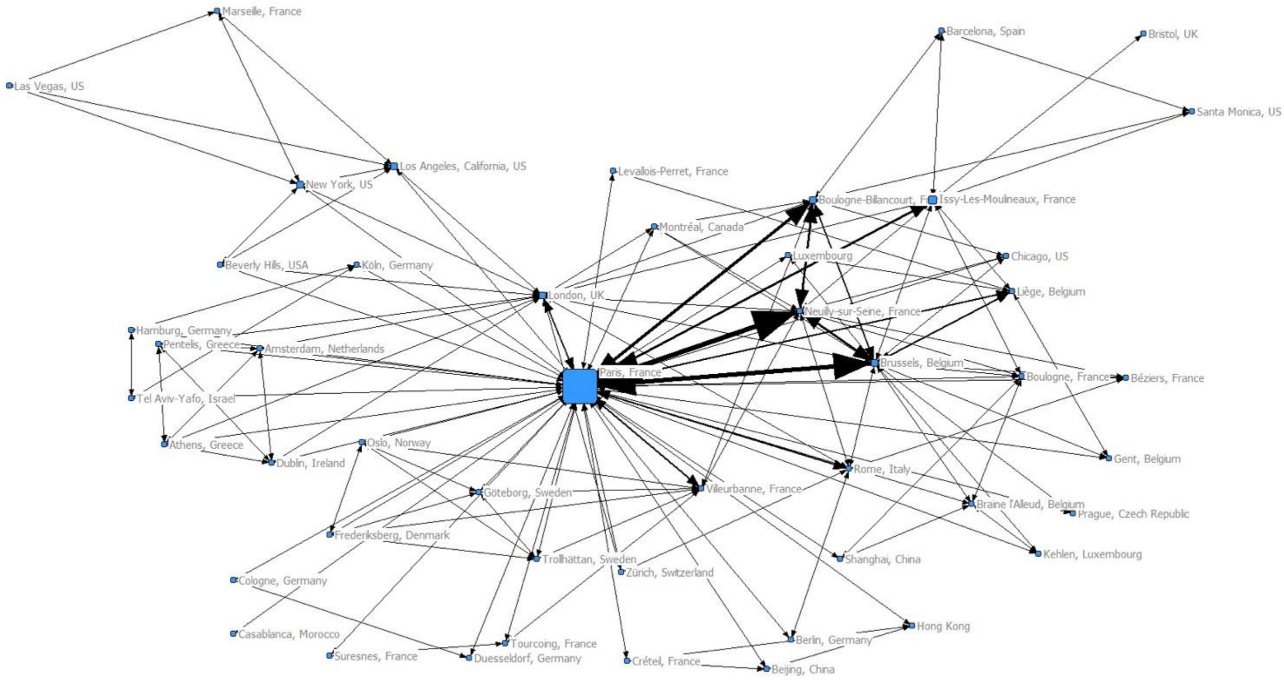


Figure 11. Urban networks of French film production in 2015, network within 49 cities (source: own visualisation).

Not surprisingly, Paris is still the most important node in this network. As shown in the figure 6, more than half of the French films in the market are coproduced with foreign partners in 2015, the urban network is seen more international than 2005. The frequent cooperation between Paris and Neuilly-Sur-Seine, Paris and Boulogne-Billancourt, Paris and London, Paris and Issy-les-Moulneaux are still very high. However, the position of Brussels has become more remarkable, making it the most important partner to Paris today. The Franco-Belgian co-production partnership is seen to be very active in recent years (Scoffier, 2014). The node of Beijing is not in the network of 2005, but pops up in the network of 2015, which is mainly due to the importance of Chinese market in recent years. China has been the 2nd largest market after USA by gross box office revenue, which makes it a very attracted place for global film producers. In order to gain the attention of the Chinese audience, inviting the Chinese producers to shoot in France and co-producing with Chinese producers are the strategies of France these years (Zhang, 2016. Own interview). Besides, co-production is a good way to avoid the exporting quota of China by co-production, which can grant the films with double or multiple nationalities.

The outcome of these 3 measures of centrality shows obvious changes compared with 2005, while Paris is still the gate-keeper and the mediator of the network. Brussels has taken the place of Issy-Les-Moulineux, being among top 5 with London in 3 measures. The top 5 cities of Degree and Eigenvector are Paris, Brussels, Neuilly-Sur-Seine, Boulogne-Billancourt and London, which means they have the largest number of connections and strongest ones. In flow betweeness, Liège (Belgium) has increased its rank up to top 4, being the second important foreign mediator for french co-productions after Brussels.

Rank	Degree	Flow betweenness	Eigenvector
1	Paris, France(135)	Paris, France(1220.90)	Paris, France(0.63)
2	Brussels, Belgium(55)	Brussels, Belgium(161.48)	Neuilly-Sur-Seine, France(0.47)
3	Neuilly-Sur-Seine, France(53)	Issy-Les-Moulineux, France(149.59)	Brussels, Belgium(0.43)
4	Boulogne-Billancourt, France(37)	Liège, Belgium(97.08)	Boulogne-Billancourt, France(0.33)
5	London, UK(23)	London, UK(96.25)	London, UK(0.12)

Figure 12, centrality measures, top 5 French production network in 2015 (source: own calculation from Ucinet).

When looking at the urban network including post production cities, 19 more cities are included in the network. Similar to the case in 2005, these 18 out 19 cities function as post production cities. Within these 18 cities, 6 of them are North American cities, 6 being French cities, 5 being European cities and 1 from Asia. It is interesting to find out that Mumbai (India) which has a big name in film industry because of Bollywood. It becomes part of the network because of providing post production service to French films. Another node La Garenne-Colombes (France) locating in northwestern suburbs of Paris is seen to have strong connection with Paris. The famous post production company Tri-Track Sync is located there, making it an important post production supplier node for Paris. In the urban networks of

French film production and post production in 2015, we can see the trend of big production cities outsourcing the post production process to small cities instead of limiting itself in the cluster, which provides a chance for peripheral cities to be present in the global network and de-center part of the functions of big cities in global film industry. As mentioned in last chapter, post production is increasingly expensive in big cities because of labor cost and unsustainable business model, which forces many companies move to small cities or cities with higher public subsidies.

Besides, we can see that Paris and the cities around forms a 2-level center-periphery model, which means Paris and the cities around like Issy-les-Moulneux, Boulgne-Bilancourt, Neuillly-Sur-Seine form the national center-periphery model, while Paris and the other surrounding foreign cities like Brussels, Rome, London form the transnational center-periphery model. This fact accords with the argument of Coe at all (2000a, 2000b) when they analyzed the urban network in North America. Production companies from Toronto, Vancouver and Sydney serves as alternative clusters or satellites production locations for film productions in Hollywood. Similarly, Paris as a central node, the periphery cities like Issy-les-Moulneux, Boulgne-Bilancourt, Neuillly-Sur-Seine nationally and Brussels, Rome, London internationally function as alternative clusters or satellites production locations for French films in the network.

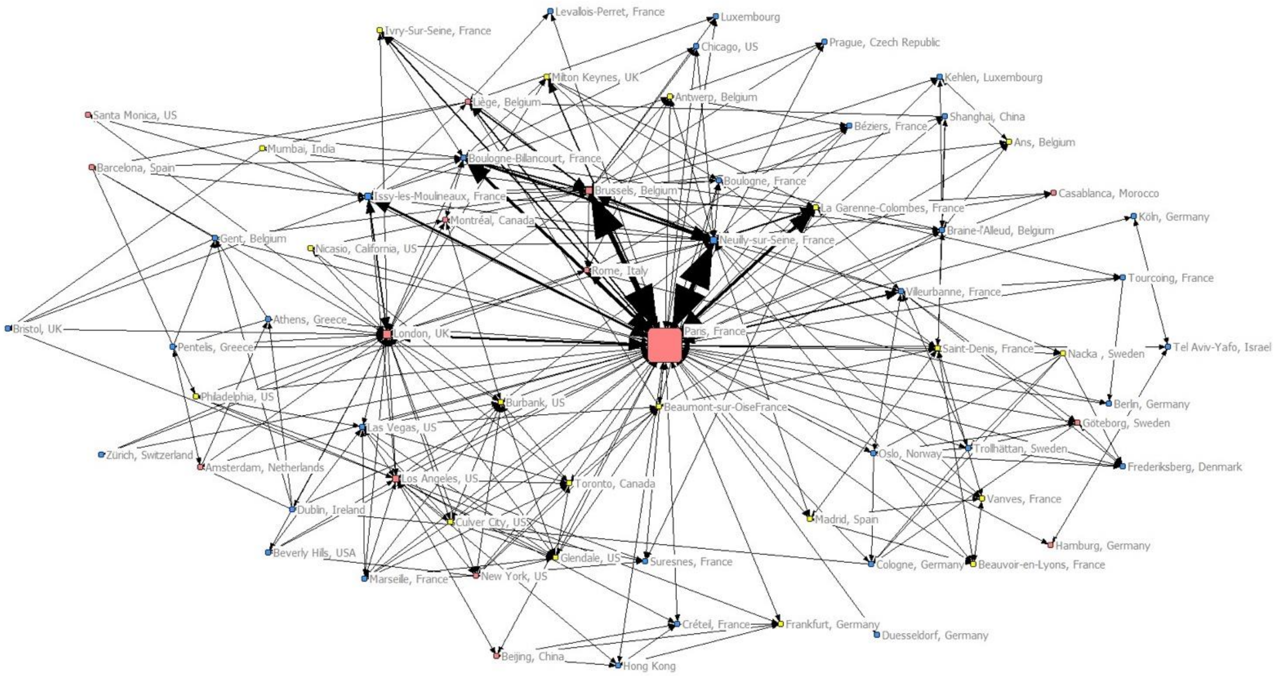
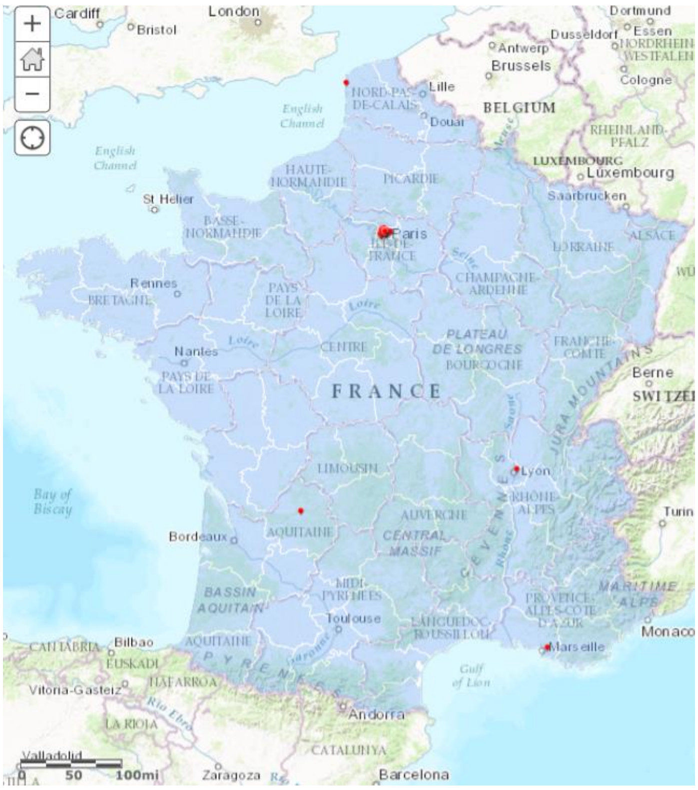


Figure 13. Urban networks of French film production and post production in 2015, network within 68 cities. Yellow means it is only post production location; blue means only production locations; red means both production and post production processes happen there.

