New Evidence on Development and Cultural Trade: Diversification, Reconcentration and Domination

Maria Masood

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Maria Masood[1]

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Abstract

International trade of cultural goods hasgained considerable importance over the last decade and has been dominated by rich countries. Meanwhile, trade in cultural goods isconsidered as a potential threat to cultural diversity, and development process isaccused of being a disguised westernization process. One question arises: how does development impact on the cultural diversity of developing countries?

This paper investigates the relationship between economic development and cultural diversity, measured here as the geographical diversity of cultural imports. Building on the recent literature about cultural diversity, a multi-dimensional approach is applied, taking into account the variety and the balance of cinema and music trade. The results evidence a nonlinear impact of development on the diversity of cultural imports.First, an increase in income leads to a diversification of the varieties consumed. Second, there exists a nonlinear relationship that translates into a reconcentration on a smaller number of partners in latter stage. Third, the reconcentration pattern favoursthe share of American products in total cultural imports.

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[1]PhD candidate – University of Geneva
maria.masood@unige.ch

1. Introduction

The cultural sector has gained considerable importance in the world economy and international trade in the last decades. According to UNCTAD's Report on Creative Economy, trade in creative goods hasincreased by 14.4% per year between 2002 and 2008. Meanwhile, developing countries' shares remained desperately low, accounting for only 22% of world exports, excluding China (UNCTAD, 2010). Cultural exports are indeed highly concentrated on a small number of exporting countries: the International Federation of the Phonographic Industry (IFPI, 2005) estimated that three countries (USA, United Kingdom and Japan) accounted for 71.7% of world retail music sales. In the cinema industry, American movies dominate the world markets; a UNESCO survey (2012) revealed that the global top 10 movies were all American. Unsurprisingly, cultural trade has become a sensitive issue in international agreements: in 2007, 121 countries, but the United States, ratified the UNESCO convention on the promotion and protection of cultural expressionsaccording to which cultural goods and services deserve a specific treatment due to their dual "economic and cultural nature, because they convey identities, values and meanings, and must therefore not be treated as solely having commercial value" (UNESCO, 2007).

Two main reasonsjustify the investigation of the link between development and cultural diversity in developing countries. First, the imbalance ofworld cultural exportscoupled with the existence of often weak cultural industries in developing countries make them particularly vulnerable vis-à-vis the protection of cultural diversity. To what extent does economic development reverse or reinforce the preeminence of developed countries' exports? In addition, two recent studies (Thoenig and al., 2009; Disdier and al., 2009) evidenced the "Trojan horse effect" of foreign cultural goods that would eventually lead toa convergence of cultural values and tastes. The second justificationcan be found in a number of development criticismanalyses: capitalism and/or globalization would lead to the creation of a unified "global cultural marketplace" (Fu, 2006) and ultimately to the "westernization of the world" (Latouche, 1996).To confront these claims, we suggest investigating whether economic development leads to a homogenization of cultural imports in favor of certain rich countries.

Relying on the recent definitional and technical improvements in the related literature, we develop some new stylized facts about the relationship between economic development and diversity in cultural imports. Our basic results are as follows: first, income leads to a diversification of imports sources consistent with the taste for variety theory (Dixit and Stiglitz, 1977, Anderson and al, 1992). Second, there exists a nonlinear relationship that translates into a reconcentration on a smaller number of partners in latter stage. This second stylized fact might provide empirical evidence for the extension of the learning by consuming theory (Lévy-Garboua and Montmarquette, 1996; Lévy-Garboua, 2002) and possibly the strategy of conquest of the emerging markets by the big players. Third, this reconcentration is in favour of rich countries and more specifically benefits American productions, whose dominance in cultural goods has been theoretically explained by the existence of a home market effect (Rauch and Trindade, 2009).

The paper is organized as follows. The theoretical framework is developed in section2. The multi-dimensional approach of cultural diversity and data used are presented in section 3. The

non-linear relationship between economic development and cultural trade is investigated in section 4 while section 5 reports evidence on the dominance effect (reconcentration on a small number of large exporters). Section 6 concludes.

2. Survey of the literature about cultural trade diversity

Economic literature about cultural trade diversity is very recent and is extending in both empirical and theoretical field.

Building upon Marvasti and Canterbury's analysis (2005), Hanson (2008) evidenced the existence of a link between economic size and concentration in cultural trade in an article analyzing movies imports of nineteen European countries over the 1992-2002 period. Based on the estimation of a gravity model, the data on US box office revenues revealed that American movies tend to have a ''more dominant position'' in smaller economies. In the same vein, Fu (2006) emphasized the increasing concentration of the movie industry around American and British productions at the expense of other countries' share. Interestingly, he observed a negative impact of income on the concentration of movie imports: reflecting the fact that richer countries tend to have a more diversified import portfolio compared to developing countries. However, Fu did not test the potential nonlinear impact of income on the concentration of movie imports. Disdier and al. (2009), provide empirical evidence that the consumption of foreign television program in France leads to significant changes in symbolical behavior: they show that traditionally, baby naming is influenced by media exposure, yet the predominance of American television programs leads to a move from traditional French names to American names.

A few theoretical models have been recently designed to describe the impact of trade on cultural diversity. Most of these models, if not all, conclude that trade has a negative impact on cultural diversity (Bala Van Long, 2005; Rauch and Trindade, 2009;Olivier and al., 2008;Thoenig and al., 2009). However,to our knowledge, nor the impact of development or income on cultural diversity, neither the potential non-linear influence of income on the consumption of foreign cultural goods has been investigated in the existing literature.

