

# Growth and Culture : what can we learn from the French experience?

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**Abstract:** From yearly postwar French data over 1968-2008, this paper provides an economic evaluation of the role of culture in growth. More precisely, it estimates the joint dynamics of real GDP and “cultural” employment at the macroeconomic level from an error-correction model. The 2 definitions of employment - creative occupations vs creative industries - extracted from the *Enquêtes Emploi* 1968-2008 lead to the same results. Actually, it appears that

1. the null hypothesis of no cointegration is rejected, which means that “cultural” employment and real GDP share a long-run equilibrium, which is not the case with “global employment”, but
2. significant heterogeneity in the dynamics of employment appears between performing arts in one hand, and the other creative industries, especially film, TV, video and radio in the other hand. Indeed the former one evolves closely according to growth whereas the latter ones are more disconnected from the macroeconomic performances.

These findings do not support the conventional idea that the creative economy could be the moving force of growth in France. Granger causality tests assess that for all creative industries growth “causes” culture according to employment. Furthermore the dynamics of employment is exogenous to growth in creative industries except for performing arts. Finally if culture could not play the role of manufacturing industries in boosting growth, the open question is not about the number of jobs created but about the quality of these new jobs in creative economy, which will require higher skills than the destroyed ones.

**Keywords:** culture, creative economy, creative industries, employment, VAR and VECM models.

**JEL classification:** Z11, L82, C32.

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## Introduction

Are culture and all occupations derived from the new engine for growth in advanced economies? Indeed, are they the future source of new jobs? These issues are not specific to France, but every country - developed and developing - is wondering about, and international organizations such as UNESCO, UNCTAD and WIPO are also implied in the debate. Nevertheless, France has always paid particular attention to culture, as a public good which must be subsidized.

Two opposite strands of literature provide an explanation of the link between growth and culture. Either culture contributes positively to growth by increasing intermediate and final consumption, and then employment and added value or causality reaches from growth to culture.

Indeed in one hand culture could play the role of an immaterial productive asset in a knowledge based-economy. Then by defining and producing new goods, cultural jobs determine significantly innovations in other sectors of activity. Along the quality ladder, introduced in new growth theories to understand the way innovation occurs and diffuses, cultural - aesthetical - features of the product are then going to be the most important. Finally if culture remains a final good - demanded for itself, it also becomes a must-have dimension of any other good. Actually, since 1990, le *Commissariat Gnral au Plan* in France, stressed this point in its report entitled “New needs, new services”, analysing “cultural tourism” as a way to lead to territorial development. This approach of the contribution of culture to growth has been challenging a long time ago by Baumol and Bowen [1966] who point out that if culture has significant impact on growth, it could not last due to high decreasing returns to scale. By studying performing arts, especially musicals in Broadway, they find no evidence of technical progress then productivity gains. It implies that increasing production costs translate either in increasing prices for the shows or decreasing wages for the artists. Whatever the case, the activity would disappear in the long run (no more demand or no more workers !). This *cost disease* could be solved either by State-funding or sponsorship. Although the lack of technical

progress could not be applied to every cultural activity, as it exists creative industries, the analysis of Baumol and Bowen [1966] points out the financial role the State could play in the cultural sector. Cowen [2002] advocates the idea that growth could benefit from the cultural sector if and only if it is competitive, whatever the existence of productivity gains.

In the other hand, many studies consider the opposite relationship between growth and culture. Indeed, following Engel's law, income determines the composition of household consumption. Culture appears then as a superior good, which makes up a larger proportion of consumption as income increases. From INSEE French data over 1960 to 2002 Greffe and Maurel (2009) show that expenditures for leisure and culture went up by 4.5% in quantity and 4.7% in value whereas food spending increases only by 2.2% in quantity. If we go further by associating culture to a luxury good, then culture belongs to the field of conspicuous consumption, characterized by snobbism or conformism. In that case, culture could be explained by income inequalities rather by growth itself, although the possibility of *bandwagon effects* attenuates the link between culture and income.

Finally the relationship between growth and culture could change across time. In a first stage, growth allows culture by making households richer. Does it mean that culture follows growth when it gets smaller? This idea has been countered: first, cultural activities need a very low level of capital to be created; second, there are no entry barriers in that sector. These 2 arguments are confirmed by empirical evidence about the workers who create such activities: they are young.

