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DIVERSITY IN THE EUROPEAN FILM INDUSTRY: DO SUBSIDIES HELP THE CAUSE?

A cross-national study.

Master Thesis



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1. Abstract

This thesis concerns the relation between subsidies and supplied diversity in the European film industry. The debate on diversity, its benefits and how it can best be preserved has not come to a final solution. Many countries apply protectionist policies with the aim, among others, to protect diversity. Subsidies are a widely used form of protectionism commonly applied among the member states of the European Union. The study aims at determining whether changes in diversity indicators are consistent with a positive effect of subsidies on diversity in the years between 2005 and 2013 in eight European countries – Denmark, Estonia, Finland, France, Italy, Portugal, Spain and Sweden. Various linear regressions are run to analyse the interaction of the different variables.

Keywords: cultural diversity, public subsidies, film industry, cultural protectionism

2. Introduction

In 2005 the UNESCO Convention on cultural diversity awakened the interest of many nations worldwide on the subject. The Convention warns against the threat of cultural homogenization and aims at allowing cultures to be able to develop independently while remaining receptive to useful inputs from other cultures (Brooks, 2006) by protecting the world's cultural diversity.

In our more and more globalised world a danger exists that stronger and more popular cultures might overcome and progressively cancel weaker single national cultures. The cause of diversity preservation is globally supported, at least officially, but it's not clear how it can best be put into practice.

Economic theory says the market should be left to its own forces letting free trade govern it. This would lead each country to specialise in the production of goods in which it has comparative advantages, thus increasing consumption opportunities for all the parties involved (Hoskins, 2004). Specialisation yields economies of scale and learning and, causing concentration of competing businesses where only the very best will succeed, it increases quality to the benefit of every nation involved. Ricardo's theory of comparative advantage assumes that every actor of production is relatively better at producing a certain good than another. It also demonstrates that when these different actors specialize in particular economic activities based on their relative productivity differences, the overall productivity will rise allowing every actor to have a higher amount of goods than would have been possible before specialisation happened (Costinot and Donaldson, 2012). This situation works to the advantage of each single party involved, not only the ones holding an absolute advantage.

The belief that the free market would naturally produce the most desirable situation in terms of overall welfare is not shared by all. Notwithstanding the empirical and mathematical proofs of the validity of Ricardo's theory of comparative advantage (Costinot and Donaldson, 2012), there are arguments against free trade and in favour of changing the situation the market would create with its only forces, through protectionist policies. There are occasions in which it is rational to apply protectionism, namely: to protect infant industries, to preserve national security preventing the country to be too dependent on others, to contain overspecialisation and to contrast the practice of 'dumping' (Hoskins, 2004). However the risk is that these justifications become an excuse to allow for unfair competition just to promote domestic industries rather than diversity (Brooks, 2006; Hoskins, 2004).

Diversity is considered important as it is a source of new ideas and inspirations, it makes various options available creating a flexible environment and thus facilitating long-term adaptability, it leads to achieving higher quality and a better fit to consumers' taste through an offer of a wider variety of products (Rosen, 2002). However, the laws of economics apply to diversity as well: not all can be preserved, there is an opportunity-cost to be considered also when discussing the diversity issue. The first thing necessary to be able to take an informed decision is to find a measure of the value of diversity (Weitzman, 1992).

At any rate, it is agreed that diversity should be preserved, though it is not clear to what extent, and it is subject of debate whether free-trade would be the best way.

The case of protectionism is particularly strong for cultural products since they are held to be different from others and many state the necessity to treat them as the exception they are (Moreau and Peltier 2004). As Hoskins writes "many countries argue that flourishing cultural industries are essential to the preservation of their own distinctive values and way of life hence well-being of nation" (Hoskins, 2004). UNESCO is concerned with the matter and the first article of the Convention on the Protection and Promotion of the Diversity of Cultural Expressions (2005) states "Culture takes diverse forms across time and space. This diversity is embodied in the uniqueness and plurality of the identities of the groups and societies making up humankind. As a source of exchange, innovation and creativity, cultural diversity is as necessary for humankind as biodiversity is for nature. In this sense, it is the common heritage of humanity and should be recognized and affirmed for the benefit of present and future generations." Cultural diversity is not only fundamental for every nation's identity, but it can lead to higher innovation and creativity (Ottaviano and Peri 2006), besides being a source of the benefits mentioned above for diversity in general.

Protectionist policies in culture can take various shapes: tariffs, quotas, domestic content requirements or public subsidies. All these measures aim at protecting local industries to preserve and favour cultural diversity. Among these the subsidisation of domestic industries is one of the most applied measures.

With this research I want to investigate whether national subsidies allocated to the film industry do actually positively influence the diversity level supplied in the country's cinemas. This will be done through the study of the diversity fluctuation in eight countries member of the EU in a period of nine years. The variation of various indexes of diversity in Denmark, Estonia, Finland, France, Italy, Portugal, Spain and Sweden will be studied in the period of time going from 2005 to 2013. The measure of diversity

applied is modelled on the studies carried out by Benhamou and Peltier (2011) and Moreau and Peltier (2004), both on diversity in the film industry.

The thesis is inserted in the ongoing debate about pros and contras of cultural protectionism. The regression analyses run in the research will try to determine whether there is a relation between the variations of the amount of subsidies allocated to the film industry and the variation of the various diversity indexes identified; and what kind of relation this is. The thesis also aims at giving a contribution to the discussion about the legitimation and de-legitimation of cultural subsidies. The practice of subsidizing the film industry is widely used in the European Union and it is not yet clear to what or whose benefit. Subsidies might be helpful to the cause of diversity worldwide, but they could also just sustain the local industry (Kish, 2001; Hoskins, 2004) or even be covertly intended just to this end (Mattelart and d'Haenens, 2014). The analysis carried out in this thesis hopes to offer an idea of whether national subsidies help the cultural diversity cause. I intend to research whether national public subsidies to cinema activities affect the diversity supplied in the European film industry. To my knowledge there is no existing document investigating this precise matter. The present thesis could be an incentive to further developments on the subject and also to a reflection on the national governments' part about the consequences of subsidies on cultural diversity.

The remainder of this thesis is organized as follows. Section 3 gives an overview of the literature about diversity, cultural diversity, its importance, its various dimensions and the pros and contras of cultural protectionism. Section 4 outlines the methodology adopted to carry out the central study of the thesis. Section 5 describes the data set and the specification of the models which will be used. Section 6 discusses the findings and results of the analysis, linking them with the literature previously analysed in section 3. Section 7 presents the concluding remarks.

3. Literature Review

In this section the concept of diversity is introduced. First it is explained what benefits diversity can bring to society, not only from the moral and ethical point of view, but also from an economic perspective. Secondly, the concept is illustrated in its dimensions and components, to give the reader a clearer and more rounded idea of what diversity stands for. Finally the arguments in favour and in disfavour of cultural protectionism are presented.

3.1 Why should we care about diversity?

As mentioned above diversity is not only a nice concept which we might want to support for moral and ethical reasons. There are a number of economic advantages to it. In particular Hoskins (2004) includes the avoidance of overspecialisation among the legitimate reasons to protect diversity. In fact, diversity can preserve flexibility and consequently adaptability in case of a change of circumstances. If the countries were to bring the process of specialisation to its extreme, they would then be extremely efficient as much as extremely vulnerable to any change which would make their field of specialisation obsolete or not viable anymore due to scarcity of resources or other instances. Diversity has in this respect an essential role in keeping a country open to various possible productions and trades, which will help the country's ability to deal with change and eventual crises, creating a long-term adaptability.

Diversity is also a source of inequality in prices and values, such inequality has some social incentives to it. Unequal rewards motivate individuals to strive for a superior performance to get hold of the highest rewards. This encouragement stimulates a continuously improving quality (Rosen, 2002). In this respect, diversity acts as a stimulus for better quality products. It does so also allowing for specialisation and better quality reached through specialised knowledge and skills. Only in a diversified world can an individual specialise in a single field and neglect other activities since those will be taken care of by others due to the diverse environment.

Ottaviano and Peri (2006) found that a higher level of diversity can cause people to see in different ways and to frame problems in new and alternative manners. Thus diversity can be a stimulus for innovation and creativity, allowing and inspiring individuals to see their surroundings in several ways, rather than in a single conformed mode.

The production of a larger variety of goods and services in a particular location has been proven to increase the productivity and utility of the people inhabiting it (Ottaviano and Peri, 2006). A diverse market can also offer a better fit to the tastes of the public, thus creating a higher welfare. The market normally tends to cater for the need of the average customer, with an average product (Farchy and Ranaivoson, 2011), neglecting particular needs. With the increase of diversity however, the products will be more differentiated and will start gaining peculiar characteristics catering for more specific targets, which will find their needs better suited, with an overall gain in welfare. Prarolo et al. (2009) found in their study on European regions also that "diversity positively correlates with productivity and causation runs from the former to the latter". Diversity is then a driving force of productivity. This productivity might, however, suffer from

intercultural frictions (Ottaviano and Peri, 2006). Diversity may come to the cost of racism and prejudices and cause open clashes (Prarolo et al., 2009). Cultural diversity can be identified as their cause, but it can also be the solution. In our globalised world is inevitable for different cultures to come into contact, the clash though can be avoided with education to diversity. The Commission of the European Communities (2007) affirm in fact that promotion of intercultural dialogue and competences are essential in the context of a global economy. Diversity is “viewed as a means of economic development and as an element to consolidate democracy” (Atkinson and Bernier, 2000 in Benhamou and Peltier 2011). This last point seems to be the one the Commission of the European Communities (2007) focuses on stating that “the originality and success of the European Union is in its ability to respect Member States’ varied and intertwined history, languages and cultures, while forging common understanding and rules which have guaranteed peace, stability, prosperity and solidarity - and with them, a huge richness of cultural heritage and creativity to which successive enlargements have added more and more. Through this unity in diversity, respect for cultural and linguistic diversity and promotion of a common cultural heritage lies at the very heart of the European project. This is more than ever indispensable in a globalizing world.” (Commission of the European Communities, 2007) .

3.2 Diversity: a three-dimensional concept

In this section an overview of the concept of diversity is given. The notion is very rich and multifaceted and could be talked of for endless paragraphs. Since defining it is not the central focus of this thesis, an introduction to the notion is given to serve the purpose of this study.

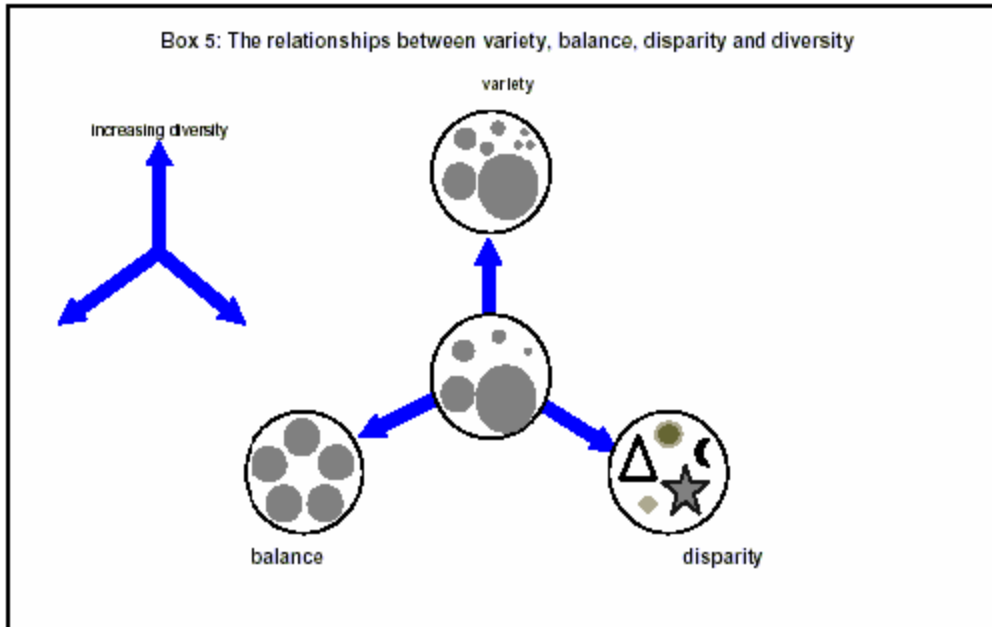
Diversity is a concept applicable to different areas of study such as biology, anthropology and culture. It is a complex idea composed by the three dimensions of variety, balance and disparity. (Benhamou and Peltier, 2007).

Variety indicates all the available options. It is the dimension accounting for the “number of categories into which a quantity can be partitioned” (Benhamou and Peltier, 2007) . The more categories present, the higher the variety.

“Balance refers to the pattern in the distribution of that quantity across the relevant categories” (Benhamou and Peltier, 2007). It can be measured by the proportion of every category compared to the overall quantity. The more even the distribution of the total quantity among each category, the higher the balance.

Disparity represents the nature of the categorization scheme and measures the degree to which the categories are different from each other. The more distant the categories, the higher the disparity.

Figure 1. Diversity dimensions



Source : Stirling, 1998, p.41

Cultural diversity is defined by Benhamou and Peltier (2007) as the “quantitative and qualitative diversity of production and consumption of cultural goods and services”. Cultural diversity should then also be distinguished between supplied and consumed. The diversity supplied should reflect the diversity demanded, which should be higher than the consumed diversity. In culture it is rational to provide more diversity than it is actually consumed (Benhamou and Peltier, 2011). Keeping in mind Caves’ “nobody knows” (2000) property of cultural products, it is rational to overproduce to improve the chances of success. Consumed diversity is indeed influenced by consumer taste and by the nature of supply, more than in other fields. In culture demand adapts to supply, rather than the other way around (Moreau and Peltier, 2004). Benhamou and Peltier (2011) add another distinction among supplied diversity: between produced and distributed diversity. Diversity should not only account for the products available but also for the accessibility of these products, accounted for by the distributed diversity.

3.3 Arguments for and against cultural protectionism

As mentioned in the introduction, cultural products are believed to be different from other 'regular' products since they embody the culture of a nation. Due to the intrinsic value they hold, many think they should be treated differently from other products and that specialisation in the area in which a country holds comparative advantage is not desirable when talking about cultural production. Many state that a nation's welfare depends on national cultures which can only prosper if national cultural production prospers too (Hoskins, 2004). Free trade poses three main threats to national cultures: potential contamination and destabilization; homogenization and the economic threat of foreign domination of cultural industries (Baughn and Buchanan, 2001). To prevent these, the free market should be suspended in the cultural field and imposed measures should change the situation ensuring that national cultures are protected.

Chu-Shore (2009) however, poses a doubt about this supposed 'exception' of cultural goods. As opposed to the general theory of free trade as carrier of higher quality and variety, in cultural industries free trade is said to lead to homogenization. This is a contradiction of the logic of international trade in all other industries. Chu-Shore (2009) notices how innovation comes about with "incremental changes to an existing set of knowledge" (Chu-Shore, 2009). The same stands for consumers' taste, which depends on previous exposure. So it appears that innovation depends on older products and experience. This experience becomes shared when two countries open a common trade, thus the reference points for future production and innovation merge in time. This phenomenon leads to homogenization in all fields, not only the cultural one. If taken to its extreme homogenization can become a limit to innovation and therefore to economic growth. This would not only make free trade not beneficial for all the parties involved, but actually negative for each of them (Chu-Shore, 2009). According to Chu-Shore (2009) cultural goods are not exceptional, but actually all markets run the risk of standardization if free trade is not controlled.

In the case of culture this control can take various shapes; Mas-Colell (1999) distinguishes two major kinds of protection of cultural goods: the protection of national cultural production, focused on the origin of products, and the protection of production of national culture, focused on the content. The latter seems more legitimate to the author also because it does not necessarily imply an intervention making market competition unfair. Any producer can make products which show the signs of national culture, even if they are from a different country than the one represented in their products. Moreover "Cultural preservation is classified as the protection of the ability to

create expressions of cultural identity” (p.135, Brooks, 2006), meaning it is the culture and identity of a nation that need preserving, not its cultural industries. However the problem with this approach is that it is hard and potentially dangerous to define what national culture really is. The concept of national identity is itself suspect since it implies a degree of cultural immutability (Delacroix and Bornon, 2005). National cultures are the result of various borrowings and combinations and they are constantly changing. In this view the ‘purity’ of national cultures cannot be guarded since it is mostly fictional (Delacroix and Bornon, 2005).

