The determinants of the diversity of cultural expressions
An international quantitative analysis of diversity of production in the recording industry

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Abstract

After the adoption of the Unesco Convention on Cultural Diversity in October 2005, the issue of what may favour diversity of production in the media and cultural industries has become even more crucial. On the other hand there has been a long tradition of economic analysis of diversity of production. However, the analysis so far has had 2 flaws. First of all, there have been few quantitative and most of all econometric studies. Moreover such studies have never gone beyond the influence of market structure.

This paper aims at filling both gaps of the analysis. (i) First I propose a multidisciplinary overview of the literature devoted to the determiners of diversity of production in cultural and media industries. (ii) Then I apply an econometric analysis of these determiners in the case of the recording industry. To conduct this analysis, I use a database on 69 countries built from data provided by the Industrial Federation of the Phonographic Industry and its national branches. My main results concern the influence of not only the market structure but also economic and demographic factors.

Keywords: cultural diversity, product differentiation, recording industry, open system account, diversity of production, indexes of diversity

1. Introduction

Diversity of production or product differentiation is a long-established research issue in industrial and micro-economics. It has been systematically analyzed since the advent of the models of monopolistic competition (see notably Chamberlin, 1933). The interest has been renewed with models of convex preferences (see notably Dixit and Stiglitz, 1977). All these models provide interesting insights on the influence of market structure on diversity. However, they rely on complex and hardly comparable definitions of diversity, which could explain why there have been rarely empirically applied.

On the other hand, there are many economic and sociological papers on diversity of production in cultural and media industries. The almost unanimous approval of the UNESCO Convention on the Protection and the Promotion of the Diversity of Cultural Expressions in 2005 and its ratification by a growing number of countries have certainly renewed the interest for this issue. Until recently, these applied papers have however neglected to precisely define diversity and/or to address the issue of the determinants of diversity.

One crucial issue is precisely that diversity of production remains difficult to define. As in the case of biodiversity, this is however clearly "*more than matters for semantic wrangling*" (McIntosh, 1967, p.392). Definitions of biodiversity have enabled researchers to discuss this concept in a way that is neither ambiguous nor arbitrary (Sugihara, 1982); they have allowed balancing goals in terms of diversity with the cost of promoting it (Weitzman, 1992; Solow *et al.*, 1993).

The primary goal of this paper is to provide a definition of diversity of production and to apply it to cultural industries. This definition is used to build tools to assess diversity of production in the recording industry. The assessment should stand as a prerequisite for any policy in favour of cultural diversity as well as to assess its results. The assessment should also help to understand what influences cultural diversity and to what extent. This is a particularly important issue at a time when globalization is accused of leading to homogenization. **The aim of the paper is thus to understand what are the determinants of diversity, through an econometric analysis of international data on the recording industry.**

2. A three-dimensional definition of diversity of production

2.1. A general definition of diversity: diversity as a mix of variety, balance and disparity

I propose to define cultural diversity as a three-dimensional concept. Firstly, **diversity is a mixture of *variety*, *balance* and *disparity*** (Stirling, 1998; Moreau and Peltier, 2004): all other things being equal, the greater the variety/balance/disparity, the greater the diversity.

To assess the diversity of any system (e.g. music production), this system must first be divided into different types or categories (e.g. titles, geographical origins, etc.). Variety corresponds to the number of different types. Balance represents the way every type is represented. It can be measured by the proportion for every type (e.g. the number of goods for every type that is produced or sold as compared to the total number of goods available). Disparity is the dissimilarity between existing types, for example between the farthest two types or for every pair of type.

The first dimension of our definition of cultural diversity applies to any kind of diversity. Indeed, it was first formulated by Stirling (1998) who works on technological diversity. Part or all of the components have also appeared in works on biodiversity (Simpson, 1949), finance (Markowitz, 1952), psychology (Junge, 1994) and communication theory (Shannon, 1948).

2.2. Supplied diversity, consumed diversity

Beyond this general definition of diversity, cultural diversity has specific features. I rely on the assumption that **cultural diversity is comparable to a form of diversity of production**, particularly when assessed in the case of the cultural and media industries. For most cultural activities, there is production and then there is a market for that production in a broad sense, i.e. a place where supply meets demand. This is clearly the case for cultural goods and services and is also arguable for other cultural activities. In this case, **in every market, you have two kinds of diversity: diversity as it is supplied by suppliers and diversity as it is accepted by demanders**.

The second dimension of our definition of cultural diversity will therefore distinguish between *supplied diversity* and *consumed diversity* (Eaton and Lipsey, 1989; Van Cuilenburg and Van der Wurf, 2001).

Supplied diversity corresponds to the diversity of what is made available. Consumed diversity refers to diversity as it is actually consumed, thus depending on both consumer tastes and supplied diversity. Suppliers may be the creators or any intermediary actor. Likewise, consumers can be the audience or any intermediary actor in the supply chain, from a publisher to a retail outlet. The word 'consumption' must be understood in a very broad sense: a consumer does not necessarily pay for this consumption and the product is not necessarily destroyed afterwards.

However, consumed diversity should not be considered equivalent to *demanded diversity*. Demanded diversity corresponds to the level and nature of diversity that is desired by consumers independently of what is actually supplied, just as in neoclassical economic models demand exists independently of supply. Demanded diversity reflects consumer tastes but these tastes do not depend on what is actually available. Nevertheless, it is difficult to know what people would like to have in terms of diversity and far more reasonable to assume that supply has an influence on consumption and thus supplied diversity on consumed diversity.

2.3. Product, producer and consumer diversity

Thirdly, cultural diversity relies on complex interactions between the diversity of producers, products and consumers.

Product diversity refers to the diversity of the characteristics of products that can be goods or services, either supplied or consumed. *Producer diversity* means diversity of actors at every stage of the production and distribution process. The distinction between producer and product is not always obvious, especially for artists since they also benefit from marketing and communication. The products are generally linked to their creators, which is specific to cultural products. Producers are different from products insofar as they

are able to change. Once a movie has been released, it cannot change; if another version of this movie is released, it is another movie. However, an artist can evolve but remains the same person.

Consumer diversity consists of the diversity of the people who obtain and consume products. Consumers are targeted by producers who encourage them to consume their products. Consumer diversity should not be confused with demanded diversity. While the latter is an economic concept that relies on the assumption of stable preferences that are independent of the nature and level of supply, the former aims to reflect the diversity of consumer tastes. Above all, consumer diversity is linked to diversity of cultural identities, beliefs and habits. It reaches far beyond economic issues.

2.4. Summary

Given these three dimensions of diversity, **I define cultural diversity as the variety, balance and disparity of products in the way they are made available and then consumed; of producers according to their potential market power and the way this power is expressed; and of the consumers as far as their tastes and different identities are concerned.**

3. Literature review on the determinants of diversity

3.1. The influence of market structure on diversity of production

3.1.1. Efficiency Vs Diversity

The most consensual result of monopolistic competition models consists in the contradiction between efficiency (i.e. minimization of production costs) **and diversity** (i.e. generally variety of supplied products). Such an opposition relies on the existence of **economies of scale** in the production process (Lancaster, 1990). This is the case in cultural and media industries because fixed costs (e.g. production and promotion) are high, especially relative to marginal costs (e.g. reproduction and distribution costs). Moreover thanks to digitization, marginal costs tend to be lower and lower.

Such economies favour a reduction in the diversity of producers. Most of all an increasing in variety results in an increasing of the production costs. On the contrary when less types of products are produced but each in a higher quantity it may result in a decreased unit cost. Consumers may profit of this decreasing cost through a diminution of the retail price. However they may prefer more diversity whereas it could be more profitable for firms to propose less diversity (Lancaster, 1979). There is an opposition between two kinds of interests': the consumers, and the producers' (Dixit and Stiglitz, 1977).

Such an opposition is lessened when there are economies of scope that is to say when the production or distribution of one more type helps decreasing unit cost. For example, the cost of distributing

one more title is near of zero. Therefore, economies of scope make diversity and efficiency compatible (Stirling, 1998). This fact explains why the major companies affirm that they help promoting musical diversity.

3.1.2. Duplication as a failure of the market to provide enough diversity

The other important result of models of monopolistic competition concerning the determinants of diversity of production has been provided by Hotelling (1929). According to Hotelling, competition may lead to standardization because producers aim at a 'mean consumer' and thus neglect consumers with marginal tastes. Such a result and the related methodology have been heavily discussed thereafter (Lancaster, 1990). The model remains much used however, notably in our field.

The related notion of duplication has been popularized by Steiner (1952) in the economic analysis of media industries. Duplication means that an increase in the number of different producers does not necessarily lead to more diversity in supplied products. Rather, at least to some extent, entering firms (e.g. radio stations) prefer to produce the same type of products that are already produced because thus they can get an access to a wider audience even though some consumers may not have their preferred type of product produced (Steiner, 1952).

Most following studies on diversity in media production focus on the issue of duplication. They find that an increasing in producer variety results in an increasing of product diversity but to a lesser extent (Steiner, 1952; Greenberg and Barnett, 1971; Levin, 1971; Van der Wurff, 2005). Van der Wurff (2005) also finds that an increasing concentration of producers may lead to the fact that supplied products less and less correspond to the consumers' tastes. Only McDonald and Lin (2004) find that diversity increases almost at the same rate as the number of available channels.

As a conclusion, for most of these researchers regulation is a solution to provide more diversity in television and radio programming (Levin, 1971). Steiner (1952) theoretically shows that public regulation positively influences diversity. Van der Wurff (2005) finds that supplied diversity is higher on public than on private broadcasting. Only Baxter (1974) finds that regulation has bad effects on diversity.

3.1.3. The influence of market structure on diversity of production in the recording industry

To conclude this brief review of the literature devoted to the influence of market structure on diversity of production let us now focus on the industry that we are going to econometrically analyze. Papers on the recording industry question the influence of concentration on product diversity.