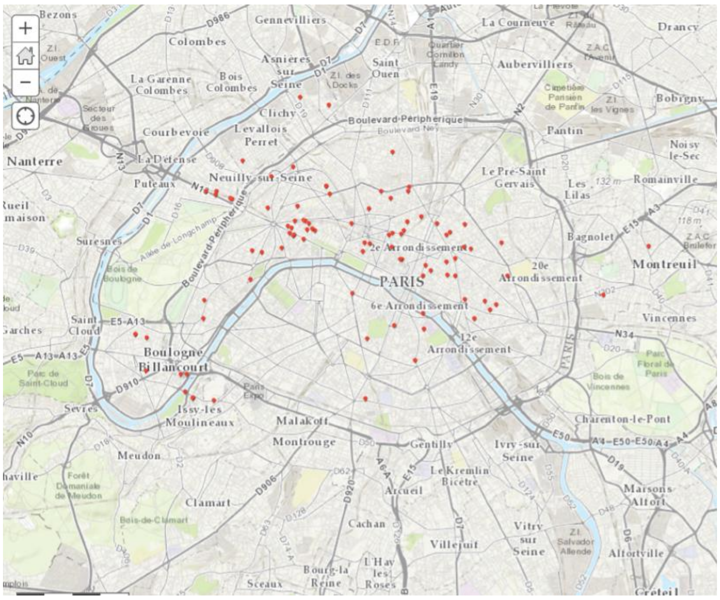
3.2 Geographical distribution of film production companies in France 2005 and 2015, taking Paris as focus

Paris is an important node in the urban network formed by the French films, where largest share of money flows to. It is necessary to have a closer look at the geographical distribution of film production companies in France, especially in Paris.

In 2005, there are in total 202 unique companies involving in producing these 86 films, while 30 of them lack of geographical information, 73 being foreign companies. So there are 99 film production companies locate in France. From the map below, we can see that the geographical distribution of the French film industry shows a high degree of agglomeration. Most of the companies concentrate in Île-de-France region with only 4 exceptional - one in Lyon, one in Marseille, one in Périgueux and one in Boulogne-sur-Mer.



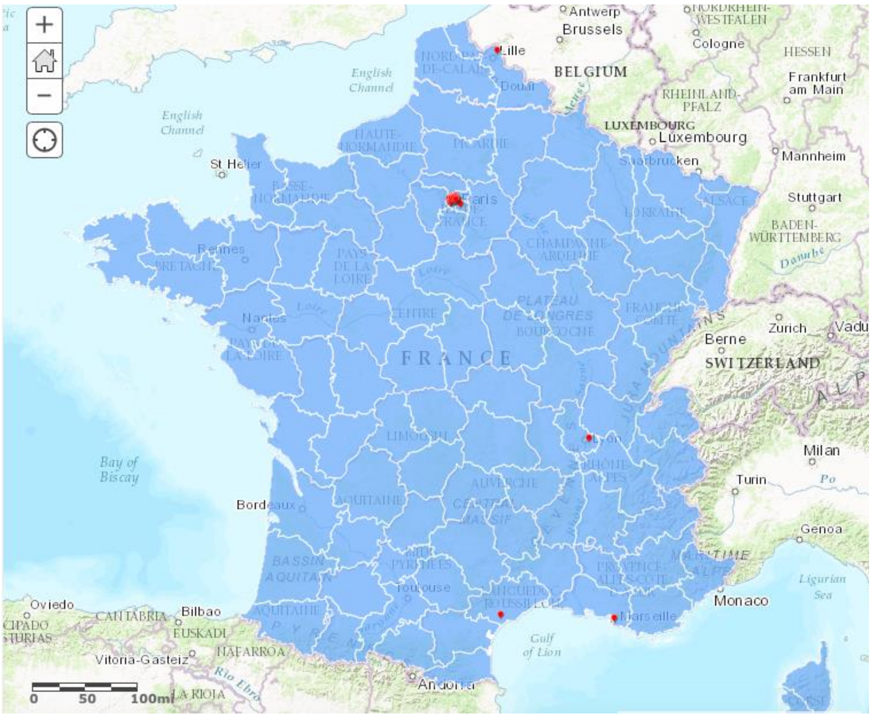
Map 2, production company geographical distribution in France 2005 (source: own visualization).



Map 3, production company geographical distribution in Great Paris 2005 (source: own visualization).

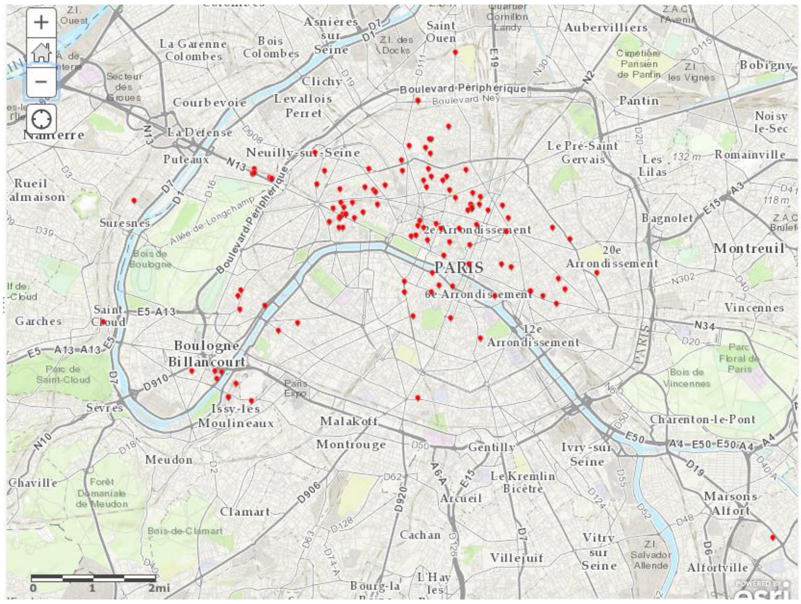
Île-de-France region, which is also called the capital region, gathers 95 production companies here, with the most profound resources and information of French film industry. Most of the film companies gather within Paris city. Among the rest, 2 are in Clichy, 1 in Levallois-Perret, 5 in Neuilly-sur-Seine, 5 in Boulogne-Billancourt, 3 in Issy-les-Moulineaux and 2 in Moutreuil. These cities are satellites cities surrounding Paris. Besides, there is a very clear division along 2 sides of Seine River. There are 10 companies in the south of Seine River (left bank), while 85 locating in the north of the river and north-west of the region (right bank).

After 10 years, in 2015, the general pattern of the production companies' distribution does not change many, although the disappearance of some old companies, the emergence of new companies and the alteration of the address do happen. In 2015, there are in total 231 unique companies involving in producing these 89 films, while 29 of them lack geographical information, and 79 being foreign companies. This means 123 film production companies are identified to be located in France. Compared with 2005, still only 4 out of 123 companies are located outside Île-de-France region, while only Rhône-Alpes Cinéma locating in Villeurbanne (a municipality in Metropolis of Lyon) remains the same after 10 years.



Map 4, production company geographical distribution in France 2015 (source: own visualization).

Within Île-de-France region, we can see the density of production companies have increased. Although the number of the companies locate in the left bank (south of the region) increases from 10 to 15, there is no sign of decentralizing from the center of Paris city. The reason why so many film production companies cluster in the right bank of the river for these 10 years can be traced back to the economic and historical situation of two banks. Right bank of the river is famous as financial center with wealthier residents, while left bank catering more artistic activities with cheaper rent. Going from La Defense to Arc de Triomphe, moving ahead to Av. des Champs-Élysées, are the places where many offices are located in Paris. Since film industry is a capital intensive business, it is not surprising that most of the production companies prefer to be located there. France's National Center of Cinematography and the Moving Image (CNC) which is an official institution supporting and promoting film, broadcast, video, multimedia and technical industries, under Ministry of Culture (CNC, 2011) is also located in the right bank.



Map 5, production company geographical distribution in France 2015 (source: own visualization).

3.3 Financial incentive, institutional cooperation and cultural proximity - elements in shaping urban network in French film industry

Production companies come together to co-produce film for many reasons, mainly five - for creative reasons, for institutional cooperation, for cultural proximity, for extending the market and for financial incentive (Morawetz et al, 2007). Since film productions are highly capital driven, so financial incentive is the biggest motivation. In the following sessions, financial incentive, institution element and cultural proximity will be explained, where financial incentive will be the main focus. Only when we understand what drives the co-productions, we can make it clear what shapes the urban network in film industry.

3.3.1 Financial incentive in France

With the characters of high risk and capital intensive, it is very vital for film industry to get enough funding and investment. In general, there are 2 ways for production companies to get funding. The 1st one is public funding and investment from government, which are mainly provided for boosting local economic and promotion of local culture. The 2nd one is international capital, including bank loan, private investment and slate financing aiming for profit (Morawetz et al, 2007). These ways don't exclude each other, and can be a good combination in practice. Unlike North American's producing model, which mostly financed by the 2nd type for the dependency of the market, European films are more likely to reply on the 1st type (Pardo, 2007: 42). The equity-funding market for film industry does exist in Europe, but it is still not as strong as the public fund, for European films are usually not considered to have as good return as American films by the equity fund. "In Europe, film production is like being in a zoo – you are kept in a cage but you have a roof over your head and someone feeds you every day; in the US, it is the jungle – you are free to go where you like but everyone is trying to kill you." said by Film Director M. Forman (Bron & Matzneller, 2011: 7). This vividly describes the importance of the film fund in Europe. Since the Second World War, film fund has been popular in Europe on the ground of culture and industry protectionism from the "invasion" of US films (Morawetz et al, 2007). Funding provided by state or region is that those co-production films can receive public funding or tax incentive in both or all the producing countries, without the worry of overlapping. So nowadays, in order to get more funding, it is very common approach for the production company to invite a local company to coproduce a film especially when the film is shot outside the home country.

Film funding scheme in Europe includes 3 layers. The 1st one is the European Union funding scheme, 2nd one being the national funding scheme, and the 3rd one being the regional funding. Within Europe, several organizations covering either all the states in European Union or states that share the same region/language. They play important role in building bridges between different countries. 5 most important ones are listed as follows:

- Eurimages (European Cinema Support Fund) operates under the Council of Europe, was set up in 1989 to encourage co-operation within Europe with members of 47 countries. It provides soft loan which should be paid back by the profit of the film (Council of Europe, 2014).