At this point, since the content is hardly definable, the argument for protection of national production regains strength: it is believed that national production will more likely produce national culture than foreign production. The difficulty of focusing on content, considered more legitimate (Mas-Colell, 1999), brings attention and protection on the origin of the production. Protectionism indeed focuses on ownership. Ownership however does not ensure that the content of a product truly represents domestic culture (Kish, 2001). Besides, the classification of a good as domestic or foreign is not always that easy; for instance films made in the US with European capital and European directors are considered to be American (Baughn and Buchanan, 2001). Kish (2001) claims free-trade is still the best option even in the case of cultural products. It offers a wider variety of products, it increases competition favouring quality and therefore it fosters diversity. Protectionist policies would reduce this variety, thus reducing consumer’s choice and affecting consumers’ rights (Kish, 2001). Delacroix and Bornon (2005) see this reduction as an imposition depriving consumers of their freedom and violating the moral doctrine of subsidiarity, according to which decisions should be taken as close as possible to those they affect. What is more, protectionist policies are not viable in today’s world as we can easily have access to any information, via the internet and all our technological means, and be exposed to foreign influence. Besides, according to cultural transmission theory, if an external product has scarce value connection with the internal culture, then there will be no effect. If instead there is some common ground and internal culture is affected, no protectionist policy will be able to prevent it. Protectionism runs the risk to simply defend inefficient producers, while disadvantaging more efficient foreign ones (Kish, 2001). Protectionism interpreted as a barrier to foreign products could even cause a decrease in diversity.

Still, some arguments state it is fair to forcedly introduce demand for national culture in case it is naturally weak, though this means taking away some freedom from the

consumers. Also, public good and network externalities can create a failure in transmission to the market of an actually existing demand, in which case the forced introduction would be legitimate (Mas-Collel, 1999). Delacroix and Bornon (2005) notice how cultural products, especially films, tell a story and how the value of this story resides not only in the intrinsic quality of the product, but also in the receptor's character. Foreign receptors might not be able to extract the full meaning of the story, thus making imported fare inferior to domestic produce, aligned with one's culture and with a fully comprehensible meaning. If this instance proved to be true, there would be a justification for cultural protectionism (Delacroix and Bornon, 2005).

Furthermore there is concern for potential cultural erosion of weaker and smaller countries, which protectionism could help avoid being crushed by giant cultural producers. In the film industry the biggest threat is represented by the USA, which dominates cinema and TV production. Brooks (2006) found that at the time of his research 85% of worldwide ticket sales for cinema were directed to Hollywood films. When such a strong player is present on the market the risk of dumping arises. Dumping indicates a situation when a country sells its products to others at such a low price that it would be impossible for other countries to be competitive, which causes the extinction of that particular industry in the disadvantaged countries.

Many accuse the USA of this practice. However Hoskins (2004) explains how the USA are not artificially keeping the price down to dominate foreign markets, but that they are just recovering their costs with the domestic market and then selling their products to foreign markets still at a higher price than marginal costs. Indeed the size and wealth of the domestic market, both very positive in the case of the American film industry, work as a comparative advantage producing big domestic return on investment and allowing export with little additional costs (Baughn and Buchanan, 2001). Nevertheless, smaller countries could hardly compete with those products and prices and protectionism might help local industries and prevent the world to be dominated by mono-cultural films.

With the aid of protectionist policies the market concentration could be lower offering more countries the chance to have their culture represented on screen. We must however be careful assuming that a lower market concentration is always index of a higher diversity. If industry concentration lays on either of the two extremes, very high or very low, product diversity is found to be reduced (Ranaivoson, 2007).

At any rate, a decrease in the market power of USA films would not even be of damage to themselves, according to Francois and van Ypersele (2002). They argue that protectionist policies "by reducing the scale of Hollywood operations, [can] increase the

potential market share of US auteur cinema, thus making it more viable.” (Francoisa and van Yperseleb, 2002). Every country would then gain an increase in welfare and diversity.

The same study also poses a doubt about the cultural quality of the content of American films. Since they need to offer films appealing internationally they often ignore “local cultural subtleties”, which would not be comprehended abroad (Francoisa and van Yperseleb, 2002) as hypothesised by Delacroix and Bornon (2005) too. With the reduction of their operations scale, consequences would also include a decrease in focus on the commonly appreciated features and a keener work on quality. On the other hand, the study by Huhman and Saqib (2007) on Canadian magazine advertising showed how the elimination of the cultural protectionism in that context harmed the leading domestic competitors but favoured the smaller magazines directed to niche markets. In this case the elimination of previously adopted protectionist policies led to the offer of a wider variety and to a better service to consumers’ needs (Huhman and Saqib, 2007).

Eckel (2006) argues that while it is true that free trade may reduce diversity, it also causes an increase in real income. It is not clear then if the overall welfare increases or falls in such a situation. Protectionism can maintain diversity at a high level, but it does so by putting off the real income generated by free trade. Overall welfare would not benefit in this instance either. A possible solution would be calculating a subsidy amount to be allocated to cultural industries that is lower than the real income generated by free trade. This way diversity would be retained at pre-trade level, while real income generated by free trade would also be maintained. In such a situation welfare would be maximized (Eckel, 2006).

Subsidies seem to be the most efficient tool to preserve high diversity level. Moreau and Peltier (2004, p.141) in their analysis of diversity in the movie industries of different countries, find that countries with the highest level of diversity support the local movie industry with public subsidies. Also empirical analyses on the TV sector show a positive role of public channels in favouring diversity (Farchy and Ranaivoson, 2011). However the study by Farchy and Ranaivoson (2011) does not find that the way channels are funded has a strong impact on the matter. Moreover the way subsidies should be awarded arises a series of questions, since often they are allocated to the most successful films which arguably would have needed them the least (Baughn and Buchanan, 2001).

While no final solution has been found on the best way to foster diversity, whether protectionism could help or free market would be a better option; nor a desirable level of cultural diversity has been identified, public bodies release general and highly unspecific guide lines for its preservation. The UNESCO Convention on the Protection and Promotion of the Diversity of Cultural Expression (2005) offers a broad and fuzzy definition of cultural diversity, without providing any criterion or ex post procedure to make the definition workable (Burri, 2010).

The EU shares the same interest as among the stated objectives for its new cultural agenda is “promotion of cultural diversity and intercultural dialogue” (Commission of the European Communities, 2007). In this respect the EU is specially concentrating on the stimulation of co-productions, assigning roughly 90% of the Eurimages – the European Cinema Support Fund - annual budget to their financing and having established the LUX prize in support of their circulation (Katsarova, 2014). Besides, every member country is invited to apply any measure it finds suitable to this objective, comprehending protectionist policies. These policies, theoretically capable of fostering diversity, are suspected not to be used for this reason. Mattelart and d’Haenens (2014) argue that these measures, said to promote multiculturalism and integration of minorities, actually mean ‘integrate’ in the sense of ‘assimilate’. The policies would then aim rather at the protection and preservation of national culture, than at a fair and equal representation of the various world cultures. National laws establishing these policies might not mention diversity as a goal, however the single countries, as members of the EU, are supposed to take it into consideration and act upon the guidelines of the Union, which is not happening according to Mattelart and d’Haenens (2014).

4. Methodology

The following section introduces the methodology followed to carry out the central analysis of the thesis, based on two papers which studied the same kind of phenomenon in different contexts. The chapter explains how the issue of measuring diversity is approached and what variables are considered in order to perform the study.

I intend to analyse if and how national subsidies affect diversity in the film industry. My focus will be on the European Union, due to the interest demonstrated by it on the subject relatively recently. Since the Union has diversity among its goals for the new cultural agenda (Commission of the European Communities, 2007) I wish to understand if the member states, with the subsidies they allocate to the film industry, are supporting the EU's aim.

Diversity is a very complex concept and measuring it in a complete and exhaustive way is not possible at present. There are however various studies which proposed a way to measure it; in particular I base my attempt to confront the challenge on the two papers by Moreau and Peltier (2004) and Benhamou and Peltier (2011).

Both studies distinguish the three dimensions of diversity – variety, balance and disparity – and the diversity supplied and consumed. In this paper I decided to only focus on the diversity supplied, because of time restrictions and because logically subsidies will have a greater effect on the supply side, rather than the consumption side. Moreover Ranaivoson (2007) highlights how in cultural goods demand adapts to supply, rather than the other way around as it normally happens. This means that the consumed diversity is somehow dependent on the supplied diversity, therefore the latter aspect seems more deserving of attention.

The measurement of the disparity dimension, due to its qualitative nature, requires the establishment of a taxonomy or a way to evaluate the distance between the various products. A tool to succeed in this has not yet been found for the cultural field. As Moreau and Peltier (2004) put it “Any attempt to quantitatively assert disparity between cultural products would be far too controversial and would only weaken the proposed tool” (p. 127, Moreau and Peltier, 2004). Thereby this dimension will be excluded from my analysis.

Moreau and Peltier (2004) propose a diversity study based on three units of analysis: film, geographical origin and genre. Benhamou and Peltier (2011) conduct an analysis considering diversity from the point of view of title – just a different way of referring to film – geographical origin and language.

I decided to focus my research on the two common units: film and geographical origin. The unit analysis of genre is hard to take into consideration as data on the subject are not easy to be found and there is an ongoing debate in the film world as to how a film genre should be defined and if it is even possible to have a clear division (Costa, 2011). The language unit is useful to assess the diversity produced as on the UNESCO website (www.uis.unesco.org) there is data available on the language films where produced in; but to have a more rounded analysis it would also be necessary to have data on the language the produced films were projected in in the various countries, which requires a long process of enquiries I have not gone through. The indicators for my research will then be:

Table 1. Diversity indicators

	Variety	Balance	Disparity
Film	<p><i>Supplied:</i></p> <ul style="list-style-type: none"> – No. films released – No. domestic releases (produced diversity) <p><i>Distributed:</i></p> <ul style="list-style-type: none"> – No. screens per 100,000 inhabitants 	<p><i>Supplied:</i></p> <ul style="list-style-type: none"> – Percentage films 100% nationally produced (produced diversity) 	
Geographical origin	<p><i>Supplied:</i></p> <ul style="list-style-type: none"> – No. countries of origin – No. feature films coproduced (produced diversity) 	<p><i>Supplied:</i></p> <ul style="list-style-type: none"> – HHI countries of origin 	

For the film unit the thesis considers:

- Variety supplied: the number of films released per year in each country and the number of domestic releases. The latter stands as an indicator of the variety produced (Benhamou and Peltier, 2011).
- Variety distributed: the number of screens available per 100,000 inhabitants. This is an indicator of accessibility, important to estimate the chance that the diversity offered can be widely available in time and space (Moreau and Peltier, 2004).

- Balance supplied: percentage of films 100% nationally produced among the total number of new releases. This offers an indication of the diversity produced in a country (Benhamou and Peltier, 2011).

For the geographical origin unit the study considers:

- Variety supplied: the number of countries represented among each year's newly released movies and the number of co-productions the country took part in. The latter stands as an indicator of the variety produced (Benhamou and Peltier, 2011).
- Balance supplied: the Herfindhal-Hirschmann index, reflecting the degree of concentration of the films released for the various geographical origins. The HHI measures simultaneously variety and balance, since a variation in the number of subjects affects the final result. It varies between 0 – indicating the lowest possible industry concentration – and 10,000 – indicating a market dominated by one only player. The higher the HHI, the lower the diversity (Moreau and Peltier, 2004). This last statement though is not shared by all since, as said before, both a very high and a very low concentration reduce diversity according to Alexander (1996, as reported in Ranaivoson, 2007).

I will study the variation of these indexes during a period of nine years in eight countries member of the European Union.

I will then try to determine whether changes in diversity indicators are consistent with a positive effect of subsidies on diversity in the selected years in these countries. Since demography and economic growth have a big influence on the vitality of the cinema industry (Benhamou and Peltier, 2011) I will add the GDP per capita to the equation. Along with the GDP the regressions will be controlled by the year as external tendencies or fashions might also influence the diversity level and the population size, to control for dimension influences.

5. Method

In this section the data set is presented. First an account of the origin of the utilised data is given. Secondly the different variables are described and an illustration of the variation of the data in the analysed years is given for each country in the study, with the aid of various graphs.

5.1 Data set

In order to check the effect of subsidies on the indicators of diversity mentioned above I need to build a database containing information about these indicators in the highest possible amount of countries for the longest possible period of time. Most of the data were gathered from the national film institutions of the selected country as indicated by the European Audio-visual Observatory website (<http://www.obs.coe.int/web/obs-portal/home>). Data about GDP and population size were instead retrieved from Eurostat (<http://ec.europa.eu/eurostat/data/database>). Table 2 displays the organizations the data was taken from.

Eight countries were selected for the analysis due to information availability. Many European countries do not offer access to, or do not have clear ways to access, the data needed for this study and were therefore excluded from it. The analysed countries are Spain, France, Portugal, Finland, Denmark, Estonia, Sweden and Italy. Again for reasons of data availability the study will focus on a period of nine years, between 2005 and 2013, since these were the years which all (or almost all) the necessary data was available for.

Table 2. Data sources

Variables	Denmark	Estonia	Finland	France	Italy	Spain	Portugal	Sweden
No. films released	2005-2013 DFI	2005-2013 EFI	2005-2013 FFF	2005-2013 CNC	2005-2013 Cinetel	2005-2013 MECD	2005-2012 ICA	2005-2013 SFI
No. domestic releases	2005-2013 DFI	2005-2013 EFI	2005-2013 FFF	2005-2013 CNC	2005-2013 Cinetel	2005-2013 MECD	2005-2012 ICA	2005-2013 SFI
Percentage of 100% nationally produced films	2005-2012 DFI	2005-2013 EFI	2005-2013 FFF	2005-2013 CNC	2005-2013 Cinetel	Missing data	2005-2012 ICA	2005-2007 SFI
No. co-	2005-	2005-	2005-	2005-	2005-	Missing	2005-	2005-

productions	2013	2013	2013	2013	2013	data	2012	2007
	DFI	EFI	FFF	CNC	Cinetel		ICA	SFI
No. screens / 100,000 inhabitants	2005-2013	2005-2013	2005-2013	2005-2013	2005-2013	2005-2013	2005-2013	2005-2013
	DFI	EFI	FFF	CNC	Cinetel	MECD	ICA	SFI
No. countries of origin	2005-2013	2005-2013	2005-2013	Missing data	2005-2013	2005-2013	2005-2012	2005-2013
	DST	EFI	FFF		Cinetel	MECD	ICA	SFI ^a
Geographical HHI	2005-2013	2005-2013	2005-2013	2005-2013	2005-2013	2005-2013	2005-2012	2005-2013
	DST	EFI	FFF	CNC	Cinetel	MECD	ICA	SFI ^a
Subsidies	2005-2013	2005-2013	2005-2013	2005-2013	2005-2013	2005-2013	2005-2012	2005-2013
	DFI	EFI	FFF	CNC	MiBAC	MECD	ICA	SFI ^a
GDP per capita	2005-2013	2005-2013	2005-2013	2005-2013	2005-2013	2005-2013	2005-2013	2005-2013
	Eurostat	Eurostat	Eurostat	Eurostat	Eurostat	Eurostat	Eurostat	Eurostat
Population size	2005-2013	2005-2013	2005-2013	2005-2013	2005-2013	2005-2013	2005-2013	2005-2013
	Eurostat	Eurostat	Eurostat	Eurostat	Eurostat	Eurostat	Eurostat	Eurostat

Note. DFI = Danish Film Institute; DST = Statistics Denmark; EFI = Estonian Film Institute; FFF = Finnish Film Foundation; CNC = French National Film Centre; MiBAC = Italian Ministry for Cultural Heritage and Cultural Activities; MECD = Spanish Ministry of Education, Culture and Sport; ICA = Portuguese Institute for Cinema and Audio-visuals.

^a Data provided in a direct communication with the Film Institute and not available online.

5.1.1 Set of dependent variables

In this section the dependent variables, serving as diversity indexes, are presented, with the specification of possible missing data for some of them and eventual methods of calculation to obtain the final datum used in the regression.

Number of films released: Variety supplied for the film unit will be accounted for by the number of films of every kind and length newly released in the analysed countries in each of the nine years. For Portugal the information is missing for the year 2013.

Number of domestic releases: The supplied produced film variety will be represented by the number of domestic films of any length and kind newly released in the country every year. The information is again missing for Portugal in the year 2013.

Percentage of 100% nationally produced feature films: The supplied produced film balance is accounted for by the percentage of 100% nationally produced feature films on the overall number of released feature films. The values of the variable were calculated dividing the number of films 100% nationally produced by the number of feature films released, data gathered from the institutions displayed in Table 2.

Information on the number of 100% nationally produced films is not available for each country every year. It is missing for Spain *in toto*, for Sweden between 2008 and 2013, for Portugal and Denmark for the year 2013. This lack of data will not compromise the analysis since multilevel models, which will be used for this study, can estimate parameters successfully notwithstanding missing data (Field, 2013).

Number of co-productions: Co-productions are considered as a sign of the supplied produced geographical variety. Again data is not available for Spain *in toto*, for Sweden between 2008 and 2013 and Portugal for the year 2013. This variable is of particular interest since the work of the European Union in fostering diversity in the film industry has very much concentrated on the stimulation of co-productions. Roughly 90% of the funds handed out by the Union within the Eurimages program are assigned to this purpose and the LUX prize has recently been instituted to support their circulation (Katsarova, 2014).