Peterson and Berger (1975) find that the increasing concentration of the recording industry since the 40's has led to less diversity; more precisely, because of their conservatism, the major companies are not

favorable to innovation whereas their vertical integration enables them to limit competition. This is the "*cyclical account*", that is opposed by proponents of the "*open system account*" like Lopes (1992) and Dowd (2001).

Both agree that there has been an increasing concentration in the recording industry. However, it has corresponded to an increasing competition. Dowd (2004) thus explains that the American recording industry has become more and more concentrated from the 40's until at least the 80's. However, the major companies then began to organize competition between their labels. As well, they left the market open for the independent companies, notably by organizing their distribution. The successful aim of such a strategy was to face uncertainty on the success of recordings and at the same time to prevent actors to enter the market. Moreover the major companies succeeded in providing a diverse and innovative production (Lopes, 1992; Dowd, 2001).

3.2. The neglected influence of social, economic and demographic conditions

As our brief overview shows, **there is a huge amount of literature on the influence of market structure on diversity**. This is **to be compared to the neglected influence of social, economic and demographic conditions on cultural diversity**. Some authors emphasize this influence though, like Benhamou and Peltier (2007) for demography and the market size.

To our knowledge, the only result consists in that the market size has a positive impact on supplied variety. Particularly, in models with convex preferences (i.e. consumers as a whole have a preference for diversity, e.g. Dixit and Stiglitz, 1977), the higher the number of consumers, the higher the variety of supplied products. Our approach aims at providing the first analysis ever of the influence of social, economic and demographic conditions on cultural diversity. Not only do we consider the influence of the market size but also of the inequality of incomes, the level of development and the spreading of the Internet.

4. Sources

4.1. A large international data base

In the cultural field, the issue of international comparisons has become very important (Bonet et Négrier, 2002). Our database includes 74 countries and data from 1970 to 2005. In this paper, we focus on the year 2002, for which we have **data on 69 countries**. **Most previous research on diversity of production in media and cultural industries focused on one country**, either the United States of America (Blank, 1966; Levin, 1971 ; Greenberg et Barnett, 1971 ; Peterson et Berger, 1975 ; Anderson *et al.*, 1980 ; Lopes, 1992 ; Alexander, 1996 ; Dowd, 2001 ; Dowd, 2004; Chung et Cox, 1994 ; McDonald et Lin, 2004 ; Elberse

et Oberholzer-Gee, 2006) or France (Benhamou et Peltier, 2006 ; 2007), or the Netherlands (Christianen, 1995). The other researches concern only a restricted number of countries. Most time, these countries are in very close economic or geographic situations. For example, Hellman et Soramäki (1985) compare diversity of video production in the United States and in the United Kingdom whereas Van der Wurff (2005) analyzes diversity of television programs in 8 European countries (Finland, France, germany, Greece, Italy, Netherlands, Spain and the United Kingdom).

On the other side, Moreau and Peltier (2004) analyze diversity of movie production not only in the United States, in France and in the European Union but also in a recently developed country (South Korea), in a country in transition to a market economy (Hungary) and in a developing country (Mexico). Lastly, Lizardo (2007) uses a very large number of countries to analyze production in the recording and movie industries. However, he does not study diversity, rather the determinants of the share of local production in sales, which is only one aspect of cultural diversity as we assess it. The type of methodology used to assess diversity and its determinants is partially linked to the size of the data base: **most previous researches do not use econometric assessment because they rely on too few data**. The only exceptions are Christianen (1995), Van der Wurff (2005) and Lizardo (2007) with the problems evoked before.

Our data base includes 30 European countries[1], 10 from the Middle East[2], 11 from Central and South America[3], 12 from Eastern and Central Asia[4], the main countries from North America[5] and Oceania[6] and 2 from sub-Saharan Africa[7]. **We have very different countries in terms of size or development**; this is a very important point regarding our econometric analysis. This base did not exist before. We built it through a collecting of data provided by national unions of recording producers, generally members of the International Federation of the Phonographic Industry. To complete this base we used more general data, issued by the United Nations Statistics Division (Unsd) or The World Bank.

4.2. A heterogeneous database

Our database is heterogeneous – a usual flaw of cultural data (Bonet et Négrier, 2002). This heterogeneity comes from the fact that data are collected at national levels, and the Ifpi does not always succeed in harmonizing these data. It takes three forms:

(i) Each country provides its own kind of data. Therefore, the indexes on diversity are not provided for every country but only for a more or less great amount of them.

[1] Germany, Austria, Belgium, Bulgaria, Croatia, Denmark, Spain, Estonia, Finland, France, Greece, Hungary, Ireland, Iceland, Italy, Latvia, Lithuania, Norway, Netherlands, Poland, Portugal, Czech Republic, Rumania, the United Kingdom, Russia, Slovakia, Slovenia, Sweden, Switzerland, Ukraine.
[2] Saudi Arabia, Bahrain, Egypt, United Arab Emirates, Israel, Kuwait, Lebanon, Oman, Qatar, Turkey.
[3] Argentina, Brazil, Chile, Colombia, Ecuador, Jamaica, Mexico, Paraguay, Peru, Uruguay, Venezuela.
[4] China, South Korea, Hong-Kong, India, Indonesia, Japan, Malaysia, Pakistan, the Philippines, Singapore, Taiwan, Thailand.
[5] Canada, the United States.
[6] Australia, New Zealand.
[7] South Africa, Zimbabwe.

(ii) When data are provided for an index, the year available might change from one country to another: data are unbalanced.

(iii) There can be differences between countries as for the methodologies that are used to provide data. However data of unions of recording producers and of the Ifpi are the only available data. Although we will have a cautious use of them, let us remember that they are used even by the Unesco since nobody else provides data on this industry.

5. Methodology

Our aim is to describe and to explain the relationships between the different aspects of diversity of the recording production and the determinants of these many aspects. However, diversity is a complex phenomenon; thus it is possible that a variable may cause one aspect of diversity to increase but another to decrease. Such an analysis will allow us to better understand the underlying mechanisms of cultural diversity as well as the links between this diversity and structural national characteristics.

Our econometric approach is based on two kinds of methods. First we built correlation matrixes. Every element of the matrixes gives (i) the correlation between the variable in row and the one in column and (ii) the number of avaible observations. Bold elements refer to statistically significant elements:

- there are more than 5 observations
- the correlation coefficient is superior to 0.5 or inferior to -0.5. These levels are sufficient in social sciences according to Anderson *et al.* (2000).

A negative coefficient corresponds to a negative relationship between both indexes; a positive coefficient corresponds to a positive relationship between both indexes. A coefficient near zero means that there is no linear relationship between both variable. Finally, a correlation shows that both indexes evolve in the same way but not that there is an explicative relationship (Wonnacott and Wonnacott, 1991).

Therefore, we also used robust ordinary least square regressions models in order to also provide explanations and not only correlations. Considering some limitations of our base, we were constrained to leave aside most indexes since only a few countries provided data for these indexes. We kept regressions with an adjusted R^2 strictly superior to 0.25, a level considered as sufficient in social sciences (Anderson *et al.*, 2000). In general a sample is big enough to use OLS regressions as soon as there are more than 30 observations (minus explanatory variables) (Sanders et Allart, 1992). However we also kept some regressions with a number of observations inferior to this threshold.

6. Main results

6.1. Diversity of supplied products (in industrialized countries)

To analyze the diversity of supplied products, we use data on novelties, in absolute numbers and according to the origin. These results are significant only for industrialized countries.

Table 1: Correlation matrix for diversity of supplied products

	11	12	13	14
12	**.9871 [6 obs.]**			
13	**-.6254 [6 obs.]**	**-.5432 [6 obs.]**		
14	**-.7192 [5 obs.]**	**-.6363 [5 obs.]**	**.9547 [5 obs.]**	
10	-.2021 [9 obs.]	-.2098 [6 obs.]	**.6691 [6 obs.]**	.4855 [5 obs.]
15	**-.715 [5 obs.]**	.4333 [3 obs.]	-.9346 [3 obs.]	- [2 obs.]
26	-.3824 [9 obs.]	**-.5404 [6 obs.]**	**.9551 [6 obs.]**	**.8932 [5 obs.]**
27	.1894 [8 obs.]	.2302 [5 obs.]	**-.8632 [5 obs.]**	-.7082 [4 obs.]
28	-.3675 [8 obs.]	**-.5121 [5 obs.]**	.1461 [5 obs.]	-.0195 [4 obs.]
32	.2842 [9 obs.]	.3759 [6 obs.]	**-.5879 [6 obs.]**	**-.5138 [5 obs.]**
33	.3987 [9 obs.]	**.5196 [6 obs.]**	**-.6045 [6 obs.]**	**-.6636 [5 obs.]**
34	**.5191 [9 obs.]**	.4987 [6 obs.]	**-.5649 [6 obs.]**	**-.654 [5 obs.]**

Calculations according to the data of the Ifpi, the World Bank and the UN Statistics Division

10 : Market Share Of Independent Distributors

11 : Number Of Novelties

12 : Number Of National Novelties

13 : Share Of National Novelties

14 : Balance Of Novelties According To The Origin

15 : Market Share Of Supermarkets

26 : Population

27 : Gross Domestic Product Per Capita

28 : Share Of Broadband

32 : Human Development Index

33 : Share Of Urban Population

34 : Share Of Internet Users

There are many significant correlations among indexes of supplied diversity. *Number Of Novelties* and *Number Of National Novelties* are strongly positively correlated whereas *Number Of National Novelties* and *Share Of National Novelties* are negatively correlated: the number of local novelties most of all depends on the number of novelties rather than on the share of local novelties among all novelties. Since *Number Of Novelties* and *Share Of National Novelties* are negatively correlated, we see that an increasing in the number of available novelties results in more novelties that are imported and thus in a lower share of local novelties. There also seems that there are not enough local novelties. Actually, *Share Of National Novelties* and *Balance Of Novelties According To The Origin* are positively strongly correlated: a decreasing of the share of local novelties reduces diversity of novelties according to their origin. Consistently, an increasing in the number of novelties is linked with a reduction of diversity of novelties according to their origin.

