Market Integration and Convergence in Consumption Patterns*

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July 2018
Preliminary version

Abstract

This paper explores the evolution of cultural distances across French departements in a context of deep market integration. Using household survey data on food consumption in France from 1974 to 2005, we find that (1) France is characterized by strong localized tastes in food consumption, which (2) converge over time, and (3) not only due to changes in price and income. In short, France becomes "flatter", culturally more homogenized.

Keywords: Convergence, Culture, Market Integration

*We thank Daron Acemoglu, David Atkin, Bruce Blonigen, Davin Chor, Arnaud Costinot, Dave Donaldson, Ben Faber, Rob Feenstra, Cecile Gaubert, Sebastien Lecocq, Stephane Turolla and seminar participants at Bayreuth U., UC Berkeley, UC Davis, ENS Paris Saclay, Harvard Kennedy School, Hebrew U., INRA Aliss, INRA Rennes, INSEAD, Oregon U., Oslo BI, Passau U., and PSE for their helpful comments.

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1 Introduction

At the beginning of the eighties, Levitt (1983) claimed that "the world's needs and desires have become irrevocably homogenized." He pointed to the ascendancy of the "global corporation" that "sells the same things in the same way everywhere." There is however surprisingly little empirical evidence of a homogenization in needs and desires despite a more globalized world. We aim to fill this gap by estimating the degree of homogenization of consumption patterns in a context of deep market integration.

The consequences of homogenizing consumption, and culture in general, are being hotly debated. The opposition to trade and migration is now prevalent in political discourses of several developed countries, with specific protests on its impact on homogenizing consumption behaviors.[1] Beyond concerns,[2] reducing cultural differences across and within countries could bring important benefits.[3]

In this paper, we explore the evolution of cultural differences across French regions. Market integration in France has dramatically increased since the 1970s, following the development of high speed trains and highways that changed the ability to move people, ideas, goods, and services. Using France as an example of deep market integration, our results indicate that France is characterized by strong localized tastes in food consumption, which converge over time. This convergence appears not to be fully explained by changes in the economic environment (i.e. prices and income). In short, we find that

[1] Protests range from the "McDonaldization" (Ritzer, 1983) or "coca-colonization" of the society to the influence of GAFA, an acronym for Google, Apple, Facebook, and Amazon.

[2] Concerns are related to perceived threats to culture and values. For instance, 69% of US citizens think their way of life must be protected against foreign influence (Pew, 2009). A recent survey by *The Economist* (November 18, 2016) reveals that, on average, more than 62% of respondents in 19 developed and emerging countries agree that a country is stronger when its people have a shared and common culture, that can be threatened by globalization. See also Mayda and Rodrik (2005).

[3] Among the benefits, we may emphasize the gains from trade (Janeba, 2007; Atkin, 2013; Bisin and Verdier, 2014), the ease of public good provision (Alesina et al., 1999), the increase in social capital (Alesina and La Ferrara, 2000), and the decreasing probability of conflict (Montalvo and Reynal-Querol, 2005).

France becomes culturally more homogenized.

We use household surveys on food consumption in France two years apart in time, in 1974 and 2005, to explore how consumption patterns evolved over a 30-year period of significant integration. Food consumption offers several advantages to tackle a major challenge in estimating convergence in a context of deep integration: How do we tease out changes in price and income from changes in culture? A first advantage is the availability of consumer spending surveys, which provide detailed information on food expenditures and quantities, as well as household and individual characteristics. Second, food attributes are more stable than other products: they evolve slowly, allowing to track changes in consumer behavior across time and space – on the contrary to, say, durable goods which overcome a drastic change in composition and characteristics. Third, food is strongly marked by group identity and membership, a fact reported in the anthropological and sociological literature (Barthes, 1961; Mintz and Du Bois, 2002). Food can be viewed as a fast-moving component of culture, which could rapidly change with market integration.

France is characterized by a high heterogeneity of food patterns and local cultures. The allocation of expenditure on fats and oils illustrates such a spatial divide: the North-West of France uses butter as a cooking fat, while the South-East uses olive oil.[4] The left panel of Figure 1 shows that in 1974 the share of butter in expenditures on fats and oils appears indeed to be spatially concentrated in North-West regions such as Normandy or Brittany. The right panel, in 2005, shows that the entire territory is converging to a diet with less butter. The highest share of consumption (over 68 percent) disappeared, although the geographical divide in consumption remains visible. The fat example easily generalizes to other food categories. We observe a significant raw convergence in overall

[4]This divide is historical, as shown by the map of fat consumption in rural France in 1952 (see Figure 3 in Appendix A).

food consumption despite local heterogeneity.

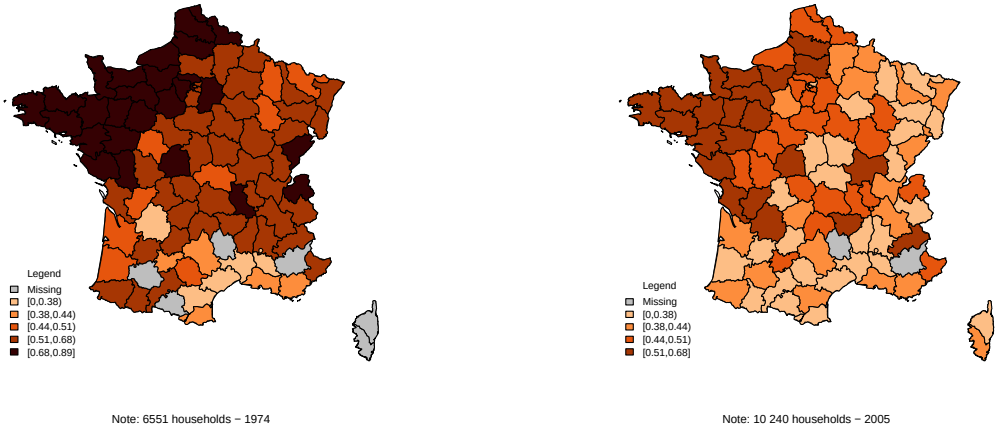

Figure 1: Share of Butter in Fat Expenditures, 1974 vs 2005

To tease out changes in the economic environment from changes in culture, we estimate a structural demand system on food products using two rounds of the French consumer survey (1974 and 2005). Our taste measure are estimated at the *départements* (hereafter departements) level, which are geographical divisions equivalent to districts. The taste is thus the departement component of food budget shares that cannot be explained by the vector of prices, total food expenditure and household controls. With these taste estimates in hand, we construct a bilateral taste distance across pairs of French departements for each year and product. We regress these bilateral taste distances on bilateral geographical distance and contiguity, conditioning on departement-by-year-by-good fixed effects to control for any systematic differences across departements, year and goods (availability of products, access to ports, fraction of migrants, etc.). We find that the more geographically distant the departement, the stronger the bilateral taste distance. More interestingly, the variance of the bilateral taste distances sharply decreases from

one period to the other, as well as the geographical distance elasticity. The reduction in cultural distance is fairly robust. It is true across all products and categories, even those products for which local cultures are particularly persistent, such as the use of fat. These results provide evidence towards a reduction in food culture differences between French departements from one generation (the 70s) to another (the 2000s).