Number of screens: The number of screens available per 100,000 inhabitants offers an idea of the accessibility of films to the population and is here considered an index of the film variety distributed.

Number of countries of origin: The number of countries producer or co-producer of at least one film released in one country in one year accounts for the geographical variety supplied. This information is missing for France since the data reported by the CNC attributes films singularly to 27 countries while attributing the rest to 'other' countries not better specified. Thus the resulting number of countries of origin for films released in France is always 28 and therefore not considered.

Geographical HHI: The geographical HHI is an index for the geographical balance supplied. It is computed by attributing each released film in a country in one year to one or more nations. For Sweden, Spain, Denmark, Finland, France and Italy what was available was a list stating how many films came from each country. For Estonia and Portugal instead, a list of all the films released per year was provided; for every film there was an indication about the producing country/ies. In this case if the film was produced by one single country then one whole film was attributed to said country, if the film was coproduced then an equal fraction of the film was attributed to each coproducing country. In co-productions there are usually one or more major co-producers and one or more minors, so not all the participating countries contribute to the same degree. However, since information about the participation level of each country is hardly available I assumed all the coproducing countries participated equally (so if a film was co-produced by two countries I would attribute 0.5 films to each and so

on). At this point, once a list stating the number of films coming from each country was made, the Herfindahl-Hirschman Index was calculated. The values of this index can vary from 0 to 10,000, a higher value indicates a higher concentration. The HHI is both a measure of balance and variety, since its results change also according to the number of players considered. For France however, given that the number of countries considered is always the same, as mentioned above, it only accounts for the geographical balance.

5.1.2 Set of independent variables

This section describes the independent variables used in the regressions and the reason why each control variable was inserted in the model. Hypotheses about the results are also introduced.

Subsidies: Subsidies are the focus independent variable for all the regressions run in this thesis. To control for the size of each country this variable will be used in terms of subsidies per capita. Their effect is expected to be significant and positive on all aspects of diversity production (H_1) following Katsarova (2014) in her statement that European countries have a greater focus on production than distribution and promotion. Seconding the suspicions of Kish (2001) and Mattelart and d'Haenens (2014) on the effect of protectionist policies on the overall diversity, subsidies are not expected to have an effect on any of the indicators other than the ones of produced diversity (H_2).

GDP: GDP acts as a control variable for the country's wealth, to have a real wealth control and consider also the demographics of each country I use GDP per capita.

Year: The year variable is inserted in the analysis to control for eventual external factors. As attention to diversity has become stronger and stronger since the UNESCO convention (2005), some positive effects might be due to a global tendency in this direction. Besides, the economic crisis of 2008 affected the whole world and might have had an effect on the films produced and screened all over the world. To control for global or European trends not due to subsidy or wealth reasons, year will be used as an independent variable in all the regressions.

Population size: The size of the country and its population most probably have an effect in the films exhibited and produced. To control for this influence the independent variable of population size in million inhabitants is inserted in the analysis.

Summary statistics of all the variables are displayed in table 3.

Table 3. Descriptive statistics

Variable	N	Mean	Std. Dev.	Min.	Max.
Geographical HHI	71	2846.568	542.045	2114.20	4941.60
No. films released	71	340.55	158.403	145	654
No. domestic releases	71	91.32	91.726	4	330
Screens / 100,000 inhabitants	72	6.276	2.041	3.09	10.77
No. countries of origin	62	28.52	7.991	14	49
Percentage of 100% nationally produced films	55	.134	.101	.03	.31
No. co-productions	56	26.68	35.982	2	133
GDP per capita	72	28197.222	10508.0649	8300.00	45500
Subsidies per capita	72	3.081	2.176	.00	8.66
Population size M	72	25.237	25.107	1.29	65.56

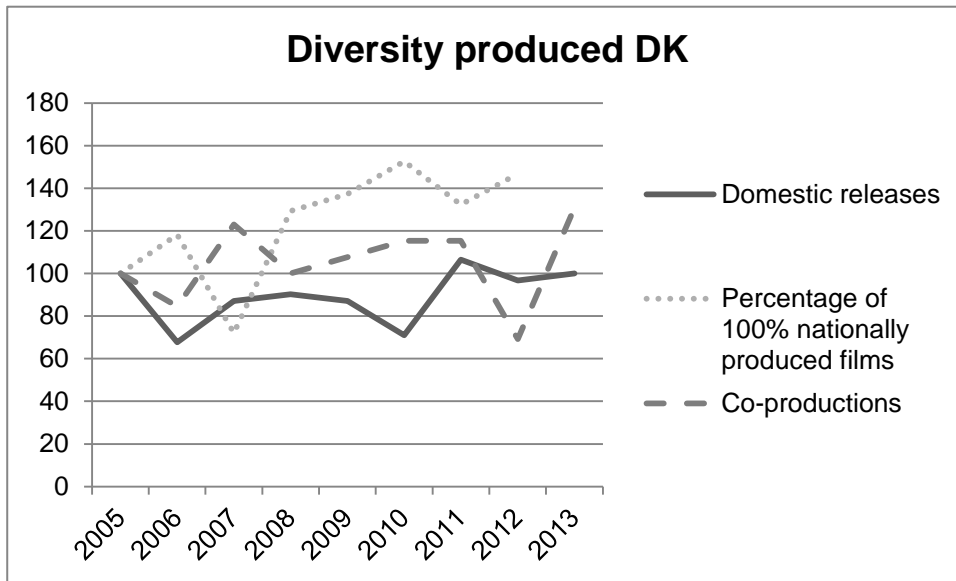
5.1.3 Data by country

The following graphs give a clearer picture of the data collected. For each country three graphs are presented showing the variation in the produced diversity variables, the supplied and distributed diversity variables and the independent variables. To compare the variations of these variables expressed in different units, they were all transformed into percentage variations, always starting with 100 for the values of the year 2005. Explanation is given for exceptional peaks and/or relevant data variations in the graphs, where possible.

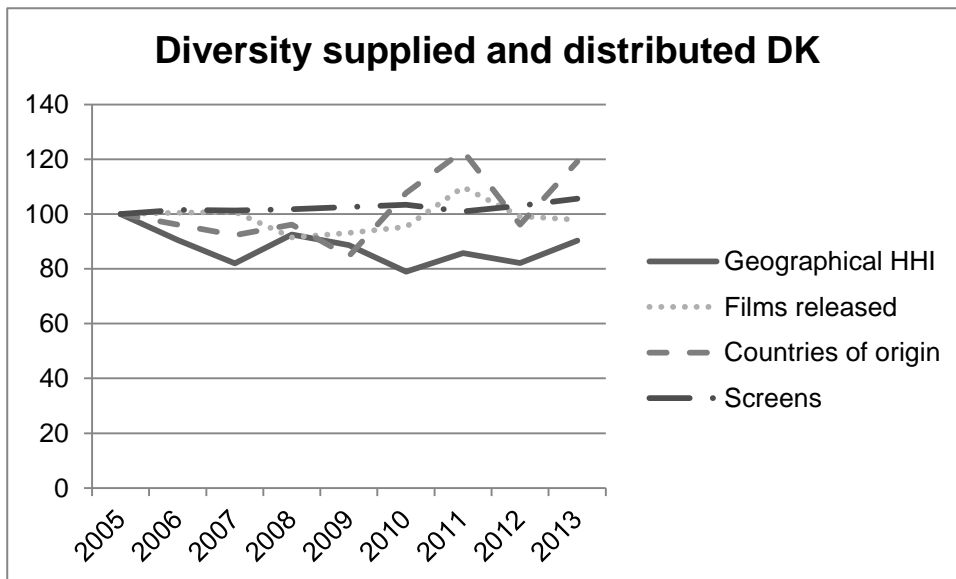
Denmark

The seemingly tortuous variation of the percentage of films 100% nationally produced and number of co-productions is due to the small numbers the lines describe. The negative peak in co-productions in 2012, for instance, is only describing a difference of 6 films between 2011 and 2012.

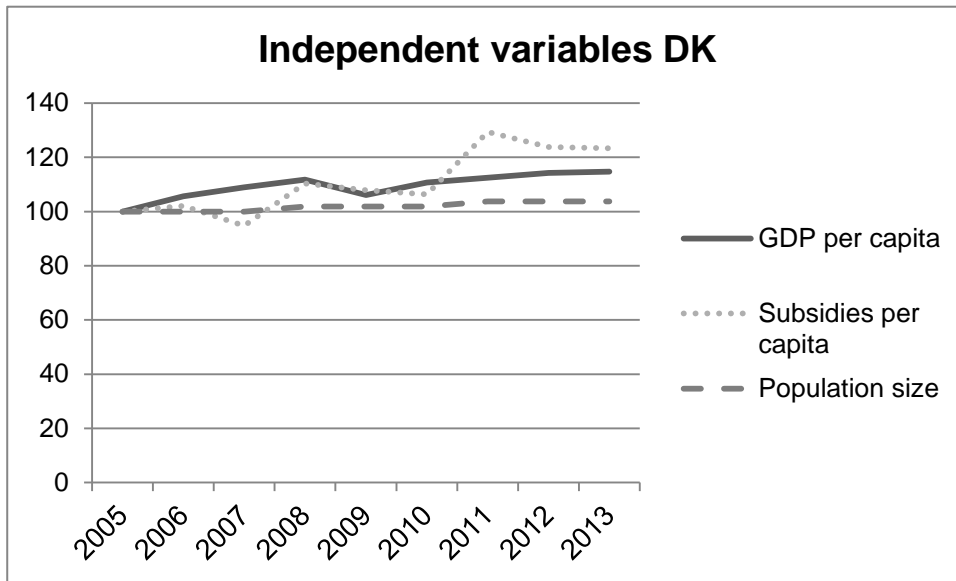
Graph 1. Diversity produced in Denmark



Graph 2. Diversity supplied and distributed in Denmark



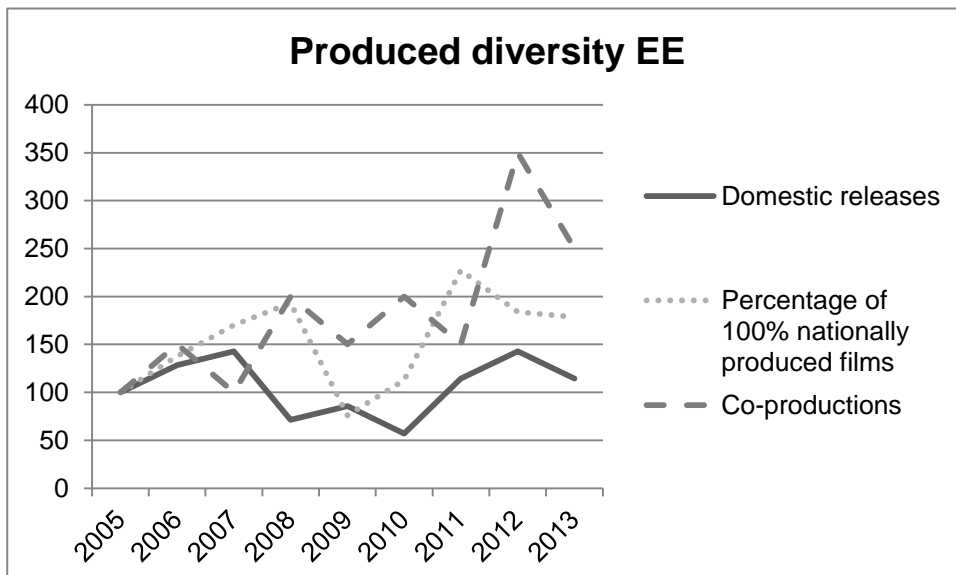
Graph 3. Independent variables Denmark



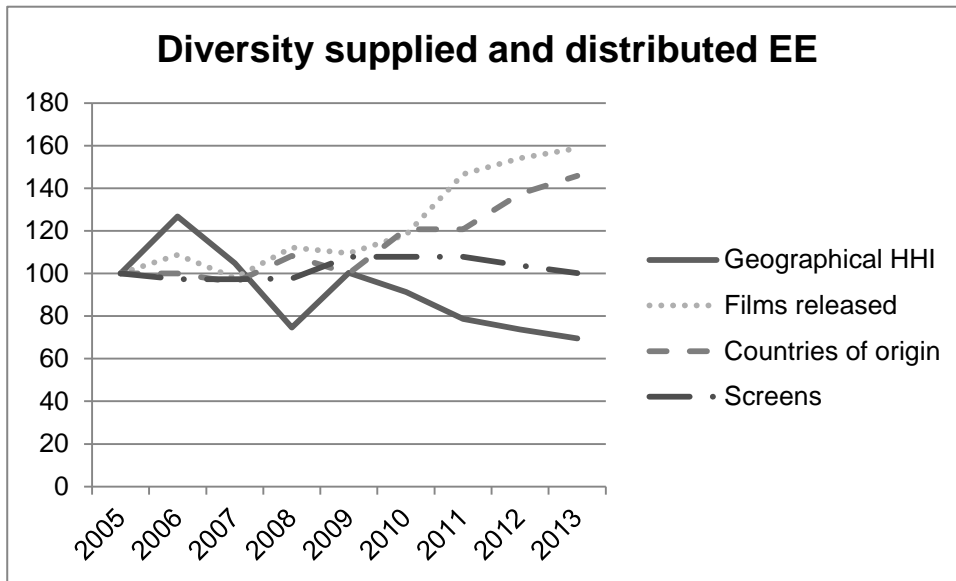
Estonia

Estonia is a small country with a small national production, the peaks in the graph are explained by the fact that the numbers accounted for are low and therefore even a small change in numbers can cause the percentage variation to fluctuate greatly.

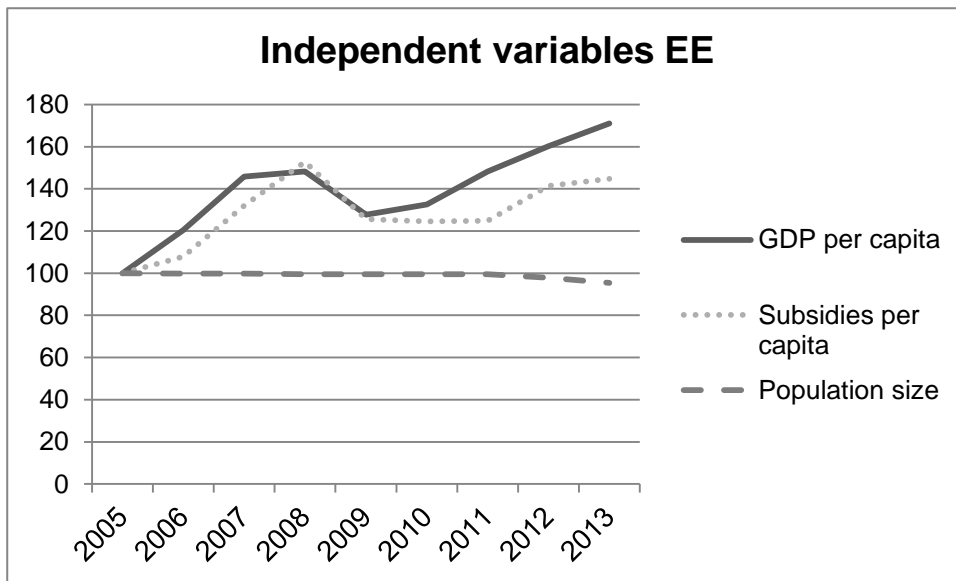
Graph 4. Diversity produced in Estonia



Graph 5. Diversity supplied and distributed in Estonia



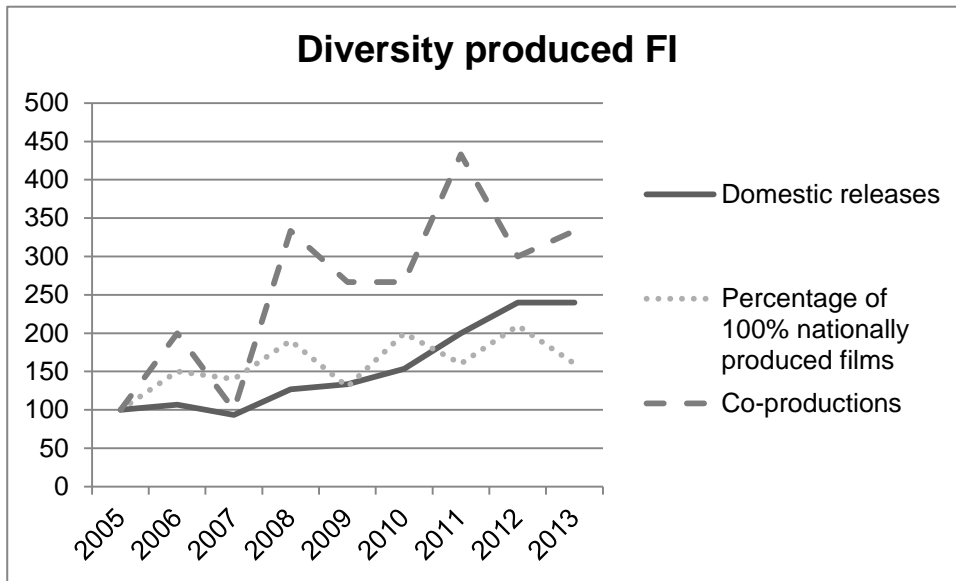
Graph 6. Independent variables Estonia



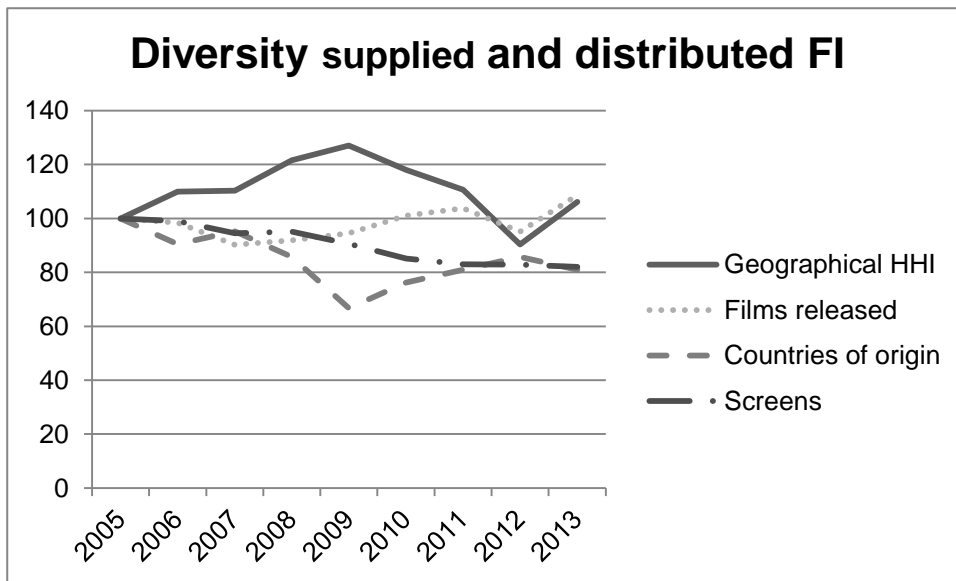
Finland

The number of co-productions varies greatly and there is a specially notable peak in 2008. Again the numbers described are not high, so even a small variation causes a great percentage change, however a transition from 3 to 10 co-produced films is still notable.