We see also that diversity of distribution and of selling points influence diversity of supplied products. First, *Market Share Of Independent Distributors* is positively correlated with *Share Of National Novelties*. This seems consistent with the idea that independent recording companies favor local production. Also, we find that *Market Share Of Supermarkets* and *Number Of Novelties* are negatively correlated: this tends to show that super- and hypermarkets do not favor innovation.

If one now considers the influence of social, demographic and economic conditions, one first finds no confirmation of the insight of Dixit and Stiglitz (1977) according to which the market size (as measured by *Gross Domestic Product, Population* or *Gross Domestic Product Per Capita*) has a positive influence on supplied diversity. Since *Gross Domestic Product Per Capita* is negatively correlated to *Share Of National Novelties*, it appears that the wealthiest countries are those in which the local share of novelties is the lowest, and therefore supplied diversity can be assumed to be the least. This is quite the contrary with the population size. Actually, *Population* has a negative influence on *Number Of National Novelties* and a positive one on *Share Of National Novelties* and *Balance Of Novelties According To The Origin*.

Countries with a higher *Human Development Index* have a lower *Share Of National Novelties* and then a lower *Balance Of Novelties According To The Origin*. The result is the same for countries with a higher *Share Of Urban Population* or a higher *Share Of Internet Users*. Conversely countries with a higher *Share Of Urban Population* have a higher *Number Of National Novelties* and countries with a higher *Share Of Internet Users* a higher *Number Of Novelties.*

Many results here are interesting. **First of all, there can be contradictions between two aspects of cultural diversity**, as here between the number of novelties and their balance according to their origin. **Diversity of producers has an influence on diversity of supplied products** that will be further discussed in following sections. Finally, there is an important influence of social, demographic and economic conditions on diversity of supplied products. Another ambiguity of cultural diversity appears here: **cultural**

diversity is not necessarily the highest in the most favored countries. Particularly, a higher index of human development leads to less supplied diversity.

6.2. What does favour best-sellers?

The analysis of certified titles allows us to consider variety of consumption (with *Number Of Certifications*) and most of all its balance according to the titles (with *Market Share Of Certifications*).

Table 2: Correlation matrix for certified titles

	3	4
4	**.6558** **[7 obs.]**	
9	**-.5859** **[8 obs.]**	-.4064 [7 obs.]
15	**-.6252** **[5 obs.]**	-.3021 [4 obs.]
16	-.4813 [8 obs.]	**-.8236** **[7 obs.]**
18	**.5319** **[8 obs.]**	**.7136** **[7 obs.]**
22	**.7758** **[8 obs.]**	.2343 [7 obs.]
25	**.7323** **[8 obs.]**	**.9148** **[7 obs.]**
26	**.5471** **[8 obs.]**	**.9043** **[7 obs.]**
27	**.633** **[8 obs.]**	**.5345** **[7 obs.]**
32	**.5033** **[8 obs.]**	.3704 [7 obs.]
34	**.5193** **[8 obs.]**	.4121 [7 obs.]

Calculations according to the data of the Ifpi, the World Bank and the UN Statistics Division

3 : Number Of Certifications

4 : Market Share Of Certifications

9 : Diversity Of Distributors

15 : Market Share Of Supermarkets

16 : Balance Of Sales According To The Origin

18 : Market Share Of National Production
22 : Sales
25 : Gross Domestic Product
26 : Population
27 : Gross Domestic Product Per Capita
32 : Human Development Index
34 : Share Of Internet Users

Let us first take a look at *Number Of Certifications* (see Table 4). Unsurprisingly, the higher the market size the higher the number of certified titles, that is why *Number Of Certifications* is positively correlated with *Gross Domestic Product*, *Gross Domestic Product Per Capita* and *Population*. As well, *Number Of Certifications* and *Sales* are positively correlated.

Number Of Certifications and *Diversity Of Distributors* are negatively correlated, which means that a lower diversity of producers leads to a greater variety of consumed products. The result will be discussed after. Lastly, *Number Of Certifications* and *Market Share Of National Production* are positively correlated: an increasing in the number of certified titles seems to benefit more to local products.

By construction one expects *Market Share Of Certifications* to be positively correlated with *Number Of Certifications* and negatively with *Sales*. The first correlation is confirmed but not the second one. Thus, total sales and sales by the best-sellers evolve in the same way and at rather equivalent rates.

Like *Number Of Certifications*, *Market Share Of Certifications* is positively correlated to *Gross Domestic Product*, *Population* et *Gross Domestic Product Per Capita*. The wealthier/more populated a country, the higher the concentration of sales on a restricted number of titles. Lastly, *Market Share Of Certifications* is positively correlated to *Market Share Of National Production* but negatively to *Balance Of Sales According To The Origin*. An increased concentration of sales on a restricted number of titles favours sales of local production but at the expense of the diversity of sales according to the origin.

The importance of best-sellers, in absolute or relative terms, is thus positively linked with social, economic and demographic context; once again **cultural diversity** – as measured here by balance of sales – **is not necessarily the highest in the most favored countries**. Also concentration of sales seems to benefit to local production but not diversity of sales according to the origin.

6.3. Determinants of sales

The analysis of correlations first shows that the wealthier a country the higher the level of sales per inhabitant. This is proven by the strong positive correlation between *Sales* and *Gross Domestic Product Per Capita*.

Table 3: Correlation matrix for consumed products

	16	18	22
11	**-.5145** **[9 obs.]**	**-.5371** **[9 obs.]**	.3719 [9 obs.]
12	**-.5918** **[6 obs.]**	**-.7648** **[6 obs.]**	.3167 [6 obs.]
13	.3606 [6 obs.]	**.8721** **[6 obs.]**	**-.5889** **[6 obs.]**
14	**.5196** **[5 obs.]**	**.8558** **[5 obs.]**	**-.6021** **[5 obs.]**
27	.0951 [59 obs.]	-.3506 [60 obs.]	**.8968** **[67 obs.]**

Calculations according to the data of the Ifpi, the World Bank and the UN Statistics Division

11 : Number Of Novelties
12 : Number Of National Novelties
13 : Share Of National Novelties
14 : Balance Of Novelties According To The Origin
16 : Balance Of Sales According To The Origin
18 : Market Share Of National Production
22 : Sales
27 : Gross Domestic Product Per Capita

OLS regressions confirm this result (see Table 4). Alone or combined with other explanatory variables, *Gross Domestic Product Per Capita* keeps a positive coefficient, significantly different from zero. This is true for every kind of country; though, the adjusted R^2 is higher when all countries are considered altogether. For example, a regression on all countries (59 observations) with *Gross Domestic Product Per Capita* as the only explanatory variable gives an adjusted R^2 equal to 0,801 (see line 5). The explanation is rather simple: recordings are not necessity goods so that poor people are going to buy fewer recordings than wealthy people. This seems to remain true at the macroeconomic level. In other words, there is an income effect for recorded music (Curien and Moreau, 2006).

The correlation matrix finally shows that in developed countries *Balance Of Novelties According To The Origin* and *Sales* are negatively correlated: the more balanced the novelties according to the origin, the lower the level of sales. Thus, an increasing of the share of local novelties does not promote sales but quite the contrary, a very interesting result for cultural policy-makers.

In our regressions we distinguish between the countries that belong to the Oecd and the others, that is to say between developed and developing countries. In both types of countries, *Gross Domestic Product Per Capita* remains the most important explanatory variable (see lines 6 and 7). However, both kinds of

countries differ in terms of the influence of *Population* and *20% Richest On 20% Poorest*. For developed countries, the bigger the population size (see line 1) or the more unequal the distribution of incomes (see line 3), the higher the level of sales whereas this is quite the contrary for developing countries (see lines 2 and 4).

In the end, **the most crucial positive determinant of sales per inhabitant is wealth per inhabitant**. Moreover – but less significantly – in developed countries population and inequality of incomes positively influence the level of sales, contrarily to the share of local novelties; in developing countries population and inequality of incomes negatively influence the level of sales. All this shows **deep differences between countries in function of their wealth, something that a global analysis alone could not have shown**.

Table 4: OLS regressions (Sales as a dependent variable)

	Independent variables[1]							
	30	*27*	*26*	*18*	*Const*	F-Test[2]	Adjusted R^2	Observations
1		0,795***	0,365**	-0,065	0,377	0	0,668	28
		(10,65)	(2,44)	(-1,05)	(1,37)			(oecd)
2		0,55***	-0,014*	0,009	0,164	0	0,587	32
		(5,81)	(-1,77)	(0,48)	(1,4)			(non oecd)
3	9,83*	0,881***			-0,473	0	0,713	27
	(1,73)	(12,59)			(-1,48)			(oecd)
4	-0,969*	0,598***			0,257**	0	0,571	32
	(-1,79)	(4,57)			(2,73)			(non oecd)
5		0,837***			0,092**	0	0,801	67
		(15,49)			(2,07)			(all)
6		0,821***			0,213*	0	0,675	28
		(13,38)			(1,73)			(oecd)
7		0,583***			0,158***	0	0,626	39
		(7,01)			(3,19)			(non oecd)

Calculations according to the data of the Ifpi, the World Bank and the UN Statistics Division

***p<0,01 **p<0,05 *p<0,1

18 : Market Share Of National Production
26 : Population
27 : Gross Domestic Product Per Capita
30 : 20% Richest On 20% Poorest

[1] coefficient
(t-value)
The blank compartments indicate that the variable is not included in the estimated model

6.4. Determinants of the market share of national production

We now consider diversity of consumed products according to the origin. We first analyze determinants of *Market Share Of National Production*. The correlation matrix first shows relations between this index and indexes related to diversity of supplied products (see Table 3). We found that the higher the number of novelties, the lower the share of local novelties. This is true also for consumption and not only for supply. Actually *Number Of Novelties* and *Market Share Of National Production* are negatively correlated. *Number Of National Novelties* and *Market Share Of National Production* are also negatively correlated, which shows that to increase the number of local novelties is not enough to promote consumption of local products, quite on the contrary. Rather, as shows the strongly positive correlation between *Share Of National Novelties* et *Market Share Of National Production*, the proportion of local novelties is more important than their absolute number.