3. Assessing the diversity of trade in cultural goods

3.1 Measuring cultural diversity

i. Themeasure of diversity

Following the recent literature about cultural diversity (Moreau and Peltier, 2004; Benhamou and Peltier, 2009; Flores, 2009; Farchy and Ranaivoson, 2011), we apply the multidimensional definition of diversity developed by Stirling (1999). Contrary to traditional analysis that assimilates diversity to variety, this approach is more comprehensive as the diversity of a system is considered as the product of three complementary components:
- The variety of the elements « the number of categories into which system elements is apportioned »;

- The balance "function of the pattern of apportionment of elements across categories";
- The disparity: the extent to which categories differ from one another.

Considering diversity in cultural goods, we define the elements as the imported cultural goods units and the categories as the origin of these imports, namely the cultural partners. Accordingly, we can define the three dimensions of diversity as follows:

- Variety corresponds to the number of partners. We assume here that each country produces a cultural-specific movie, or song, that is different from a creation produced by another country. Because of the impossibility of measuring the variation in the content of the traded cultural goods, this approach appears to be the most appropriate to measure the variety of the traded good;
- Balance refers to the distribution of imports among the different partners measured with concentration indices. In accordance with the related literature, we apply two traditional indices: the Herfindhal Hirshman and the Shannon index; in addition we introduce a new concentration index that can be conveniently decomposed into the two components of our definition of diversity.
- Disparity: due to data scarcity, we will not be able to measure this dimension in the framework of our analysis. Measuring to what extend an American movie is more distant to a Brazilian one compared to a Korean one require an arbitrary selection of criteria for measuring it that is not in the scope of our study.

ii. The measure of the balance

In order to measure the balance of import shares among the partners, we compute different concentration indices. On the one hand, we compute the traditional indices found in the literature: the Herfindhal Hirshman and the entropic Shannon indices and on the other hand we apply the decomposition of the entropic Theil index.

- Herfindhal Hirshman index (HHI)

Herfindhal-Hirshman index is a traditional concentration measure in the analysis of firms' market share in a given industry. It is defined as the sum of the squares of the categories' shares: the more balanced the distribution of the shares, the lower the index (normalized to range between 0 and 1). i refers to the importer, j to the exporter and x_{ij} is the bilateral trade flow:

$$\text{HHI index}_i = \sum_{j=1}^{n} s_{ij}^2$$

$$\text{Where } s_{ij} = \frac{x_{ij}}{\Sigma_{j=1}^{n} x_{ij}}$$

- Shannon index

Widely used in the ecological literature, Shannon index is an entropy index: it measures the uncertainty (entropy or degree of surprise) in predicting the category (here: the origin) to which belong an element (here: the import unit).

This index ranges from 0 to 1, if the distribution is concentrated on one category, and the other categories are very rare, though numerous, Shannon entropy approaches zero: there is no uncertainty in the prediction of the category of a given random element.

$$\text{Shannon index}_i = -\sum_{j=1}^{n} s_{ij} \ln s_{ij}$$

- Theil index

An innovation of the present paper is the decomposition of the entropic Theil index, that is a variation of the Shannon index, to assess cultural diversity. Following Cadot et al(2010), we decompose this index into two components to explain concentration: a within element (intensive margin) that measures the distribution of element's shares among different categories, and a between component (extensive margin) that measures the number of active categories, thus reflecting the variety of the imports.

Concentration at the intensive margin implies a more unequal distribution of shares among the cultural partners and concentration at the extensive margin can be interpreted as a decrease of active origins or decreasing variety. This calculation is based on the partition of our sample into two sub-groups: active and inactive cultural trade flows (per year and cultural good) that are considered respectively as within and between group. We can show that the evolution in the within group (active partnerships) reflects changes at the intensive margin and evolution in the between group (inactive partnerships) signifies changes at the extensive margin.

Hence, the overall Theil index is explicitly explained by two components (more details on the decomposition in appendix).

$$\text{Theil index}_i = \frac{1}{n}\sum_{j=1}^{n} z_i \ln z_i$$

$$\text{Where } z_i = \frac{x_{ij}}{\frac{\sum_j^n x_{ij}}{n}}$$

Where n is thenumber of (country of) origin of the imported goods.

3.2 Cultural trade data

The study of trade in cultural goods faces two major challenges: the definition of a cultural good and the measurement of trade flows.

i. Definition of the selected cultural goods

In the framework of this paper, we rely on the widely accepted definition of UNESCO (2005) of audiovisual and recorded media products.The audiovisual category, hereafter termed cinema, comprises cinematograph films, exposed and developed, and photographic plates and film, exposed and developed. We choose to exclude the videogames from the audiovisual category since the structure of videogames trade flows differ significantly from the rest of the audiovisual products. The recorded media category, hereafter termed music, comprises: gramophone records, discs for laser reading systems for reproducing sound only, magnetic tape and other recorded media for sound.

Yet, within these categories, it is possible to distinguish the core cultural goods and related cultural products. For instance: the DVD "Lord of the Rings" would be labeled as a core cultural product while a writable CD would be classified as a related one. We will focus on the core cultural goods since we infer that cultural diversity is affectedby the content rather than the support of traded cultural products.

ii. Data sources

Another challenge of such analysis, not the least, is the measurement of the total amount of traded cultural products. Because of the importance of the informal sector (notably piracy) in developing countries and the growing digitization of contentsin the cinema and music industries, the existing international trade data underestimates the amount of cultural trade flows. Yet, there is no comprehensive database on trade in cultural services. So far, the existing studies about cultural exchanges have relied on three main data sources:

- Surveyand national charts: the monthly top 20 songs (Ferreira and al., 2010);
- Private sector: US box office receipts (Hanson 2008);
- International organizations: Comtrade database (Disdier and al., 2010) or UNESCO statistics (Fu, 2006).

The first two datasets have the advantage of providing comprehensive information in regards of the relative importance dedicated to selected foreign cultural products in a country. Yet, these procedures suffer from unrecorded cultural consumption (due to piracy for instance) and can be difficult, or impossible to collect for a large number of developing countries.