Graph 7. Diversity produced in Finland

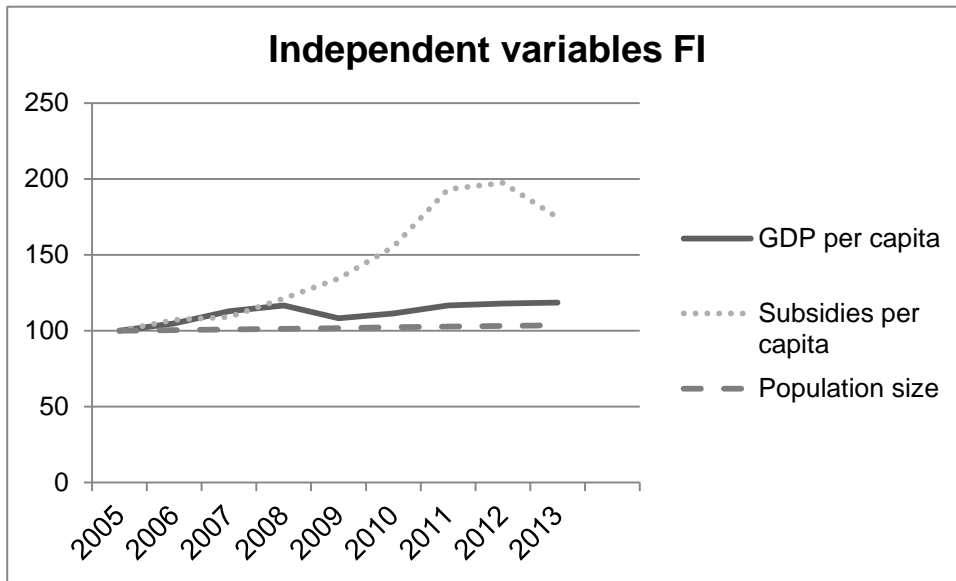


Graph 8. Diversity supplied and distributed in Finland



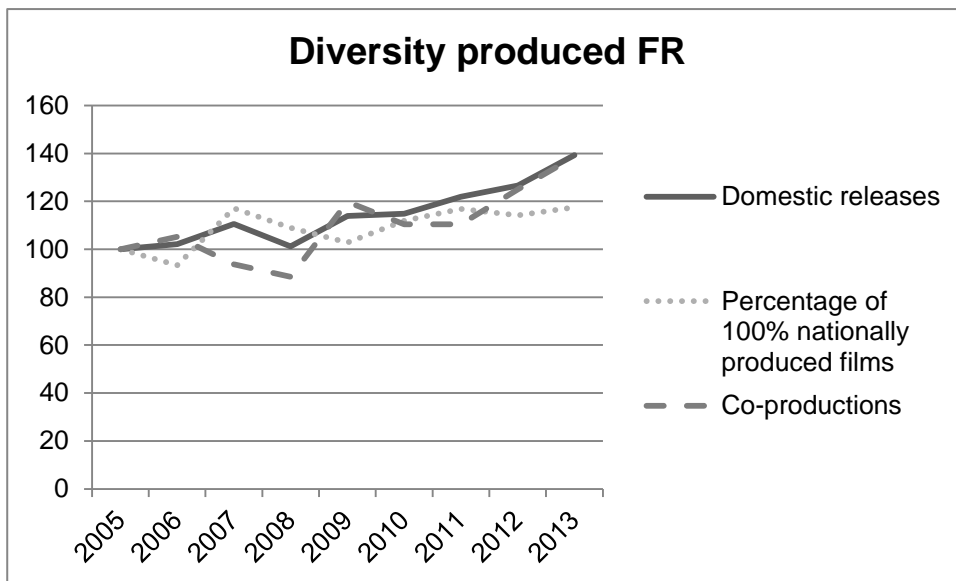
The amount of subsidies per capita have substantially grown during the analysed years until 2012, without an analogous GDP growth. It was not possible to find any document explaining the motivations of this outstanding growth, but I hypothesize this is consistent with the cultural programme of the Finnish government and that the economic crisis did not strike the country very hardly, as it did other countries subjects in the study.

Graph 9. Independent variables Finland

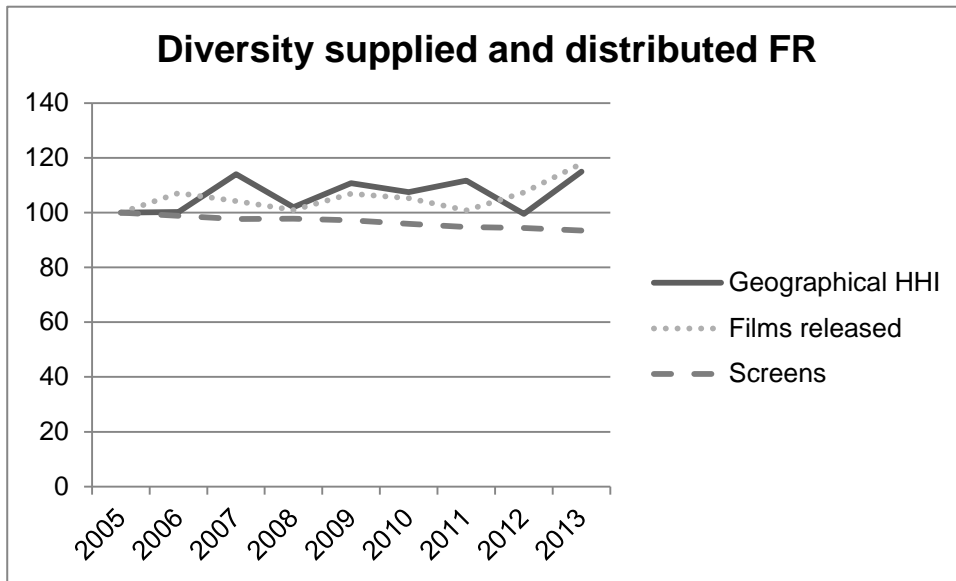


France

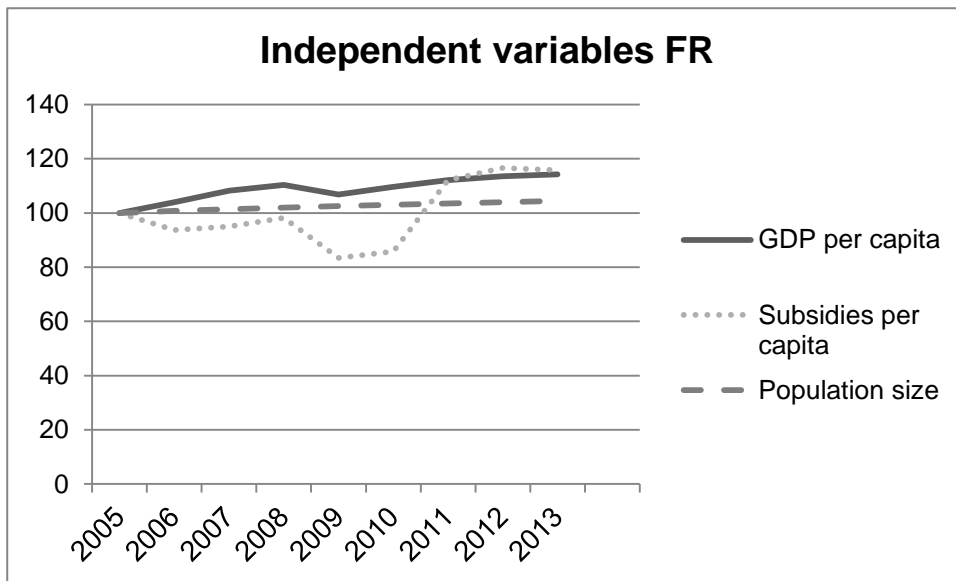
Graph 10. Diversity produced in France



Graph 11. Diversity supplied and distributed in France



Graph 12. Independent variables France

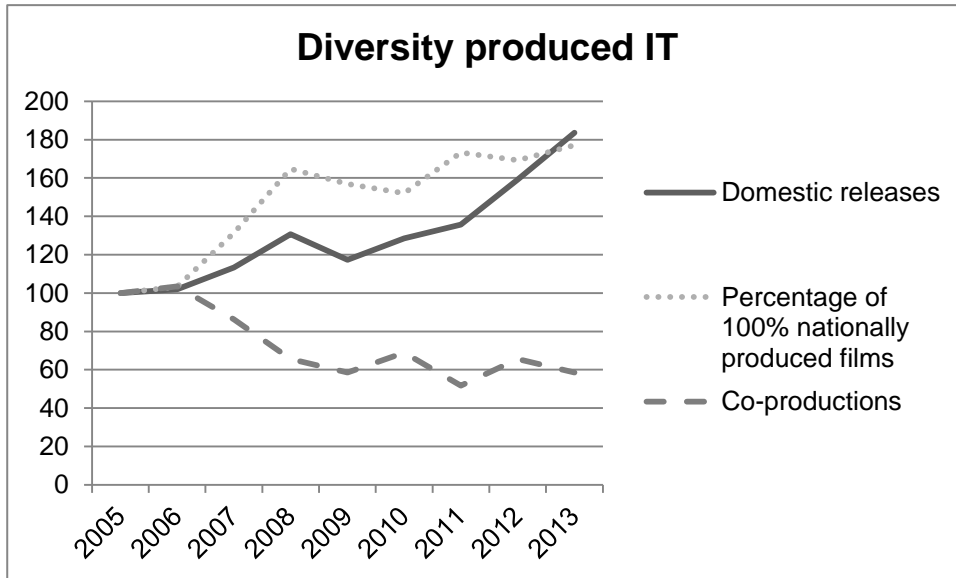


Italy

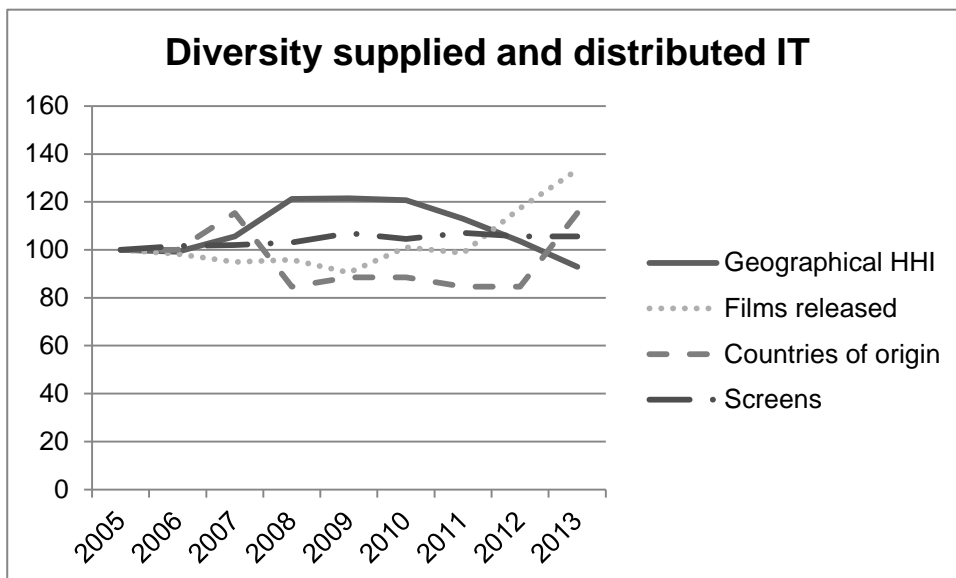
The curves describing the number of co-productions and the number of domestic releases have very different directions. The number of domestic releases keeps on growing during the analysed period to arrive at a number of national productions similar to countries that are comparable to Italy for the subsidies allocated per capita and the population size, such as Spain. The number of co-productions instead falls even though it did not start from a very high amount, as it can be compared to countries with

a similar amount of subsidies per capita but a much lower number of inhabitants, such as Sweden.