This paper provides a first answer on this issue for France over the period 1968-2008 . Indeed, from a macroeconomic point of view, it questions the relationship between growth and culture in order to disentangle the role played by each term. A big challenge of this paper was to find a relevant measure of culture. We have made the choice to use "cultural" employment, defined either by the industry or by the occupation, as allowed by *Enquêtes Emploi*. This approximation could appear an oversimplification, but monetary or added-value data about culture are known to be not reliable according to the

huge variability of the fundings of culture. Vector AutoRegressive methodology is then used to provide evaluation of the joint dynamics of real GDP and “cultural” employment. Our findings do not support the conventional idea that the creative economy could be the moving force of growth in France.

The paper is organized as follows. Section 1 describes the data and provides some descriptive statistics. Section 2 present the estimation results of the error-correction model for growth and culture. Section 3 concludes.

## 1 Data

A big challenge of the paper was to find reliable data about culture. We have chosen a quantity - employment - rather than prices, less reliable. But employment in culture leads to encounter another difficulty: there is a gap between employment in creative industries and creative occupations. Indeed employment in creative industries is likely to be higher than strictly creative occupations since there are non creative occupations in creative industries. A solution would be to look only after creative occupations in creative industries (37% of workers) but the whole creative occupations are not only present in creative industries. Then there are more creative occupations than those present in the only creative industries. Then the gap between non creative and creative occupations in the creative industries could be offset by the gap between creative occupations in the creative industries and those in the non-creative industries.

Actually these imbalances are small and will not affect the common path between growth and culture, as the systematic use of these two measures of cultural employment will show.

## 1.1 Cultural employment

2 yearly aggregate measures of the national cultural employment over 1975 to 2008 have been build from the French Labor Surveys or *Enquetes Emploi*<sup>3</sup>.

- All the individuals declaring being employed in a creative industry (see appendix 1)<sup>4</sup>.
- All the individuals declaring having a creative occupation (See appendix 2).

Changes in classification have occurred and been corrected before providing the time series in figure 1:

- Creative industries: 1973, 1993, 2003. We deal only with changes in 1994 and 2003 for statistical reasons by using 2 time dummies<sup>5</sup>.
- Creative occupations: 1977, 1982, 2003. We deal only with the change in 1982.

Data for employment and unemployment are also extracted for the same source of data as cultural employment. Real GDP is provided by yearly *National Accounts*, base 2000, from INSEE. All the time series have been transformed by the logarithm, as it could be seen from Figure 1. In spite of their differences, the 2 measures of cultural employment seem to share the same trend. Indeed, their share in employment are increasing. For all the creative industries the average share is 3.07% and it is increasing by 1.22%. The share of creative occupations in employment is smaller (2.80%) as well as its growth rate (0.79%).

Finally employment in every creative industry is also studied in order to check for homogeneity. 3 out of them will be of particular interest: performing arts; film, TV, video,

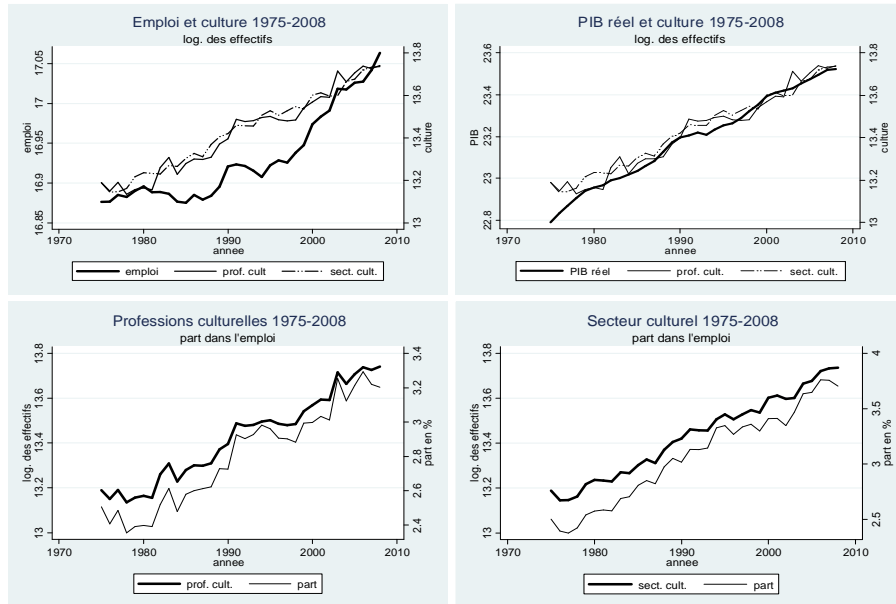
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<sup>3</sup>Since 2003 there are built on a quarterly basis. This change of frequency is taken into account by considering only individuals of the first quarter, as previously yearly surveys occurred in March, and by using the yearly weight.