To date, Comtrade database is the most comprehensive existing dataset about trade and cultural trade particularly. Recent papers about trade in cultural goods have relied on this dataset (Disdier and al., 2010; Thoenig and al., 2009, Lionetti, 2010). It nevertheless has some shortcomings, among which the incomplete coverage of coproduction transactions and the absence of information about trade incultural services.Yet, it should be noted that these limitations are also encountered with the alternative datasets[2].

Hence, though imperfect, Comtrade database is the best existingsource to consider the patterns of trade flows of cultural goods in developing countries. Especially, this database provides crucial information about the two dimensions of diversity: the evolution of the number of trading partners and the relative importance of each partner in the total amount of cultural imports.

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[2]Alternatively, UNESCO provides a database only about film imports and its coverage is very low, excluding most developing countries

Following these different arguments, we choose to perform our analysis using the BACI database, that is an improved version of the Comtrade database. This version of the dataset is more suited to the analysis of developing countries' trade since BACI reconciles import and export data records based on the method known as "mirror data" and taking into account the quality of countries' declarations, the average mirror flows, the evaluation of cost insurance and freight rates (Gaulier and Zignago 2008).

Figure 1: Evolution of developing countries' imports from BACI database, 1995-2007
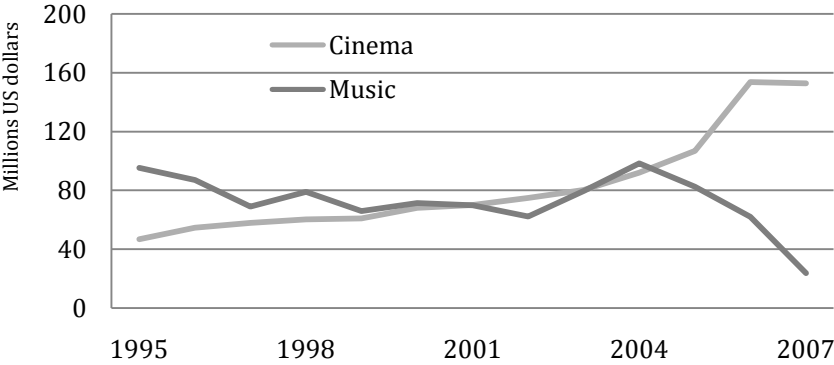
Source: Author's' calculations from BACI database

According to BACI database, developing countries' imports of cinema products have more than tripled between 1995 and 2007. However, the picture is different when we look at the evolution of music trade that has been divided by 4 during the same period. This fall is explained by the collapse of music physical imports from 2005, with a decrease of imports from 98 to 23 millions of US dollars, most probably due to the rise of immaterial trade. To minimize the bias that might arise because of these evolutions in the music sector, we will focus on the pre-2005 period of our dataset.

Our sample covers 124 developing countries' imports over the 1995-2007 period for the cinema trade and 1995-2004 for the music trade.

4. Empirical investigation: what impact of development on the diversity of cultural exchanges ?

4.1 Impact of development on the diversity of cultural imports

i.   Descriptive statistics:

We consider the number of partners as an indicator of the variety of cultural exchanges: assuming that each and every partner has specific cultural traits that translate into differentiated cultural goods.

Table 1: Descriptive statistics: Number of partners

Sector	Developing countries		Developed countries	
	Cinema	Music	Cinema	Music
Average	6.35	6.77	21.1	22.56
Standard deviation	6.86	6.31	15.42	15.12
Minimum	0	0	0	0
Maximum	36	34	67	75

Source: Author's' calculations from BACI database

Table 2: Descriptive statistics: Concentration indices

	Developing countries				Developed countries			
	Theil			HHI	Theil			HHI
	Total	Between	Within		Total	Between	Within	
Cinema	3.79	3.21	0.58	0.54	3.33	2.04	1.29	0.39
Music	3.73	3.12	0.6	0.52	3.14	1.91	1.23	0.35

Source: Author's calculations from BACI database

FromTable **1**, developing countries' import portfolio appears less diversified than developed countries where the number of cultural partners is thrice as large as developing countries' portfolio. In addition, overall concentration of cultural imports sources (Table **2**) is greater for developing countries over the sample period. Indeed, the overall Theil and the Herfindhal-Hirshmann index are smaller in both sectors for developed countries, reflecting higher diversification of import sources compared to developing countries.

ii. An agnostic approach: a non parametric analysis

Before implementing our estimation strategy, we test the link between income and cultural diversity without making any assumption on the form of the relationship through the use of a nonparametric procedure: the locally weighted smoothing scatter (lowess) method (Cleveland, 1994). Lowess procedure yields a smoothed curve that results from the estimation of a low degree polynomial for each point of the dataset.This approach is particularly convenient in the exploratory stage for assessing the direction of the relationship between two variables as it "lets the data speak".

In addition, we compute a quadratic function that estimates the relationship between two variables allowing for the existence of a nonlinear relationship.

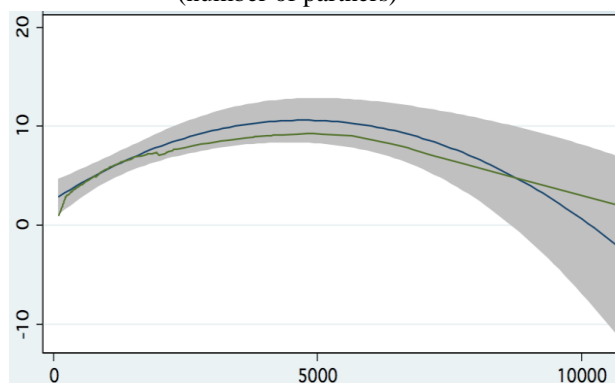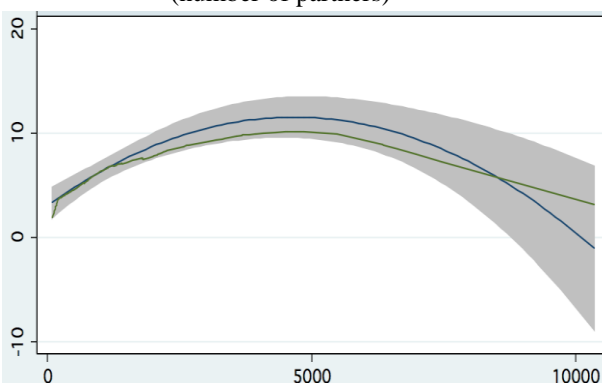Figure 2: Cinema – impact of income on the variety (number of partners)