Table 5: OLS regressions (*Market Share Of National Production* as a dependent variable)

	Independent variables [1]												
	34	*33*	*32*	*31*	*27*	*26*	*16*	*10*	*9*	*Const*	F-Test[2]	Adjusted R^2	Observations
1			3,99*			2,6***	0,511	0,302		-5,29**	0	0,687	36
			(1,71)			(6,51)	(3,14)	(1,13)		(-2,71)			(all)
2				-4,78**		3,25***	0,564***		-7,78***	11,9***	0	0,851	25
				(-2,23)		(17,54)	5,42		(-3,51)	3,52			(oecd)
3	-5,68***	-5,35***			1,5**					9,34***	0	0,266	32
	(-3,12)	(-3,1)			(2,71)					(7,4)			(non oecd)
4			5,51**			2,29***		0,457***		-3,50*	0	0,582	36
			(2,57)			(9,17)		(3,01)		(-1,82)			(all)
5				-11,2**		3,09***			-7,4*	17,2***	0	0,702	25
				(-2,64)		(7,89)			(-2,01)	(2,92)			(oecd)
6						2,68***	0,604***		-2,91	2,84	0	0,673	36
						(7,2)	(4,54)		(-1,06)	(0,7)			(all)
7						3,13***	0,625***		-7,5***	9,55***	0	0,846	25
						(14,96)	(5,97)		(-3,62)	(2,93)			(oecd)
8			-12,3***	-11,3***						19,6***	0	0,475	25
			(-4,52)	(-2,87)						(7,89)			(non oecd)
9						2,13***		0,359**		1,77***	0	0,558	36
						(6,19)		(2,31)		(3,86)			(all)
10						2,71***				2,81***	0	0,494	29
						(5,77)				(7,97)			(oecd)
11								0,771***		1,8**	0	0,462	12
								(6,24)		(2,93)			(non oecd)

Calculations according to the data of the Ifpi, the World Bank and the United Nations Statistics Division

***p<0,01 **p<0,05 *p<0,1

9 : Diversity Of Distributors

10 : Market Share Of Independent Distributors

16 : Balance Of Sales According To The Origin

26 : Population

27 : Gross Domestic Product Per Capita

31 : Gini Index

32 : Human Development Index

33 : Share Of Urban Population

34 : Share Of Internet Users

[1] Coefficient

(t-value)

The blank compartments indicate that the variable is not included in the estimated model

Regressions on all countries (see Table 5) first shows a positive influence of *Population* (see lines 1; 4; 6; 9). In a predictable way, the bigger the countries the higher the share of local products in consumption. *Balance Of Sales According To The Origin* also has a positive influence on *Market Share Of National*

Production (see lines 1 and 6): the more diverse the consumption according to the origin, the higher the share of local production in consumption. *Human Development Index* (see lines 1 and 4) and *Market Share Of Independent Distributors* (see lines 4 and 9) have also a positive influence on *Market Share Of National Production*. These results are however a bit different when one makes a difference between developed and developing countries.

In developing countries, only the positive influence of *Market Share Of Independent Distributors* is confirmed (see line 11). Other variables are however important. *Share Of Internet Users*, *Share Of Urban Population* (see line 3), *Human Development Index* and *Gini Index* (see line 8) all have a negative influence on *Market Share Of National Production* whereas *Gross Domestic Product Per Capita* has a positive influence (see line 3). In developing countries, it thus appears that independent distributors favour local production and that the wealthier the country the more likely local production will be consumed. The use of the Internet, the importance of urban population, a more equal distribution of income all favour a consumption of alien production; Since the Human Development Index includes wealth as well as education and health, one finds that the more developed a country, the lower the consumption of local production.

The case for developed countries is radically different. In these countries, diversity of distribution stands against the share of local production in consumption as shows the negative influence of *Diversity Of Distributors* (see lines 2; 5; 7). The countries with the most equal distribution of incomes are also those with the lowest level of local production in consumption (see lines 2 and 5). On the contrary, as in the general case the size of the population and the diversity of consumption are positive factors (see lines 2; 5; 7).

We found that diversity of producers as well as the economic, demographic and social contexts have an impact on diversity of consumed products, which helps us understanding the functioning of cultural diversity in the recording industry. It helps also promoting it since we find that there are differences according to the type of country or characteristics of the countries.

6.5. Determinants of consumed diversity according to the origin

Finally we analyze the determinants of *Balance Of Sales According To The Origin*. The correlation matrix shows the influence of the diversity of supplied products on diversity of consumed products (see Table 3). Notably, *Balance Of Sales According To The Origin* and *Balance Of Novelties According To The Origin* are positively correlated. Just like for the share of local production among novelties, we find that an increasing in the number of new products reduces diversity of consumption according to the origin.

Considering all countries at once, we find a positive influence of *Human Development Index* and a negative one of *Gini Index* and *Gross Domestic Product Per Capita* (see line 2). However we find interesting results for developed and developing countries.

For developed countries *Gini Index*, *Gross Domestic Product Per Capita* (see line 5) and *Population* (see lines 1 and 3) have a negative influence on *Balance Of Sales According To The Origin*, contrarily to *Market Share Of National Production* and *Diversity Of Distributors* (see lines 1 and 3). The wealthier/bigger/more unequal the distribution of incomes, the more unbalanced the consumption according to the origin. On the contrary, more diversity of distributors helps promoting diversity of consumption.

For developing countries, one finds a positive influence of *Human Development Index* (see lines 4 and 7) and to a lesser extent *Gross Domestic Product Per Capita* (see lines 4 and 6). The most developed countries among developing ones have the most balanced consumption according to the origin.

Table 6: OLS regressions (*Balance Of Sales According To The Origin* as a dependent variable)

	Independent variables[1]									
	32	*31*	*27*	*26*	*18*	*9*	*Const*	F-Test[2]	Adjusted R^2	Observations
1			-0,28*	-3,1***	0,882***	7,56***	-6,09	0	0,573	24
			(-1,75)	(-5,42)	(5,17)	(3,55)	(-1,7)			(oecd)
2	16,8***	-3,63*	-1,02***				-5,43***	0	0,395	52
	(6,61)	(-1,73)	(-4,2)				(-2,7)			(all)
3				-3,23***	0,948***	7,75***	-7,15*	0	0,569	25
				(-4,88)	(6,18)	(3,38)	(-1,95)			(oecd)
4	13,3***		0,822				-4,46**	0	0,623	31
	(5,26)		(1,66)				(-2,34)			(non oecd)
5		-17,2***	-0,554**				13,4***	0,008	0,324	27
		(-3,04)	(-2,49)				(6,86)			(oecd)
6			2,099***				5,57***	0	0,432	31
			(4,66)				(14,86)			(non oecd)
7	17,2***						-7,16***	0	0,597	31
	(7,93)						(-4,17)			(non oecd)

Calculations according to the data of the Ifpi, the World Bank and the UN Statistics Division

***p<0,01 **p<0,05 *p<0,1

9 : Diversity Of Distributors
18 : Market Share Of National Production
26 : Population
27 : Gross Domestic Product Per Capita
31 : Gini Index
32 : Human Development Index

[1] coefficient
(t-value)
The blank compartments indicate that the variable is not included in the estimated model.

7. Discussion

7.1. On the influence of market structure

As recalled before (see 3.), the influence of the market structure on diversity of production has been much studied through general theoretical models as well as through empirical analysis of cultural and media industries. Our analysis confirms some results. First, we found that concentration of selling points for recordings tends to reduce the number of novelties. This is to be linked with the opposition between efficiency and diversity. Actually an increased concentration of retailing is measured by a higher market share of super- and hypermarkets, that is to say selling points that do not propose a huge variety of products and that rely on economies of scale. **Thus we confirm here the opposition between economies of scale and variety, an opposition that is not compensated by economies of scope.** On the other hand, and somewhat contrarily to this result, hyper- and supermarkets do not seem to favour best-sellers.

The influence of the market structure is mainly assessed through distribution. Independent producers first have a significant influence on the weight of local production. For developed countries, we found it for the share of local production in supply. For developing countries, the influence is assessed for the consumption of local production. Diversity of distribution, that also takes into account the market shares of the major companies, shows more ambiguous results. In the developed countries, the more diverse the distribution, the lower the market share of national production; but the higher the diversity of consumption according to the origin.