The estimation of our taste measures relies on the real prices faced by the households. Three natural concerns arise in the estimation of demand systems. The first one is the endogeneity of prices: if producers endogenize the consumer's taste in their pricing strategies, they may increase prices, which lower the budget shares of favorite goods and in turn reduce our measure of tastes. The second one is measurement errors: if prices are not well measured, our taste estimates may be contaminated by price effects. The third concern is that our survey provides expenditure and quantity in 1974 and 2005, which allow us to compute household unit values that could be contaminated by quality choice. To cope with these concerns, we use median city prices in the estimation which impart less measurement errors, represent a better measure of local costs and are less contaminated by household choice and quality effects. We also implement two sensitivity checks to test the robustness of our results. First, we instrument median prices in Hausman (1996)'s fashion with prices in same size cities in non-contiguous departements in order to capture production prices. Our results are robust to this instrumental variable approach. Second, we can get a sense of how prices affect our results by not controlling for them. Our thought experiment is that if mis-measured prices make our localized taste estimates larger, not controlling for them should worsen this bias. Surprisingly, when we omit to control for prices, we get *lower* taste estimates. This implies that prices also act as a force of convergence.

There exists little empirical evidence on Levitt (1983) prediction on the convergence in "needs and desires" in a more globalized and integrated world. On the contrary, a wide

body of literature points to persistent, spatially correlated, heterogeneity of consumption patterns within and between countries (Atkin, 2013, 2016; Bronnenberg et al., 2012; Dubois et al., 2014). In fact, empirical evidence of the persistence of differences extends to other cultural choices, such as values, baby's name or music consumption (Head and Mayer, 2008; Disdier et al., 2010; Ferreira and Waldfogel, 2013; Bertrand and Kamenica, 2018; Desmet and Wacziarg, 2018). Gracia and Albisu (2001), Kónya and Ohashi (2007) and Aizenman and Brooks (2008) provide some pieces of evidence of a convergence in food consumption patterns, and mention the correlation with trade patterns. They do not disentangle, however, the taste component from the change in the economic environment occurring from deep integration. We use a structural demand system to estimate for taste convergence across locations while taking into account the economic environment.

Our study is also related to the literature on the effects of deep integration on cultural diversity. Theoretical predictions are ambiguous. Depending on the assumptions on the type of trade and social interactions, models may predict that trade integration reinforces cultural diversity (Olivier et al., 2008; Belloc and Bowles, 2013), or leads to cultural convergence (Bisin and Verdier, 2014; Maystre et al., 2014). Our paper points towards a cultural convergence faster than what would be predicted by price and income changes. This is consistent with social interactions across locations, or a cultural externality sufficiently large so as to tilt the cultural advantage in favor of a global cultural trait.

Finally, our work connects with research in trade aimed at measuring the impact of globalization on welfare and the cost of living (Feenstra, 1994; Broda and Weinstein, 2006; Atkin et al., 2018; Redding and Weinstein, 2018). Our approach relies on estimating a structural demand system on detailed and unique household surveys from the 70s.

The article is organized as follows. We present in section 2 the data, descriptive statistics, and stylized facts on consumption patterns, prices and income convergence in France

between 1974 and 2005. Section 4 uses the structural demand system to estimate the departement taste parameters and check their convergence. Section 5 concludes.

2 Data and French Context

2.1 The Family Budget Survey

The Family Budget Survey or *Budget des Familles* (BDF, hereafter) is conducted by the Institut National de la Statistique et des Etudes Economiques (INSEE) whose main goal is to evaluate living standards. Each survey, performed every five years, records household expenditure for food and non-food items following the National Accounts classification. It also provides detailed data on demographic, economic, social and spatial characteristics of the household and of each of the members such as age, sex, name, number of children, income, education, living conditions, and socio-professional category.

Each survey represents a random uniform sample of about 10,000 to 15,000 dwellings, and covers all metropolitan France. The detailed expenditures of each household are recorded during a fifteen days survey in a notebook. In order to take into account seasonal effects, each survey is conducted in eight waves (one eighth of the sample each), of six weeks each, over an entire year.

Expenditures are recorded in each survey but quantities only for two rounds: BDF 1973-74 and BDF 2005-06. We use these two rounds in order to compute unit values for each good consumed. The 1973-74 round comprises 14,082 households and the 2005-06 contains 10,240 households.

2.2 Economic Integration in France

During the thirty-year period, from 1973-74 to 2005-06, France underwent a significant economic integration (Combes and Lafourcade, 2005), following the development of high speed trains and highways that changed the ability to move people, ideas, goods, and services across French departements. The French intercity high-speed rail service was developed in the 1970s. Following the inaugural service between Paris and Lyon in 1981, the network, centered on Paris, has expanded to connect main cities across France (Marseille, Lille, Bordeaux, Strasbourg, Rennes). The French highway network also developed dramatically. At the beginning of the 1970s, only 1,125 km of intercity highways were in service. Thirty years later, at the beginning of the 2000s, the highway network was over 10,000 km long (Fayard et al., 2005). The average drive time to reach the nearest motorway junction was approximately halved over this period.[5]

2.3 Household Localization

Both rounds of the survey contain city and departement identifiers. Regions are defined according to the administrative division of metropolitan France into 96 units called "départements" (hereafter departements). The departement is considered as the appropriate unit of analysis. Its creation dates back from the first French constitution, voted in 1790, with a clear economic motivation. The size of each departement was such that it would be possible from any point inside the departement to reach its centrally located capital city and come back within 48 hours by horse. Even today, departements represent meaningful lines of demarcation inside France (see Combes et al., 2005). They have been given an important number of social and welfare allowances, with corresponding bud-

[5]Using information from INSEE, we computed that the average drive time to reach the nearest motorway junction was 59 minutes (s.d.=38) in 1969 versus 26 minutes (s.d.=32) in 2008.

getary transfers. In particular, the departement is in charge of social actions, education, transport infrastructures, and the cultural heritage management. Our final sample contains 1031 cities in 89 departements in 1974 and 2380 cities in 94 departements in 2005.[6]

2.4 Food Expenditure

The main issue in following consumption trends over time is the entry or exit of products. To keep track of similar items over time, we focus on food expenditures which are relatively more stable than other products. They evolve more slowly, allowing to track changes in consumer behavior across time and space – on the contrary to, say, durable goods which overcame a drastic change in composition and characteristics. Moreover, food is strongly marked by group identity and membership, a fact reported in the anthropological and sociological literature (Barthes, 1961; Mintz and Du Bois, 2002). As a cultural product, food can be viewed as a fast-moving component of culture, which may vary with market integration. Food therefore is a promising starting point in the analysis of the evolution of consumption patterns.