Figure 3: Music – impact of income on the variety (number of partners)

Source: Author's calculations from BACI database
The green line corresponds to the lowess estimation and the blue line represents the quadratic function associated with the corresponding 95 % confidence intervals

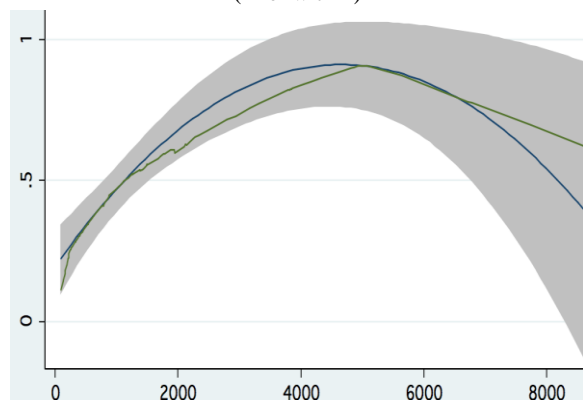Figure 4: Cinema – impact of income on the balance (Theilwithin)

Figure 5: Music – impact of income on the balance (Theilwithin)
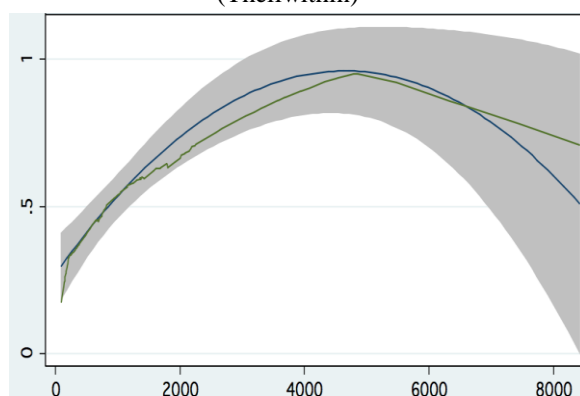
Source: Author's calculations from BACI database
The green line corresponds to the lowess estimation and the blue line represents the quadratic function associated with the corresponding 95 % confidence intervals

The estimation of these non-parametric equations indicates the existence of a nonlinear relationship between economic development and the number of partners for both sectors.

Regarding the balance of imports' share among partners, income appears to have a potential non-linear impact: a higher concentration is followed by diversification process in the cinema and music sector[3]. However, the confidence intervals being relatively large in Figure **4** and Figure 5, the significance of the relationship is unsure.

Ensuing these preliminary steps, we investigate the hump shaped relationship betweeneconomic development and cultural diversity in the following section.

   iii.   Estimation of the relationship between development and the diversity of cultural imports:

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[3]Note that with the Theil index, higher concentration translates into an increase of the index, while diversification decreases the value of the Theil.

This section is based on the estimation of the following equation:

$$y_{it} = gdpc_{it} + gdpc^2{}_{it} + \partial_i + \gamma_t + \varepsilon_{it}$$

Where y_{it} is a measure of diversity and gdpc is the gross domestic product per capita, a traditional measure of economic development. Our dependent variable is the decomposition of the Theil index into a variety component (number of partners: Theil between) and a balance component (Theil within). By construction (see the calculation of the index in appendix),the overall Theil is the sum of these two components.As a consequence, to measure the different dimensions of diversity, we have three different dependent variables:
- Between component of the Theil: measure the diversification of import sources;
- Within component: measure the balance of the exporters' shares;
- Overall Theil: the sum of the between and within components.

Because of the panel structure of our variable, we introduce time and individual fixed effects to capture the heterogeneity of the sample.∂_i represents the importer fixed effect in order to capture time invariant specific characteristics that may have an impact on the concentration of imports (for instance the relative distance from the majors' market). γ_t captures year specific effect so as to remove a possible time trend from our estimates and any shock that might affect all the countries in a specific period and impact our dependent variable.

Following the hump shape of the non-parametric curve, we add a quadratic term amongour explanatory variables in order to test the existence of a nonlinear impact of economic development on cultural imports concentration. To my knowledge, it is the first study that allows and tests the nonlinear impact of economic development on cultural diversity.

According to Lind and Melhum (2007), the significance of the quadratic term is not a sufficient condition to establish the existence of a nonlinear impact: "this criteria is too weak" and leads to a misinterpretation of a convex but yet monotone relationship. Adapting Sasabuchi procedure, they test the significance of the turning point by considering two additional conditions: i) the estimated threshold must be contained in the data range, ii) slopes on each side of the turning point should correspond to the hump shape curve. We reportthe Sasabushi-Lind-Melhum test (named Sasabuchi test henceforth) for all quadratic estimations to confirm the robustness of the non-linear relationship.