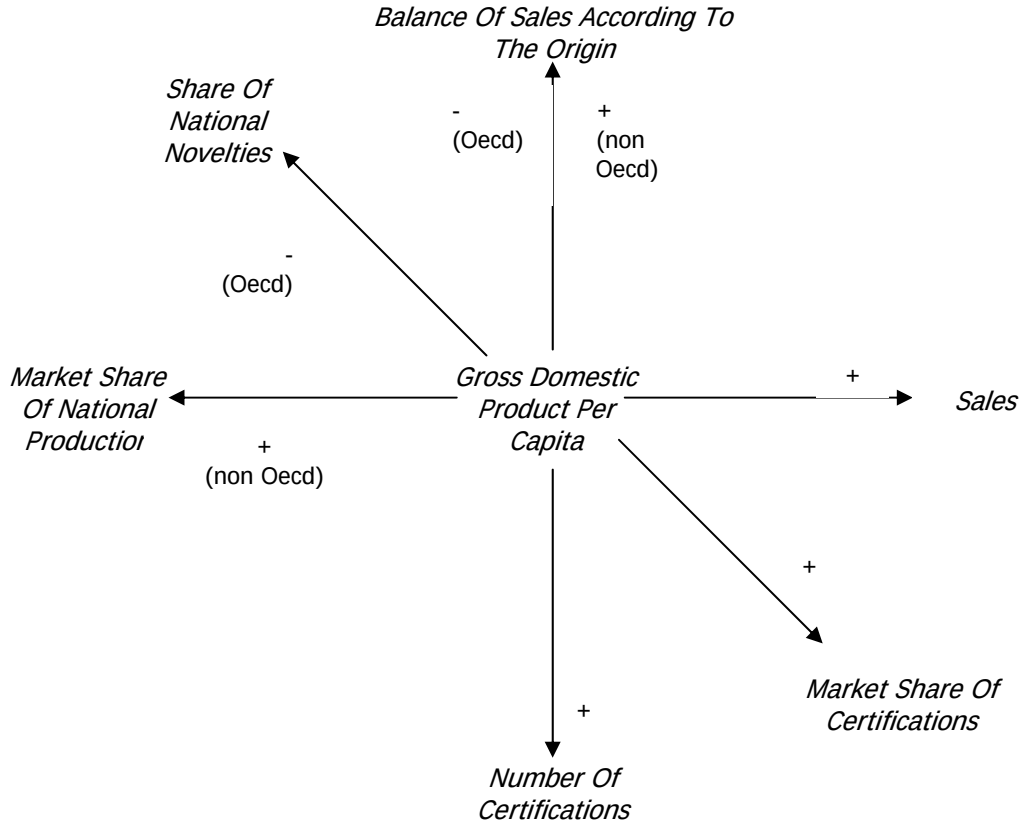
Interestingly though, diversity of distribution is negatively correlated with the number of certified titles. Thus, **our analysis confirms the "*open system account*" theory developed by Dowd (2001)**. According to it major companies succeed in keeping a high level of diversity: a more concentrated market can lead to a more diverse market. We find that a lower diversity of distributors leads to a greater variety of consumed products. **This result was always discussed at the level of the Usa but we confirm it at the international level.**

7.2. On the influence of social, demographic and economic conditions

In the end, **unlike most previous research on diversity of production in media and cultural industries, we put forward the influence of the social, demographic and economic context**. First of all, **the influence is direct**, as it is summarized in the following figures.

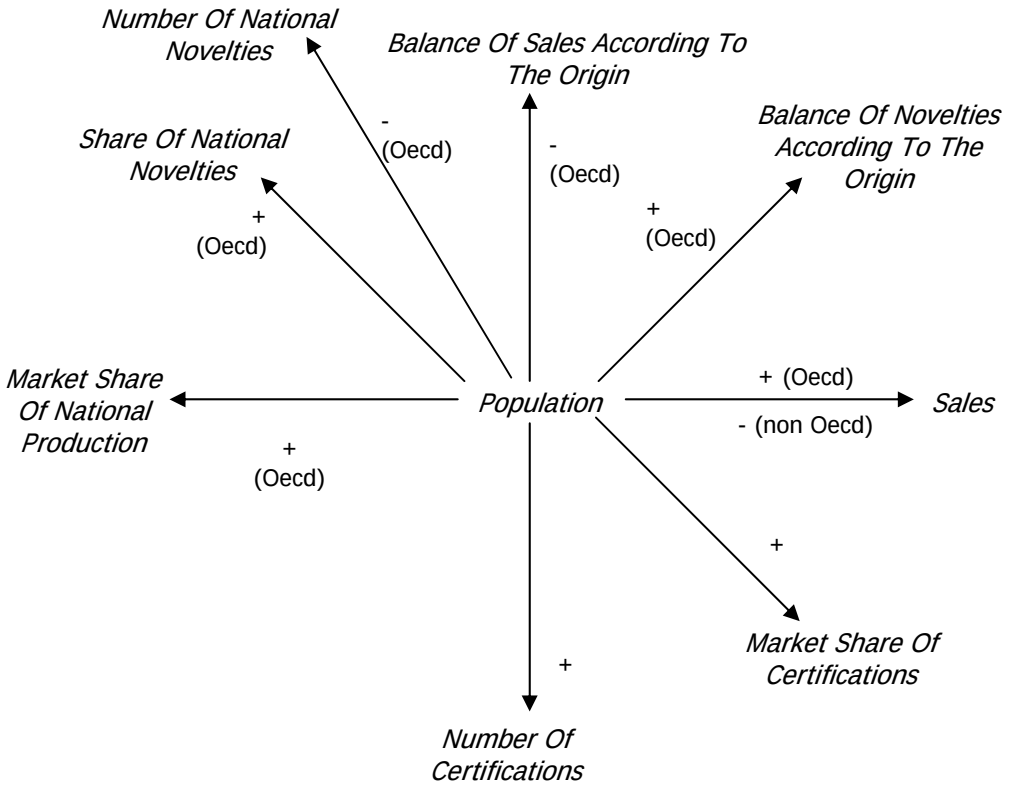
Gross domestic product per inhabitant mostly influences consumption. It favours certified titles and their share in total sales. Most of all, it favours sales.

Figure 1 : Influence of GDP per capita on diversity of production



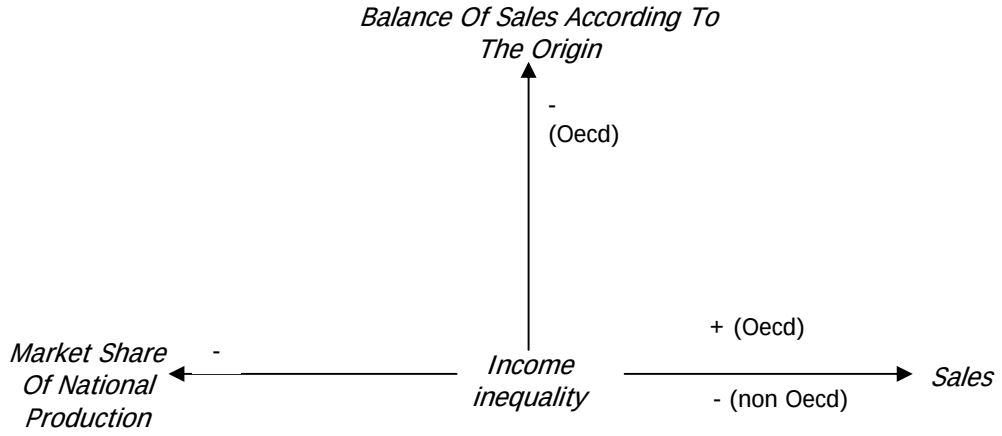
Population size has a huge influence on diversity of supplied products (in developed countries) as it favours the share of national novelties and thus diversity of novelties according to the origin. It also positively influences certified titles.

Figure 2 : Influence of population on diversity of production



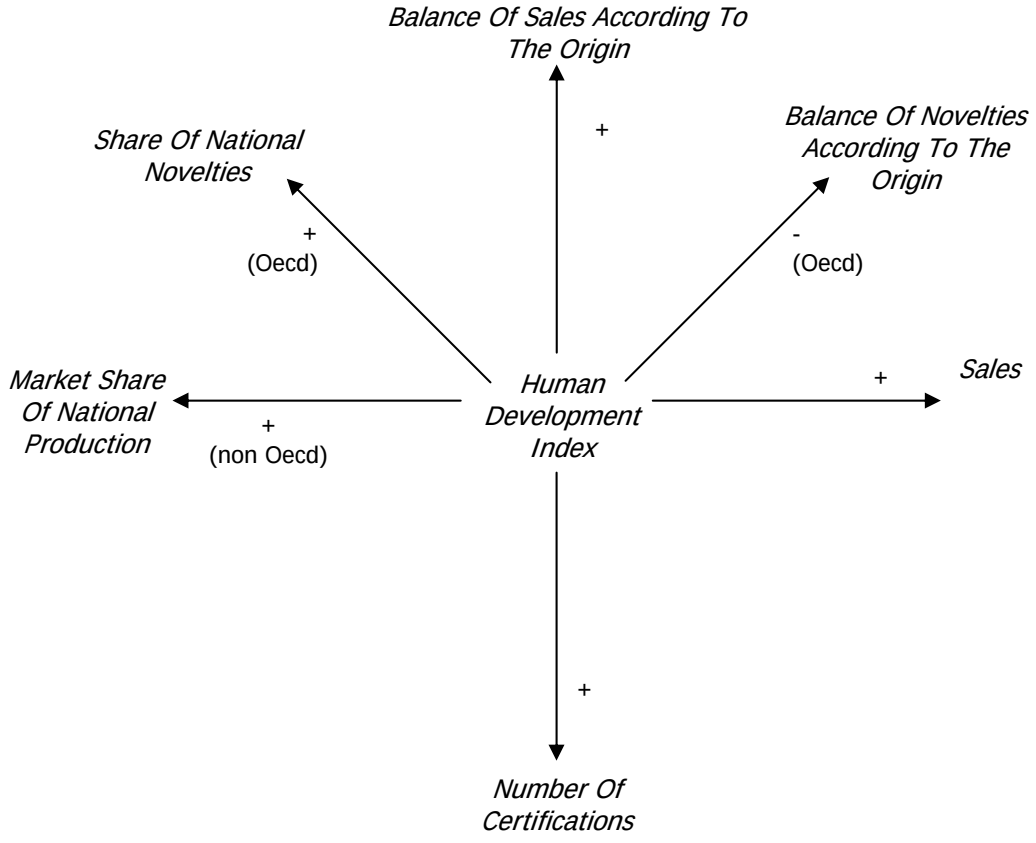
The distribution of incomes has a negative impact on the market share of national production. In more 'egalitarian' countries, one gets a lower market share of the national production. This leads to a lower diversity of consumed products according to the origin only in developed countries.