In our empirical analysis, we consider a two-level demand system with nine broad categories of food at the higher level and various goods within each broad category at the lower level. For example, we consider a lower level demand of butter and olive oil within the fat category. Table 1 shows the nine broad categories and the corresponding goods.

The nine categories are defined following Dubois et al. (2014), and allow us to compare the food expenditure as measured by the BDF surveys to the detailed barcode data they use. Table 2 compares both dataset in 2005. If expenditures in U.S. dollars per quarter are different across the two datasets, the expenditures in shares are remarkably similar.

Table 3 gives the median and mean unit values in BDF 2005-2006 compared to the ones

[6]French communes, called cities for simplicity, are analogous to civil townships and incorporated municipalities in the United States. As of January 2015, there were 36,681 cities in France.

Table 1: Food Categories and Corresponding Goods in BDF Surveys

Broad Categories	Main Good Items
Fruits	Fresh, canned or frozen fruit as well as fruit juices
Vegetables	Fresh, canned or frozen vegetables and starchy food
Grain	Flour, cereals, dry and fresh pasta, rice, couscous, breakfast cereals, and breads
Dairy	Milk, cream, cheese, and yogurt
Meats	Beef, pork, lamb, veal, poultry, as well as bacon, ham, sausages, eggs and all fish and seafood, whether fresh, smoked, frozen or canned; nuts
Fats	Oils, butter, margarine, and lards
Sugar	Sugar, syrup, honey and artificial sweeteners
Drinks	Alcohol, sodas, water, coffee, tea and beverages other than alcohol
Prepared	All commercially prepared items, whether sweet savory, frozen, canned or deli.

Table 2: Expenditure by Broad Category in 2005

	Expenditure ($ per quarter)		Expenditure shares (%)	
	(1)	(2)	(3)	(4)
Category	BDF	DGN	BDF	DGN
Fruits	40.65	29.65	7.1	6.6
Vegetables	54.17	44.22	9.5	9.7
Grains	44.90	25.33	7.8	6.0
Dairy	82.75	74.90	14.4	16.7
Meats	180.22	147.53	31.5	31.0
Oils	12.40	15.14	2.2	3.3
Sweeteners	1.51	5.85	0.3	1.4
Drinks	33.91	26.81	5.9	5.9
Prepared	122.50	96.35	21.4	21.2

Notes: Col. (1) and (3) report statistics from the "Budget des Familles" [BDF]. Cool. (2) and (4): statistics from Homescan panel, reported in Dubois, Griffith, and Nevo (2014, AER). Figures are the mean of the distribution across households and quarters and are per person per quarter using an adult equivalent caloric needs scale, conditional on strictly positive expenditure in that category in that quarter. Expenditure is in US$ using the same exchange rate of €1 = $1.25.

reported by Dubois et al. (2014) for similar categories. The numbers are very comparable, and the price hierarchy is almost preserved between the two surveys.[7]

To sum up, although the barcode data gives more detail in consumption than the household surveys, it is reassuring that we get comparable estimates of average unit values and expenditure in 2005. Moreover, the BDF has a clear advantage to explore the evolution of cultural differences across space and time. The BDF goes back to the sev-

[7]The main difference with our classification is that the drinks category that does not incorporate alcohol in Dubois et al. (2014).

enties, which enables us to study the consumption of two different generations during a period of sharp economic integration.

Table 3: Mean and Median Prices by Broad Category in 2005

	BDF		DGN
	(1)	(2)	(3)
Category	Median	Mean	Mean
Fruits	2.23	2.83	2.09
Vegetables	2.95	4.57	2.53
Grains	3.50	3.63	3.89
Dairy	4.65	6.12	3.26
Meats	11.1	12.21	10.33
Oils	5.40	5.49	5.19
Sweeteners	2.43	2.73	2.79
Drinks	1.12	4.87	0.89
Prepared	6.36	7.94	6.04

Notes: Col. (1) and (2) report statistics from the "Budget des Familles" [BDF]. Col. (3) depicts statistics from Homescan panel, reported in Dubois, Griffith, and Nevo (2014, AER). Units are US$ per 1 kilogram using the same exchange rate of €1 = $1.25.

3 Unconditional Convergence of Food Consumption

3.1 Unconditional Convergence in Budget Shares

We first check for any unconditional converging pattern in the raw data. To do so, we explore the relationship between the growth in average budget share of each of the nine food categories from 1974 to 2005 and the initial 1974 share for each French departement.

We find that the gap in average consumption shares between the French departements is closing over time. Table 4 shows the correlation between the growth and the initial share, which is negative and highly significant for all food categories. For example, one additional percentage point in the 1974 consumed share of fruits in a French departement leads to a 12 percentage points lower growth rate between 1974 and 2005. The initial share

also explains a large part of the variation (R-squared of 30 to 70% except for fats).

Table 4: Growth of Budget Share (%) on Initial (1974) Budget Share

Broad categories	Estimates	R^2
1. Alcohol	-9.99[a]	0.25
2. Dairy	-8.47[a]	0.62
3. Drinks	-19.84[a]	0.62
4. Fats	-2.89[a]	0.09
5. Fruits	-12.35[a]	0.40
6. Grains	-13.96[a]	0.61
7. Meats	-1.88[a]	0.33
8. Prepared	-31.31[a]	0.72
9. Vegetables	-4.74[a]	0.28

Note: [a] denotes significance at the 1% level.

Figures 4 to 12 in Appendix B.1 illustrate the relationship shown in Table 4. They highlight two other interesting patterns: first, the initial shares (1974) widely differ across French departements, consistent with localized tastes. Second, the budget shares do not converge in a single direction, i.e. all departements either decrease or increase their consumption over time. For most of our nine categories, we observe both positive and negative growth rates. Regions having a relatively lower initial budget share experience a higher growth rate, while departements having a relatively higher initial budget share tend to decrease their consumption.

Measurement error and mean reversion. Two issues threaten the raw consumption convergence observed in the data to be a mere spurious correlation. The first one is measurement error, and the second is mean reversion.