- The Nordisk Film and TV Fund was established in 1990. It is a supra-national fund set up by the inter-governmental agreement within five Nordic countries (Denmark, Finland, Iceland, Norway and Sweden). It provides support for top-up financing of feature films, TV-fiction, drama-series and documentaries. It is also secretariat of Nordic Council Film Prize with the tasks of arranging and hosting the annual event Nordic Talents held in Copenhagen each autumn (Nordisk Film & TV Fund, 2015).

- International Organization of the Francophonie operates the Image Fund within the French speaking countries, including members of France and Belgium (International Organization of the Francophonie, 2013).
- Ibermedia is a venture encourage co-production of films and documentaries made in Spanish and Portuguese- speaking community made up of nineteen countries include Spain, Portugal in Europe and some Latin American countries (Ibermedia Program, 2013).

France has a very comprehensive financial incentive to films to attract the international films having physical contact with France and co-production with local production companies, in total 24 funding bodies supranationally, nationally, regionally and locally. These funds cover developing, promoting, shooting, production, distributing and post producing in terms of all relevant levels of the value chain.

Within these fund schemes, special film funds focusing on selected countries are also important schemes in enhancing the co-production in specific countries, like Germany-France film fund installed by German Federal Film Fund (FFA) and France's National Center of Cinematography and the moving image (CNC) (Martin, 2015). This kind of funds can be traced back to 1980s when the stance of the Ministry of Culture was bound up with French foreign policy (Jäckel, 2007). François Mitterrand was the president at that time. He encouraged dialogue between "the prosperous North" and "the underprivileged South". He also tried to boost the cooperation between the west and the east (Looseley 1997: 77). This stand in foreign policy encouraged aids like the Fonds Sud and the Fonds ECO (Fonds d'aide aux coproductions avec les pays d'Europe Centrale et Orientale) to provide to support the co-production between France and countries in the south and east.

Besides the direct funds from state and regions, indirect funds include Investment obligations, Loan guarantees and tax-based incentives (Bermek, 2007). The sources of the funding system include the TV investments, direct allocation from Cultural Ministry and

Soficas[1], among which, the most famous from French TV channels. Free-to-air nets, TF1 and M6 are obligated to invest a fixed share of their annual revenues to French (co)production films. Free-to-air channels have invested 189.3 million dollars, while Canal Plus invested $240 million dollars in 2011 (Keslassy, 2012). The total percentage of TV channels account for 35.5% of the total investment to French films in 2015 (see figure 14).

Since middle of 1990s, it is believed that the direct funds will trap the European films into the "soft budget constraints" (Morawetz et al, 2007: 14), because films are trying to meet the requirement of the funds instead of audience. So supporting institutions started to extend their requirement to commercial success by the way of Investment and low interest Loan.

Besides, tax-based incentive is a very important approach to support the co-production in France, which is more advanced compared with Denmark, who does not have tax incentive in film industry. Tax credit which was introduced to French film in 2004 is a very common support in French cultural framework. It is reduced from the corporation tax from the production companies (Bermek, 2007). Besides, the investors can also get reduction of their tax burden if they invest into films, which gathers a big pool of money not only from France, but also from Germany, the UK, and the US ((Morawetz et al, 2007).

TV (pay and free-to-air) investments (equity and prebuys)	Selective subsidies (CNC and the regional governments	Automatic subsidies (CNC)	Distributors MG[2] (Theater, Video, Internet. Sales)	Investments of French producers	Investments of foreign producer	Soficas
35.5%	5.6%	2.5%	13.7%	30.4%	9.8%	3.4%

[1] Soficas means Les Sociétés de financement de l'industrie cinématographique et de l'audiovisuel. They are investment companies to collect private funds devoted exclusively to financing film production and audiovisual (CNC, 2016)

[2] Distributor MG means the minimum guarantee from distributors. It a certain percentage of money paid from distributor to producer before the release of the film in order to assure the minimum revenue for producer. In return, distributor can share certain percentage of profit after the film is released.

Figure 14, how films are financed in the global amount of money gathered for 234 majority French productions in 2015 (1 single film can get multiple sources of financing, so the added up value here is not 100%). Source: CNC, 2016.

The Centre National de la Cinématographie (National Center of Cinematography and the moving image, CNC) is the primary institution which is in charge of the financial incentive schemes in France. It was set up by Ministry of Culture and Communication in 1946 (Jäckel, 2007). Basically, it is like a window the films have to face with when applying all kinds of financing. Besides the national fund that goes through CNC, regional or local funds, set up by local and regional authorities emerged since 1990s. Since 2003, new measures were taken to increase funding delivered by the regions. One euro of state funding is added to every two euro awarded by the regions, up to maximum 1 million euro per region (Lange & Westcott, 2004). These funds financed by CNC and local or regional governments help to decentralize the fund from CNC and promote the regional and local film production. île-de-France and Rhône-Alpes Cinéma are among the ones with the largest regional funding in France.

As to the criteria in direct and indirect interventions, they have different criteria in terms of whether the film is restricted by the co-production agreements or not, while most of them apply to 3 criteria of langue, nationality and location. Except some additional requirements are affixed to some specific funds. Included, general criterial as follows (Bermek, 2007):

- Language: most of the films receiving French fund or tax incentive should be in French or the regional languages of France, except for the international co-productions, which are dual languages.
- Nationality: For most of the criteria, at least one French production company should get involved in the co-productions in order to get the funding support of co-production.
- Location: Regardless of the nationality, those films which want to enjoy the tax based incentive should have some physical economic activities or some expenditure spent within the territory of France or the specific regions. The expenditures spending in France should be 50% of the total budget or at least 1 million euro.

When comparing these criteria, they are actually quite similar to those of Denmark's (will illustrated below), as well as the other countries'. In France, the combination of different public subsidies, including the tax based incentive and funding can be as high as 50% of the French spending. For some difficult films (1st or 2nd film of the director) or low-budget ones (less than 1 million euro), it can be even as high as 60% (Bermek, 2007). In this way, the international co-production is obviously welcomed and encouraged, while enhancing the city networks of French-foreign cities.

In recent years, France is faced with the competition from the other European countries. In 2014, a Chinese film S*omewhere Only We Know* directed by famous director Jinglei Xu was shot in Prague, which was initially planned to be shot in Paris. "The production company contacted us and wanted to film in Paris, but in the end they changed their mind and went to Prague. Prague is much cheaper than Paris, and Czech Republic gives big support to international film cooperation these years" Yan Zhang, International Project Manager of Film France (The French Film Commission supported by CNC) said (Own interview). So in order to make itself more attracted, France released the condition of getting tax rebate from spending more than 1 million euro in France to "spending more than 1 million euro or spending half of the budget in France" in 2005, attracting the small budget films to France as well. In 2016, it has increased the tax rebate from 20% to 30%, making it more competitive in Europe (CNC, 2016).

3.3.2 Institutional cooperation

To enhance the political relationship and to create social and political resonance, sometimes 2 countries will tend to cooperate in many culture and economic activities, including film co-productions. As it is mentioned, the 1st governmental co-production agreement were between Italy and France in 1949 after the Second World War, which starts the consistency of co-production agreements between different countries in the world. The co-production agreements are backed by the government, sometimes as part of the deals of foreign diplomatic policies. This kind of agreements work really well in fostering city networks in film production. Today Denmark has co-production agreements with more than 4 countries, including New Zealand, Australia, Canada, France and so on. France has the largest number of bilateral co-production agreements in Europe, with 56 countries. It includes Belgium's French community, Germany, UK and so on. Germany has 18 co-production agreements, and Spain having 17, UK having 13 (CNC, 2016). All the co-productions between production companies are supervised by these international co-production agreements, which are supervised by European Cinematographic Co-Production Convention under European Council (Scoffier, 2014). All the countries which have signed bilateral co-production agreement have created State support systems for their own film industries as well (CNC, 2016). Although every agreement is very individual, in general, they grant the co-productions with dual citizenship, and enjoys all the local supporting policies in both countries.

When looking at the biggest international partners of French cities in producing films, they are Brussels, London and Berlin. Besides the fact that all of them are seen as having complete and supportive film funding scheme in their own countries, their co-production agreements with France reveal the institutional support as well, because it contains different terms in different agreements. In all the agreements, there are fixed proportion contributed by France and other countries, which differ from 10% to 30% of minimum and 70% to 90% of maximum. For agreements between France and Belgium, Germany, Lebanon, Luxembourg and Switzerland, the tolerance of the proportion is the largest, with a minimum of 10% and a maximum of 90%. This means in the co-productions, if France is the minority producer, as long as France's contribution reaches 10%, the co-production film can enjoy the citizenship rights and benefit both in France and contracted countries. Lebanon is the previous colony of France, which enjoys special support from France while Belgium, Germany, Luxembourg and Switzerland are very close in partners in diplomacy, culture and economic, especially Belgium, Luxembourg and Switzerland being Francophone countries in Europe (Zhang, 2016. Own interview).

3.3.3 Geographical proximity and cultural similarity

As it has been pointed out that French films have close links with Belgian and British production companies, it is obvious that geographical proximity and cultural similarity have great impact on the decision of co-production. For Brussels, as French speaking and Dutch speaking country, it is much easier to communicate with France especially in region of Wallonia regions. Since Belgium does not have a federal support system, both French-speaking and Flemish Communities have their own separate film funds (Lange & Westcott, 2004), it is very vital for its domestic films to go out in order to get more funds, when most of the time the French speaking partners in France can be a good option. Although Luxembourg City being very small, being another French speaking country, and geographically close to France, it has seen obvious direct connection with Paris as well.

CHAPTER 4

Denmark shows the diverse side from France. Being the most important film production location and film market in Nordic countries, it has very long film producing history as France. Denmark represents countries whose film productions are in small scale, dominating Nordic market together with Sweden after the US market share (Bondebjerg & Redvall, 2011). With only 5 million populations, Denmark has a rather small scale in both production and film market. However, due to the long history and high quality of the films, Denmark has a global reputation in film making, especially in artistic value.

4.1 Urban networks of film production in Danish films in 2005 and 2015

In 2005, there are 48 films involved in Denmark's production out of 233 top films in Danish market, while 125 (co)produced in North America. In 2015, there are 40 films involved in Denmark's production out 256 top films in Danish market, and 143 (co)produced in North America. There is an obvious Hollywood films dominance while Danish films are about 20% of the domestic market in both years.

Within the films involving Danish production (at least one Danish production company participated), 65% of them are (trans)national productions in 2005, 65% in 2015, staying as a stable status (see table 2). Of 48 films involved in Danish production in 2005, 17(35%) were national single-city film productions, mainly Copenhagen (8) where a lot of media and small films companies are located, and Valby (5) where the biggest film company in Nordisk Film is based. Of 40 films participated in Danish production in 2015, there are 14 (35%) single-city film productions, of which, still mainly produced in Copenhagen (7) and Valby (3). To analyze the social network formed by the (trans)national multi-city film productions, the relationship of the cities is shown below.

	Transnational multi-city film productions (share of Danish produced/co-produced films)	National multi-city film productions (share of Danish produced/co-produced films)	National single-city film productions (share of Danish produced/co-produced films)	Total Danish produced/co-produced films (share of all top 233 and 256 films)
Denmark 2005	21 (44%)	10 (21%)	17 (35%)	48 (20.6%)
Denmark 2015	18 (45%)	8 (20%)	14（35%）	40（15.6%）

Figure 15. Films with produced or coproduced in the top 200 in 2005 and 2015 Denmark (sources: Statistic Denmark; own conclusion).