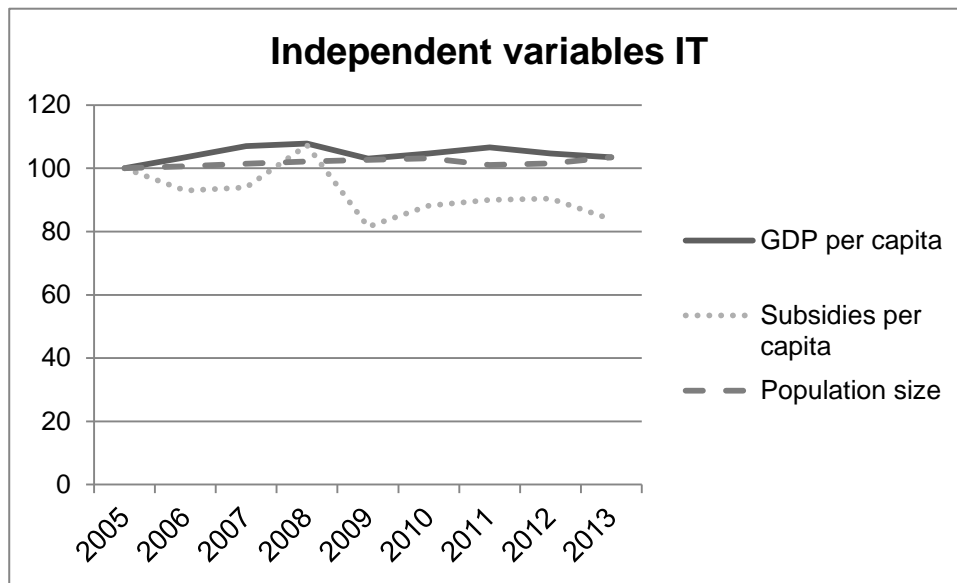
Graph 13. Diversity produced in Italy



Graph 14. Diversity supplied and distributed in Italy



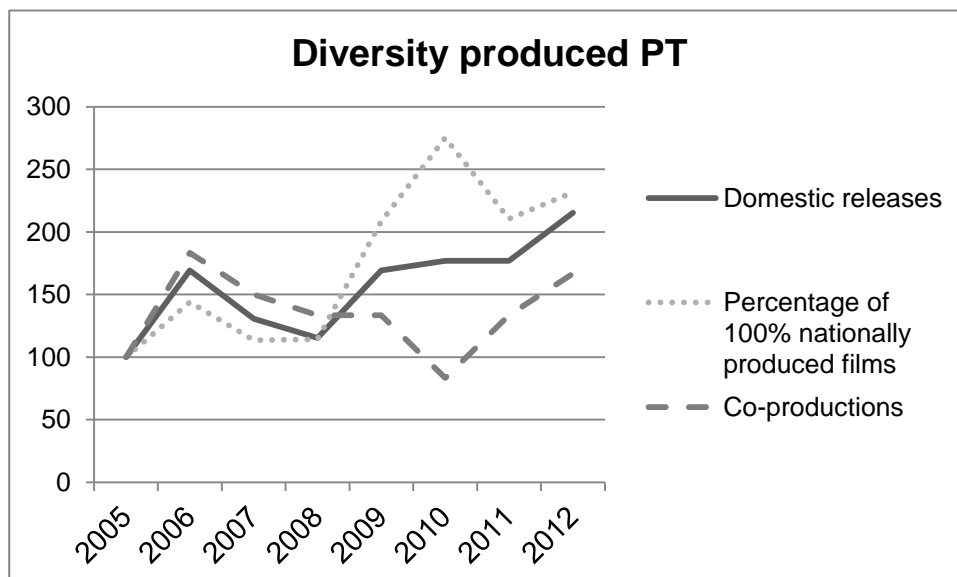
Graph 15. Independent variables Italy



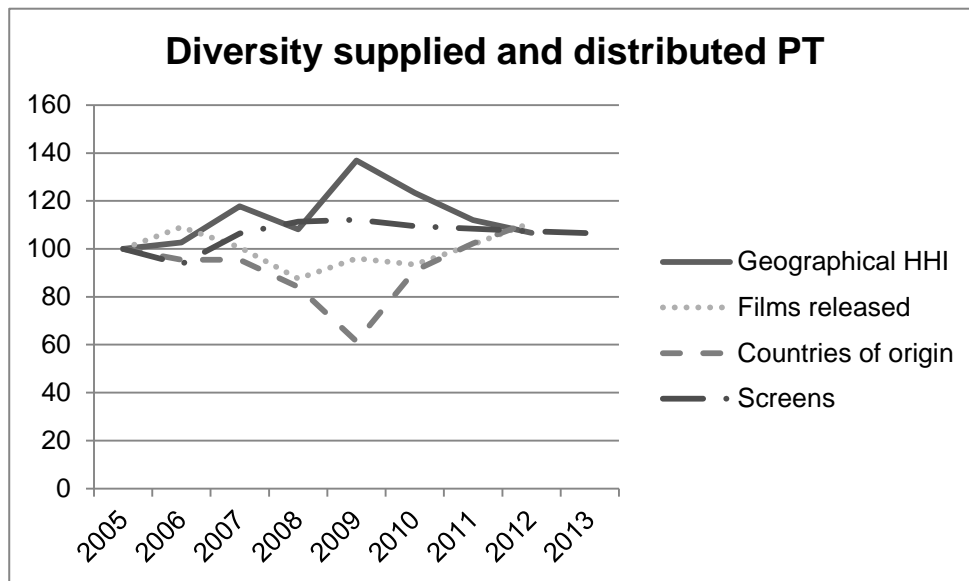
Portugal

The opposite peaks of percentage of 100% nationally produced feature films and number of co-productions are notable, even though the numbers dealt with are again low so the percentage variation might look more relevant than it would be looking at the actual numbers.

Graph 16. Diversity produced in Portugal



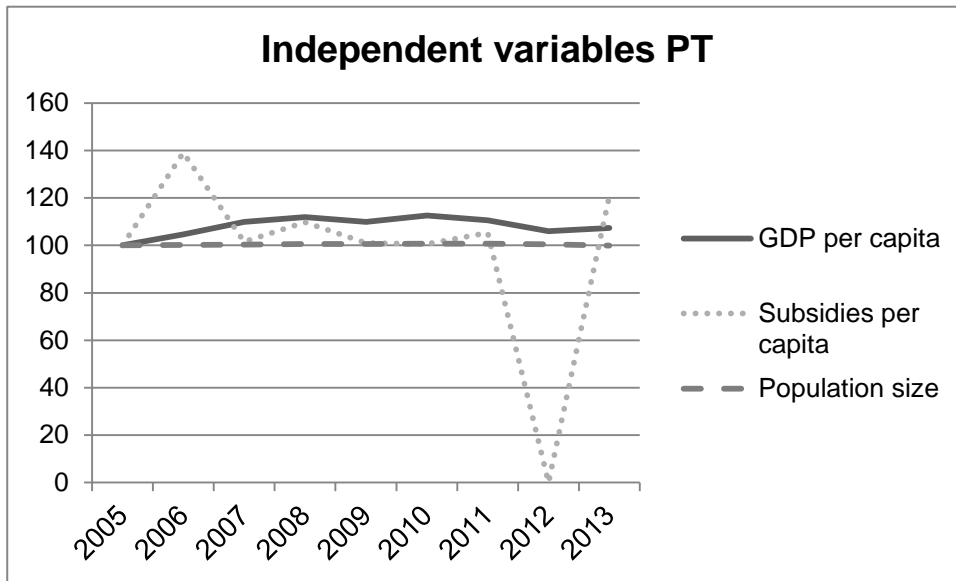
Graph 17. Diversity supplied and distributed in Portugal



The amount of public subsidies allocated to the film industry in Portugal are accounted for in different documents on the ICA website (<http://www.ica-ip.pt>) under the different headers of Production, Distribution, Exhibition, Festival, Formation. Data about the subsidies allocated for distribution and formation in 2005 and 2006 were missing. As to formation there seems to be a constant amount of money to support it, so the same was estimated for these two years. The amounts allocated for distribution were estimated by calculating the average percentage variation occurred in the following years and applying it retrospectively.

The downward peak in Graph 18 of subsidies per capita in 2012 is due to the allocation of no subsidies to the film industry from the Portuguese government for that year.

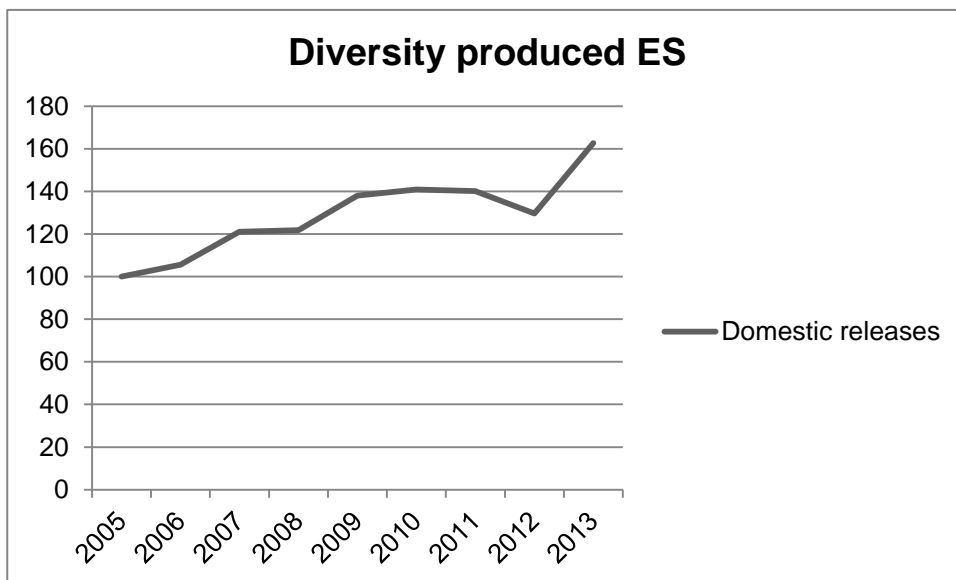
Graph 18. Independent variables Portugal



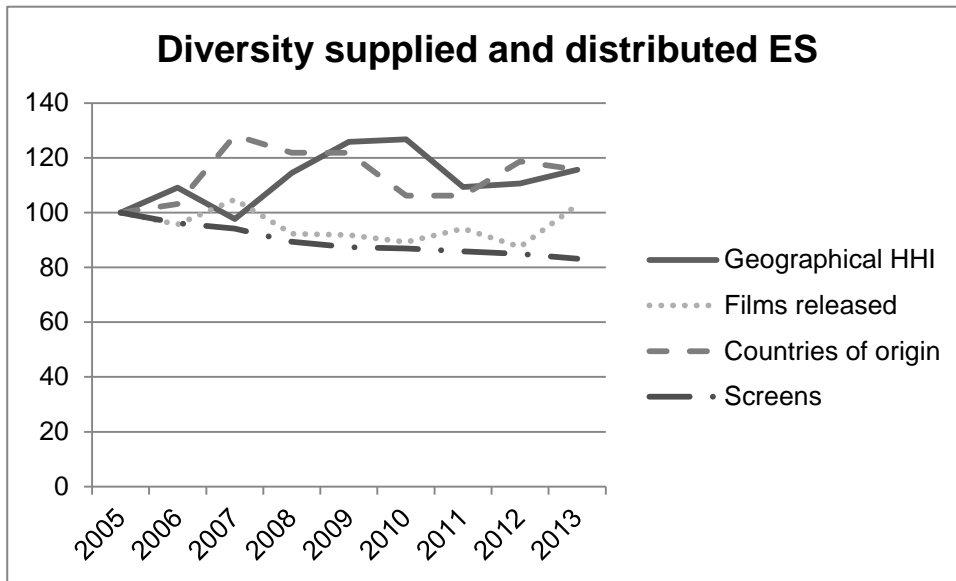
Spain

The only indicator of produced diversity considered for Spain is the number of domestic releases since data on films 100% nationally produced and the number of co-productions was not available.

Graph 19. Diversity produced in Spain

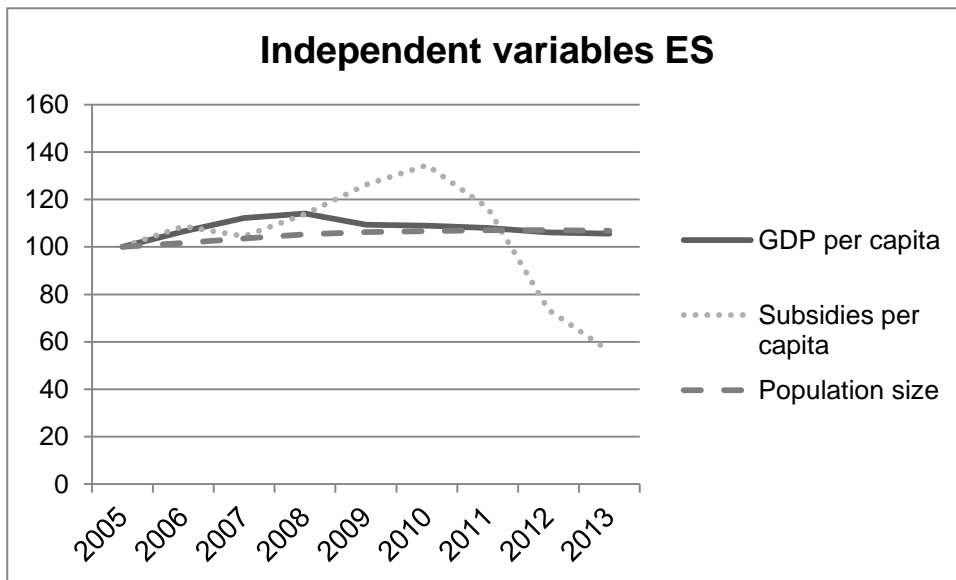


Graph 20. Diversity supplied and distributed in Spain



In graph 21 is notable how the amount of subsidies allocated to the film industry by Spain has started hastily decreasing in 2010, arguably a consequence of the economic crisis.

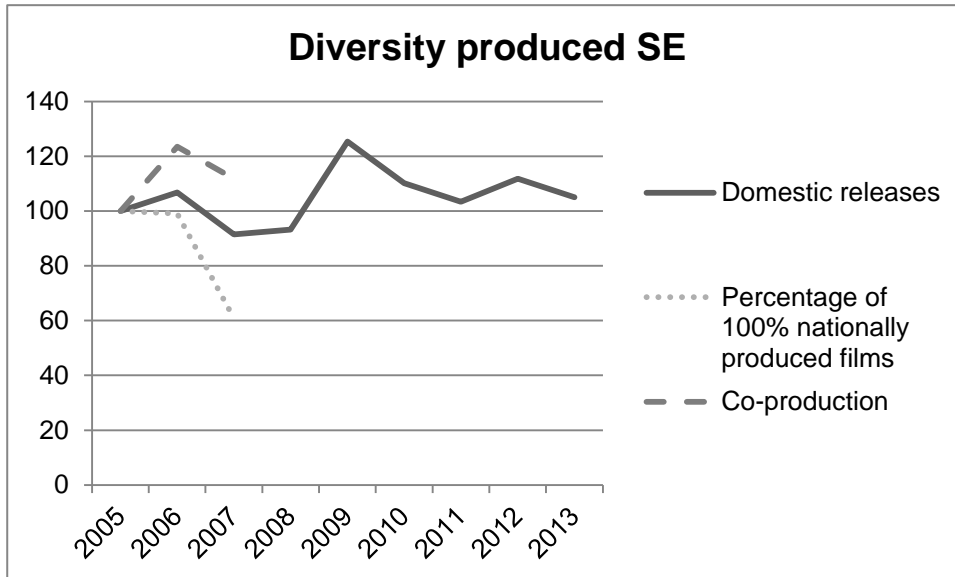
Graph 21. Independent variables Spain



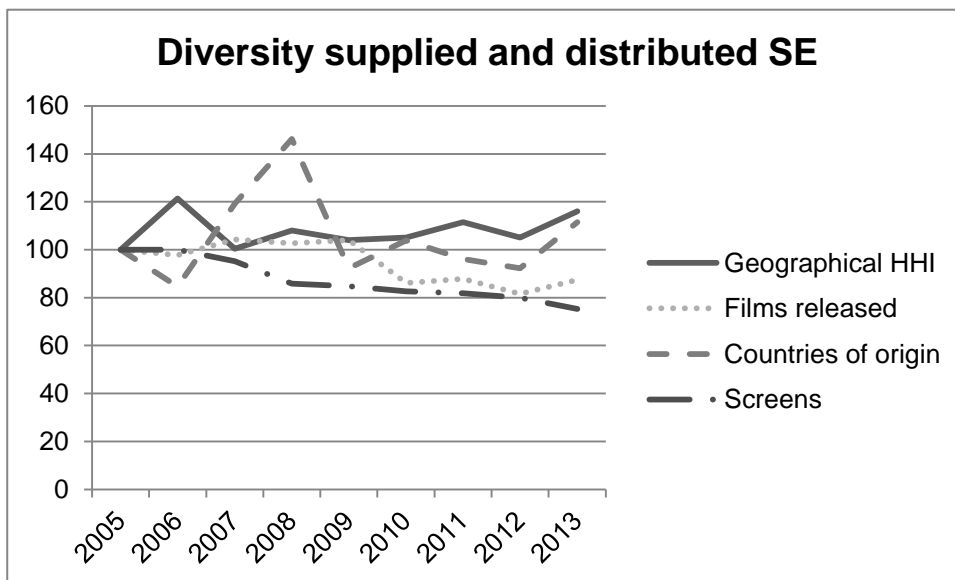
Sweden

For Sweden diversity produced is accounted for by all three indicators only until 2007, as no data about the percentage of 100% nationally produced feature films and the number of co-productions was available after that year.

Graph 22. Diversity produced in Sweden



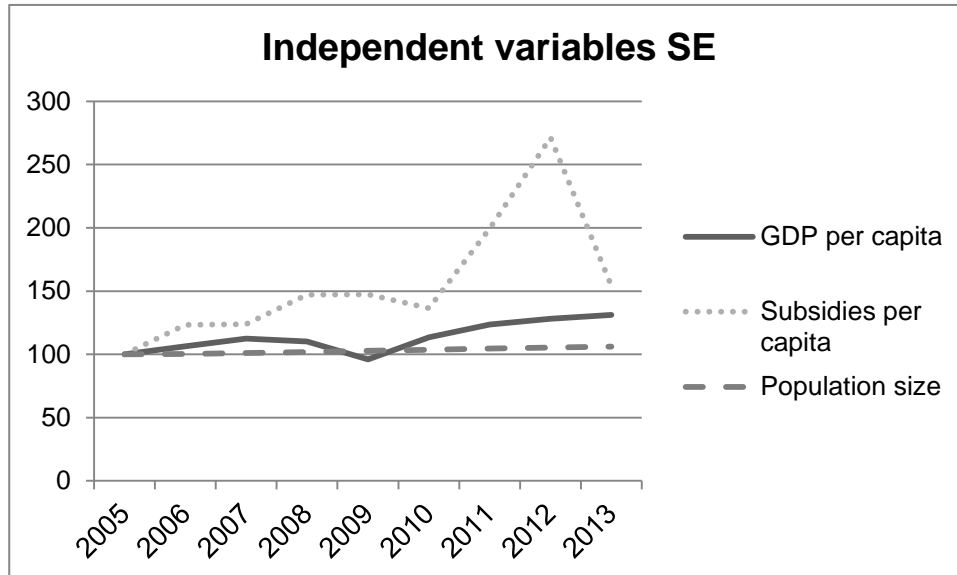
Graph 23. Diversity supplied and distributed in Sweden



The amount of subsidies are reported by the SFI in Swedish krona, the values were converted through the website fxtop.com at the exchange rate registered on 1st January of each year of interest. The subsidies per capita show a positive peak

in 2012, to then decrease again from the following year. No explanation can be given for this.