Table3: Impact of income per capita on the decomposition of the Theil index

Dependent variable: Decomposition of the Theil index						
Estimation technique	Fixed Effect regression					
Sector	Cinema			Music		
Dependent variables	Theil	Theilbetween	Theilwithin	Theil	Theilbetween	Theilwithin
GDPc	-0.0310	-0.391***	0.359**	-0.504***	-0.397**	-0.107
	(-0.240)	(-2.750)	(2.357)	(-2.909)	(-2.383)	(-0.791)
GDPc squared	0.0126	0.0364**	-0.0237	0.0477***	0.0372*	0.0105

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	(1.261)	(2.272)	(-1.430)	(3.111)	(1.901)	(0.600)
Constant	3.805***	3.743***	0.0613	4.296***	3.495***	0.801***
	(23.19)	(24.86)	(0.362)	(21.33)	(19.87)	(5.744)
Observations	1,392	1,392	1,392	1,153	1,153	1,153
R-squared	0.026	0.045	0.044	0.017	0.013	0.017
Sasabuchi test	-	2.23**	1.35*	2.9***	1.85**	-
Turning point	-	5,367	7,569	5,280	5,332	-
Importer FE	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	Yes

Clustered Robust t-statistics in parentheses

***, ** and * denoting significance at the 1%, 5% and 10% level

These results confirm the existence of the nonlinear impact of economic development on thevariety of cultural imports (suggested in the non parametric estimation): income leads first to diversification but is then correlated with a reduction in the number of partners. In the cinema sector, one unit increase in income leads to a decrease in the Theil between component of0.391 points. The impact is lower in the music industry where a one unit increase reduces the between component by 0.397 points. Note that replacing Theil between by the number of partners as the dependent variable yields similar results, the results are reported in appendix(Table**9**). This nonlinearrelationship is confirmed by the Sasabushi test for both sectors.

However, the impact on the balance of import sources is mixed[4]: it has no significant impact in the music sector and is correlated with a negative influence on the diversity of cinema import sources. Though the quadratic income term suggests the existence of a nonlinear impact on the balance of cinema imports, Sasabuchi test rejects the significance of the turning point. In the cinema sector, the two contrasting effects compete and lead to the non-significance of the total index.

Overall, income appears to have a nonlinear impact on the diversity of cultural imports, explained by the variety component. We provide tentative explanation of thisnon-linear relationship insection 5.

The two other balance indices confirm our Theil results (note that the Shannon index has an opposite sign compared to Theil and HHI indices: the more diversified, the larger the Shannon index):

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[4]The within component of the Theil index is the component that might be most affected by the quality of the data. Indeed, we assume that unrecorded trade influences the importance of trade flows rather than the existence of an active trade relationship. If we look at the two main reasons why trade is unreported: piracy and digitization, we can reasonably assume that these factors should not lead (at least, for now) to the end of physical trade flow but rather explain the decrease of amounts exchanged (Lionetti and al., 2010).

Table4:Impact of income per capita on the Shannon and HHI indices

Dependent variable: Concentration indices				
Estimation technique	Fixed effect regressions			
Sector	Cinema		Music	
Dependent variable	HHI	Shannon	HHI	Shannon
GDPc	-0.0039	0.0303	-0.241***	0.502***
	(-0.0609)	(0.234)	(-3.178)	(2.901)
GDPc squared	0.00419	-0.0126	0.022***	-0.048***
	(0.796)	(-1.256)	(3.127)	(-3.105)
Constant	0.552***	0.927***	0.795***	0.454**
	(6.927)	(5.654)	(8.930)	(2.254)
Observations	1,392	1,392	1,153	1,153
R squared	0.011	0.011	0.018	0.016
Turning point	-	-	5,488	5,277
Sasabuchi test	-	-	3.08 **	2.9***
Country FE	yes	yes	yes	yes
Year FE	yes	yes	yes	yes

Clustered robust t-statistics in parentheses
***, ** and * denoting significance at the 1%, 5% and 10% level

Alone, this table can be misleading, since income appears to have a non-significant impact on the concentration of cinema imports. Yet, the decomposition of the Theil index above informs us that this insignificant result is explained by the contradictory impact of income on the two dimensions of diversity: it first favors variety while deterioratingthe balance of import shares.

5. Survival of the fittest ?

5.1 Concentration trend in the trade of cultural goods

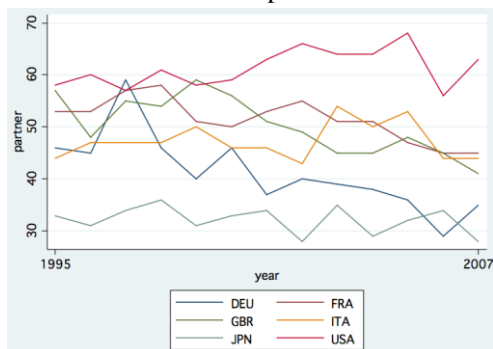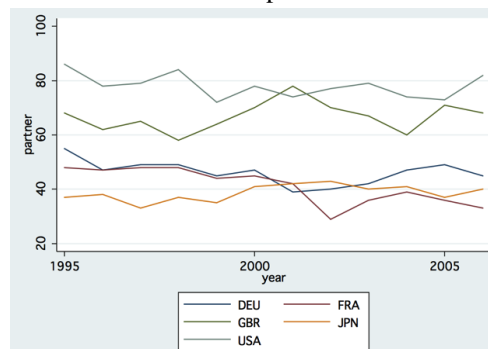Figure 6: Evolution of the number of partner by cinema exporters

Figure 7: Evolution of the number of partner by music exporters

Source: Author's calculations from BACI database

From these graphs, we can observe the evolution of the top exporters' position to developing countries over the 1995-2007 period. In the cinema sector, only the USA appears to have increased the number of existing active trade relationships while the other top exporters'portfolio has decreased over the sample period.

In the music sector, characterized by a higher number of partners per exporter compared to cinema, the top exporters seem to have maintained their position. This implies that if the reconcentration occurred, they have not been negatively affected over the sample period.