<sup>4</sup>2 definitions of the film, TV, video and radio industry are possible. We keep the first one, most stable over the period.

<sup>5</sup>They are specified as a permanent change in the level of the time series:  $T_{year} = \begin{cases} 1 & \text{if } t \geq year \\ 0 & \text{otherwise} \end{cases}$ .

Figure 1: Cultural Employment, Employment and real GDP: level and share in %

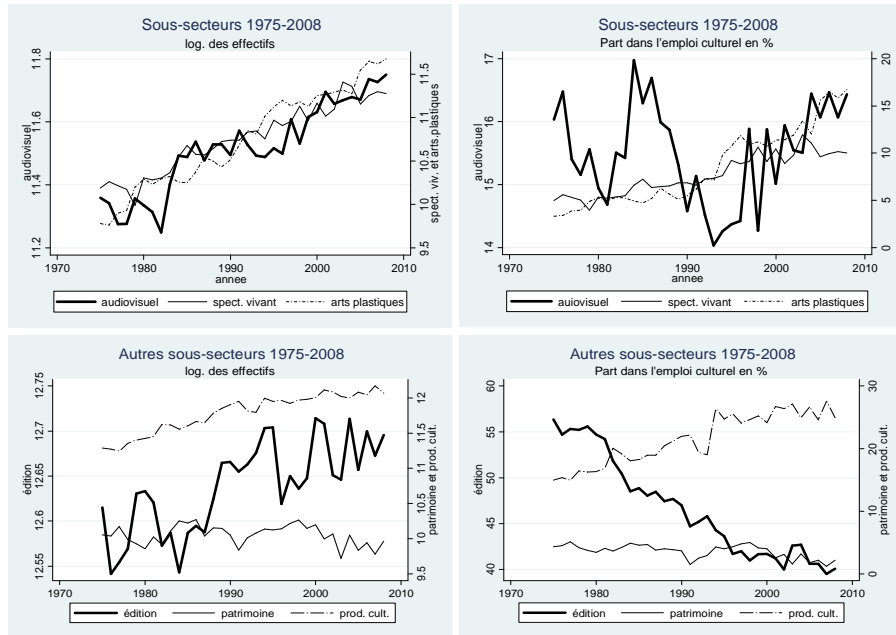


radio and photography (denoted hereafter audio-visual sector); visual arts. There are obtained the same way as cultural employment of creative industries since the latter is the sum of employment in each creative industry. These time series, except employment in visual arts industry, are corrected for the change of classification in 2003<sup>6</sup>. Employment in the other - less - creative industries are presented in Figure 2 for purpose of comparison, and also as they get a large share of the cultural employment, especially edition industry whose level and share are the highest even if decreasing.

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<sup>6</sup>For the film, TV, video and radio industry, the time dummy is specified as a jump:  $T_{year} = \begin{cases} 1 & \text{if } t = year \\ 0 & \text{otherwise} \end{cases}$

Figure 2: Cultural Employment by Creative Industries: level and share in %





## 1.2 Heterogeneity between employment and cultural employment, and between industries

**Employment and cultural employment** When looking at Figure 1, the trend of cultural employment is closer to that of real GDP than employment. Table 1 presents average growth rates of real GDP, employment, and cultural employment in order to check this difference.

Table 1: Average growth rates: GDP, employment, cultural employment

%	GDP	Employment	Cultural Employment	
			Industry	Occupation
1975-2008	2.22	0.57	1.66	1.67
1975-1985	2.45	-0.01	1.14	0.89
1986-1995	2.18	0.45	2.25	2.23
1996-2008	2.07	1.09	1.60	1.83

Hence cultural employment seems to be stabilized over the period whereas the job content of growth has clearly decreased. Indeed the cultural growth rates are higher than that of employment. At least, it provides evidence in favor of the cultural sector to be highly labour-intensive.

**Cultural employment by industry.** Table 2 presents similar descriptive statistics as in Table 1, but for employment by creative industry.