Regarding to urban network produced by (trans)national co-productions, in 2005, 31 unique cites participated in Danish film co-productions including 8 Danish cities, 7 Nordic country cities (except Denmark), 16 other European country cities (except Nordic countries). It shows a distinct presence of Nordic countries with half of the films being produced within Denmark, Norway, Sweden and Iceland, while there are no non-European cities showing up. With these 31 cities, a symmetric matrix (31*31) is made to find the city network of them (see figure 16).

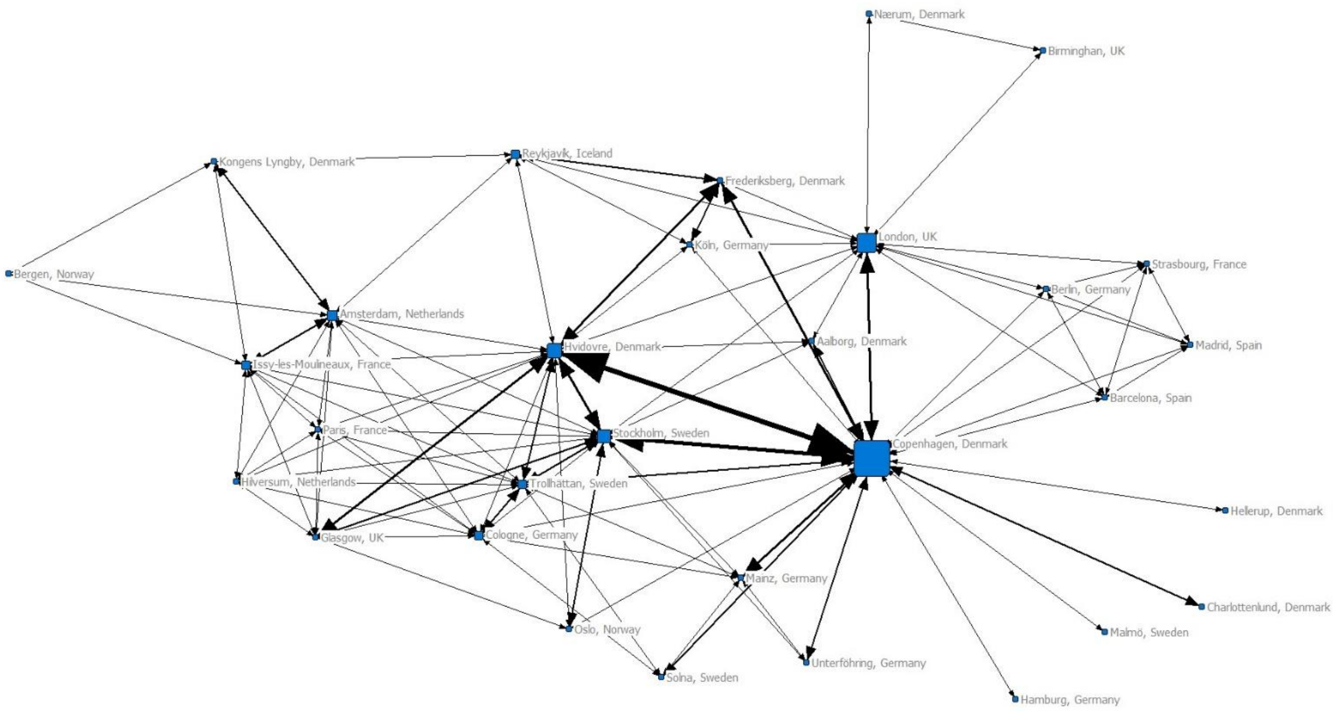


Figure 16. Urban networks of Danish film production in 2005, within 31 cities.

As figure 16 illustrates, Copenhagen is the most important city positioning in the center of the network, which is similar to the case of France. In the international level, 2005 Danish film production mostly involved the cities in north Europe, and a few couple of Geman cities: Cologne, Köln, Mainz, Berlin and Hamburg, while only limited connections shown in other cities like Issy-les-Moulineaux (France), Amsterdam (Netherland), Hilversum (Netherlands), Madrid (Spain), Strausbourg (France) and Paris (France). Nationally, Danish production is wide spread in the whole country within 8 cities, which shows a high degree of dispersion, while Hvidovre and Copenhagen locating in the middle with bigger centrality. Hvidovre - Copenhagen – Stockholm, and Copenhagen – Frederiksberg - Hvidovre form 2 triads that have the most frequent cooperation with each other. Internationally, the connection between Denmark and Sweden is very prominent, especially the frequent cooperation between Hvidovre (Denmark), Copenhagen (Denmark) and Stockholm (Sweden). This indicates that Danish film production is highly limited within Northern Europen in 2005.

The result of the centrality measures shows that Copenhagen has the highest scores in Degree, Flow betweenness and Eigenvector, just as the network describes. Among all the top 5 cities, almost all of them are North European cities, except Amsterdam in West Europe. Copenhagen, Hvidovre and Stockholm are in the top 5 of these 3 measures, and top 3 in Degree and Eigenvector, which means they have the largest number and most influential partners, making them a stable triad. The high centrality of Hvidovre and Copenhagen is due to the big film production companies Zentropa Entertainments and Filmbyen (Film City) located in Hvidovre, while Copenhagen houses many small and medium film production companies that needs (trans)national cooperation to finish the film production. London, Stockholm and Amsterdam function as the foreign “gate-keeper” for Danish film co-productions. Although Trollhättan (Sweden) ranks as the last one in Degree and Eigenvector, it reveals its high potential to develop itself with the help of its domestic partner, Stockholm.

Rank	Degree	Flow betweenness	Eigenvector
1	Copenhagen, Denmark (46)	Copenhagen, Denmark (337.95)	Copenhagen, Denmark (0.652)
2	Hvidovre, Denmark(31)	London, UK (160.44)	Hvidovre, Denmark (0.450)
3	Stockholm, Sweden(26)	Stockholm, Sweden (49.67)	Stockholm, Sweden (0.380)
4	London, UK(16)	Amsterdam, Netherlands (48.13)	London, UK(0.191)
5	Trollhättan, Sweden (15)	Hvidovre, Denmark (41.03)	Trollhättan, Sweden (0.18)

Figure 17, centrality measures, top 5 Danish production network in 2005 (source: own calculation from Ucinet).

When the post production locations are taken into consideration, 6 more cities are added to the network: Göteberg (Sweden), Kastrup (Denmark), Budapest (Hungary), Bielefeld (Germany), Los Angeles (US), Surrey (UK). They all function as post production cities. It is the 1st time in this network that city from Eastern Europe is networked. The triad of Hvidovre, Stockholm and Copenhagen is strengthened by the fact that they are the place hosting production and post production. London has a big reputation of high quality post production in Europe, which is also shown in the network that London's flow betweenness is bigger than before, and the frequency of cooperation is higher as the strength of the line shows. As to Kongens Lyngby, which is a small city in Denmark, it becomes more prominent in the network than before, because one of the biggest Danish post production studio Det Danske Filmstudie are located there. For the other cities which are identified with only production locations (blue in figure 18), it is because the Danish films are mostly small and medium scale, which typically has lower budget compared to French films. It is thus unrealistic to have too complicated post productions in the films, and those that are made are often internalized in the production companies.

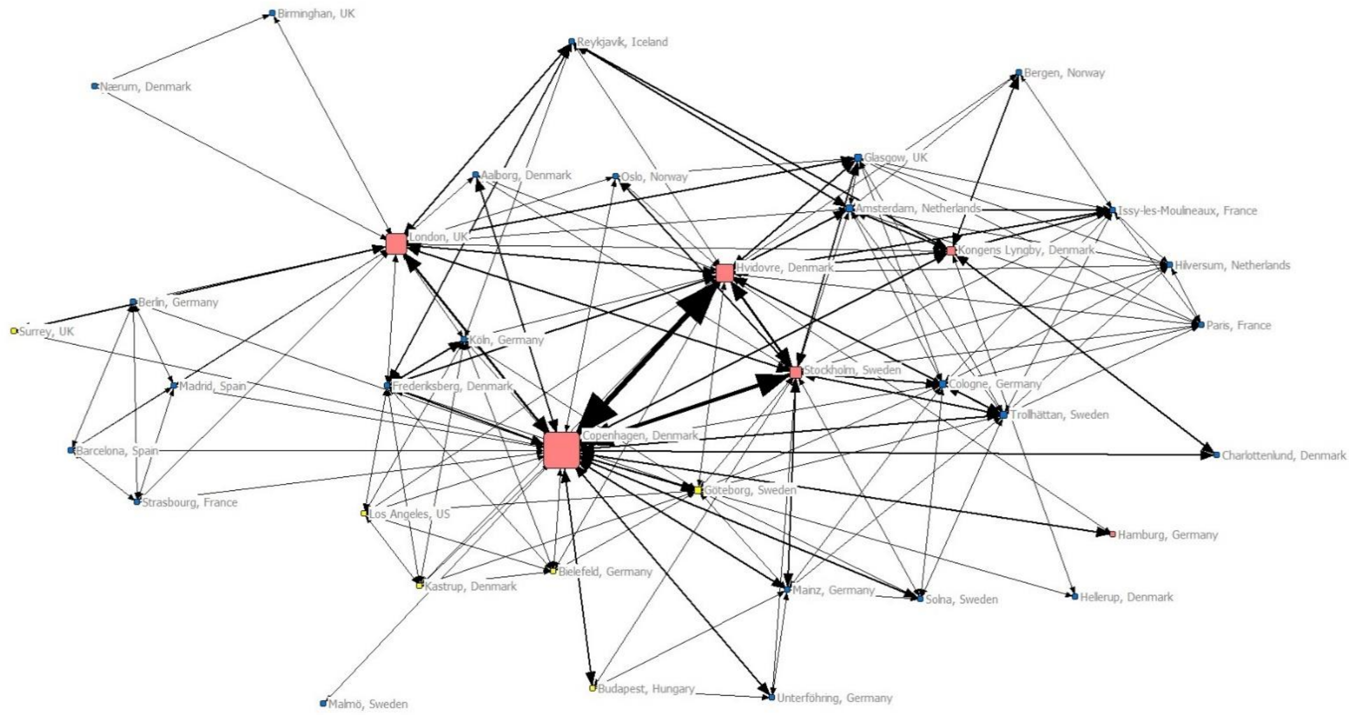


Figure 18. Urban networks of Danish film production and post production in 2005, network within 37 cities. Yellow means it is only post production location; blue means only production locations; red means both production and post production processes happen there.