5.2 Who wins?

In the following regressions, we focus on the countries above the threshold (that have crossed the threshold or are above the threshold in the sample period[5]). We test whether the share of aselected group of countries has benefited from the reconcentration trend through the estimation of the following equation:

$$exporter'share_{it} = gdpc_{it} + gdpc^2_{it} + \partial_i + \gamma_t + \varepsilon_{it}$$

The information about the reconcentration pattern is expected to come from the coefficient of the quadratic term of the equation: indeed, income squared provides information about the impact on diversity once the threshold is crossed. The dependent variable is a ratio of the share of a selected exporter (or group of exporters) on the overall import flows by year and importer.

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[5]List of countries above the threshold in the cinema sector: Argentina, Chile, Dominica, Grenada, Kenya, Libya, Lebanon, Lithuania, Latvia, Mexico, Uruguay, and Venezuela.
In the music sector: Argentina, Chile, Grenada, Kenya, Libya, Mexico and Uruguay.

We firstexamine whether the reconcentration process in developing countries benefits their counterparts or favors richer countries' exports and thus reinforces the existing imbalance in world cultural trade[6].Our dependent variable is calculated as follows:

$$Share\ of\ developing\ countries_{itk} = \frac{imports\ from\ developing\ countries_{itk}}{total\ imports_{itk}}$$

where i is the importer, t the period and k the sector.

Table5: Testing the reconcentration process according to the development status of the exporter

Dependent variable: Developing countries share in cultural imports		
Estimation technique: Fixed effects		
Sector	Cinema	Music
GDPc	-0.00213	0.0391
	(-0.0338)	(0.131)
GDPc squared	-0.00717	0.00619
	(-1.496)	(0.299)
Constant	0.348	-0.268
	(1.766)	(-0.258)
Observations	138	66
R-squared	0.187	0.108
Number of importers	12	7
Country FE	yes	yes
Year FE	yes	yes

Clustered robust t-statistics in parentheses
***, ** and * denoting significance at the 1%, 5% and 10% level

From this table, there is no evidence that economic development favors developing or developed countries cultural exports.

We now turn to the impact on the share of cultural products from individual countries. All the regressions performed yielded non-significant coefficients except for cultural goods originating from the USA. The related regression is based on the following dependent variable:

$$Share\ of\ USA\ products_{itk} = \frac{import\ from\ USA_{itk}}{total\ imports_{itk}}$$

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[6]Note: the distinction between developed and developing countries is based on the World Bank classification, 2011.

Table6: Testing the reconcentration process on American imports

Dependent variable : USA share in total imports		
Estimation technique : Fixed effect		
Sector	Cinema	Music
GDPc	-0.119	-0.723**
	(-1.191)	(-3.070)
GDPc squared	0.0183*	0.448**
	(2.139)	(2.515)
Constant	0.550	3.121***
	(1.742)	(3.950)
Observations	138	66
R-squared	0.138	0.358
Number of importers	12	7
Country FE	yes	Yes
Year FE	yes	yes

Clustered robust t-statistics in parentheses
***, ** and * denoting significance at the 1%, 5% and 10% level

When considering the American share in total cultural imports, it clearly appears that reconcentration benefits the American product exports in both sector, whilst it has no impact on other countries' share. These results extend Fu's findings (2006)about American dominance in cultural goods to developing countries and confirm the predictions ofRauch and Trindade's theoretical model (2009).

5. Identifying the transmission channel

As hypothesized in the related literature, the home market effect can explain the dominance of a few players in the world cultural market. In the presence of increasing returns to scale combined with high transaction costs[7], Helpman and Krugman (2005) influential paper tells us that the production of differentiated products tends to locate in the market having the higher level of demand. In addition, according to Rauch and Trindade (2006) another factor can be added to the analysis to explain the dominance of the American cultural products: the existence of consumption externalities in the case of cultural goods. Consuming a cultural good is a social experiment, what consumers want is "not so much experiencing the "best" of everything as it is to experience the same things as other people and thereby also experience the benefits of sharing" (Watts, 2007). With the development of virtual social interactions and

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[7]Here cultural discount replace the traditional transportation costs (Hoskins et al, 2007)

falling communications costs, the network externalities effect is reinforced: the larger country's preferences tend to dominate. According to the related theoretical literature, the home market effect coupled with consumption externalities might explain the concentration of cultural trade on a small number of exporters, and possibly help identifying the origin, but not the non-linear impact of income.

This unexpected non linear impact of income on the diversity of cultural imports may result from two distinct, but not mutually exclusive, features: first, there might exista learning by consuming effect on the demand side, another plausible assumption refers to the strategy of the market leaders:once a market has reached a critical size, *majors* starts fueling them with their productions that crowd out the other competitors.

5.1. The demand side: learning by consuming effect

Alternatively to the rational addiction approach developed by Stigler and Becker (1977), Levy-Garboua and Montmarquette (1996, 2011) developed the*learning by consuming* theory to explain the pattern of cultural consumption. According to this model, consumers are unaware of their true tastes; their subjective structure of preferences is revealed through a process of consumption experiences. If these experiences turn out to be positive, the consumption is likely to increase, whilst a negative past experience lead to a decrease in the consumption of the related variety. Applied to trade in cultural goods, this selection process would translate into a consumption trial of different varieties (here, defined as the import sources) that reveals the true preferences of the consumer and eventually leads to the choice of the preferred varieties, hence the preferred cultural partners. That would explain the non-linear impact of income on the diversity of cultural imports: an increase in income allows testing different varieties of a given product, and with experience, the consumers select the varieties corresponding to his taste and abandon the others.