Table 2: Average growth rates: employment by industry

%	Audio-visual	Performing	Visual	Edition	Libraries et al.	Crafts
1975-2008	1.19	3.29	5.74	0.24	-0.28	2.37
1975-1985	1.31	4.88	4.70	-0.28	1.66	3.14
1986-1995	0.28	2.91	8.71	1.17	-0.96	3.49
1996-2008	1.79	2.37	4.26	-0.06	-1.25	0.92

The growth rate of the number of workers implied in the audio-visual sector is the smallest, whatever the period considered, whereas visual arts industry knew a very advantageous decade in 1986-1995 by doubling its growth rate. The number of workers in performing arts industry increased two times less than previously, since 1986. Nevertheless there is a striking difference with the other industries, which shows lowest growth rates at the end of the period, even negative for the edition industry. This low dynamics of libraries et al. industry implies that cultural tourism has more benefitted to services associated with this industry like transportation, hospitality, related products and so on. Table 3 explains these differences, as the 3 most creative industries just account for only one third of the cultural employment. The share of the audiovisual sector in employment is remarkably stable over the period whereas crafts and design industry multiplies by 3 its initial share. The evolution of the share of performing arts in employment is similar, which means that these 2 industries could have benefitted from active support by policy measures. Again edition industry presented an opposite evolution with a large decrease of its share in employment.

Table 3: Average shares in employment by industry

%	Audio-visual	Performing	Visual	Edition	Libraries et al.	Crafts
1975-2008	15.50	7.04	8.49	46.58	3.59	21.54
1975-1985	15.68	5.47	4.53	53.25	4.24	16.98
1986-1995	15.07	7.11	6.91	46.24	3.53	21.32
1996-2008	15.69	8.31	13.05	41.19	3.08	25.58

## 2 Estimation Results

### 2.1 Empirical models

To evaluate the nature of the relationship between growth and culture, we specify a multivariate model with real GDP, employment and cultural employment (total or by

industry) along the lines proposed by Sims (1980) and denoted Vector-AutoRegressive (VAR) models. Indeed, by dealing with all the variables in the same way, as endogenous, without assuming any theoretical properties, it is possible to test afterwards some theoretical predictions and then provide some hints on the issues here at stake, on the sense of causality between growth and culture. Then we build a Vector-Autoregressive model, in level or first-differences, depending on the presence of a unit root among the variables. If there is at least one, we can test for cointegration and if any, then the VAR model becomes a Vector Error Correction Model (VECM), as proposed by Johansen (1991). What we expect at least is a long-run relationship between growth and culture, which takes the following form:

$$Z_t = \beta_1 GDP_t + \beta_2 E_t + \beta_3 EC_t$$

where  $E$  denotes employment,  $EC$  cultural employment (total or by industry) and  $Z$  is a residual (or the error correction term if the variables are non stationary), which is stationary. We can test the exclusion of employment from this relationship by  $H_0 : \hat{\beta}_2 = 0$  and using a likelihood ratio test statistics if it is a cointegration relationship. Once we have concluded about the univariate and multivariate properties of each variable, we can estimate the following model, which is a VECM without a short-run dynamics:

$$\begin{cases} \Delta GDP_t &= \mu_1 + \alpha_1 Z_{t-1} + \varepsilon_{yt} \\ \Delta E_t &= \mu_2 + \alpha_2 Z_{t-1} + \varepsilon_{et} \\ \Delta EC_t &= \mu_3 + \alpha_3 Z_{t-1} + \varepsilon_{ct} \end{cases}$$

where  $\mu_i$  are constant, and  $\varepsilon_i$  white noises. If there is a short-run dynamics, at least one lag of the dependant variables as regressors, then the VECM writes:

$$\begin{cases} \Delta GDP_t &= \mu_1 + \alpha_1 Z_{t-1} + a_1 \Delta GDP_{t-1} + a_2 \Delta E_{t-1} + a_3 \Delta EC_{t-1} + \varepsilon_{yt} \\ \Delta E_t &= \mu_2 + \alpha_2 Z_{t-1} + b_1 \Delta GDP_{t-1} + b_2 \Delta E_{t-1} + b_3 \Delta EC_{t-1} + \varepsilon_{et} \\ \Delta EC_t &= \mu_3 + \alpha_3 Z_{t-1} + c_1 \Delta GDP_{t-1} + c_2 \Delta E_{t-1} + c_3 \Delta EC_{t-1} + \varepsilon_{ct} \end{cases}$$

The parameters of interest are here the coefficients of the cointegration relationship, the  $\beta_i$ , and the speeds of adjustment to this long-run equilibrium, the  $\alpha_i$ . Indeed they

will determine the nature of causality between the variables, even if there is no short-run dynamics. Indeed cultural employment could be affected, and GDP also, by the other variables via the cointegration relationship if the parameters  $\alpha_3$  is different from zero. We will finally implement Granger's (1960, 1980) causality tests from the VECM estimates. This notion of causality, largely used in time series analysis, relies on two principles: *(i)* the cause happens prior to its effect, *(ii)* the cause makes unique changes in the effect, in other words, the causal series contains unique information about the effect series that is not available otherwise. Then the conditional distribution of future values of one variable should differ with the information set, when excluding the cause or not. This notion of causality could then be interpreted as the cause helping to improve the forecast of the effect.