In 2015, after 10 years, the production network seems to be more international when looking at the diversity of which cities are involved. Denmark made great progress in the diversity of the co-productions. 10 years ago, the film coproduction was limited mostly within North Europe and some cities in Germany. Now the international film production has been seen the trend of enlarging to the other part of Europe like Vienna (Austria), Riga (Latvia), Łódź (Poland) and Prague (Czech Republic), and even to other part of the world like Saint-Anice (Canada), Accra Metropolis (Ghana), Rio de Janeiro (Brazil), Mexico City (Mexico). Aarhus as the second biggest city in Denmark does not show up in the production network in 2005, but now starting to have a position strongly connected to Copenhagen due to the setup of Filmby (fim city) and Den Vestdanske Filmpulje (the West Film Fund) in Aarhus. The constant prominence of Trollhättan (Sweden) is contributed by the regional film fund Film i Väst since 1992, which will be elaborated in detail later. The Copenhagen-Stockholm-Hvidovre triad has broken partly due to the decline of Zentropa Entertainments since 2008.

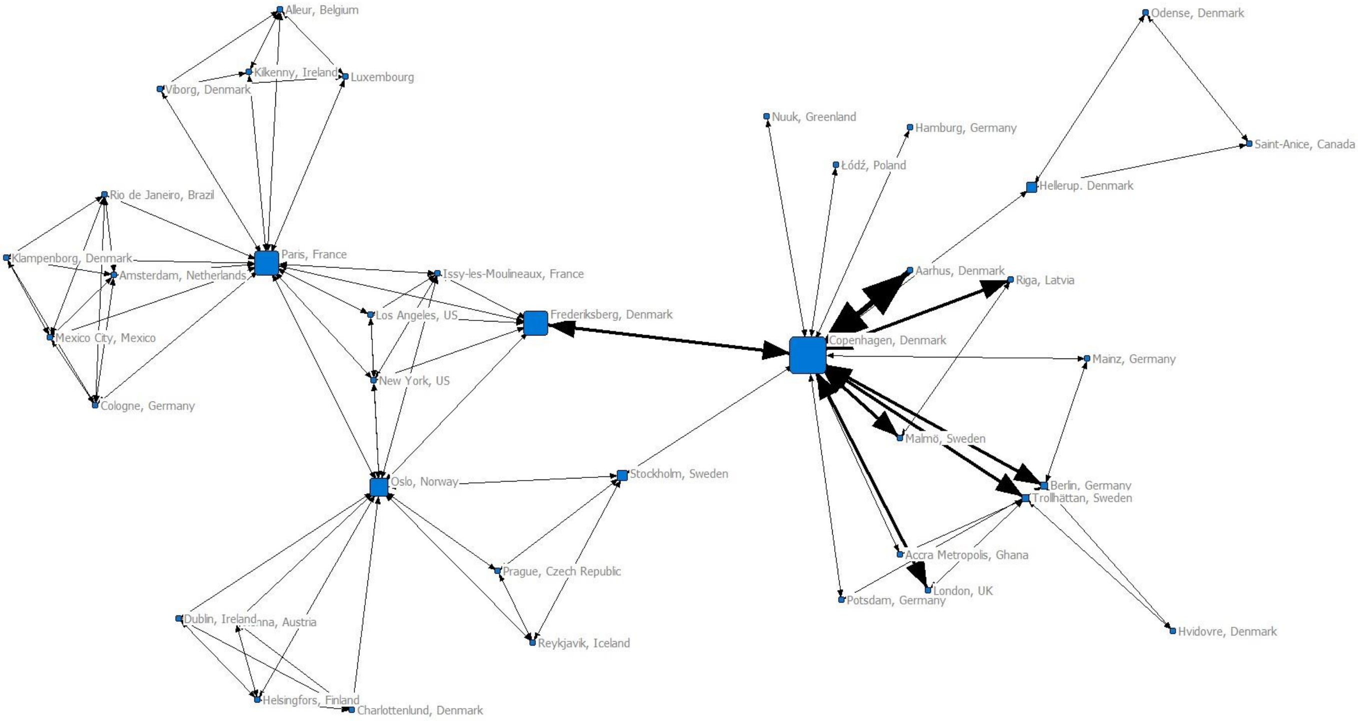


Figure 19, urban networks of Danish film production in 2015, network within 39 cities.

Rank	Degree	Flow betweenness	Eigenvector centrality
1	Copenhagen, Denmark (23)	Copenhagen, Denmark (927.43)	Copenhagen, Denmark (0.778)
2	Paris, France (14)	Paris, France (572.93)	Aarhus, Denmark (0.258)
3	Oslo, Norway (12)	Oslo, Norway (452.67)	Trollhättan, Sweden (0.21)
4	Frederiksberg, Denmark (7)	Frederiksberg, Denmark (301)	Berlin, Germany (0.201)
5	Berlin, Germany (5)	Hellerup, Denmark (145)	Frederiksberg, Denmark (0.2)

Figure 20, centrality measures, top 5 Danish production network in 2015 (source: own calculation from Ucinet).

When it comes to the analysis of the centrality measures, as in 2005, Copenhagen occupies the No. 1 in three measures, having the largest number of connections and being the most important node in passing information. The top 5 cities in 3 measures have changed a lot compared with those in 2005. Unexpectedly, London disappears from the top 5 of the measures, while it ranks top 5 in 2005. Instead, the position of Paris has increased, so as to Oslo. Paris pops up very close with Danish cities, providing more chances for Danish film production to be more internationalized. Copenhagen and Frederiksberg are always in the top 5 of 3 measures, being the most important nodes in Danish film industry. Frederiksberg is a municipality in Copenhagen capital region, being considered as a place for middle and upper class to live. Many institutions and companies are also located here in favor of the nice environment there. The important production company Nimbus Film Productions are based there and contributes a lot in the international co-productions quite often. Oslo as the second most influential foreign partner after Paris replaces the position of Stockholm, increasingly participating in Danish film productions, while Trollhättan (Sweden) still keeps a very strong and direct connection with Copenhagen.

In early 1990s, almost all the film production of Sweden was concentrated in the capital city Stockholm. And Trollhättan used to be industrial city producing automobile. After the removal and decline of the conventional industry, the regional initiative of making Trollhättan a creative and intelligent place was planned and implemented (Karlsson & Stough, 2005: 459). In 1992, Swedish regional film fund and production company Film i Väst was set up in Trollhättan as a strong backing supporting film industry of Trollhättan. In recent years, the previous industrial complex in the surrounding area of Film i Väst has been renovated into facilities that include shooting studios and post production studios. Since its inception, more than 500 feature films have been produced there, so the locals have given it the nicknamed “Trollywood” (Film i Väst, 2016).

When taking the post production location into networking, 3 more cities – Prague (Czech Republic), Lillehammer (Norway), Göteborg (Sweden) are involved, and function as post production cities. Besides, Oslo, Los Angeles, Copenhagen, London, Hvidovre and Mexico City are revealed to function as both production and post production cities, which are traced back to have the same cities to finish the post production process when producing the same films. For example, *Testament of Youth* is coproduced by Denmark and UK with the production companies locate in Copenhagen and London, and the post production companies Framestore and Munky are based in London as well. This is one of the cases that both production and post production processes are clustering in the same location. Another film *Iqbal & Den Hemmelige Opskrift* (2015) is a Danish film produced in Copenhagen, but part of the post production is outsourced to Prague (Czech Republic), where the cost is cheaper. This is also linked to the change of supporting scheme of Czech Republic. The independent film fund which covers not only production, but also post production, distribution and exhibition was set up in 2013 in Czech Republic, attracting more foreign countries like Denmark to cooperate with the local companies. As it has been illustrated in the French film industry part, outsourcing the post production process to countries with cheaper labor cost will be a trend in the future, since the images and sounds of the films can easily be transmitted after the shooting process is done.

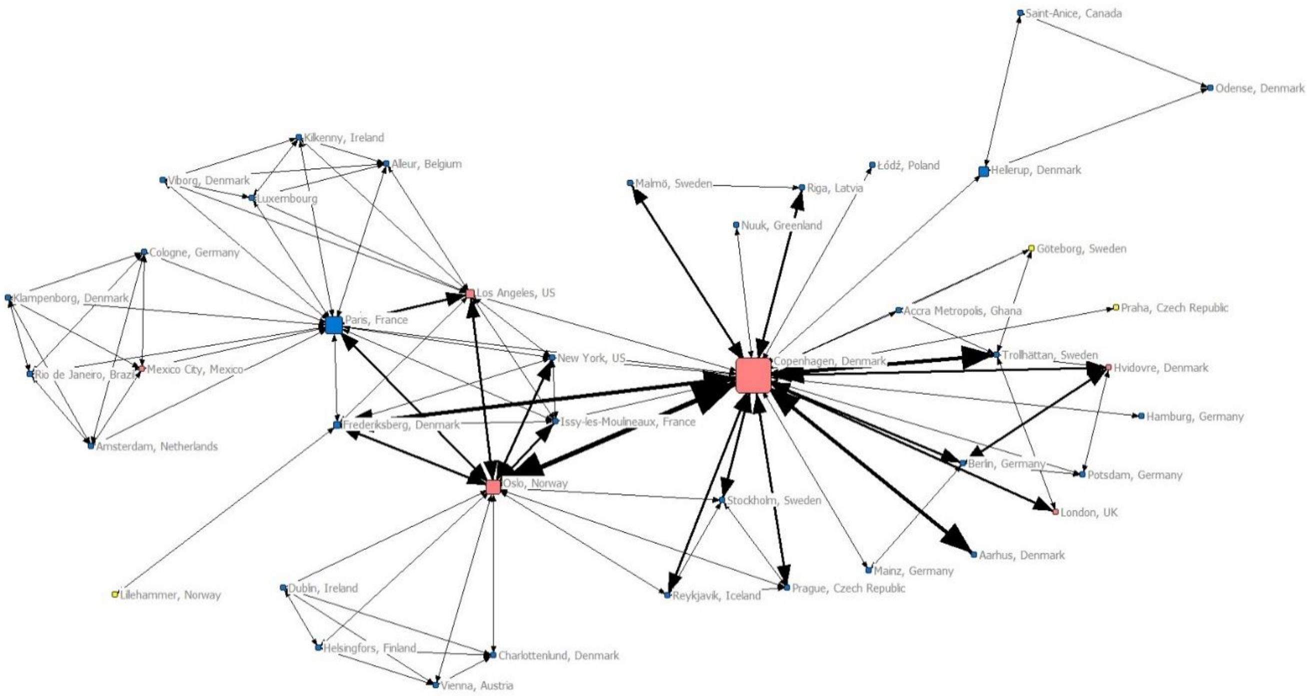


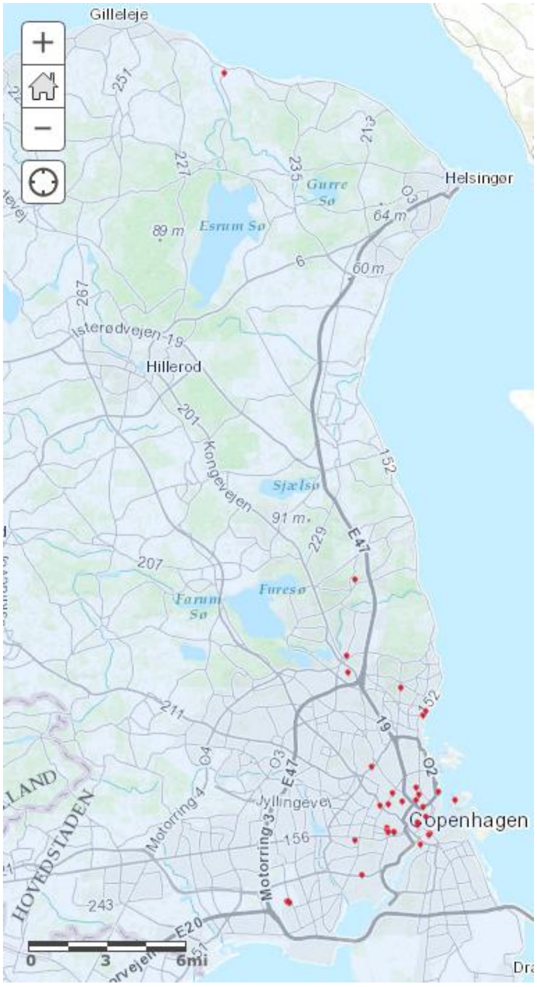
Figure21, urban networks of Danish film production and post production in 2015, network within 41 cities. Yellow means it is only post production location; blue means only production locations; red means both production and post production processes happen there.