Measurement error is known to be a potential cause of spurious convergence in the growth literature (see Acemoglu, 2008). If the initial budget share s_{1974} is imprecisely measured, then the measurement error is also found in the growth rate $g = \frac{s_{2005}}{s_{1974}} - 1$. A spurious convergence would be observed in the case of a non random measurement error

following a very specific trend. For instance, we consider a non convergence scenario where all departement's budget shares grow at the same rate over time. However, let's assume that the larger the initial share, the larger the measurement error. As the initial share is at the denominator of the growth rate, a bigger share implies a lower growth rate by virtue of the measurement error. We could thus very well observe convergence in this case, though it would only be driven by measurement error.

The question we ask in the following counterfactual analysis is: if there is no convergence and no error at $t+1 = 2005$, what is the minimum error needed at $t = 1974$ to obtain the convergence pattern of our data (Figures 4 to 12 in Appendix B.1)? We consider a constant growth rate across French departements in budget shares (i.e. no convergence),[8] and only assume measurement error on the initial share s_{1974}.[9] Table 10 in Appendix B.2 shows the results of the counterfactual analysis. We observe that in order to reproduce our convergence patterns, this type of measurement error needs to bias the initial budget shares by 30% on average (40% to 90% for the highest share). This measurement error is large compared to the small variance of the budget shares in each category (the highest budget share is never more than twice the average budget share).

Note that the pattern of measurement errors follows a very specific trend, and any other type would not produce our convergence figures or would go against them. This is the case of budget shares being underestimated as they grow. It is therefore very unlikely that the convergence pattern we observe is only driven by measurement errors.

Dealing with the mean reverting trends is a more difficult problem to tackle. The observed convergence can be a simple return to past homogenization in consumption. It could be that consumption was homogenized in the 50's, before diverging and then con-

[8] We consider the growth rate of the smallest share as it is assumed to be less contaminated by measurement errors.

[9] Assuming that the share s_{2005} is also affected by measurement error would actually increase the measurement error we need on s_{1974} to reproduce the convergence patterns, as it would reduce its effect on the growth rate (given that s_{2005} is at the numerator).

verging. France is, however, a country with large historical differences in food cultures. The divide of oil versus butter consumption is an example of such persistent differences which we can observe in our data (see Figure 1) as well as historical maps such as a map of fat consumption in rural France in 1952 (see Figure 3 in Appendix A).

3.2 Unconditional Convergence in Prices and Income

Two obvious candidates to explain the convergence in consumption patterns across departements are price and income convergence. Both factors are potential consequences of economic integration. First, trade may induce relative prices to converge across departements, which, according to Stigler and Becker (1977), could very well predict a convergence in consumption patterns over a significant period of time. We find indeed that prices converged for all food categories over the period, as shown in Figures 13 to 21 in Appendix B.3. As above, the convergence in prices (unit values) is measured as the relationship between te growth rate from 1974 to 2005 and the initial 1974 unit value.

Second, economic integration may induce income convergence across departements. If preferences are non-homothetic with respect to income, the poorer departements get relatively richer and therefore start consuming more like the richer departements. We see in Figure 22 in Appendix B.3 that this is the case for France over the period: initial poorer departements have a much higher growth rate than richer ones over the period.

These stylized facts call for an empirical analysis flexible in prices and income in order to identify a residual effect of economic integration on local tastes. We should therefore consider a demand system allowing for price substitution and non-homotheticity with respect to income to account for the change in the economic environment following integration. Only then could we potentially capture the effect on local tastes aside from the traditional economic channels.

4 Empirical Analysis

4.1 First Step: Estimating Tastes

4.1.1 AIDS Demand System

The demand modeling is based on the multistage budgeting approach to construct a two-level demand system for food products. Our primary motivation for adopting this approach and using the Almost Ideal Demand System (AIDS) (Deaton and Muellbauer, 1980) is a practical one. The AIDS expenditure function is a second-order approximation to any arbitrary expenditure function. It allows enough flexibility in the price space, with all substitution patterns between products, as well as in the income space with its nonhomothetic structure. Moreover, the AIDS expenditure function generates a demand system in which tastes are additively separable from price and income effects, which is very useful given limited amounts of data.[10] As in Atkin (2013), the local (departement) component of food budget shares that cannot be explained by the vector of prices, total food expenditure and household controls provides our taste measures.

While this demand estimation approach offers functional form flexibility, its application poses one challenge. Demand systems in the product space cannot deal with a varying number of products. The AIDS was typically developed with broad product categories in mind, which are consumed by all consumers at every period (Chaudhuri et al., 2006). Focusing on food renders the problem less severe because food products evolve more slowly than other products and most of them are consumed in both periods (1974 and 2005). Nonetheless, to further tackle the challenge of entry and exit of products, we additionally aggregate food products in two levels: the higher level corresponds to the

[10] See Feenstra (2010); Atkin (2013); Fajgelbaum and Khandelwal (2016); Liu and Meissner (2017) for the use of the AIDS model in the trade literature.

allocation of food expenditures into broadly defined categories of food, such as grains, meats, and fats (see Table 1). We index the higher category level by b (a mnemonic for "broad"). At the lower level, we consider various goods within each board category, such as chicken, beef, or mutton in the meats category. We index the lower category level by g (a mnemonic for "good"). We employ the AIDS to estimate demand at both category-level, $c = \{b, g\}$, the higher and the lower.

The AIDS expenditure function defines the minimum expenditure $e(u, \mathbf{p}_h; \Theta_d)$ to attain a specific u utility level at a given vector $\mathbf{p}_h$ of prices p_{ch} faced by household h. Θ_d is a vector of tastes θ_{cd}, which are identical across households within a departement d for a food category c. The AIDS is specified by the logarithm of its expenditure function which takes the form:

$$\ln e(u, \mathbf{p}_h; \Theta_d) = \alpha_0 + \sum_c \alpha_c \ln p_{c,h} + \frac{1}{2} \sum_c \sum_{c'} \gamma_{cc'} \ln p_{c,h} \ln p_{c',h} + u\beta_0 \prod_c p_{c,h}^{\beta_c}, \qquad (1)$$

where $p_{c,h}$ is the price of category $c = \{b, g\}$, and α_c, β_c, and $\gamma_{cc'}$ are parameters. These parameters satisfy the following restrictions: $\sum_c \alpha_c = 1$ (adding up), $\sum_c \gamma_{cc'} = \sum_c \beta_c = 0$ (homogeneity) and $\gamma_{cc'} = \gamma_{c'c}$ for all c, c' (symmetry). Note that β_c governs the strength of non-homotheticity.