Graph 24. Independent variables Sweden



5.2 Specification and estimation of the models

This section explains what model the data is fitted to in the regression analyses carried out with the data described in the previous paragraphs.

The study fits multilevel linear models for all the diversity indexes except the percentage of 100% nationally produced films and the number of national co-productions which are best described as simple linear models.

Such models use fixed and random effects accounting for correlation in the data, linearly introduced into the model. The data set is structured in two hierarchical levels, with level 1 units nested in the level-2 units of countries. The general specification of the models is:

$$y_{i\text{country}} = \beta_{0\text{country}} + \beta_1 \text{Subsidy}_{yi} + \beta_2 \text{GDP}_i + \beta_3 \text{Year}_i + \beta_3 \text{Population}_i + \varepsilon_{i\text{country}}$$

$$\beta_{0\text{country}} = \beta_0 + u_{0\text{country}}$$

where the intercept $\beta_{0\text{country}}$ is modelled as a random intercept in terms of level-2 country variables. The slopes do not vary across contexts and are therefore fixed. The focal independent variable is the amount of subsidy given to the film industry each year controlled by the GDP per capita, country size and year.

All models are tested for normality and homoscedasticity. A histogram showing the distribution of the model's residuals is produced for every model to visually check whether the normality assumption holds. The assumption is also checked through the Kolmogorov-Smirnov test which "compares the scores in the sample to a normally distributed set of scores with the same mean and standard deviation. If the test is non-significant ($p > .05$) it tells us that the distribution of the sample is not significantly different from a normal distribution" (Field, 2013). The assumption of homoscedasticity is tested through Levene's test which "tests the null hypothesis that the variances in different groups are equal" (Field, 2013). If the test is non-significant ($p > .05$) the variances are roughly equal and the assumption is tenable (Field, 2013). All the graphs, tables and specifications regarding assumption tests are to be found in Appendix A.

6. Results

This section firstly reports the results of the various regressions run having each time a different diversity indicator as output. Secondly, the implications of these results are discussed and linked to the literature previously analysed in chapter 3. Lastly, the limitations of the study are outlined and suggestions for future research are given.

6.1 Data analysis

6.1.1 Geographical origin HHI

The geographical origin HHI appears not to be significantly predicted by any of the considered independent variables.

Table 4. Geographical HHI regression

Coefficients	Value	Standard error	P value
Fixed effects			
Overall intercept	31712.830	35016.889	.368
Subsidies per capita	24.647	58.798	.681
GDP per capita	-.012	.013	.400
Year	-14.209	17.495	.419
Population M	-2.815	5.574	.632
Random effects			
Country intercept (variance/standard error)	126889.43 / 70438.87		
AIC / BIC	1064.164 / 1080.003		
logLik	1050.164		
Number of observations	71		
Number of groups (countries)	8		

After testing the model's assumption normality was found to hold valid, while the homoscedasticity assumption was breached (see Appendix A)

6.1.2 Films released

The overall number of films released in the cinemas is significantly predicted by the variables of year and population size. The passing of time positively influences the output with the year variable having a positive sign (4.239), which shows an upward overall trend in the number of films released. The variable of population size also positively affects the output (5.237) indicating that the bigger the country the higher number of films will be released in the theatres.

Table 5. Films released regression

Coefficients	Value	Standard error	P value
Fixed effects			
Overall intercept	-8216.028	3271.855	.014
Subsidies per capita	.361	7.032	.959
GDP per capita	-.003	.002	.087
Year	4.239	1.643	.012
Population M	5.237	1.064	.002
Random effects			
Country intercept (variance/standard error)	33.431 / 19.773		
AIC / BIC	726.559 / 742.398		
logLik	712.559		
Number of observations	71		
Number of groups	8		

After testing the model for normality and homoscedasticity both assumptions are found to hold valid.

6.1.3 Domestic films released

The number of nationally produced films released in the cinemas is highly significantly predicted by all the variables except the one indicating the amount of subsidies per capita allocated to the film industry. GDP per capita has a slightly negative relation with the output (-.002), which would indicate that richer countries per capita release a slightly inferior amount of domestic films compared to poorer countries. Population size and year are instead positively related to the output indicating an upward trend in time in the amount of domestic films released and a tendency of releasing more domestic films in comparatively bigger countries.

Table 6. Domestic releases regression

Coefficients	Value	Standard error	P value
Fixed effects			
Overall intercept	-10020.644	1360.921	< .001
Subsidies per capita	-.018	3.016	.995
GDP per capita	-.002	.001	.010
Year	5.017	.685	< .001
Population M	3.991	.721	.003
Random effects			

Country intercept (variance/standard error)	33.431 / 19.773
AIC / BIC	602.927 / 618.766
logLik	588.927
Number of observations	71
Number of groups	8

After testing the model for normality and homoscedasticity both assumptions are found to hold valid.

6.1.4 Screens per 100,000 inhabitants

The number of screens available per 100,000 inhabitants is significantly predicted by none of the considered variables.

Table 7. Number of screens regression

Coefficients	Value	Standard error	P value
Fixed effects			
Overall intercept	74.520	45.559	.106
Subsidies per capita	-.107	.104	.308
GDP per capita	-4.525E-5	3.149E-5	.155
Year	-.033	.023	.160
Population M	-.042	.029	.187
Random effects			
Country intercept (variance/standard error)	33.431 / 19.773		
AIC / BIC	126.902 / 142.838		
logLik	112.902		
Number of observations	72		
Number of groups	8		

After testing the model for normality and homoscedasticity both assumptions are found to hold valid.

6.1.5 Number of countries of origin

The number of countries of origin is significantly predicted by none of the considered variables. The only positive relation is with the year variable (.432) which would show an upward trend through the considered years in the number of countries where films

released came from. The year variable does not predict the output very significantly but its P value (.063) still shows some correlation.

Table 8. Countries of origin regression

Coefficients	Value	Standard error	P value
Fixed effects			
Overall intercept	-833.008	456.569	.073
Subsidies per capita	-.818	.884	.362
GDP per capita	-.0001	.0002	.503
Year	.432	.228	.063
Population M	-.004	.113	.969
Random effects			
Country intercept (variance/standard error)	33.431 / 19.773		
AIC / BIC	384.140 / 399.030		
logLik	370.140		
Number of observations	62		
Number of groups	7		

After testing the model for normality and homoscedasticity both assumptions are found to hold valid.

6.1.6 Percentage of feature films 100% nationally produced

To estimate the percentage of 100% nationally produced feature films against the overall number of released feature films, a simple linear model is used. Including a random intercept to nest level 1 units into countries (level 2 units) did not improve the model, and actually increased the value of the log-likelihood. The focal independent variable is the amount of subsidy per capita allocated to the film industry each year controlled by the GDP per capita, the population size and the year.

The model then takes the form:

$$\text{National_films_percentage}_i = \beta_0 + \beta_1 \text{Subsidy}_i + \beta_2 \text{GDP}_i + \beta_3 \text{Year}_i + \beta_3 \text{Population}_i + \varepsilon_i$$

Table 9 displays the estimates for the percentage of the 100% nationally produced feature films equation. The standard errors and confidence intervals have been computed using Bias-corrected and accelerated bootstrapping to overcome uncovered problems of non-normality and heteroscedasticity. Field (2013) states that problems dealing with violated assumptions can be overcome by using robust methods like

bootstrapping, which will generate confidence intervals and significance tests of the model parameters.

The model accounts for 91.8% of the variation in the outcome with two highly significant predictors. The population size and year show a positive relation to the outcome. This indicates that the more populated the country is the more feature films nationally produced will be released in cinemas compared to other nationalities; as well as that in the analysed years there has been an upward trend as to the proportion of nationally produced feature films released in the theatres.

Table 9. Percentage of 100% nationally produced films regression

Variables	Coefficient	Robust standard error	95% Confidence interval		Sig.
Constant	-11.173	3.197	-17.234	-5.629	.002
Subsidies per capita	-5.997E-5	.002	-.005	.005	.980
Population M	.003	.000	.003	.004	.001
GDP per capita	6.666E-7	4.568E-7	-1.956E-7	1.688E-6	.144
Year	.006	.002	.002	.009	.002
Number of observations	55				
R2 - adjusted	.918				
F	152.466				

6.1.7 Number of co-productions

To estimate the number of national films co-produced, a simple linear model is used. Including a random intercept to nest level 1 units into countries (level 2 units) was redundant, thus not improving the model. The focal independent variable is the amount of subsidy per capita allocated to the film industry each year controlled by the GDP per capita, the population size and the year. Spain and Sweden were excluded from this analysis due to lack of relevant data.

The model then takes the form:

$$\text{Co-productions}_i = \beta_0 + \beta_1 \text{Subsidy}_i + \beta_2 \text{GDP}_i + \beta_3 \text{Year}_i + \beta_4 \text{Population}_i + \varepsilon_i$$

Table 10 displays the estimates for the number of national co-productions equation. Following Field (2013) standard errors and confidence intervals have been computed

using Bias-corrected and accelerated bootstrapping to overcome uncovered problems of non-normality and heteroscedasticity.

The model accounts for 66.9% of the variation in the outcome with three significant predictors. The wealth indicator of GDP per capita significantly predicts the output and curiously has a slightly negative relation with it (-.001). Subsidies per capita and population size are both very significant predictors of the number of national co-productions and have a positive relation to it (7.905 and 1.234 respectively).

Table 10. Coproduction regression

Variables	Coefficient	Robust standard error	95% Confidence interval		Sig.
Constant	567.695	2267.121	-3821.127	4909.318	.812
Subsidies per capita	7.905	1.857	4.669	11.774	.001
Population M	1.234	.151	.894	1.484	.001
GDP per capita	-.001	< .001	-.001	.000	.020
Year	-.291	1.129	-2.493	1.920	.806
Number of observations	56				
R2 - adjusted	.669				
F	27.332				

6.2 Discussion

The regression analysis partly confirmed the hypotheses exposed in section 5.1.2. H_2 was completely confirmed as indeed subsidies did not show any significant effect on any of the diversity indexes that did not have to deal with national production. Public subsidies allocated to the film industry are not only intended for production, but also for promotion and marketing, distribution, festivals, imports and the physical cinema structures. In Europe the tendency is however to focus on production (Katsarova, 2014) as can be argued by looking at these results as well.

H_1 on the contrary proved to be only partly true, as in the present analysis subsidies were a significant predictor of co-productions, but of no other dependent variable. Subsidies per capita were highly significantly ($p = .001$) related to the number of national co-productions released, in a very positive way ($\beta = 7.905$). This might show that the European Union encouragement for co-productions, both through guidelines and specific programs, has been effective. Katsarova (2014) however argues that co-productions tend to be used just to secure financing, even though they have been

proven to circulate better than national productions. This analysis cannot confirm whether this statement is true since the reasons for allocating subsidies were not investigated, to determine this further research is needed.

Other significant results showed a positive trend through the analysed years in the national film production. The year variable was a positive and highly significant predictor of the general number of films released, the number of domestic releases and the percentage of films 100% nationally produced. This could be the proof of healthy and growing European national film industries notwithstanding the economic crisis started in 2008. The number of countries of origin was also positively predicted by the year at a quite low, but still worth noting significance ($p = .63$). This might show a new openness to films coming from different countries, which could mean the UNESCO convention and its guide-lines (UNESCO, 2005) are starting to have an effect on the way films are selected. The data is however not significant enough to argue such thing and this is hardly more than a speculation in the present study.

Population size was a significant predictor of various outcomes too, to no surprise. The number of total films released, of domestic releases, of films 100% nationally produced and of national co-productions were all positively related to the population size quite positively. This shows that the bigger the country is the more films are offered and produced. The coefficient for the percentage of films 100% nationally produced was the smallest out of the group (.006), but still it shows that, with the data analysed in the present study, the higher the amount of people inhabiting a country is, the higher is the ratio of national films released against foreign ones.

The real wealth indicator of GDP per capita curiously has a small but negative significant effect on both number of domestic releases (-.002) and number of co-productions (-.001). This means that the richer the country gets, the slightly less domestic films are released and co-produced. The result is odd and further research might be needed to explain it.

6.3 Limitations and future research

Every measure of diversity is quite arbitrary and cannot exhaustively describe the concept and its manifestations. This thesis is based on previous attempts at measuring it, which take into account as much as possible, but do not comprehend every single aspect and facet of it, just as the present thesis does not either.

This analysis was carried out with a scarce availability of data, both in terms of years and number of countries. With data on more European countries taken for a longer

period of time, the results could be more well-grounded and generalizable. No account was taken of other public protectionist policies regarding the film industry, which might have an effect on the supplied diversity. Diversity, as mentioned above, should be studied both as supplied and consumed (Benhamou and Peltier, 2011); this thesis only focuses on the supply side, while some possibly relevant results could be found by extending the analysis to the consumption component. The thesis also focuses on the geographical origin of films, arguably a sign of ownership rather than content (Mas-Colell, 1999). The same method could serve to study diversity from the point of view of genres, language, director's and actors' gender and other aspects more related to the film content.

To go deeper into the study it would be interesting to compare the subsidy allocation methods and check for any differences into the resulting diversity that might be due to that. The results show a significant positive relation between subsidies and number of co-productions which are very much encouraged by the European Union. The importance of the agreements for co-productions and the subsidies given by the EU fund Eurimages is growing affecting diversity according to Benhamou and Peltier (2011). An analysis of the effects of these European subsidies could integrate the analysis based on national subsidies only, offering a more complete and well-rounded picture.

Finally my inexperience with statistics was certainly a limitation; had I used or studied statistics before writing this thesis, it might have been possible to find better solutions and approaches to the discussed matters.

7. Conclusions

This thesis tried to determine whether changes in the supplied diversity, in terms of geographical origin, in the film industries of 8 European countries – Denmark, Estonia, Finland, France, Italy, Portugal, Spain and Sweden – in the years 2005-2013, are consistent with a positive effect of national subsidies on diversity. In order to address the question various indexes of diversity were identified on the basis of previous studies which analysed the same phenomenon (Benhamou and Peltier, 2011; Moreau and Peltier, 2004). Said indexes are: the number of films released in the country in one year, the HHI of the various countries of origin of said films, the number of countries of origin of the same films, the number of available cinema screens every 100,000 inhabitants, the number of domestic releases, the percentage of 100% nationally produced feature films and the number of co-productions the country participated in. These indexes account for the diversity dimensions of variety and balance and the diversity units of film and geographical origin. Several multilevel linear regressions were run taking each time a different index as their output. The focal independent variable was subsidies per capita, controlled by GDP per capita, year and population size.

The results show that subsidies per capita are a significant predictor only of the number of co-productions, while having seemingly no correlation with any of the other outputs. This could show a positive effect of the guide-lines of the European Union which is trying to encourage diversity in the European film industry particularly through stimulation of co-productions.

The results were based on a scarce number of observations due to data availability, with more data in terms of countries and time period the results could be more relevant and generalizable. Various matters are left for further research; in particular testing the effects of other protectionist policies on diversity in the film industry and how diversity is affected by initiatives, prizes and subsidies coming from the European Union.