4.2 Geographical distribution of film production companies in Denmark 2005 and 2015, taking Copenhagen as focus

Since Denmark has a long history of integrating cultural and creative resources to urban economic growth (Bayliss, 2007: 889), it is important to understand how the film industry is distributed geographically in Denmark, taking Copenhagen as focus in this paper. Within 48 films involved Danish production companies in 2005, there are in total 93 unique production companies participating in co-producing these films, which means some companies participate in production repeatedly, while 9 of them lack detailed geographical information, and 49 of them are foreign production companies. So in the end there are 35 unique Danish production companies. Their geographical distribution is shown below in order to understand the concentration and dispersion of the film industry in Denmark in 2005. The fact that Copenhagen is the capital and the cultural hub of Denmark, it is to no surprise to see that almost all of the production companies are gathered in the Region Hovedstaden (capital region), while only 1 company is identified to situate in Aalborg.

Map 6, production company geographical distribution in Denmark 2005 (source: own visualization).

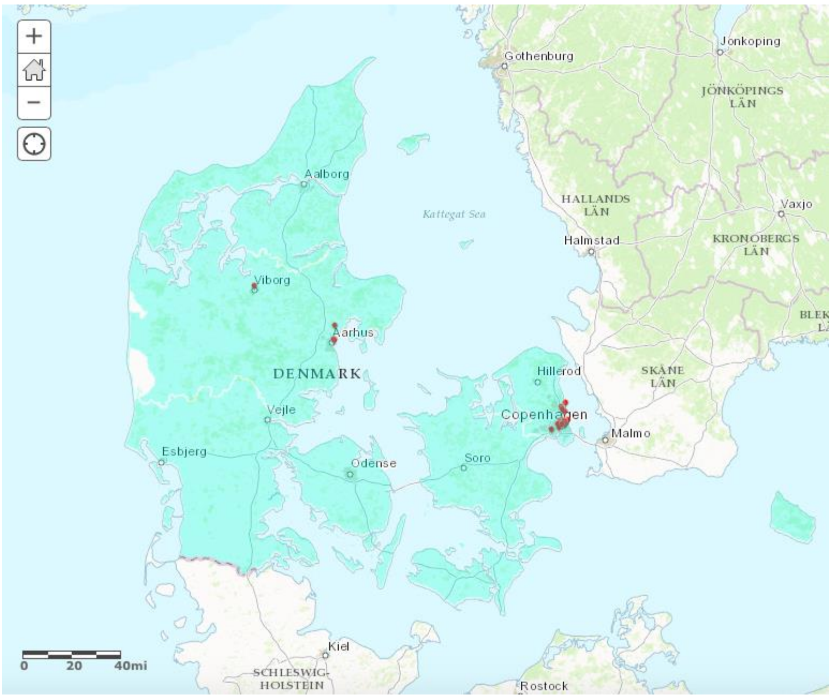
The capital region is one of the five region in Denmark and part of Greater Copenhagen, consisting of Copenhagen and Frederiksberg municipalities (The Capital Region official website). 21 out of 35 production companies are based in Copenhagen municipality, while others situate very widely. One place that should be noticed is the Filmbyen (Film city) in Hvidovre town (left corner of map 7), where 3 production companies (Zentropa Entertainments, Wise Guy Productions and Mainstream ApS) are located. Quite similar to the story of Trollhättan (Sweden), after the decline of conventional industry, Hvidovre needed to find a new economic drive to rebuild its image. It is on the North-west of Copenhagen city, founded by the founders of Zentropa Entertainments director Lars von Trier and producer Peter Aalbæk Jensen in 1997. The ambition for Filmbyen at that time was to build a cluster for the whole Danish film industry. It does attract some film production companies to (re)locate there, followed by 2 important production companies Zentropa Entertainments and Nimbus Film Productions (later moves to Frederiksberg, Denmark). However, after 2008, due to a series of comprehensive problems like the isolation of the location, inconvenient public transportation, the crisis of Zentropa and lack of (inter)national connections, Filmbyen have declined without fulfilling its initial ambition (Cazzetta, 2010).



Map 7, production company geographical distribution in capital region 2005 (source: own visualization).

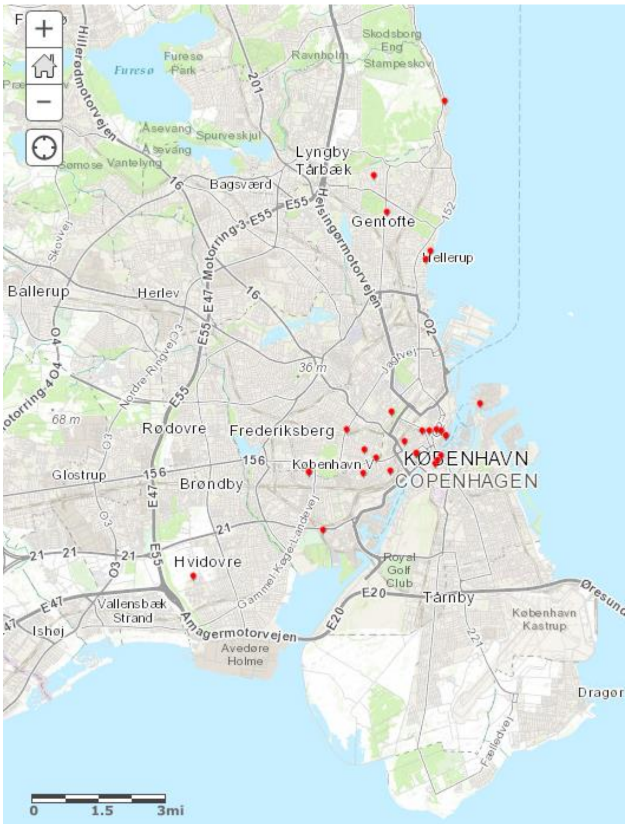
In 2015, 40 films involved Danish production companies, there are in total 90 unique production companies participating in co-producing these films, which means some companies can participate in production repeatedly, while 12 of them lack detailed geographical information, and 43 of them are foreign production companies. So in the end 35 unique Danish production companies are identified on the map. In 2015, we can see from the map that still most of the production companies are locating in and around Copenhagen city, while 1 in Viborg and 2 in Aarhus. It is clear that Denmark never lost the determination to regain its glory of being an influential film production country in Europe. After the decline of Filmbyen in Hvidovre, in 2013, a new Filmby (film city) was set up by renovating a former old power plant in Aarhus. Aarhus, being the second largest city in Denmark, was noteless for decades without too much fame. In the early of 2000s, the plan of branding the city as creative and cultural hub was started. Attracting national and international film production companies are still one of the goals. Aarhus also caters the second largest Danish regional film fund the West Danish Film Fund, which is expected to attract more filming and production companies to this city. As it is described on Filmby Aarhus's website, they aim to use the digital visual industry as a lever or business development and innovation in the private and public sectors. Now it has catered 80 media companies and two professional film studios (Radiator Film and Basmati Film, see in map) (Filmby Aarhus, 2016). Whether the aggregation effect will work, we will still have to wait and see in the coming years.

Although only one film company is shown to be located in Viborg, it partly reveals the importance of Viborg, as a city that specializes in animation, making it an indispensable supplement to Danish film industry. The famous The Animation Workshop is based there as a successful example of combining education and industry together. Many small and medium animation making companies are also based there. *Song of the sea (2014)* which was co-produced by Ireland, Denmark, Belgium, Luxembourg and France won the Academy Award for Best Animated Feature at the 87th Academy Awards (OSCAR) in 2015. Noerlum Studios which is located in Viborg participated in the production of this film.



Map 8, production company geographical distribution in Denmark 2015 (source: own visualization).

Compared with 2005, the inner city of Copenhagen has experienced more production companies settling, which may be explained by Copenhagen municipality's strategy to integrate cultural and creative resources and urban economic growth and city branding. In 2013, Copenhagen Film Fund was founded in order to create more jobs and stimulate economic growth with the lever of supporting film industry in the whole great Copenhagen area. So the capital region is covered by dual film funds – the national film fund (DFI) and local film fund (CFF), which results in the concentration of the film companies in this area. Regarding to Frederiksberg, which is a city on the west of Copenhagen city border. There are 3 companies shown to locate there in 2005, and 2 shown to locate there in 2015. As it is mentioned, it is a place with good reputation hosting middle and upper class. More importantly, it enjoys the lowest personal tax rate in Denmark (Statistics Denmark).



Map 9, production company geographical distribution in and around Copenhagen 2015 (source: own visualization).

Looking at the profiles of the Danish film companies, companies like Zentropa and Nordisk Film with international capacity are quite rare. Most of them are small companies which lack international reputation, and produces less than 1 film per year (Bondebjerg & Redvall, 2011). For these small companies, it is not easy to produce a film alone, and external support is very vital for them to survive. All the partners they pick are under careful consideration, mainly regarding to the film fund both parties can get.

4.3 Funding scheme, cultural similarity and market- Elements in shaping urban network in Danish film industry

“Financing is the key reason that makes different cities work together. Where they can get money, they will go together.”

--Thomas Gammeltoft, CEO of copenhagen film fund (own interview)

To find out the elements that shape urban network in Danish film industry, it is important to clarify the funding scheme in Denmark and its main partners. Since we have seen very clear geographical pattern in the co-production of Danish films, the institution reason and cultural similarity will be explained as well.

4.3.1 Funding scheme in Denmark

Unlike French films which earn both social reputation and market value, Danish films are still more about artistic value instead of market profit. So public funding is very vital for Danish films to survive in the competitive global market. Compared with the comprehensive funding system in France, Danish funding scheme is relatively straightforward and simple which is mostly direct funding. As Denmark considers film industry as an important factor to shape its national cultural identity (Hjort, 2002), its film funding scheme is one of the easiest to get in Europe, according to my interview with Benedetta Sandri, Assistant consultant of Zentropa, previous researcher in Copenhagen Film Fund (DFI). As Thomas Gammeltoft the CEO of Copenhagen Film Fund commented on the success of Danish Girl, which was funded by Copenhagen Film Fund, a successful film means not only invaluable international exposure and branding for Copenhagen and Denmark, but also creating growth and jobs (Copenhagen Film Fund, 2015). This explains the legitimacy to distribute large amount of public fund every year to the film industry – political reason as well as economic benefit.