Using Shephard's lemma and appropriate substitutions, we derive from equation 1 the demand functions in budget shares at the broad level, $c = b$:

$$s_{b,h} = \alpha_b + \sum_{b'} \gamma_{bb'} \ln p_{b',h} + \beta_b \ln \left(\frac{X_h}{P_h} \right), \qquad (2)$$

where $s_{b,h}$ is the budget share of broad category b in total food budget, and X_h / P_h represents the real household expenditure with X_h the total food expenditure and P_h the AIDS price index. The intercept α_b is linearly decomposed into tastes and household character-

istics such that:

$$s_{b,h} = \theta_{b,d} + \underbrace{\mathbf{\Pi Z}_h + \sum_{b'} \gamma_{bb'} \ln P_{b',h} + \beta_b \ln\left(\frac{X_h}{P_h}\right)}_{z_b}, \tag{3}$$

where $\mathbf{Z}_h$ is a vector of household characteristics and $z_b(.)$ is the effect of demographic variables, prices, and expenditure on demand, leaving out the taste estimates. θ_{bd}, our parameter of interest, is a food category-by-departement fixed effect. It constitutes our taste estimate and acts as a pure budget share shifter capturing the local (departement) component of food budget share that cannot be explained by the vector of prices or real expenditure.

Similarly, at the good level, $c = b$, the AIDS demand functions are:

$$s_{g,h} = \theta_{g,d} + \mathbf{\Pi Z}_h + \sum_{g'} \gamma_{gg'} \ln p_{g',h} + \beta_g \ln\left(\frac{X_{b,h}}{P_{b,h}}\right), \tag{4}$$

where $s_{g,h}$ is the budget share of good g within broad category b, and $X_{b,h}/P_{b,h}$ represents the real household expenditure in broad category b with $X_{b,h}$ the broad category expenditure and $P_{b,h}$ the AIDS broad price index. $P_{b,h}$ is also the price of category b used at the higher category level in equation (3). It is approximated by the Stone price index within each category b in the empirical estimation, which is a linear approximation equivalent to the AIDS broad price index (Deaton and Muellbauer, 1980; Nevo, 2011).

4.1.2 Identification

Three assumptions are required in order to identify the departement tastes implicitly defined by equations (3) (Atkin, 2013). The same assumptions apply for equation (4). First, there must be a price variation within each departement to identify the common demographic, price, and income (expenditure) effects, $z_c(\mathbf{Z}_h, \mathbf{p}_h, \frac{X_h}{P_h})$. Second, the $z_c(.)$ function

should be common across France and well approximated by our functional form. Third, the within-departement price variation must be driven by supply shocks.

This third assumption relates to one of the main challenges in the estimation of demand systems, which is the potential endogeneity of prices with respect to local demand, subsequently biasing our taste parameters. Firms could adapt supply to local tastes by increasing their prices, leading to an underestimation of the strength of local tastes. Another challenge related to prices is that French household surveys, as most surveys, mostly collect expenditure and quantity for each good. We therefore use unit values to proxy prices (expenditure divided by quantity). They are, however, biased by an endogenous choice of quality. In order to tackle both challenges, we use median unit values for each product at the lowest geographical level of analysis, the city. This approach offers various advantages: median city prices impart less measurement errors, represent a better measure of local costs and are less contaminated by household choice and quality effects. Starting from equation (3), we estimate the demand of household h for broad category b living in city ℓ in departement d in BDF survey round t (1974 or 2005):

$$s_{b,hdt} = \theta_{b,dt} + \mathbf{\Pi Z}_{hdt} + \sum_{b'} \gamma_{bb'} \ln P_{b',\ell t} + \beta_b \ln \left(\frac{X_{hdt}}{P^{\star}_{\ell t}} \right) + \epsilon_{b,hdt} \,, \tag{5}$$

where $\ln P_{b',\ell t}$ is the log median price of broad category b' in city ℓ (in departement d), $P^{\star}_{\ell t}$ is the Stone price index per location ℓ for broad category b, which approximates the price index P^h (Deaton and Muellbauer, 1980), and $\epsilon_{b,h\ell dt}$ is the error term. Following Deaton and Subramanian (1996), demographic controls $\mathbf{\Pi Z}_{hdt}$ include fraction of people by age and gender, occupation of the adults, and log of number of people. The type of store in which the household purchases the product significantly varies over time and space, so we also include the fraction of purchase in different types of store (big store, mini-mart, small retailer) by household in the controls. Equation (5) will be adapted to

the good level, $c = g$, and will follow the same estimation procedure.

We use Ordinary Least Squares (OLS) and the Iterated Linear Least Squares (ILS) (Blundell and Robin, 1999) to estimate equation (5).[11] The ILS takes into account the demand system structure of the optimization problem.[12] The OLS introduces more flexibility in the instrumentation and the variables we use to estimate the demand for each category. Note that the results are not sensitive to the estimator used.

Beyond the use of city median prices, we also implement two sensitivity checks to test the robustness of our results. First, we instrument prices with the prices in another similar areas so that they get as close as possible to the production cost, rather than reflecting local competition and demand (Hausman, 1996). Our price instrument is the average price of same sized cities (i.e., same urban stratum) in non-contiguous departements. Second, we can get a sense of how prices affect our results by not controlling for them. Our thought experiment is that if mis-measured prices make our localized taste estimates larger, not controlling for them should worsen this bias.

Another challenge in the estimation of demand systems is the endogeneity of total expenditure to each budget share. The first concern is the simultaneity bias: the budget spent on each food product and the total food expenditure are jointly decided. The second concern is measurement error which affects food expenditure[13] on the left-hand side, and hence total food expenditure on the right-hand side of equation (5). Both issues are taken care of by using an instrument for total expenditure. The most common instrument used by the literature is total income (Robin, 1999), justified by an intertemporal weak separability assumption. Total household income is recorded in the French household surveys, and is therefore used as an instrument for total expenditure in all estimations.

[11] Estimated using the program of Lecocq and Robin (2015).

[12] Notably, the simultaneous choice among all categories. It also allows to add the theoretical constraints (adding-up, homogeneity and symmetry) to the estimation.

[13] The time in which the survey registers expenditure is short and generates errors, for example zero values for goods consumed at wider intervals, or large values for stored goods.

4.2 Second Step: Bilateral Taste Distances

From the AIDS estimations of equation (5) and its equivalent at the good level, we back up the set of fixed effects $\widehat{\theta}_{cdt}$. They represent the residual differences across departement d, food category level $c = \{b, g\}$ and year t, after taking into account price, income and demographic characteristics. We use these taste estimates to construct a bilateral taste distance $\Theta_{ij,ct}$ between two departements i and j at year t for each food category level c:

$$\Theta_{ij,ct} = |\widehat{\theta}_{i,ct} - \widehat{\theta}_{j,ct}|, \tag{6}$$

As a first evidence in favor of a reduction in cultural distances across departements over time, we check if the variance of bilateral taste distances has decreased. Figure 2 reports the standard deviations of taste distances between all pairs of departements for each survey (1974 versus 2005) and broad category of food. We observe that the variance of bilateral taste distances has decreased for all categories except prepared food – a category which is arguably more heterogeneous and more consumed nowadays than thirty years back. The variance decreased by half or more for alcohol, drinks, fat, fruits, meats. Overall, this fact implies that French departements differ less in their taste in 2005 than in 1974.