5.2. The supply side: a flood of blockbusters

A second likely hypothesis to explain the non-linear impact of income on the diversity of cultural imports refers to the strategy of *majors* to enter markets representing a valuable economic opportunity. Through the powerful MPAA (Motion Picture Association of America), an inter-professional association for the defense of *majors*, the United States has developed a comprehensive strategy of conquest of overseas audiovisual markets. Indeed, MPAA lobbies for the opening of foreign markets, through the removal of quotas or other imports restrictions,and the application of retaliatory measures in case of violation of these agreements. Every year, the MPAA submit a report to the United States trade representative about the trade barriers faced by its members in "significant markets or*potentially* commercially significant markets" (MPAA, 2012). The United-Stateshave also put pressure on some developing countries to extend the liberalization of their audiovisual markets, through the signing of free trade agreements, like in Chile or Dominican Republic, that go further than the arrangement provided in the WTO multilateral agreements (Hanania, 2009).

The establishment of production and distribution structures in emerging countries also reflects this strategy. Indeed, over the past few years, the leading studios have launched mergers and acquisitions transactionstargeting Indian and Chinese distributors to penetrate these huge, yet considered difficult, markets. In a context where equipment and infrastructure are limited, the growing importance of American productions in developing countries leaves little room for other competitors.

6. Robustness checks

6.1 Are we mistakenly measuring trade openness?

To sustain our basic assumption that income has a significant impact on the diversity of cultural imports, we first test in this section if the effect of economic development is commanded by trade integration.

Hence, we introduce an openness index in the equation. For this purpose, we apply the widely used openness index from the Penn World Tables, which is calculated as an annual percentage of the sum of trade flows (imports and exports) on real GDP. The estimated coefficients reveal that the inclusion of openness does not wipe out the effect of income, yet for the music industry, the non linear impact resist only for the overall Theil. In addition, the same regressions without the income variables reveal that openness has no impact on the diversity of cultural imports (see Table**10**in appendix).

Table7: Robustness check: inclusion of openness index

Dependent variable: Decomposition of the Theil index						
Estimation technique	Fixed Effect			Fixed Effect		
Sector	Cinema			Music		
Dependent variable	T	Tbetween	Twithin	T	Tbetween	Twithin
GDPc	-0.0180	-0.372***	0.354**	-0.482**	-0.338*	-0.144
	(-0.138)	(-2.623)	(2.313)	(-2.542)	(-1.849)	(-0.932)
GDPc squared	0.0109	0.0343**	-0.0234	0.0460**	0.0301	0.0159
	(1.072)	(2.182)	(-1.397)	(2.446)	(1.319)	(0.759)
Openness	-0.00176	-0.00379	0.00203	-0.00198	-0.00209	0.000114
	(-0.564)	(-1.273)	(0.796)	(-0.952)	(-0.853)	(0.0682)
Openness squared	8.17e-06	1.33e-05	-5.15e-06	2.17e-06	4.98e-07	1.67e-06
	(0.532)	(0.899)	(-0.386)	(0.422)	(0.0797)	(0.409)
Constant	3.865***	3.905***	-0.0399	4.389***	3.577***	0.813***
	(18.88)	(22.12)	(-0.207)	(19.20)	(15.55)	(4.909)
Observations	1,389	1,389	1,389	1,143	1,143	1,143

R-squared	0.027	0.047	0.046	0.019	0.018	0.019
Det correlation matrix	0.9633					
VIF	1.04					
Country FE	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes

Clustered robust t-statistics in parentheses
***, ** and * denoting significance at the 1%, 5% and 10% level

In the regression above, the variables are potentially correlated inducing a multicollinearity problem that would lead to less precise estimation and possibly non-significant coefficients though variables are significant. To take this issue into account, we performed a collinearity test[8] indicating that the determinant of the correlation matrix is close to one, thus the variables are orthogonal, and that the variance inflation factor (VIF) is around one, well below the usual threshold (of ten). From these results, it appears that the multicollinearity problem is a minor threat to our results.

6.2 Estimation with an alternative dataset for music sector

In order to check the robustness of our conclusion in the music sector, for which the data appear to be even more affected by the collapse of physical sales, we perform the main regression using an alternative dataset. Relying on data provided by the Industrial Federation of the Phonographic Industry (IFPI) and its national branches, Ranaivoson (2010) computed the Shannon concentration indices for music import origins of 72 countries (including 32 developing countries) from 1992 to 2005.

Table8: Robustness check: use of an alternative dataset for music imports

Dependent variable : Shannon index for import sources	
Sector: Music	
Estimation technique : Fixed effect	
GDPc	0.229**
	(2.088)
GDPc squared	-0.0196*
	(-1.981)
Constant	0.246
	(1.265)
Observations	258
R-squared	0.095
Number of importers	32

[8]Developed by Philip Ender (2010)

Sasabuchi test	1.96**
Country FE	yes
Year FE	yes

The results obtained with this alternative dataset are consistent with the previous ones (obtained with BACI database): economic development first leads to a diversification of import sources and then to a concentration phase. The turning point is set at 5,846 US dollars (against 5,335 US dollars according to BACI regression), and 3 countries are above the threshold in the sample: Mexico, Uruguay and Argentina.

7. Conclusions

Economic development could influence the diversity of cultural import sources in different ways. In this study, I tested the impact of income on the variety and the balance of cultural imports. I find robust evidence that development increases the number of cultural partners in both music and cinema sector. In addition, our analysis revealed the existence of a nonlinear relationship between economic development and the variety of foreign cultural goods consumed: indeed, passed a certain threshold, countries restrict their cultural imports on a smaller number of partners. These findings provide empiricalevidence for the existence of a home market effect in trade of cultural goods potentially coupled witha learning by consuming effect,and could also reflect the strategy of *majors* in emerging markets. To my knowledge, it is the first study that allows and tests the nonlinear impact of economic development on cultural diversity.In the last part of this study, I analyze the reconcentration patterns and evidence the domination of American productions in developing countries' imports.These results are consistent with the conclusions of empirical papers focusing on developed countries imports (Fu, 2006) and corroborate theoretical predictions about richer countries, and more specifically American,cultural dominance in world cultural trade.