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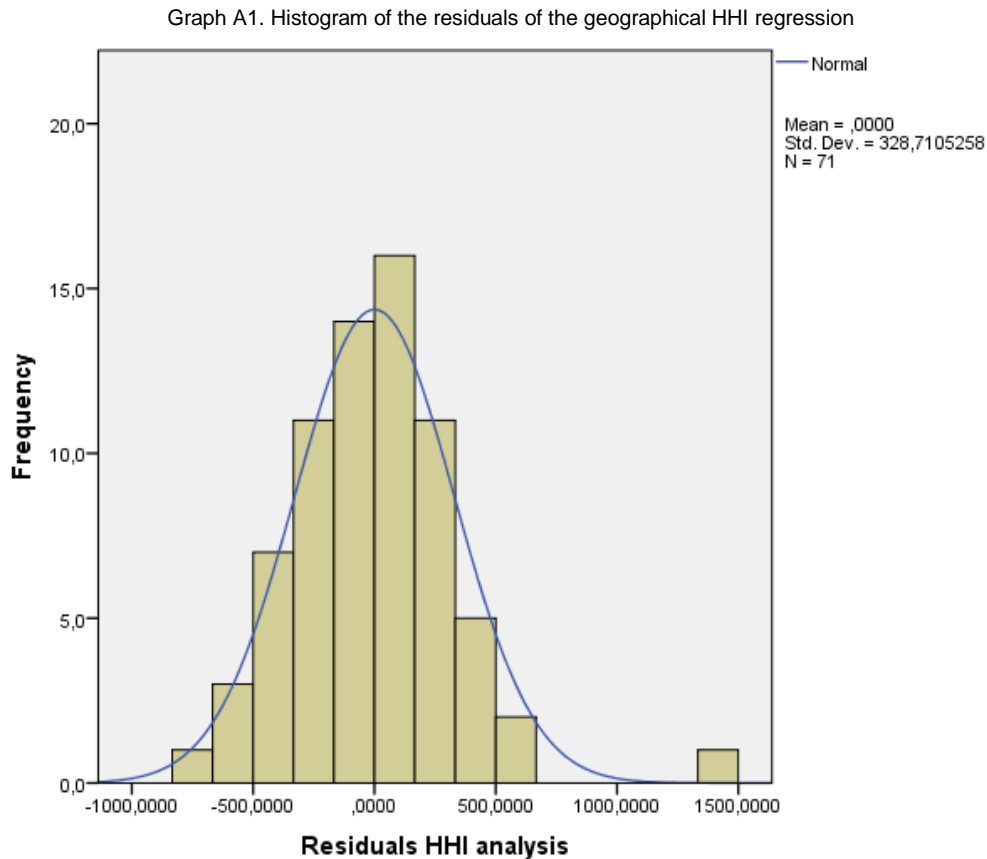
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Appendix A: Regression assumptions tests

Geographical origin HHI

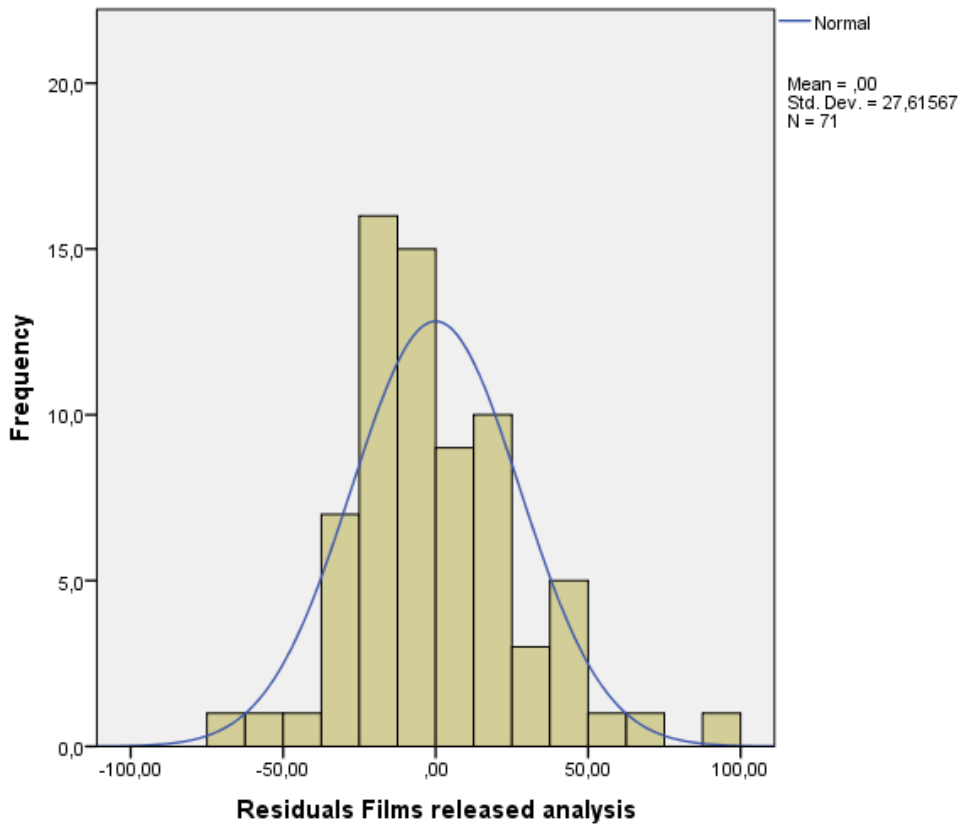


The distribution of residuals looks normal. The K-S test $D(71) = .066$, $p = .200$ did not deviate significantly from normal.

For the HHI scores the variances were unequal for the various countries, $F(7, 63) = 4.166$, $p = .001$. According to Levene's test the homoscedasticity assumption was breached.

Films released

Graph A2. Histogram of the residuals of the films released regression

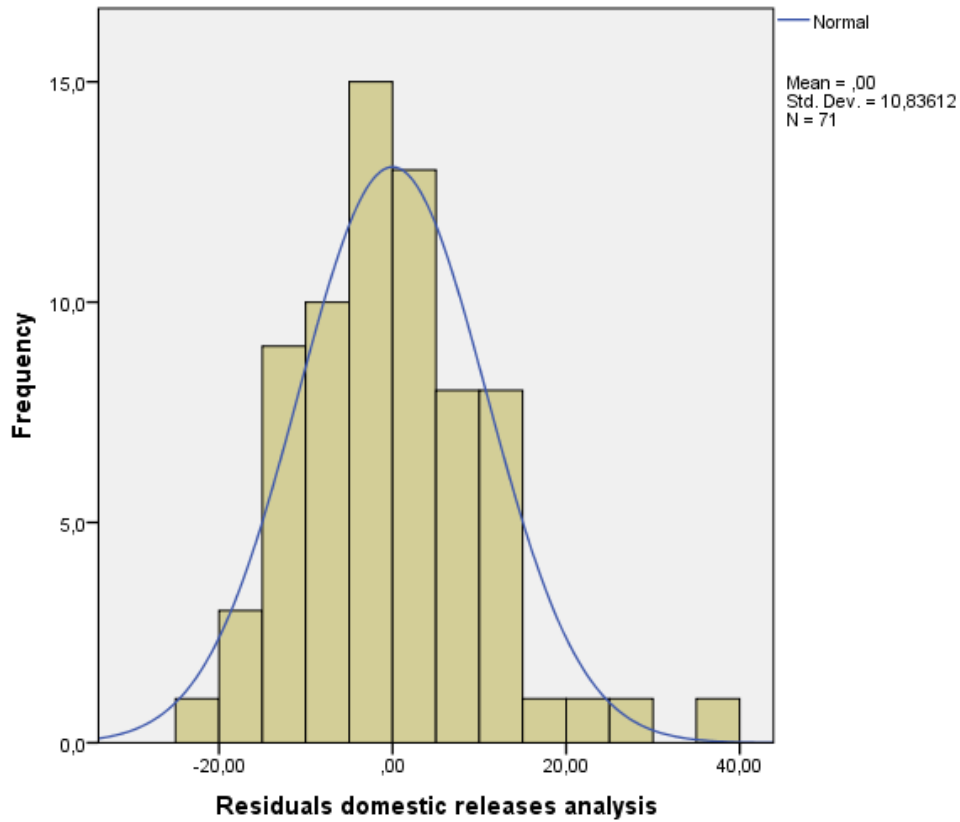


The distribution of residuals looks normal. The K-S test $D(71) = 0.088$, $p = 0,200$ did not deviate significantly from normal.

For the films released scores the variances were equal for the various countries, $F(7, 63) = 1.875$, $p = .089$. According to Levene's test the homoscedasticity assumption was confirmed.

Domestic films released

Graph A3. Histogram of the residuals of the number of domestic releases regression

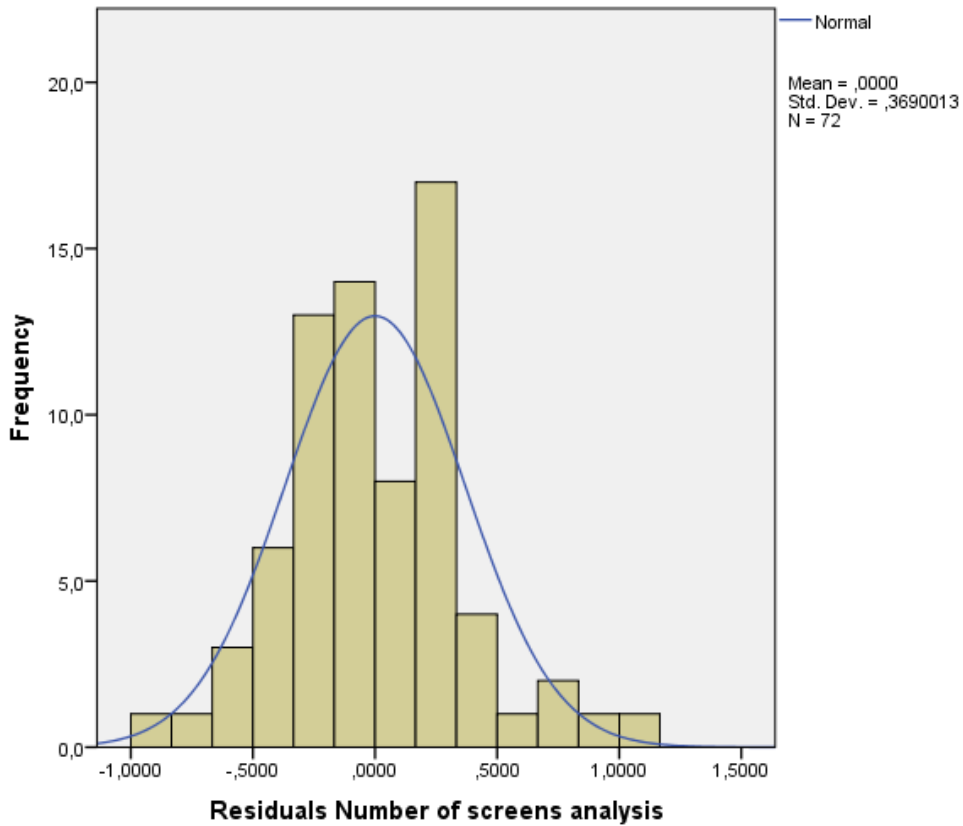


The distribution of residuals looks normal. The K-S test $D(71) = .064$, $p = 0,200$ did not deviate significantly from normal.

For the films released scores the variances were equal for the various countries, $F(7, 63) = 1.556$, $p = .165$. According to Levene's test the homoscedasticity assumption was confirmed.

Screens per 100,000 inhabitants

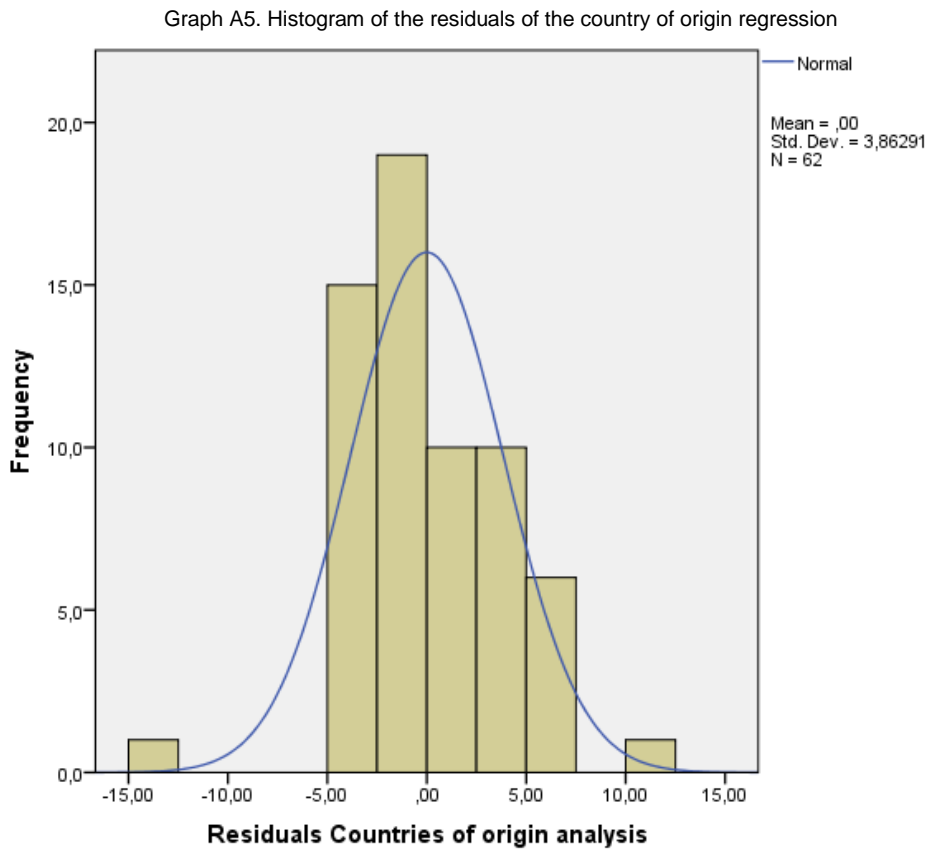
Graph A4. Histogram of the residuals of the number of screens per 100,000 inhabitants regression



The K-S test $D(72) = 0.084$, $p = 0,200$ did not deviate from normal.

For the number of screens scores the variances were equal for the various countries, $F(7, 64) = 1.724$, $p = .119$. According to Levene's test the homoscedasticity assumption was confirmed.

Countries of origin

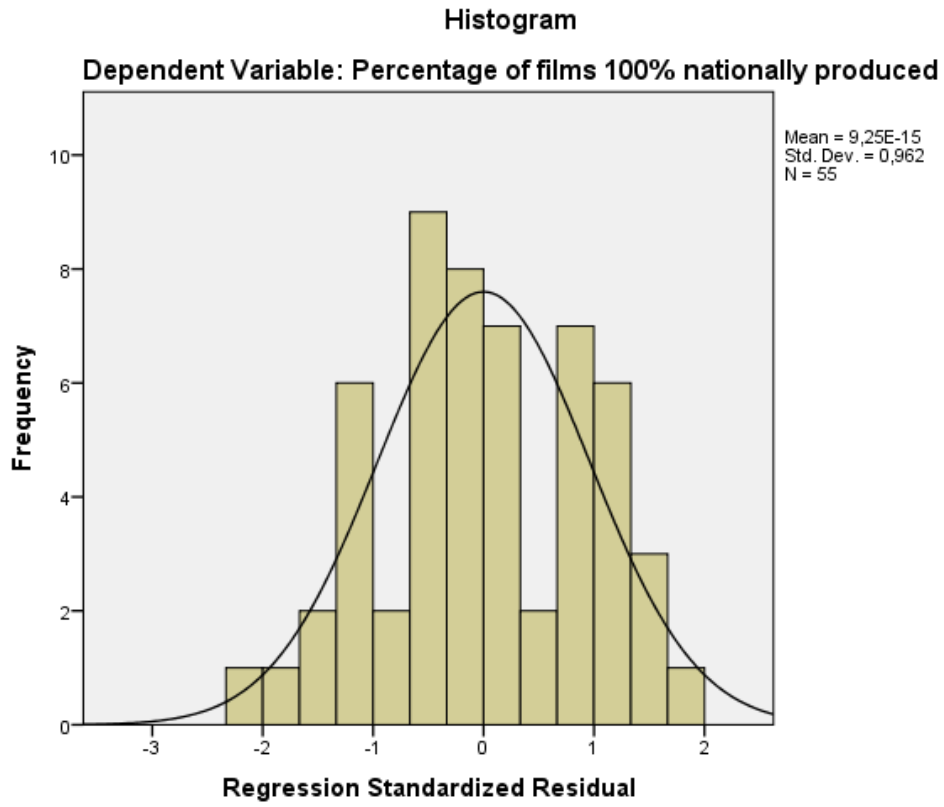


The K-S test $D(62) = 0.095$, $p = 0,200$ did not deviate from normal.