There are 4 film funds in Denmark—1 national fund and 3 regional fund. Danish Film Institute (DFI) is responsive to the national film, supporting mainly Danish feature films. It is the largest film fund in Denmark, granting money with more flexibility compared with regional and local funds. DFI being the most important and resourceful fund in Denmark, is supervised by Ministry of Culture and financed by the Danish Parliament in the Film Agreement. The new Film Agreement that was approved on 6 November 2014 is under implementation for 2015-2019. According to the goal of DFI, it supports the development, production and distribution of Danish films, but also offers funding for international co-productions. “encouraging international co-production partnerships” is written in its framework (DFI, 2016), which shows the ambition of Denmark to increase the international cooperation in film production through film funding, besides providing subsidies to national films. 95% of the films produced in Denmark got the money from DFI, accounting up to 40% of their total budgets (Sandri, 2016, own interview). It is obviously a great support to the Danish film production.

Regionally, Den Vestdanske Filmpulje (West Danish film fund) supports the development of production environments in West Danish territory, including Aarhus, Aalborg, Frederikshavn and so on. The second regional film fund Filmfyn are responsive to film productions in cities on the Fyn island including North Fyn, Odense, Nyborg and so on. Copenhagen Film Fund (CFF) is covering the whole capital region. According to the introduction from CFF official website, it invests primarily in international productions cooperated with Danish co-producers, as well as Danish projects with international distribution. Normally it covers about 40% of the Danish spending with a ceiling support of 1.2 million euros per film (Gammeltoft, 2016. Own interview).

Level	Name	Supervised institution	Located city	Fund source	Budget (2015) in millionDKK.
National	The Danish Film Institute	Ministry of Culture	Copenhagen	Public money (granted by Danish Parliament)	499
Regional	Den Vestdanske Filmpulje (the West Film Fund)	The board of representatives of municipalities	Filmby, Aarhus	Public money from representatives of municipalities and fund from Ministry of Culture	10
Regional	FilmFyn	A number of municipalities on Funen, Fionia Fund and TV 2 / DENMARK	Faaborg	Public money from representatives of municipalities and fund from Ministry of Culture	11,5
Regional	Copenhagen Film Fund	The board of members from Copenhagen Capital Region	Copenhagen	Partly from Copenhagen Capital Region and partly from	35 (2013-2015)

				private investors	

Figure 22, summary of funding bodies in Denmark (source: DFI, DVF, FilmFyn and self-conclusion).

As a general requirement to apply for the relative film fund, film production should be involved with the local producers or shooting in the territory of the film fund in order to support the local film development and increase the exposure of the local scenery in the films. However, different funds can differ in regards to the requirement and preferences for applying it. For example, Copenhagen Film Fund has emphasized on the shooting location should be within the funding region - “Our focus is on films which are shot within the region”. And the Danish Film Institute requires that the fund awarded should be used on the Danish staff.

According to the interview with Benedetta Sandri, nowadays, it’s very difficult to produce a film by a single production company without either public or private funding. When shooting a film, the first step for a production company will be to choose a location based on the story. In case a story does not require a specific location or it is a drama, you can basically choose any locations or studios; which is the case most of the time. With this fact in mind, funding and tax incentives becomes the choice of location. Mostly, according to the requirement of getting the funding, at least part of the economical activities should happen in that money supporting place. For the co-production, at least 20% of the film should be shot in the funding providing place, and 80% shot in any desired location. During the past 10 years, Denmark keeps increasing the investment in film production. Because of the flexibility and feasibility of Danish film funds, more and more production companies come to Denmark to seize the funding support. In this sense, the connections between Danish cities and cities outside Denmark are created and strengthened.

To seize the capital investment, big production companies have the flexibility to follow the funding and investment all over the world. So those countries who can provide more funding usually attract more international cooperation, which will benefit the domestic film production vice versa. As the data analysis of Danish film production network 2015 shows,

Denmark has strong connection with Sweden and Germany. They are known as countries with heavy public funding, which encourage the frequent cooperation between Denmark and Sweden, and Denmark and Germany in order to pursue market and funding in these countries. In Germany, there are national film funds like German Federal Film Fund (DFFF) and regional film fund Filmstiftung NRW, FFF Bayern, FilmFoerderung Hamburg and MDM, greatly supporting Germany-European co-productions (Pardo, 2007).
Benedetta's argument is supported by my interview with Thomas Gammeltoft, CEO of Copenhagen Film Fund. In his opinion, what makes different cities work together is mainly of financing reasons. Production companies are moving around to get money, so those cities and countries which can provide more funds will attraction more international productions.

However, in terms of tax incentive scheme, Denmark does not have it so far. Tax incentive scheme is actually more flexible than the funding scheme, since tax scheme works automatically without the evaluation of cultural point of views, while funding has relatively strict requirement. In many other countries, they have complete tax incentive scheme and even compete with each other to attract the international film production in their own territories. For example, Belgium will provide as high as 40% tax rebate if the film production activities happen in Belgium, and Italy providing 30% rebate, Iceland proving 20%, Czech Republic providing 20%. On the other hand, Denmark as a welfare country relies very much on the redistribution of the public money from tax, and that's why some people are against to use the tax incentive to support the film industry. Also some governments have seen the tendency to lessen the funding schemes for many global investors to shelter their tax liabilities at the cost of public money (Pardo, 2007). However, the private and risk capital still can't be a substitute of public money, which makes the European film still in very need of public support.
With the support of the public fund, Danish film industry keeps a steady increase in the numbers of film-related company, total turnover, and exporting value during 2009 to 2014, while the number of full time employees keeps a stable status.

Year	2009	2010	2011	2012	2013	2014
Company	95	100	114	104	110	128
Full time employees	527	473	403	432	446	467
Total turnover (million DKK.)	800	765	884	983	1276	1132

Export value (million DKK.)	28	unknown	113	279	290	348

Figure 23, the figures of company, full time employees, total turnover and export value of the Danish films (source: Danske indholdsproducenter).

4.3.2 Geographical proximity and cultural similarity

As mentioned above, Denmark has a strong connection with Germany, Norway and Sweden. From geographical side, they are neighbors close to each other, sharing similar working value and personal connections in this "regional hub". From the language perspective, the language difference is always a reason that contributes to the fragmentation of European co-productions. Norway, Sweden and Demark are all North Germanic speaking countries while German being West Germanic language, but they are all having a lot of similarity with each other, which decreases the communication cost in a way. Besides that, Nordic countries always have a common consensus about working together and getting stronger together.

Another aspect that explains the closer cooperation, is the working culture. "People in Denmark don't have as much motivation to work with those countries as with Germany and Nordic countries. This is mainly due to the consideration of cultural efficiency." Says Benedetta (own interview). Danish people might think there are more bureaucratic in south Europe, and they get used to the "comfortable zone" of Nordic countries and Germany, which are considered having an effective and simple working culture.

4.3.3 Market element

The third reason for different companies to work together is the market drive. Denmark as a relatively small country is forced to go abroad to cooperate with the other countries in order to get more fund and bigger market. As the analysis above, we have known that Denmark has strong connections with Norway, US, Sweden UK and France. Among these 6 countries, 5 of them are top 5 exporting partners, and 4 of them are top 4 importing partners of Denmark. They keep a close cooperation in exporting and importing goods and services including film. Germany has been Danish films' biggest foreign market for many years (Gammeltoft, 2016), therefore Danish production companies tend to cooperate with

Germany in film production. That's why we can see the urban network both in 2005 and 2015 that Danish cities have a lot of connections with Cologne, Hamburg, Berlin and Mainz.

Exports of goods and services			Exports of goods and services		
country	million (DKK)	Share (%)	country	million (DKK)	Share (%)
Germany	150	14.6	Germany	152	16.4
Sweden	113	10.9	Sweden	104	11.2
USA	95	9.3	UK	62	6.7
Norway	74	7.2	USA	60	6.5
UK	73	7.1	Netherlands	58	6.2
TOTAL	355	49.1	TOTAL	436	47

Figure 24, top 5 trading partner of Denmark in 2014 (source: Denmark statistic 2015)

CHAPTER 5

5.1 The capital flow of film industry

Film has the dual characters of cultural product and economic product, it's not easy to measure the returns. For co-production films, it is even more difficult to check how the capital flow between the co-producing cities and how they divide the share of the benefit in terms of economic and culture. Although the funding system in different countries all hope for local job creation, economic growth, cultural promotion and image branding, not every one can be winner as expected.

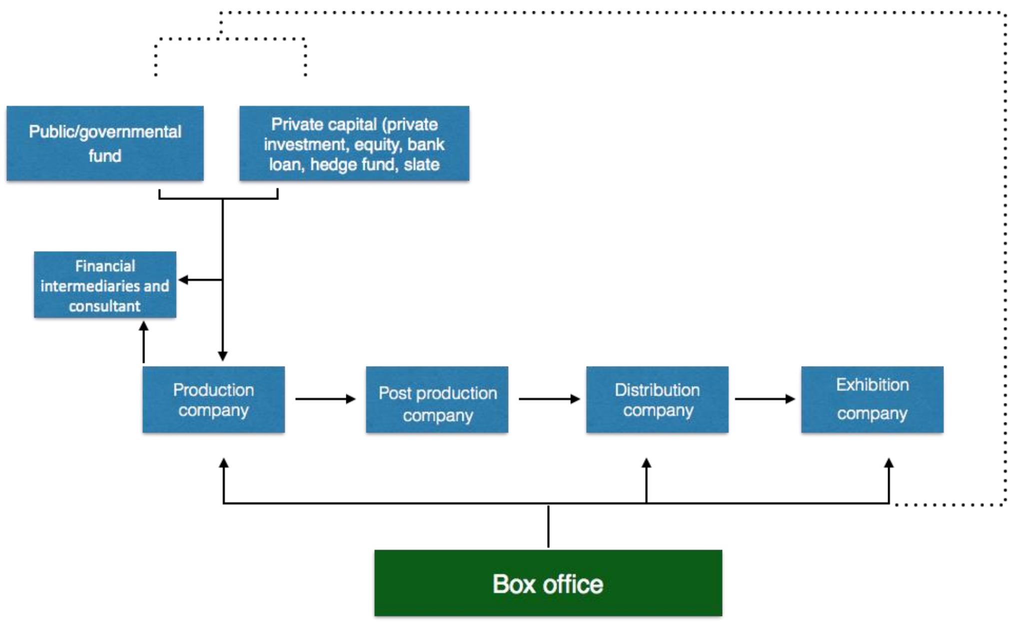


Figure 25. The capital flow of film industry (source: own visualization).