To better explore the evolution of cultural distances across departements and time, we need to control for differences across periods, departements and food products. Department specific variables, such as location, openness to trade or migration, could influence taste convergence. This could affect each category of food differently, and especially at different time periods. Inspired by the structural trade gravity estimations, we regress our bilateral taste distance on a rich set of fixed effects along with bilateral variables. The following equation is estimated between two departements i and j at year t for each food

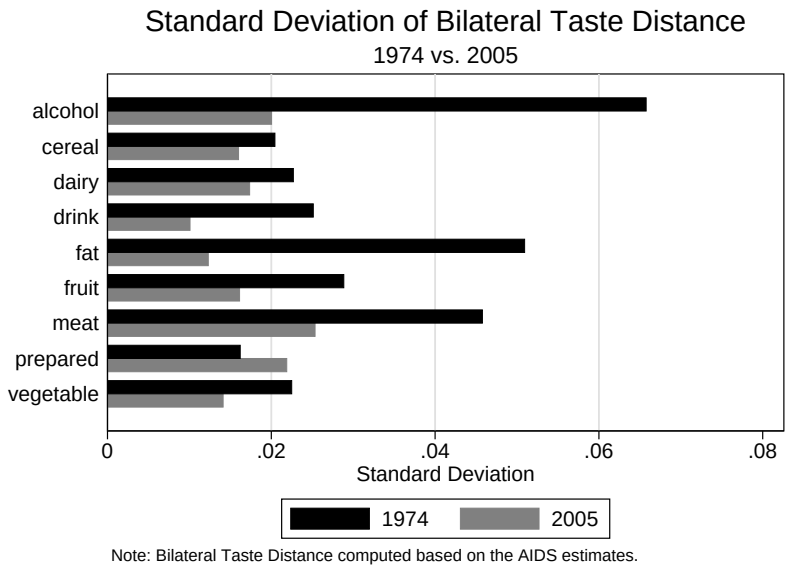

Figure 2: Standard Deviation of Bilateral Taste Distances

level $c = (b, g)$ using OLS:

$$\Theta_{ij,ct} = \chi_{i,ct} + \chi_{j,ct} + \mathbf{G}_{ij,t} + \varepsilon_{ij,ct}, \tag{7}$$

where $\chi_{i,ct}$ and $\chi_{j,ct}$ are monadic departement-by-year-by-category food product fixed effects. They absorb *all* time-varying monadic factors that may not be properly accounted for in the demand estimation. Thus, they capture any systematic difference in tastes across departements, products and years such as differences in supply, health or ads campaigns, external migration, and bordering foreign country. $\varepsilon_{ij,ct}$ is the error term. $\mathbf{G}$ is a vector of bilateral factors that may impact the taste distance between two departements i and j, such that

$$\begin{aligned}\mathbf{G}_{ij,t} = \{&\text{Contiguity}_{ij}, \ln \text{Distance}_{ij}, \text{Step Distance}_{ij}, \ln \text{Migration}_{ij,t}, \\ &\text{Media Exposure}_{ij,t}, \text{SupermarketChainExposure}_{ij,t}\},\end{aligned}$$

where Contiguity_{ij} is a dummy variable equal to one if departements i and j are contiguous; Distance is the geographic bilateral distance in kilometers between departements i and j; Step Distance measures geographical distance using a step function rather than kilometers; $\text{Migration}_{ij,t}$ represents the number of people born in departement j now living in departement i in Census year t.[14] $\text{MediaExposure}_{ij}$ represents the probability of reading the same departement newspaper in departement i and departement j. This probability is computed as the sum of products of shares of number of publications by departement newspaper for each departement pair ij.[15] $\text{SupermarketChainExposure}_{ij,t}$ represents the probability of going to the same supermarket chain in departement i and departement j in year t. This probability is computed as the sum of products of shares of surface areas by supermarket chains for each departement pair ij.

The bilateral variables $\mathbf{G}_{ij,t}$ partly capture the effect of economic integration on taste distance between departements. For example, a decrease of the effect of geographical distance on taste distance over time would indicate a reduction in cultural distance. Other bilateral variables inform us on the factors of convergence and the linearity of the relationship.

4.2.1 Are Tastes Linked to Geography?

We start our second step analysis by estimating a simple equation using OLS, a rich set of fixed effects, and the broad categories of food $c = b$:

$$\Theta_{ij,bt} = \chi_{i,bt} + \chi_{j,bt} + \gamma \text{Contiguity}_{ij,t} + \beta \ln \text{Distance}_{ij} + \delta \ln \text{Distance}_{ij} \times 2005 + \varepsilon_{ij,bt}. \quad (8)$$

[14] Census data for France collected in 1975 and 2006.

[15] This variable is computed based on daily departement press figures on the number of publications per departement in 2005. Other years have been collected to compute a time-varying probability: 1979, 1980, 1985, 1990, 1995, 2000, 2011 and 2016. Source: ACPM (Alliance pour les chiffres de la presse et des medias).

Table 5 reports the results of the estimation of equation (8) for the highest level of food demand (broad categories). Column 1 omits the interaction with the survey year 2005. It shows that geographical distance is positively correlated with taste difference across departements. Intuitively, the more geographically distant the departements the stronger the bilateral taste difference. In contrast, contiguity is negatively correlated with taste difference across departements: contiguous departements have a lower bilateral taste difference. These first results show that tastes are indeed localized in France, even controlling for the economic environment.

Table 5: Taste and Geography - Broad Categories

Dependent Variable:	Bilateral Tastes$_{ij}$: $\Theta_{ij,bt} = \lvert\widehat{\theta}_{i,bt} - \widehat{\theta}_{j,bt}\rvert$	
	(1)	(2)
Contiguity$_{ij}$ (γ)	-0.159^b	-0.155^b
	(0.067)	(0.067)
ln Distance$_{ij}$ (β)	0.340^a	0.640^a
	(0.025)	(0.042)
ln Distance$_{ij}$ $\times$ 2005 (δ)		-0.569^a
		(0.043)
Observations	73,620	73,620
Adjusted R^2	0.663	0.665
Geographical Distance Elasticity in		
1974		0.640^a
		(0.042)
2005		0.071^a
		(0.019)
Fixed Effects		
Dep$_i$ $\times$ Product$_b$ $\times$ Year$_t$	Yes	Yes
Dep$_j$ $\times$ Product$_b$ $\times$ Year$_t$	Yes	Yes

Notes: Standard errors are in parentheses clustered by country-pairs, with ^{a} denoting significance at the 1% level. The left hand side variable is $\Theta_{ij,bt} = \lvert\widehat{\theta}_{i,bt} - \widehat{\theta}_{j,bt}\rvert$ for broad category b and year t. $\widehat{\theta}$ is tastes estimated using unexplained departement variation in food budget shares from AIDS estimations. t denotes survey rounds 1974 or 2005.