Figure 3: Influence of income unequality on diversity of production



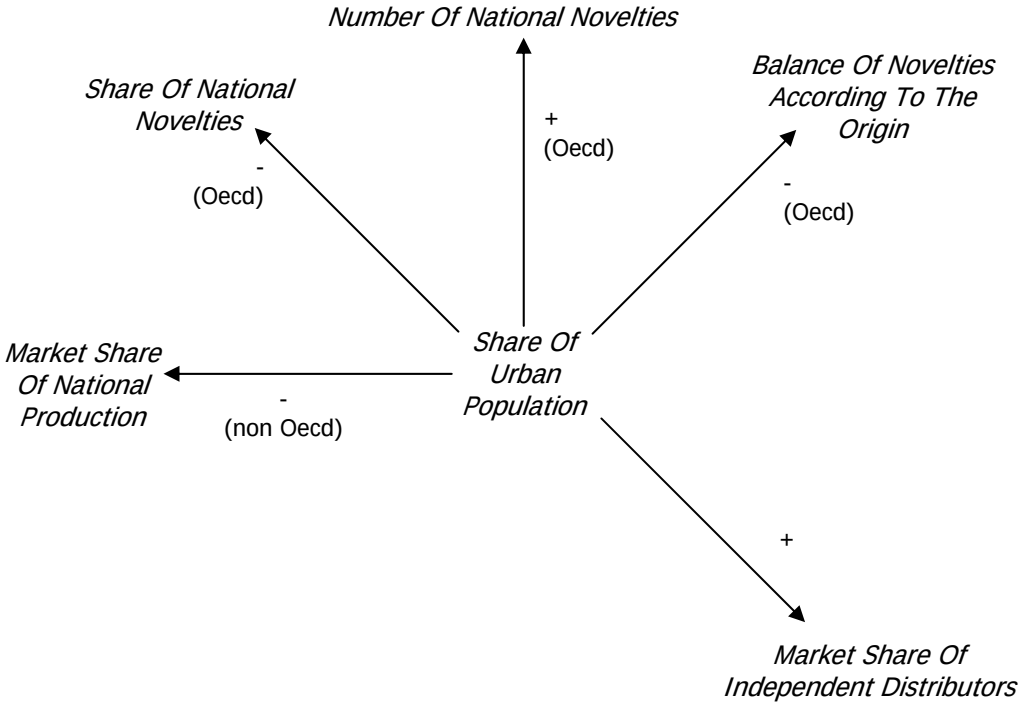
The level of development has been found to have a large influence on diversity of recording production. On the one hand, it favours variety of consumption, through sales in general and for certified titles in particular. On the other hand, it tends to reduce the share of national production in supply as well as in consumption.

Figure 4 : Influence of level of development on diversity of production



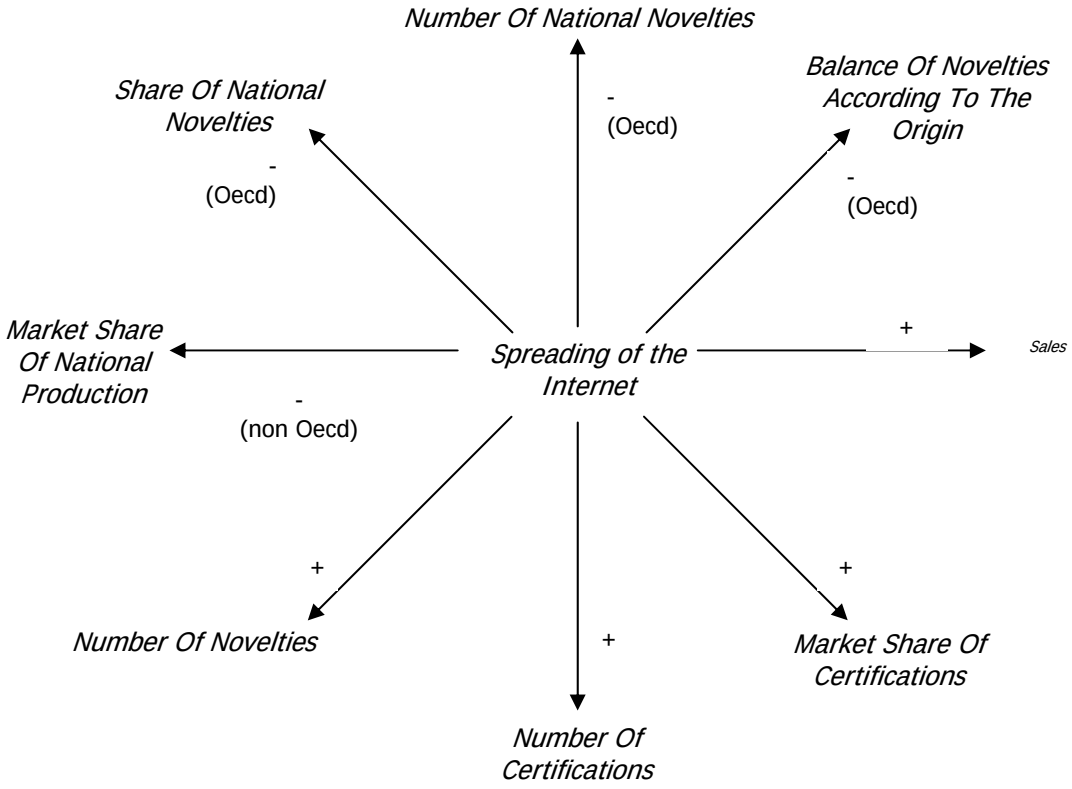
Another index relates to the share of urban population among the total population. Apart of its negative influence on the share of national production either in supply or in consumption, it is notable because it has an influence on diversity of producers. Actually the higher the share of urban population, the lower the market share of independent companies.

Figure 5 : Influence of the share of urban population on diversity of production



Finally we studied also the impact of the Internet through two indexes: the share of broadband access among all households and the share of Internet users. Internet favours variety of supply (number of novelties) as well of consumption (sales & number of certified titles). However it seems to prevent balance of supply according to the origin as well of consumption according to the title.

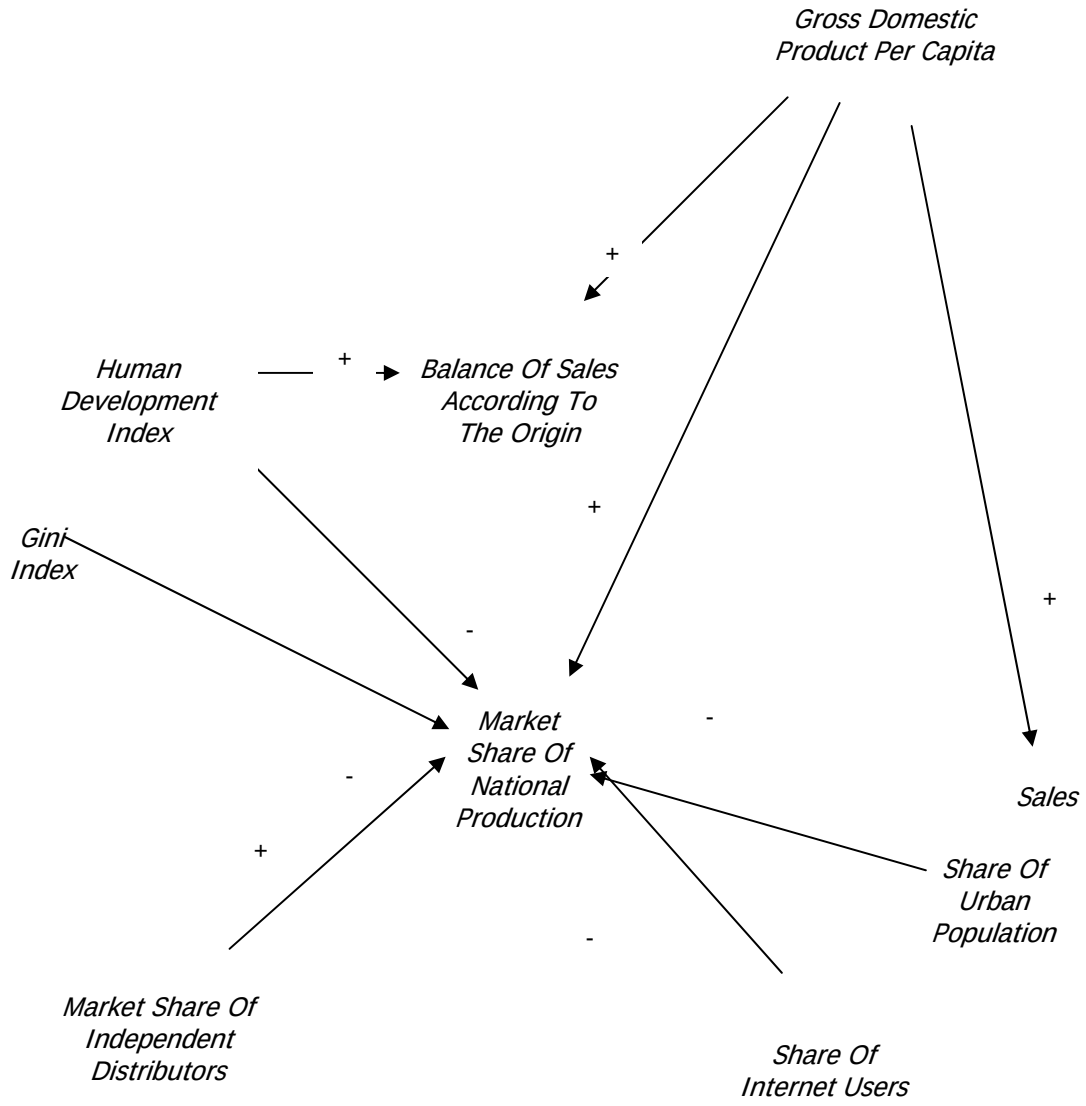
Figure 6 : Influence of the spreading of the Internet on diversity of production



Social, demographic and economic conditions have also an indirect influence. Actually relationships between aspects of cultural diversity and the influence of exogenous variables change according to the level of development reached by the country. That is why we conduct our analysis by distinguishing between developed and developing countries. We insist here on the resemblances and differences between both types of countries.