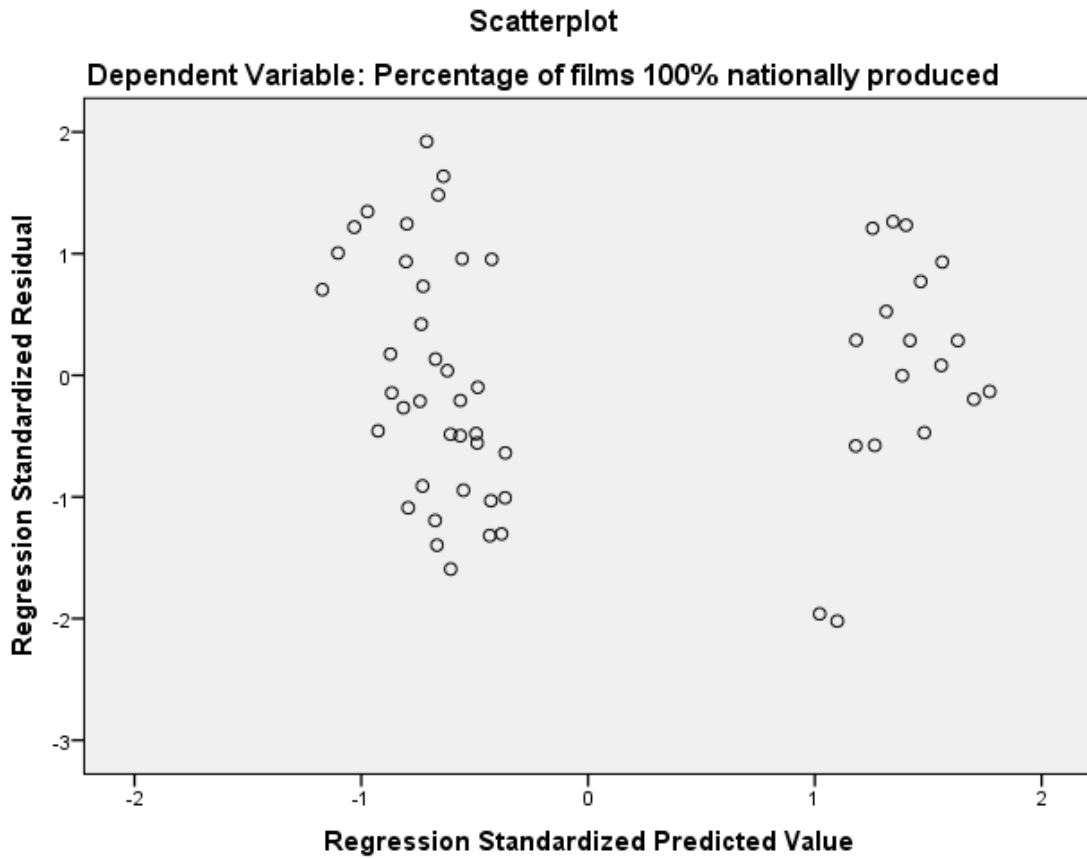
For the number of countries of origin the variances were equal for the various countries, $F(6, 55) = .526$, $p = .786$. According to Levene's test the homoscedasticity assumption was confirmed.

Percentage of 100% nationally produced feature films

Graph A6. Histogram of the residuals of the *Percentage of 100% nationally produced feature films* regression

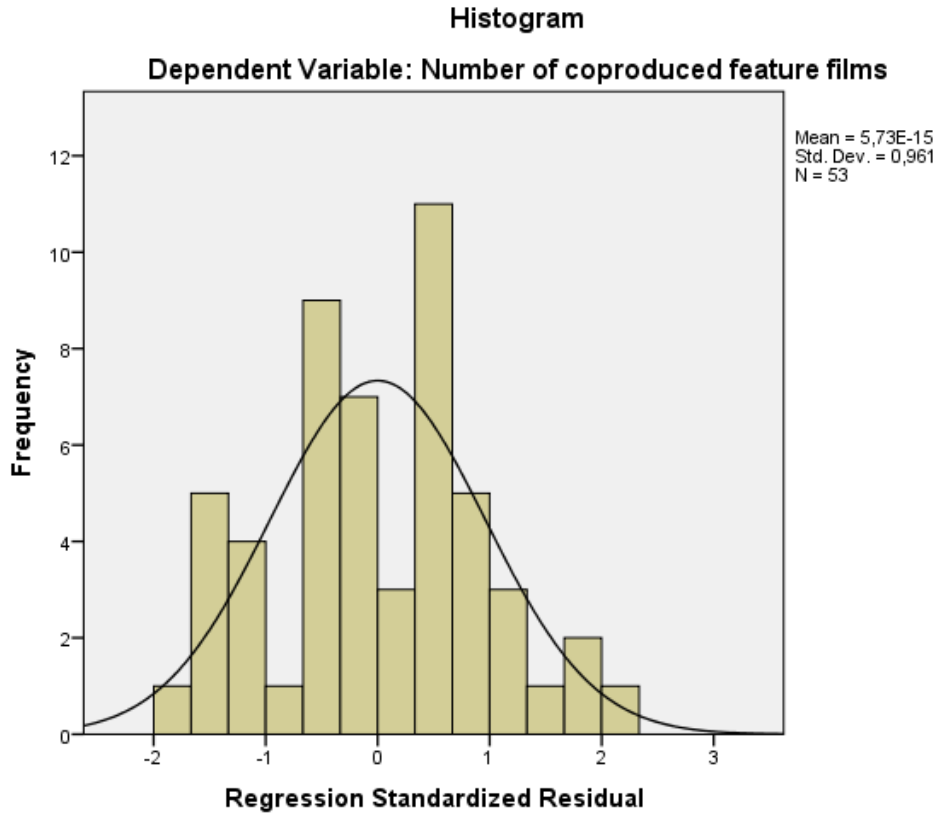


Graph A7. zpred vs. zresid of the *Percentage of 100% nationally produced feature films* regression

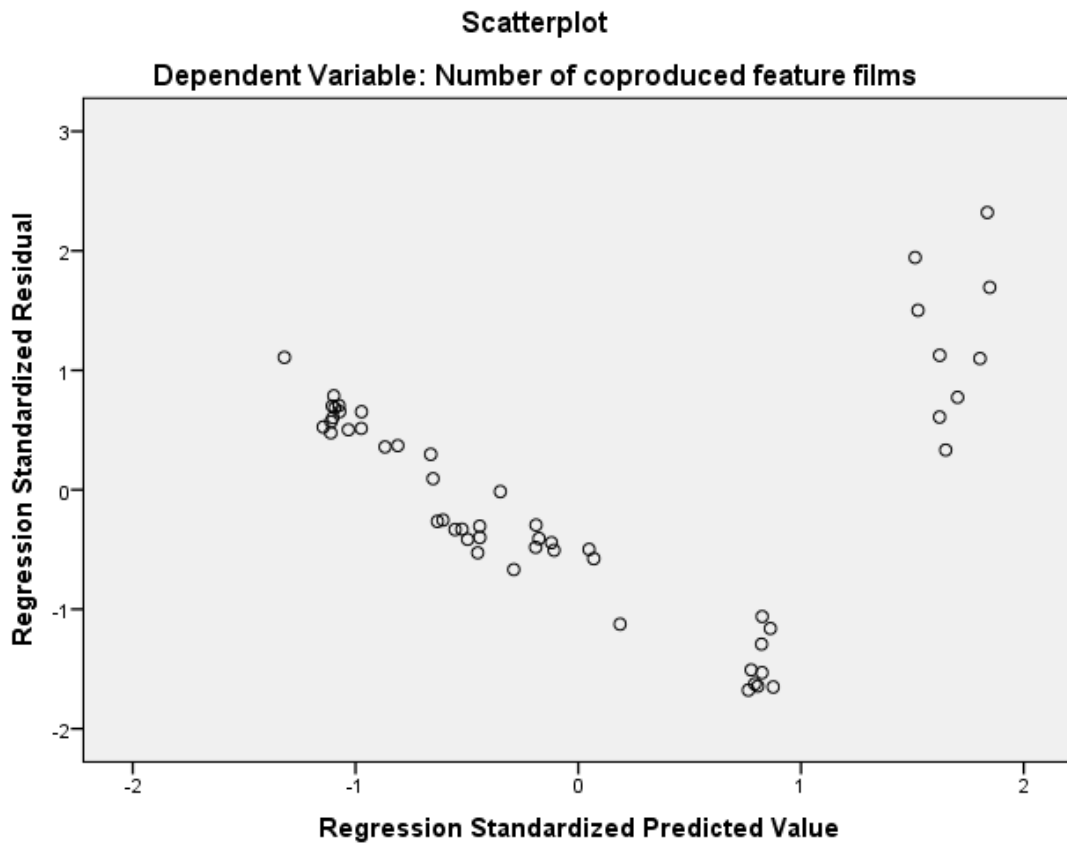


Number of co-productions

Graph A8. Histogram of the residuals of the *number of co-productions* regression



Graph A9. zpred vs. zresid of the number of co-productions regression



Appendix B: Collected data

Denmark

Table B1. Data about Denmark

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Geographical HHI	3092,892	2800,058	2536,351	2862,086	2742,679	2442,984	2653,809	2538,371	2794,706
Films released	233	234	235	213	217	222	256	231	228
Countries of origin	26	25	24	25	22	28	32	25	31
Screens / 100,000 inhab.	7,04	7,15	7,13	7,16	7,22	7,27	7,11	7,25	7,43
Domestic releases	31	21	27	28	27	22	33	30	31
%Ff 100% nationally produced	4,72%	5,58%	3,40%	6,10%	6,48%	7,21%	6,25%	6,93%	—
Co-productions	13	11	16	13	14	15	15	9	17
GDP per capita	€ 39.300	€ 41.500	€ 42.800	€ 43.900	€ 41.700	€ 43.500	€ 44.200	€ 44.900	€ 45.100
Subsidies per capita	€ 6,69	€ 6,83	€ 6,34	€ 7,38	€ 7,22	€ 7,11	€ 8,66	€ 8,28	€ 8,25
Population size	5.411.405	5.427.459	5.447.084	5.475.791	5.511.451	5.534.738	5.560.628	5.580.516	5.602.628

Estonia

Table B2. Data about Estonia

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Geographical HHI	3897,3	4941,6	4087,1	2911,1	3911,1	3560,7	3065,3	2872,8	2707,1
Films released	148	161	145	166	162	175	217	228	235
Countries of origin	24	24	23	26	24	29	29	33	35
Screens / 100,000 inhab.	5,12	4,98	4,98	5	5,52	5,52	5,52	5,31	5,13

Domestic releases	7	9	10	5	6	4	8	10	8
%Ff 100% nationally produced	4,05%	5,59%	6,90%	7,83%	3,09%	4,57%	9,22%	7,46%	7,23%
Co-productions	2	3	2	4	3	4	3	7	5
GDP per capita	€ 8.300	€ 10.000	€ 12.100	€ 12.300	€ 10.600	€ 11.000	€ 12.300	€ 13.300	€ 14.200
Subsidies per capita	€ 3,30	€ 3,55	€ 4,35	€ 5,03	€ 4,14	€ 4,11	€ 4,12	€ 4,66	€ 4,77
Population size	1.347.510	1.344.468	1.344.468	1.340.935	1.340.415	1.340.127	1.340.194	1.318.005	1.286.479

Finland

Table B3. Data about Finland

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Geographical HHI	3145,676	3459,907	3470,025	3823,746	3995,244	3712,568	3479,345	2842,449	3339,75
Films released	184	181	166	169	174	186	191	175	200
Countries of origin	21	19	20	18	14	16	17	18	17
Screens / 100,000 inhab.	6,31	6,25	5,96	6	5,72	5,37	5,24	5,23	5,17
Domestic releases	15	16	14	19	20	23	30	36	36
%Ff 100% nationally produced	5,43%	8,29%	8,43%	11,24%	7,47%	10,75%	8,38%	12,00%	8,00%
Co-productions	3	6	3	10	8	8	13	9	10
GDP per capita	€ 31.300	€ 32.800	€ 35.300	€ 36.500	€ 33.900	€ 34.900	€ 36.500	€ 36.900	€ 37.100
Subsidies per capita	€ 2,49	€ 2,67	€ 2,72	€ 3,02	€ 3,35	€ 3,87	€ 4,81	€ 4,92	€ 4,35
Population size	5.236.611	5.255.580	5.276.955	5.300.484	5.326.314	5.351.427	5.375.276	5.401.267	5.426.674

France

Table B4. Data about France

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Geographical HHI	2700,298	2707,216	3078,467	2753,38	2989,842	2900,928	3023,898	3063,6	3165,231
Films released	550	589	573	555	588	579	594	615	654
Countries of origin	—	—	—	—	—	—	—	—	—
Screens / 100,000 inhab.	3,30	3,26	3,23	3,23	3,21	3,17	3,13	3,12	3,09
Domestic releases	237	242	262	240	270	272	289	300	330
%Ff 100% nationally produced	25,64%	23,94%	30,02%	27,93%	26,36%	28,67%	29,97%	29,27%	30,12%
Co-productions	96	101	90	85	115	106	106	120	133
GDP per capita	€ 28.100	€ 29.200	€ 30.400	€ 31.000	€ 30.000	€ 30.800	€ 31.500	€ 32.100	€ 32.100
Subsidies per capita	€ 4,25	€ 3,98	€ 4,04	€ 4,17	€ 3,54	€ 3,64	€ 4,76	€ 4,95	€ 4,92
Population size	62.772.870	63.229.635	63.645.065	64.007.193	64.350.226	64.658.856	64.978.721	65.276.983	65.560.721

Italy

Table B5. Data about Italy

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Geographical HHI	2572,496	2551,459	2718,089	3118,775	3126,919	3104,02	2905,608	2666,541	2390,057
Films released	392	385	372	376	355	396	387	460	523
Countries of origin	26	26	30	22	23	23	22	22	30
Screens / 100,000 inhab.	5,074	5,158	5,174	5,229	5,429	5,305	5,433	5,356	5,357
Domestic releases	98	100	111	128	115	126	133	156	180
%Ff 100%	17,60%	18,18%	23,12%	28,99%	27,61%	26,77%	30,49%	29,78%	31,17%

nationally produced									
Co-productions	29	30	25	19	17	20	15	19	17
GDP per capita	€ 25.600	€ 26.500	€ 27.400	€ 27.600	€ 26.400	€ 26.800	€ 27.300	€ 26.800	€ 26.500
Subsidies per capita	€ 1,42	€ 1,32	€ 1,33	€ 1,52	€ 1,16	€ 1,25	€ 1,28	€ 1,28	€ 1,19
Population size	58.751.711	59.131.287	59.619.290	60.045.068	60.340.328	60.626.442	59.394.207	59.685.227	60.782.668

Portugal

Table B6. Data about Portugal

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Geographical HHI	2180,579	2238,309	2566,992	2358,534	2983,835	2690,056	2443,199	2324,861	—
Films released	274	299	276	240	263	256	279	304	—
Countries of origin	44	42	42	37	27	40	45	49	—
Screens / 100,000 inhab.	4,87	4,56	5,18	5,42	5,46	5,33	5,28	5,23	5,19
Domestic releases	13	22	17	15	22	23	23	28	—
%Ff 100% nationally produced	2,55%	3,68%	2,90%	2,92%	5,32%	7,03%	5,38%	5,92%	—
Co-productions	6	11	9	8	8	5	8	10	—
GDP per capita	€ 15.100	€ 15.800	€ 16.600	€ 16.900	€ 16.600	€ 17.000	€ 16.700	€ 16.000	€ 16.200
Subsidies per capita	€ 0,80	€ 1,12	€ 0,82	€ 0,88	€ 0,81	€ 0,81	€ 0,85	€ -	€ 0,97
Population size	10.494.672	10.511.988	10.532.588	10.553.339	10.563.014	10.573.479	10.572.721	10.542.398	10.487.289

Spain

Table B7. Data about Spain

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Geographical HHI	2165,4	2362	2114,2	2479,4	2724,7	2744,4	2366,9	2396,9	2504,2
Films released	598	572	627	552	549	534	563	523	615
Countries of origin	32	33	41	39	39	34	34	38	37
Screens / 100,000 inhab.	10,08	9,69	9,50	9	8,80	8,76	8,65	8,56	8,38
Domestic releases	142	150	172	173	196	200	199	184	231
%Ff 100% nationally produced	—	—	—	—	—	—	—	—	—
Co-productions	—	—	—	—	—	—	—	—	—
GDP per capita	€ 21.300	€ 22.700	€ 23.900	€ 24.300	€ 23.300	€ 23.200	€ 23.000	€ 22.600	€ 22.500
Subsidies per capita	€ 1,30	€ 1,41	€ 1,35	€ 1,47	€ 1,63	€ 1,74	€ 1,51	€ 0,95	€ 0,73
Population size	43.296.338	44.009.971	44.784.666	45.668.939	46.239.273	46.486.619	46.667.174	46.818.219	46.727.890

Sweden

Table B8. Data about Sweden

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Geographical HHI	2186,169	2653,853	2194,76	2360,087	2274,931	2298,117	2436,825	2296,874	2537,985
Films released	303	296	316	311	315	261	266	247	265
Countries of origin	26	22	31	38	24	27	25	24	29
Screens / 100,000 inhab.	10,76	10,77	10,25	9,24	9,13	8,90	8,82	8,61	8,10
Domestic releases	59	63	54	55	74	65	61	66	62
%Ff 100%	12,01%	11,90%	7,32%	—	—	—	—	—	—

nationally produced									
Co-productions	17	21	19	—	—	—	—	—	—
GDP per capita	€ 34.700	€ 36.900	€ 39.000	€ 38.200	€ 33.300	€ 39.400	€ 42.900	€ 44.500	€ 45.500
Subsidies per capita	€ 1,12	€ 1,38	€ 1,38	€ 1,64	€ 1,65	€ 1,52	€ 2,23	€ 3,03	€ 1,72
Population size	9.011.392	9.047.752	9.113.257	9.181.927	9.256.347	9.340.682	9.415.570	9.482.855	9.555.893