## 2.2 Results

Before estimating the joint dynamics of cultural employment and real GDP in a time series framework, the preliminary step is to test for the presence of a unit root. In case the unit root could not be rejected for each time series, the following step is to test for the dimension of the cointegration space before estimating either a VAR model in differences or an error-correction model.

Table 4 presents the results of the unit root tests proposed by Elliott et alii (1996), for the level and the first differences of the logarithm of each variable.

Every variable is non stationary except the logarithm of workers in the performing arts industry. As we work with a small sample (33 observations), and unit root tests have low power, we consider all the time series to be non stationary. They are covariance-stationary since their first differences are all stationary. Now we look after cointegration between real GDP, employment, cultural employment (total or by industry). We then apply Johansen's (1988, 1991) maximum eigenvalue and trace tests, for the number of cointegration relationships denoted  $r$ . The results are given in Table 5, for the multivariate model with GDP, employment and cultural employment.

Table 4: Unit root tests

	GDP	Employment	Cultural Industry	Employment Occupation	Audio-visual	Performing	Visual
Log.	-2.92	-0.85	-2.52	-2.80	-2.47	-4.66	-3.21
$\Delta$	-2.76	-4.42	-6.27	-4.14	-7.33	-8.05	-5.63

One lag of the first differences of the variable is added in order to deal with autocorrelation. The critical value for the test with a linear trend at 5% is -3.33 for the log. The critical value for the test without a trend, at 5% is -2.40 for the first differences.

Table 5: Cointegration - cultural employment

Test	Maximum eigenvalue				Trace			
	Occupation		Industry		Occupation		Industry	
	0	1	0	1	0	1	0	1
$H_0 : r = 0$	<b>21.61</b>	20.84	<b>29.28</b>	<b>22.68</b>	<b>33.47</b>	<b>32.92</b>	<b>39.88</b>	<b>35.52</b>
$H_0 : r = 1$	11.72	11.54	10.25	11.60	11.86	12.08	10.60	12.65
$H_0 : r = 2$	0.14	0.54	0.34	1.05	0.14	0.54	0.34	1.05

Bold numbers correspond to a  $p$ -value lesser than 5%.

<sup>a</sup>: the number of lag is selected by Akaike and Schwarz Information Criteria.

There is at least one cointegration relationship between GDP, employment and cultural employment, whatever the definition of the former, since the null hypothesis of no cointegration ( $r = 0$ ) is rejected. Moreover, it is not possible to reject the null hypothesis of 1 cointegration relationship as shown by the result of the tests with  $H_0 : r = 1$ . The same tests are implemented for the multivariate model with employment by creative industry replacing cultural employment. The results are provided in Table 6.

Testing for cointegration when using employment by creative industry rather than by total cultural employment reveals heterogeneity among creative industries relative to the long-run dynamics. Indeed only performing arts seem to share a common equilibrium with real GDP and employment, contrary to the 2 other creative industries. When

Table 6: Cointegration - employment by creative industry

Test	Maximum eigenvalue						Trace					
	Audio-visual		Performing		Visual		Audio-visual		Performing		Visual	
	Lag <sup>a</sup>	0	1	0	1	0	1	0	1	0	1	
$H_0 : r = 0$	18.20	18.64	<b>21.44</b>	<b>22.28</b>	16.77	18.77	<i>29.23</i>	<i>29.57</i>	<b>34.46</b>	<b>43.52</b>	24.96	<b>30.03</b>
$H_0 : r = 1$	10.61	10.09	12.52	<b>19.40</b>	7.74	10.94	11.03	10.93	13.02	<b>21.24</b>	8.19	11.26
$H_0 : r = 2$	0.42	0.84	0.50	1.84	0.45	0.32	0.42	0.84	0.50	1.84	0.45	0.32

Bold numbers correspond to a  $p$ -value lesser than 5%.

Italic numbers correspond to a  $p$ -value lesser than 10%.