There are in fact **few resemblances**. The most stable relation concerns the positive influence of gross domestic product per inhabitant on sales per inhabitant. Also, in both kinds of countries, the more unequal the distribution of incomes, the lower the market share of national production.

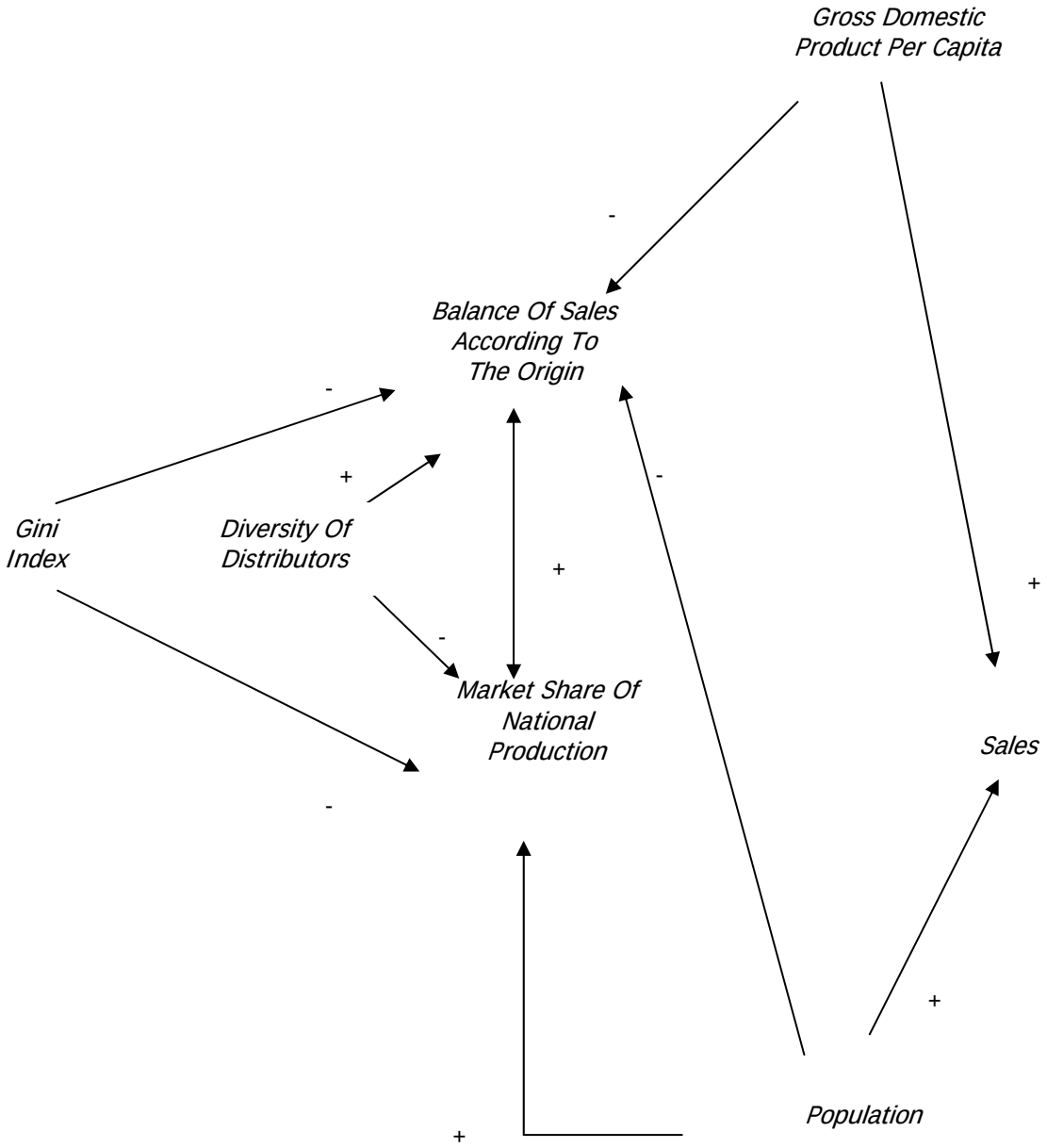
Figure 7 : Relations between sales, sales of local production and diversity according to the origin in developing countries



Both kinds of countries first differ as for the significant explanatory variables. Population size and diversity of distribution play a great role in developed but not in developing countries to explain

diversity of production, and this is quite the contrary for the index of human development, the share of urban population, the share of Internet users and the market share of independent distributors.

Figure 8 : Relations between sales, sales of local production and diversity according to the origin in developed countries



Relationships also differ. Gross domestic product per inhabitant is the most important exogenous variable for developing countries since it has an influence on our three indexes of product diversity. For developed countries, the role is played by the population size. Lastly, in developed countries, the balance of sales according to the origin is influenced by the higher amount of explanatory variables whereas it is the market share of national production for developing countries.

9. Conclusion

In this paper, our first aim has been to propose a definition of diversity of production in the cultural and media industries. **The aim of the definition is to provide a common basis for discussion among disciplines and at the same time to enable to build indexes to quantify cultural diversity.** We applied such a set of indexes to the recording industry in a large sample of very different countries. The first originality of the approach relies on the number of countries included. Never has a research on diversity of production in media and cultural industries relied on so many countries. Also, previous researches on diversity seldom used econometric tools. This allows us to give first results as for the determinants of diversity.

The influence of the structure market on product diversity is at the core of previous research on diversity of production. Our results confirm some of the main previous results. First of all, we confirm the open system account (Lopes, 1992; Dowd, 2001; 2004) at an international level and to more recent data on the recording industry.

Concentration of distribution may lead to a higher variety of consumed products. However this does not necessarily mean that concentration of distribution and product diversity always go hand in hand. On the contrary, the higher the market share of independent distributors, the higher the share of local production in novelties in developed countries. Also in such countries the higher the diversity of distributors the more balanced the sales according to the origin. In developing countries, the independent producers seem to favor the share of the local production in sales. **Lastly, as shows the negative influence of concentration of selling points on the number of certified titles, there is a contradiction between efficiency and diversity.**

In this research we put forward the influence of social, demographic and economic conditions. Such an influence had been neglected by the literature on diversity of production in media and cultural industries maybe because of the lack of data. We found unsurprisingly that the main determinant of sales per capita is income per capita. The most important result consists in that there is not

necessarily a positive link between the development and diversity (e.g. the higher the income per capita, the more unbalanced the sales per title).

The influence of social, demographic and economic conditions can also be indirect. We modelled this by distinguishing between developed and developing countries. We then found that the relations between different aspects of cultural diversity or the influence of exogenous variables differ significantly between developed and developing countries.

Finally, our empirical analysis confirms that cultural diversity is a multidimensional phenomenon. Economists have for a long time discussed the necessity for a trade-off between diversity and other criteria, notably efficiency. **Besides we show that there are trade-offs *inside* cultural diversity.** Diversity may be considered from different viewpoints (i.e. origin, title, novelties, distribution, selling points). We found that **there is not necessarily a harmony between all these viewpoints**. Some examples of contradictions are:

- the higher the diversity of the distributors, the lower the number of certified titles
- the higher the number of novelties, the lower the diversity of sales according to the origin

To prove the existence of such contradictions is firstly important for a better understanding of the functioning of the recording industry at a global level. Besides this shows that cultural diversity is no monolith. **The prevailing consensus around the notion of cultural diversity only reveals that it lacks a precise understanding.** This is particularly important from the policy makers' point of view. They cannot only affirm that their aim is to promote and protect cultural diversity. Rather they will have to precise which aspects of cultural diversity their policy aims at enhancing and at the expense of which other. Thus implicit trade-offs should be made clearer.

According to us, the work developed here should be adapted to other cultural and media sectors. Comparisons between sectors would be helpful in order to get a better understanding of the notion of cultural diversity and its political implications

Bibliography

ALEXANDER, PETER J. (1996), « Entropy and Popular Culture: Product Diversity in the Popular Music Recording Industry », *American Sociological Review*, 61, 1, p.171-174.

ANDERSON, BRUCE, HESBACHER, PETER, ETZKORN, K. PETER, DENISOFF, R. SERGE (1980), « Hit Record Trends, 1940-1977 », *Journal of Communication*, 30, 2, spring, p.31-43.

ANDERSON, DAVID R., SWEENEY, DENNIS J., WILLIAMS, THOMAS A. (2000), *Statistiques pour l'économie et la gestion*, 2e édition, Paris : De Boeck Université.

BAXTER, WILLIAM F. (1974), « Regulation and Diversity in Communications Media », *The American Economic Review. Papers and Proceedings of the Eighty-sixth Annual meeting of the American Economic Association*, 64, 2, May, p.392-399.

BENHAMOU, FRANÇOISE, PELTIER, STEPHANIE (2006), « Une méthode multicritères d'évaluation de la diversité culturelle : application à l'édition de livres en France » *in* GREFFE, XAVIER (ed.) (2006), *Création et diversité au miroir des industries culturelles*, La Documentation française, Paris, p.313-344.

BENHAMOU, FRANÇOISE, PELTIER, STÉPHANIE (2007), « How should cultural diversity be measured ? An application using the French publishing industry », *Journal of Cultural Economics*, 31, p.85-107.

BLANK, DAVID M. (1966), « The Quest for Quantity and Diversity in Television Programming », *The American Economic Review*, 56, 1/2, March, p.448-456.

BONET, LLUIS ET NEGRIER, EMMANUEL (2002), « L'observation culturelle face à la globalisation. Quelles sources d'information pour évaluer quels objectifs de politique culturelle ? », *Colloque international sur les statistiques culturelles*, Montréal, 21-23 octobre.

CHAMBERLIN, EDWARD H. (1933), *The Theory of Monopolistic Competition*, Cambridge, Mass.: Harvard University Press.

CHRISTIANEN, MICHAEL (1995), « Cycles in Symbol Production? A New Model to Explain Concentration, Diversity, and Innovation in the Music Industry », *Popular Music*, 14, p.55-93.