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Variable	Average	Minimum	maximum	Standard dev	10%	50%	90%

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8. Appendix

a. Descriptive statistics

Gdpc, $ 2000 constant	1 781	58	13 139	1 972	217	1 033	4 610
Nb of partner cinema	7.54	0	37	7.23	1	5	19
Nb of partnermusic	6.76	0	34	6.31	1	5	16

b. Calculation of the decomposition of the Theil index

As presented above the overall Theil index is calculated as follows:

$$Theil\ index_i = \frac{1}{n} \sum_{j=1}^{n} z_i \ln z_i$$

$$Where\ z_i = \frac{x_{ij}}{\frac{\sum_j^n x_{ij}}{n}}$$

Where x_{ij} is the bilateral trade flow, and n, the number of potential exporters. Interestingly, this index can be decomposed into two components (Cadot, Carrère and Strauss Kahn (2010)) through the decomposition of the notional number of partners. The Theil index is then the sum of a within element (intensive margin) that measures the distribution of element's shares among different categories, and a between component (extensive margin) that measures the number of active categories, thus reflecting the variety of the imports. This calculation is based on the partition of our sample into two sub-groups: active and inactive cultural trade flows (per year and cultural good) that are considered respectively as within and between group

The between group component is calculated as follows:

$$Theil\ between_i = \sum_{j=0}^{1} \frac{1}{n} \frac{z_j}{z} \ln \frac{z_j}{z}$$

Where z is the average import value, z_j the average import value in group j.

The within group component is calculated as follows:

$$Theil\ within_i = \sum_{j=0}^{1} \frac{1}{n} \frac{z_j}{z} \left[\frac{1}{n_j} \sum_{k \in j} \frac{x_k}{z_j} \ln \frac{x_k}{z_j} \right]$$

Where n_j is the number of trading partner in the active group. Concentration at the intensive margin implies a more unequal distribution of shares among the cultural partners and concentration at the extensive margin can be interpreted as a decrease of active origins or decreasing variety.
It can be then verified that Theil within + Theil Between = Theil index

c. Estimation of the impact of development on the number of partners

Table9: Impact of income on the number of partners

Dependent variable: number of partners		
Estimation technique: fixed effect		
Sector	Cinema	Music
GDPc	2.34***	2.11**
	(2.815)	(2.027)
GDPc squared	-0.169*	-0.212*
	(-1.931)	(-1.910)
Constant	3.273***	5.196***
	(3.455)	(4.240)
R-squared	0.032	0.028
Number of i	124	128
Sasabuchi Test	1.85**	1.86**
Country FE	Yes	yes
Year FE	Yes	Yes

Clustered robust t-statistics in parentheses

***, ** and * denoting significance at the 1%, 5% and 10% level

Table10: Impact of openness on the decomposition of the Theil index

Dependent variable : Decomposition of the Theil index						
Estimation technique	Fixed effect			Fixed effect		
Sector	Cinema			Music		
Dependent variable	T	Tbetween	Twithin	T	Tbetween	Twithin
Openness	-0.00164	-0.00417	0.00253	-0.00247	-0.00262	0.000147
	(-0.532)	(-1.351)	(0.956)	(-1.169)	(-1.057)	(0.0874)
Openness squared	8.13e-06	1.47e-05	-6.61e-06	3.34e-06	1.75e-06	1.59e-06
	(0.537)	(0.967)	(-0.487)	(0.645)	(0.281)	(0.384)
Constant	3.875***	3.513***	0.362***	3.915***	3.245***	0.669***
	(29.32)	(26.25)	(3.241)	(31.05)	(23.05)	(6.790)
Observations	1,393	1,393	1,393	1,147	1,147	1,147
R-squared	0.022	0.034	0.019	0.009	0.014	0.017
Number of i	121	121	121	123	123	123
Country FE	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes

Clustered robust t-statistics in parentheses

***, ** and * denoting significance at the 1%, 5% and 10% level

e. List of developing countries

Based on 2011 World Bank classification

Albania	Gambia	Nicaragua
Algeria	Georgia	Niger
Angola	Ghana	Nigeria
Argentina	Grenada	Pakistan
Armenia	Guatemala	Panama
Azerbaijan	Guinea	Papua new guinea
Bangladesh	Guinea-bissau	Paraguay
Belarus	Guyana	Peru
Belize	Haiti	Philippines
Benin	Honduras	Romania
Bhutan	India	Russian federation
Bolivia	Indonesia	Rwanda
Bosnia and Herzegovina	Iran	Saint Kitts and Nevis
Brazil	Jamaica	Saint Lucia
Bulgaria	Jordan	Senegal
Burkina Faso	Kazakhstan	Sierra Leone
Burundi	Kenya	Solomon islands
Cambodia	Kiribati	South Africa
Cameroon	Kyrgyzstan	Sri Lanka
Cape Verde	Lao people's Dem. Rep.	Sudan
Central African Republic	Latvia	Suriname
Chad	Lebanon	Syrian Arab Republic
Chile	Liberia	Tajikistan
China	Libyan Arab Jamahiriya	Tanzania, united rep
Colombia	Lithuania	Thailand
Comoros	Macedonia	Togo
Congo	Madagascar	Tonga
Congo, Dem. Rep.	Malawi	Tunisia
Costa Rica	Malaysia	Turkey
Cote d'Ivoire	Maldives	Turkmenistan
Cuba	Mali	Uganda
Djibouti	Marshall islands	Ukraine
Dominica	Mauritania	Uruguay
Dominican republic	Mauritius	Uzbekistan
Ecuador	Mexico	Venezuela
Egypt	Micronesia	Vietnam
El Salvador	Moldova, Rep	Yemen
Eritrea	Mongolia	Zambia
Ethiopia	Morocco	Zimbabwe
Fiji	Mozambique	
Gabon	Nepal	