The uncertainty in box office contributes to the uncertainty in economic return. In the whole flow of film capital (shown as figure 25), it starts from the financing resources, which may come from governmental funding, private investment, bank loan, hedge fund or slate financing. In Europe, governmental funding is the main source. In international co-productions, many foreign production companies tend to seize help from the financial intermediaries or film consultant companies before finding partners and getting funding. These intermediaries make large profit by providing all kind of services, mainly legal and financial consultancy (Hodouskova, 2016. Own interview). The high cost of financial intermediaries or film consultant companies may contribute to the inflation of the total cost of film production (Morawetz et al, 2007). After the money is invested into the production, the money flows to production companies, post production companies, distributors and exhibitors. The cost can be partly covered by the box office after it is on exhibition. However, the profit out of box office is not certain. For private capital, normally it can have proper return if the box office makes profit, while for public capital, it is not necessary to be guaranteed a pay back, especially for the tax rebate. Another worry is that film productions transfer the risk to broadcaster and tax payer by trying to meet the requirements of the supporting policies instead of market and audience, which leads to higher possibility of failure. And the more they fail, the more they need to cling to public money (Ilott, 2013: 3). In 2014, Danish film companies accomplished a total turn over of 1132 million DKK (Danske indholdsproducenter, 2014), of which, the total direct public money from different film funds in Denmark that was poured was over 530 million DKK., which is almost half of it. Considering the cost of labor and other cost, the profit of it can be very little or none. So after the money invested is redistributed, the European circle of film capital is dependent very much on the steady pouring of public money, which raises the question of how to make the funding schemes and wealth re-distribution more efficient and sustainable for policy makers (Morawetz et al, 2007).

One may argue that even the direct return from box office is not certain, however a film does bring invisible benefit to a city, like the job creation, economic growth during the shooting, and tourism effect after the film is released. Some tourists claim that they come to

Denmark because they are attracted by the beautiful scenes in *Danish Girl,* which is co-produced by UK, USA, Belgium, Denmark and Germany, but it is always difficult to measure and find out the influence a film brings. And for most of the films which don't have too many international audience, the tourism effect is too little to be noticed. Besides, to get more tax rebate, some companies may risk to make the book cost inflate. Some temporary "project companies" are set up in order to reach the requirement of co-production, which benefits very little for local industry. In this case, production companies share the risk and cost to the TV channel and tax payers instead of sharing the revenue and benefit. So cities especially small cities with supporting scheme won't always be winners in the "game" of capital.

5.2 Conclusions

Contemporary films can be seen as "global products". This paper uses top films geographical data in 2 different markets as database to analyze the urban network in respective film industries. Denmark is a representative of small-scale, disintegrated in production processes and strong state-subsidized, while France represents big-scale, disintegrated and strong state-subsidized (Lorenzen, 2008).

My hypothesis at the beginning of the paper are proved partly. For the geographical pattern of production processes, more and more production and post production companies have seen to escape from the clusters and tend to cooperate internationally with other cities. For the city connections, during these 10 years, there are more cities especially small cities participating in the network formed by film production. For French films, European cities, North American cities and Asian cities are connected with French cities, especially Paris, through the transnational film production. However, the connection and cooperation is uneven. Paris is functioning as a central node with most resources and a gatekeeper, getting largest money flow in the network. Its connection with Brussels, Rome and London is stronger than those with others. Nationally, Issy-Les-Moulineux, Boulogne-Billancourt and Neuilly-sur-Seine functioning as the satellite cities of Paris, have very strong connections with Paris, showing high degree of dependence on it. For Danish film productions, similar to France, Copenhagen as the capital city, positions as the most important node in the network. It is true that it keeps a very tight tie with North Europe, especially with Nordic countries, rather than any other cities in the world in 2005. But in 2015, Danish film production network becomes more international involving cities in other parts of Europe and the world. Nationally, the urban network between Copenhagen and Frederiksberg, Copenhagen and Aarhus are strongest. Internationally, Copenhagen has very close network with several German cities especially Berlin, and several Swedish cities like Malmö, Trolhättan. Through Frederiksberg, Paris, Oslo, New York and Los Angeles are connected to Danish film industry in 2015.

From the network analysis including post production process, the organization implementation approach in Europe tends to be horizontal integration, different from US model as vertical integration (Lorenzen, 2008), which has ownership in production, distribution and exhibition. In horizontal integration, big production companies are seen to extend to the other areas of the same filmmaking process, like internalizing the post production process by setting up the post production departments inside the companies. As it is analyzed above, there is an obvious trend of breaking down the horizontal integration in the production, by outsourcing the post productions to other specialized companies or other countries on the basis of cheaper cost instead of being limited within the clusters. This trend accelerating the internationalization of film making processes.

There are several elements contributing in shaping the urban network of film production, like financing, institutional support, geography/culture proximity and market reason, but financing seems to be the most important element.

- Financing.

  Bob Woodward: The story is dry. All we've got are pieces. We can't seem to figure out what the puzzle is supposed to look like… Hunt's come in from the cold. Supposedly he's got a lawyer with $25,000 in a brown paper bag.
  Deep Throat: Follow the money.

  (All the President's Men, 1976)

  The quotes from the film about Watergate scandal seems a perfect footnote here. “Follow the money”, that’s exactly what film production does. As the nature of film industry is capital intensive, the financial incentive becomes so vital for European films since they can’t rely on the market. Being in favor of the “film industry syndrome”, which is linked to a basket of possible benefits like economic growth, job creation, city promotion and tourist attraction, governments use the financial incentive as “bait” to attract the international production companies and retain local companies. It is a trend globally, especially in Europe, where different countries compete with each other in attracting co-productions and shooting activities in their own territory. Since physical economic activities locally are always part of the requirements, in this sense, the financial incentives in film industry help to promote their own cities on the global film map.

In the case studies of France and Denmark, France has a very comprehensive financing supporting scheme, where the money mainly comes from TV (Pay and free-to-air) investment (equity and prebuys), selective subsidies (CNC and the regional governments), automatic subsidies (like tax incentive) and Soficas (financial companies for film industry). Among them, only Soficas takes the market success as the basis of investment, while others will be granted when films meet the requirements of local spending, co-production agreement and cultural value. Denmark has simpler financing incentive, mainly direct subsidies and selective subsidies. Countries with abundant financing support are very popular in production companies as it provides more possibilities for co-productions to chase different kind of money. For example, by co-productions, a film can get private equity from Germany, tax reduction from the France and direct funding from Denmark, which forms a unique urban network driven by capital. The film Alexander (2005) is one of the examples. It is co-produced by Germany, US, Netherland, France, UK and Italy, shot in Thailand and Morocco. It announced a budget of 155 million dollars (IMdb, 2004), taking partly from Germany’s private investment (Bayerische HypoVereinsbank AG München, Germany), UK’s private fund (130 million pound, Matrix Film Finance) and France’s selective subsidy.
Within a country, the uneven distribution of public funding geographically contributes to the uneven development of film industry. Especially the capital area which is covered by multiple funds creates the magnetic effect to attract the film companies and film production there.

- Institutional cooperation

  Film expression sometimes can be an ideological expression. Thus, the cooperation between different countries in filmmaking will take the ideology and institutional support into consideration. For many countries, the stance of the Ministry of Culture, which is normally the supervised authority of film industry, is bound up with their foreign policies. 2 countries which have the same agenda in economic and cultural exchange will tend to have more cooperation activities in film industry. As it is discussed in the paper, Denmark has kept a close connection in film co-production with the Nordic Council countries including Finland, Iceland, Norway and Sweden under the Nordic countries economic development agenda. With the back of bilateral co-production agreements signed by governments, France developed strong partnership with 56 countries in film co-production, especially coproduced frequently with Belgium, Germany and Luxembourg with a strong connection both in diplomacy, economic and culture as foundation.

- Geographical proximity and cultural similarity

  In the cases of Denmark and France, geographical proximity and cultural similarity is a big factor for film co-productions. Firstly, professionals from similar cultural background will be easier to work together in similar working style. Secondly, film as a cultural production is very important for audiences to understand the creativity and art behind it. So audiences who share the same language and cultural understanding will tend to accept the same films. Within these countries, the previous cluster paradigm has been broken while the regionalization of film production is formed. The Nordic language region Denmark-Sweden- Norway, the francophone region France-Belgium- Luxembourg which characterize as geographical proximity and cultural similarity has formed strong network with each other through co-productions.

- Market element

  To understand the taste of the local audience and attract them, the easiest approach for foreign production company is to cooperate with local production company to make the film a “hybridization”. It is not a new concept, and was already adopted by

US since 1950s to enlarge the European market. For Denmark, Germany is the second largest partner after Sweden, and is Denmark's biggest film foreign market for years. For France, being the most important film production and market in Europe, it also functions as a gate to connect the other periphery nodes with its strong market attraction. Every year, Eastern European countries come to Paris to host film exhibition and festivals to promote their films and try to take part in the global film industry. They also present themselves in French film festivals, making full use of the global exposure of French film festivals. "If you want to play the game, you have to join the big player" said Hodouskova. (Hodouskova, 2016. Own interview).

For countries which have film importing quota like China, co-production is a good way to avoid the quota by granting double or multiple nationalities to the films. China has become 2nd largest market after USA by gross box office revenue, which motivates the co-production between other countries and China in order to have a better position in Chinese market. As shown in the social network analysis, France has stronger connections with Beijing and Hong Kong in co-productions in 2015 compared with 2005.

On the other hand, in this "game" of film co-production, the uneven development of global film industry is seen. The network accelerates the film capital accumulation in the important nodes like Paris and Copenhagen, while the small nodes sometimes can't get more than they pay. They may be misled by the high expectation of culture and economic effects created by global film cooperation, making the paid TV channel and the tax payer to share the risk rather than sharing the benefit.

5.3 Limitation

This paper sheds light on the methodology of using the co-production films to chase the urban network of film production, which is an approach seldom adopted before. It has to deal with hundreds of geographical data, highly relying on the companies' geographical information online. When comparing geographical locations of the production companies as well as the post production companies, some companies were merged or taken-over by other companies. And some companies were created on the base of the projects in the specific countries, which means it is not a company with permanent location. This may result in the difficulty in identifying the geographic location of the production company. But this happens in very limited instances, which does not affect the overall analysis and visualization of the network.

Apart from some difficulties in locating the headquarters, this paper does not mention the distribution partnerships which is also an inevitable factor to contribute to the network of the film industry. Since the focus of the urban network is based on the film co-productions, the elaboration of cooperation in distribution may result in distraction of the topic. Also from the technical operation, since one big distribution company may cover several countries and even all over the world like Gaumont, its economic activities rely on more intangible service rather than on the geographical attachment. Compared with the other production processes like production and post production, it can be also very difficult to include the distribution pattern into the value chain. Besides, the regular flow of the connections depends more on the enlargement of datasets, like 5-10 years, which can be done in future studies.

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APPENDIX: in-depth interview list

(in chronological order)

1 Interviewee: Benedetta Sandri, assistant consultant of Zentropa, Denmark; previous researcher in Copenhagen Film Fund; Previous production runner in Pupkin Production Srl., Italy

Interview location: Copenhagen, Denmark

2 Interviewee: Thomas Gammeltoft, CEO of Copenhagen Film Fund

Interview location: Copenhagen, Denmark

3 Interviewee: Ran Zhang, International Project Manager of Film France

Interview location: Paris, France

4 Interviewee: Markéta Hodouskova, director of Czech In Festival and the international; NGO of Film New Europe Association; expert of Czech State Fund for Cinematography

Interview location: Paris, France