The key null hypothesis is that the effect of the Geographical Bilateral Distance on the Bilateral Taste Distance is identical in 1974 and 2005. This is stated as $H_0 : \delta = 0$, which means that geography has the same impact on taste in both periods. In column 2, we interact the geographical distance with a year fixed effect for 2005. The results show that $\hat{\delta}$ is negative and significantly different from zero. Moreover, the magnitude of $\hat{\delta}$ suggests that the effect of geography on taste is much lower in 2005. Thus, the magnitudes of the geographical distance effects are significantly different between 1974 and 2005. The estimate of the distance effect in 2005 (0.071 with a standard error of 0.019) is around one-tenth of the magnitude in 1974.

4.2.2 Is the Geographical Distance Effect Linear?

The previous results are robust to decomposing distance across four categories from below 244 kilometers to above 525 kilometers of distance. We observe that the effect of geography on taste difference is stronger as geographical distance is larger between departement pairs (see Table 6). There is again a stark difference between 1974 and 2005: compared to the baseline category (below 244 km), the distance estimates are much stronger in 1974 compared to 2005.

Table 6: Taste and Step Distance - Broad Categories

Dependent Variable:	Bilateral Tastes$_{ij}$: $\Theta_{ij,bt} = \lvert\widehat{\theta}_{i,bt} - \widehat{\theta}_{j,bt}\rvert$		
	1974 & 2005	1974	2005
km $\leq$ 244	Excluded distance category		
244 $<$ km $\leq$ 380	0.303^a	0.582^a	0.041^a
	(0.032)	(0.059)	(0.020)
380 $<$ km $\leq$ 525	0.380^a	0.688^a	0.095^a
	(0.033)	(0.062)	(0.019)
525 $<$ km	0.609^a	1.107^a	0.161^a
	(0.035)	(0.067)	(0.022)
Observations	73,620	35,226	38,394
Adjusted R^2	0.660	0.613	0.647
Dep$_i$ $\times$ Product$_b$ $\times$ Year$_t$ FE	Yes	Yes	Yes
Dep$_j$ $\times$ Product$_b$ $\times$ Year$_t$ FE	Yes	Yes	Yes

Notes: Standard errors are in parentheses clustered by country-pairs, with ^{a} denoting significance at the 1% level. The left hand side variable is $\Theta_{ij,bt} = \lvert\widehat{\theta}_{i,bt} - \widehat{\theta}_{j,bt}\rvert$ for broad category b and year t. $\widehat{\theta}$ is tastes estimated using unexplained departement variation in food budget shares from AIDS estimations. t denotes survey rounds 1974 or 2005. The excluded variable is less than 244 km.

4.2.3 Taste, Migration and Cultural Exposure

We enrich equation (8) to estimate the following model:

$$\begin{aligned}\Theta_{ij,bt} = {} & \chi_{i,bt} + \chi_{j,bt} + \gamma \text{Contiguity}_{ij,t} + \varepsilon_{ij,bt} \\ & + \beta_1 \ln \text{Distance}_{ij} + \delta_1 \ln \text{Distance}_{ij} \times 2005 \\ & + \beta_2 \ln \text{Migration}_{ijt} + \delta_2 \ln \text{Migration}_{ijt} \times 2005 \\ & + \beta_3 \ln \text{MediaExposure}_{ij} + \delta_3 \ln \text{MediaExposure}_{ij} \times 2005 \\ & + \beta_4 \ln \text{SupermarketChainExposure}_{ijt} + \delta_4 \ln \text{SupermarketChainExposure}_{ijt} \times 2005.\end{aligned} \tag{9}$$

Equation (9) aims, first, at checking if the reduction in taste differences over time is not only due to composition effects because of migration between departements. We also add bilateral factors that may impact taste and cultural differences such as the probability of reading the same departement newspaper or going to the same supermarket chain in

departement i and departement j. Results are reported in Table 7.

Table 7: Taste, Migration and Cultural Exposure - Broad Categories

Dependent Variable:	Bilateral Tastes$_{ij}$: $\Theta_{ij,bt} = \lvert\widehat{\theta}_{i,bt} - \widehat{\theta}_{j,bt}\rvert$			
	(1)	(2)	(3)	(4)
Contiguity$_{ij}$	0.025	-0.135^b	-0.173^a	0.061
	(0.072)	(0.066)	(0.065)	(0.073)
ln Distance$_{ij}$	0.333^a	0.556^a	0.604^a	0.299^a
	(0.050)	(0.044)	(0.040)	(0.054)
ln Distance$_{ij}$ $\times$ 2005 (δ_1)	-0.272^a	-0.513^a	-0.546^a	-0.272^a
	(0.055)	(0.044)	(0.040)	(0.059)
ln Migration$_{ijt}$	-0.238^a			-0.238^a
	(0.035)			(0.035)
ln Migration$_{ijt}$ $\times$ 2005 (δ_2)	0.196^a			0.196^a
	(0.039)			(0.039)
Media Exposure$_{ij}$		-0.345^b		-0.305^b
		(0.145)		(0.142)
Media Exposure$_{ij}$ $\times$ 2005 (δ_3)		0.136		0.079
		(0.151)		(0.147)
Supermarket Chain Exposure$_{ijt}$			0.147	0.243
			(0.376)	(0.374)
Supermarket Chain Exposure$_{ijt}$ $\times$ 2005 (δ_4)			-1.507^b	-1.490^b
			(0.772)	(0.769)
Observations	147,312	147,312	147,312	147,312
Adjusted R^2	0.665	0.665	0.665	0.665
Geographical Distance Elasticity in				
1974	0.333^a	0.556^a	0.604^a	0.299^a
	(0.050)	(0.044)	(0.040)	(0.054)
2005	0.062^a	0.043^b	0.059^a	0.027
	0.022	(0.019)	(0.019)	(0.022)
Dep$_i$ $\times$ Product$_b$ $\times$ Year$_t$ FE	Yes	Yes	Yes	Yes
Dep$_j$ $\times$ Product$_b$ $\times$ Year$_t$ FE	Yes	Yes	Yes	Yes

Notes: Standard errors are in parentheses clustered by country-pairs, with ^{a} denoting significance at the 1% level. The left hand side variable is $\Theta_{ij,bt} = \lvert\widehat{\theta}_{i,bt} - \widehat{\theta}_{j,bt}\rvert$ for broad category b and year t. $\widehat{\theta}$ is tastes estimated using unexplained departement variation in food budget shares from AIDS estimations. t denotes survey rounds 1974 or 2005. The excluded variable is less than 244 km.