<sup>a</sup>: the number of lag is selected by Akaike and Schwarz Information Criteria.

looking only at the trace test statistic, there is a hint of cointegration for both audio-visual and visual creative industries, at least at 10% for the former and with one lag in the short-run dynamics for the latter. The estimation of the error correction model could confirm or not the presence of cointegration for each kind of cultural employment. Table 7 presents the estimation of the cointegration relationship for each kind of cultural employment.

Table 7: Cointegration - estimation

Employment	Occupation		Industry		Performing Arts	
	0	1	0	1	0	1
Lag						
$H_0 : \beta_2 = 0$	0.62	0.02	0.11	0.83	0.71	-
$p$ -value	0.43	0.89	0.73	0.83	0.40	-
$\hat{\beta}_1$	1.02	0.99	0.99	0.96	0.88	-
$\hat{\beta}_3$	-0.97	-0.75	-1.05	-0.90	-0.40	-
Long-run elasticity	1.05	1.31	0.94	1.06	2.2	-

As expected, employment is excluded from the cointegration space, which means that only real GDP and cultural employment (whatever its definition) share a common long-run equilibrium over the period across study. We then compute a kind of long-run

elasticity which is simply derived from the cointegrating equation:

$$EC_t = -\frac{\beta_1}{\beta_3}GDP_t + Z_t$$

When considering total cultural employment, this elasticity is very large, equal to 1, which implies that in the long run any variation of one variable is occurring for the same amount in the other one. Causality tests allow to know if one of this variable is exogenous relative to the other. When looking at performing arts industry, this elasticity is doubled, which means that an increase of 1% in GDP goes along with an increase of 2% in employment. For this industry, we do not report the cointegration estimates associated to  $p = 1$  because we have 2 cointegrating vectors, and the estimation results are not so easy to interpret, as the likelihood ratio statistic for the exclusion of employment from one of the cointegration relationship could not be computed.

Table 8 will help to determine the sense of causality between real GDP and cultural employment if any.

$EC \rightarrow GDP$  means that cultural employment Granger-causes real GDP and this can be tested in the equation of GDP by looking at the statistical significance of all the coefficients associated to cultural employment, e.g the weight of the error correction term ( $\alpha_1$ ) and the first lag of first differences of cultural employment ( $a_3$ ). Except for performing arts industry, cultural employment never causes real GDP. At this point, we know from a macroeconomic perspective that we cannot support the idea that culture has been one of the moving force of growth in France. On the contrary GDP Granger-causes cultural employment at the level of the whole industry. This findings seem to be drawn by the behavior of one industry, performing arts, since the other ones are exogenous to real GDP. And we can see that employment in performing art industry is also Granger-caused by GDP.

Table 8: Causality tests

Model	VECM						VAR		
	Occupation		Industry		Performing		Performing	Audio-visual	Visual
Employment Lag	0	1	0	1	0	1	1	1	1
	<i>EC → GDP</i>						<i>EC → GDP</i>		
$\alpha_1$	-0.05	0.00	-0.07	0.03	<b>-0.08</b>	-	-	-	-
$a_3$	-	0.05	-	-0.08	-	-	0.00	0.00	4.85
	<i>EC → EG</i>						<i>EC → EG</i>		
$\alpha_2$	<b>0.09</b>	<b>0.10</b>	<b>0.08</b>	<b>0.17</b>	<b>0.06</b>	-	-	-	-
$b_3$	-	0.04	-	-0.01	-	-	<b>0.02</b>	0.08	<b>4.37</b>
	<i>GDP → EC</i>						<i>GDP → EC</i>		
$\alpha_3$	<b>0.45</b>	<b>0.24</b>	<b>0.44</b>	<b>0.27</b>	<b>1.03</b>	-	-	-	-
$c_1$	-	0.55	-	0.46	-	-	-1.66	0.00	0.23
	<i>EG → EC</i>						<i>EG → EC</i>		
$c_2$	-	-0.60	-	-0.68	-	-	-1.20	0.51	0.37

Bold numbers correspond to a  $p$ -value lesser than 5%.

### 3 Conclusion

If culture and growth share some common dynamics, when measuring culture with employment, it relies essentially on the performing arts industry. Indeed, we do not succeed to establish a more robust link with all the creative industries. Visual and audio-visual industries, among the most creative, seem to be disconnected from growth and employment. Further research will then consist in introducing some nonlinearities to test the existence of regimes conditionally to business cycle states.



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