CHUNG, KEE H., COX, RAYMOND A. K. (1994), « A Stochastic Model of Superstardom: An Application of the Yule Distribution », *The Review of Economics and Statistics*, 76, 4, p.771-775.

CURIEN, NICOLAS, MOREAU, FRANÇOIS (2006b), *L'industrie du disque*, Paris : La Découverte, coll. « Repères ».

DIXIT, AVINASH K., STIGLITZ, JOSEPH E. (1977), « Monopolistic Competition and Optimum Product Diversity », *American Economic Review*, 67, 3, June, p.297-308.

DOWD, TIMOTHY J. (2001), « Musical Diversity and the U.S. Mainstream Recording Market, 1955-1990 », version anglaise de : (2000), « Diversificazione musicale e mercato discografico negli Stati Uniti, 1955-1990 », *Rassegna italiana di sociologia*, XLI, 2, p.223-263.

DOWD, TIMOTHY J. (2004), « Concentration and Diversity Revisited: Production Logics and the U.S. Mainstream Recording Market, 1940-1990 », *Social Forces*, 82, 4, June, p.1411-1455.

EATON, B. CURTIS, LIPSEY, RICHARD G. (1989), « Product differenciation », *in* Schmalensee, Richard, Willig, R.D. (eds.) *Handbook of Industrial Organization, Volume II*, Elsevier Science Publishers B. V., p.952-1009.

ELBERSE, ANITA, OBERHOLZER-GEE, FELIX (2006), « Superstars and Underdogs: An Examination of the Long Tail Phenomon in Video Sales », *Harvard Business School Working Paper Series*, no. 07-015.

GREENBERG, EDWARD, BARNETT, HAROLD J. (1971), « TV Program Diversity—New Evidence and Old Theories », *The American Economic Review, Papers and Proceedings of the Eighty-Third Annual Meeting of the American Economic Association*, 61, 2, May, p.89-93.

HELLMAN, HEIKKI, SORAMÄKI, MARTTI (1985), « Economic Concentration in the Videocassette Industry: A Cultural Comparison », *Journal of Communication*, 35, 3, summer, p.122-134.

HOTELLING, HAROLD (1929), « Stability in Competition », *The Economic Journal*, 39, 153, March, p.41-57.

JUNGE, K. (1994), « Diversity of Ideas About Diversity Measurement », *Scandinavian Journal of Psychology*, 35, p.16-26.

KENNEDY, PETER (2003), *A guide to econometrics*, Oxford : Blackwell Publishing.

LANCASTER, KELVIN (1979), *Variety, Equity and Efficiency: Product Variety in an Industrial Society*, New York: Columbia University Press.

LANCASTER, KELVIN (1990), « The Economics of Product Variety: A Survey », *Marketing Science*, 9, 3, summer, p.189-206.

LEVIN, HARVEY J. (1971), « Program Duplication, Diversity, and Effective Viewer Choices: Some Empirical Findings », *The American Economic review. Papers and Proceedings of the Eighty-Third Annual Meeting of the American Economic Association*, 61, 2, May, p.81-88.

LIZARDO, OMAR (2007), « Globalization and culture: a sociological perspective », February 10 Version.

LOPES, PAUL D. (1992), « Innovation and Diversity in the Popular Music Industry, 1969 to 1990 », *American Sociological Review*, 57, 1, February, p.56-71.

MARKOWITZ, HARRY M. (1952), « Portfolio selection », *The Journal of Finance*, VII, 1, March, p.77-91.

MCDONALD, DANIEL G., LIN, SHU-FANG (2004), « The Effect of New Networks on U.S. Television Diversity», *The Journal of Media Economics*, 17, 2, p.105-121.

MCINTOSH, ROBERT P. (1967), « An Index of Diversity and the Relation of Certain Concepts to Diversity », *Ecology*, 48, 3, May, p.392-404.

MOREAU, FRANÇOIS, PELTIER, STÉPHANIE (2004), « Cultural Diversity in the Movie Industry: A Cross-National Study », *The Journal of Media Economics*, 17, 2, p.123-143.

PETERSON, RICHARD A., BERGER, DAVID G. (1975), « Cycles in Symbol Production: The Case of Popular Music », *American Sociological Review*, 40, 2, April, p.158-173.

SANDERS, DONALD H., ALLARD, FRANÇOIS (1992), *Les statistiques : une approche nouvelle*, 2e édition, Montréal : Chenelière/McGraw-Hill.

SHANNON, CLAUDE E. (1948), « A Mathematical Theory of Communication », *The Bell System Technical Journal,* 27, p.379–423.

SIMPSON, EDWARD H. (1949), « Measurement of Diversity », *Nature*, 163, April 30, p.688.

SOLOW, ANDREW, POLASKY, STEPHEN, BROADUS JAMES (1993), « On the Measurement of Biological Diversity », *Journal of Environmental Economics and Management*, 24, p.60-68.

STEINER, PETER O. (1952), « Program Patterns and Preferences, and the Workability of Competition in Radio Broadcasting », *The Quarterly Journal of Economics*, 66, 2, p.194-223.

STIRLING, ANDREW (1998), « On the Economics and Analysis of Diversity », *SPRU Electronic Working Papers Series*, 28.

VAN CUILENBURG, JAN, VAN DER WURFF, RICHARD (2001), « Impact of Moderate and Ruinous Competition on Diversity: The Dutch television Market », *The Journal of Media Economics*, 14, p.213-229.

VAN DER WURFF, RICHARD (2005), « Competition, Concentration and Diversity in European Television Markets », *Journal of Cultural Economics*, 29, p.249-275.

WEITZMAN, MARTIN L. (1992), « On Diversity », *The Quarterly Journal of Economics*, 107, 2, May, p.363-405.

WONNACOTT, THOMAS H., WONNACOTT, RONALD J. (1991), *Statistiques. Économie – Gestion – Sciences – Médecine (avec exercices d'application)*, Paris : Economica.

Annex: Description of the indexes used in our empirical analysis

Table 7 : Indexes used to assess diversity of recording production

<table>
<tr><th></th><th>Variety</th><th>Balance</th><th>Disparity</th></tr>
<tr><td rowspan="3">Supplied Diversity</td><td rowspan="2">Number Of Novelties</td><td>Share Of National Novelties</td><td rowspan="3">-</td></tr>
<tr><td>Balance Of Novelties According To The Origin</td></tr>
<tr><td colspan="2">Number Of National Novelties</td></tr>
<tr><td rowspan="6">Consumed Diversity</td><td colspan="3">Diversity Of Distributors</td></tr>
<tr><td rowspan="2">Sales</td><td>Market Share Of Independent Distributors</td><td rowspan="5">-</td></tr>
<tr><td>Market Share Of Supermarkets</td></tr>
<tr><td colspan="2">Variety And Balance Of Distributors In Certifications</td></tr>
<tr><td rowspan="2">Number Of Certifications</td><td>Share Of Independent In Certifications</td></tr>
<tr><td>Market Share Of Certifications</td></tr>
</table>

Product Diversity

Producer Diversity

Table 8: Indexes of diversity of production

Name of the Index	Description	Mathematical formula	Number of countries	Link to diversity
Indexes of producer diversity				
Diversity Of Distributors	Index of diversity of distributors according to the market share. Inspired by the Shannon Index	$-\sum_{j=1}^{Maj} \frac{\frac{n_j}{n}}{1-\frac{n_{indies}}{n}} \ln\left(\frac{\frac{n_j}{n}}{1-\frac{n_{indies}}{n}}\right)$	38	+
Market Share Of Independent Distributors	Market share of independent distributors	$\frac{1}{10}\frac{n_{indies}}{n}$	38	+
Market Share Of Supermarkets	Market share of super- and hypermarkets	$\frac{n_{hyper}}{n}$	13	-
Indexes of diversity of supplied products				
Number Of Novelties	Number of new discs per million of inhabitants	$\frac{N}{1000.Pop}$	13	+
Number Of National Novelties	Number of new national discs per million of inhabitants	$\frac{N_{nat}}{1000.Pop}$	7	+
Share Of National Novelties	Share of new national discs among all novelties	$\frac{N_{nat}}{N}$	7	/
Balance Of Novelties According To The Origin	Shannon Evenness index of new discs according to the origin	$-\frac{\sum_{i=1}^{R}\frac{N_i}{N}\ln\frac{N_i}{N}}{\ln R}$	7	+
Indexes of diversity of consumed products				
Balance Of Sales According To The Origin	Shannon Evenness index of sold discs according to the origin	$-10\frac{\sum_{i=1}^{R}\frac{n_i}{n}\ln\frac{n_i}{n}}{\ln R}$	73	+
Market Share Of National Production	Market share of national production	$\frac{1}{10}\frac{n_{nat}}{n}$	73	/

Sales	Sales of recordings per inhabitant	$\frac{n}{Pop}$	71	+
Indexes of diversity related to the best-sellers				
Number Of Certifications	Number of certified discs	C	8	+
Market Share Of Certifications	Sales of certified discs relative to total sales	$\frac{n_C}{n}$	7	-

Social, demographic and economic indexes

Market size (source: United Nations Statistics Division):
- *Population*
- *Gross Domestic Product Per Capita*
- *Gross Domestic Product*

Level of development (source: United Nations):
- *Human Development Index* takes into account wealth but also longevity and education
- *Share Of Urban Population* assesses the share of urban population among the whole population

Inequality of the distribution of incomes (source: World Bank):
- *10% Richest On 10% Poorest* assesses the ratio of the income or expenditure share of the 10% richest group to that of the 10% poorest: the higher this index the more unequal the distribution of income in the country
- *20% Richest On 20% Poorest* is very alike but for the 20% poorest and the 20% richest
- *Gini Index* is a common measure of unequality that takes into account all incomes.

Spreading of the Internet:
- *Share Of Broadband* corresponds to the share of broadband among all connections (source: Oecd)
- *Share Of Internet Users* is the share of Internet users among the whole population (source: World Bank)