In column 1, estimates show that the magnitudes of the geographical variables (distance and contiguity) have been reduced by the introduction of the migration variables. This effect is expected due to the high correlation between geography and migration. The closer the departements i and j are, the bigger the migration flows. Also, the larger the stock of bilateral migrants, the lower the bilateral taste difference. Interestingly, both the

migration and the geographical distance elasticities are significantly lower in 2005 compared to 1974.

In column 2, we replace migration with media exposure with the same intuitive result: the higher the probability of being exposed to the same kind of information and advertisement through the access to similar newspapers, the lower the taste differences. The media exposure effect is virtually identically in 1974 and 2005.

In column 3, we replace migration with supermarket chain exposure with different results. In 1974, the probability of going to the same supermarket chain does not affect taste. By contrast, in 2005, we find that the probability of going to the supermarket chain reduces the bilateral taste distance.

Column 4 adds all the above variables together without significantly changing the results of the first three columns.

The central result of these estimations is that the effect of distance on bilateral taste is still positive and significant despite these controls, while the effect of bilateral geographical distance in 2005 is now null. This points out to a real convergence in food cultures across French departements beyond these variables.

4.2.4 Taste and Endogeneity Issues

Our results are robust to an instrumental variable (IV) AIDS estimation of the taste parameters, with instruments for prices and expenditures (results available upon request). The geographical distance IV estimates are larger, which provides an additional evidence that price endogeneity may attenuate our taste estimates. We nonetheless observe a sharp decrease of their magnitude in 2005 (compared to 1974).

Beyond the use of the instrumental variable approach, we can get a sense of how prices affect our results by omitting them in the AIDS estimation. Our thought experiment is

that if mis-measured prices make our localized taste estimates $\beta\theta$ larger, not controlling for them should worsen this bias. On the contrary, if prices are endogenous to taste and attenuate our taste estimates, not controlling for them would lead to smaller differences across regions and to a smaller convergence. This experiment is estimated in Table 8. Results point that when we omit to control for prices, we get *lower* taste estimates. These results are line with the idea that endogenity of prices lead to attenuate our taste estimates. As a consequence, the geographical distance elasticity in 1974 is only about 40% (=0.260/0.640) of its magnitude when we do control for prices (see column 2 in Table 5).

Table 8: Taste without Price Control and Geography - Broad Categories

Dependent Variable:	Bilateral Tastes$_{ij}$: $\Theta_{ij,bt} = \lvert\widehat{\theta}_{i,bt} - \widehat{\theta}_{j,bt}\rvert$	
	(1)	(2)
Contiguity$_{ij}$ (γ)	-0.011	-0.009
	(0.023)	(0.023)
ln Distance$_{ij}$ (β)	0.170^a	0.260^a
	(0.009)	(0.012)
ln Distance$_{ij}$ $\times$ 2005 (δ)		-0.170^a
		(0.013)
Observations	73,620	73,620
Adjusted R^2	0.626	0.627
Geographical Distance Elasticity in		
1974		0.260^a
		(0.012)
2005		0.090^a
		(0.010)
Fixed Effects		
Dep$_i$ $\times$ Product$_b$ $\times$ Year$_t$	Yes	Yes
Dep$_j$ $\times$ Product$_b$ $\times$ Year$_t$	Yes	Yes

Notes: Standard errors are in parentheses clustered by country-pairs, with ^{a} denoting significance at the 1% level. The left hand side variable is $\Theta_{ij,bt} = \lvert\widehat{\theta}_{i,bt} - \widehat{\theta}_{j,bt}\rvert$ for broad category b and year t. $\widehat{\theta}$ is tastes estimated using unexplained departement variation in food budget shares from AIDS estimations. t denotes survey rounds 1974 or 2005.

4.2.5 Taste and Geography at the Good Level

Finally, we run the same equation (8) within each category using good-specific taste shifters. Table 9 reports the estimates of geographical distance for both years on our nine food categories conditioning on departement$_i$-good$_g$-year$_t$ and departement$_j$-good$_g$-year$_t$ fixed effects. First, we observe the same pattern within each category: geographical distance positively affects taste differences across departements, but much more so in 1974 than in 2005. Second, we see that distance predicts higher taste differences in highly cultural categories of food such as fat products, even if these categories seem to converge faster; for example, the estimate of the distance effect for fats in 2005 is more than twice smaller than in 1974.

The robustness of our results for all food categories and within each category brings strong evidence that we observe a convergence in food consumption in France following the economic integration of the past thirty years, aside from a drastic change in the economic environment.

5 Conclusion

This article estimates the impact of trade integration on the convergence of food cultures in France. By doing so, it proposes a method to disentangle the economic effect (prices and income convergence) from the cultural effect of economic integration in a two-steps analysis: first, estimating a flexible demand system which accounts for prices and income effects and integrates taste shifters; second, building a bilateral taste distance across locations using these estimated taste shifters by product and location.

We find that food tastes have converged over time in France, as (1) the standard deviation of bilateral taste distances across departements has significantly reduced over time

Table 9: Estimates of the Effect of Geographical Distance on Bilateral Taste Distance, within each Category

	Both Periods	1974	2005	# obs
1. Alcohol	1.166^a	1.792^a	0.596^a	82,750
	(0.04)	(0.06)	(0.05)	
2. Grains	0.327^a	0.392^a	0.268^a	66,200
	(0.02)	(0.02)	(0.02)	
3. Dairy	0.496^a	0.757^a	0.259^a	66,200
	(0.02)	(0.04)	(0.03)	
4. Drinks	0.915^a	1.578^a	0.312^a	66,200
	(0.03)	(0.05)	(0.03)	
5. Fats	4.079^a	5.980^a	2.348^a	82,750
	(0.12)	(0.18)	(0.10)	
6. Fruits	0.242^a	0.420^a	0.079^b	66,200
	(0.03)	(0.04)	(0.03)	
7. Meats	0.279^a	0.437^a	0.136^a	148,950
	(0.01)	(0.01)	(0.01)	
8. Prepared	0.199^a	0.309^a	0.099^a	115, 850
	(0.02)	(0.04)	(0.01)	
9. Vegetables	0.291^a	0.363^a	0.224^a	82,750
	(0.02)	(0.03)	(0.03)	

Standard errors in (.), clustered by country-pairs, with $^a p < 0.01$.

across products and (2) geographical distance is less associated with taste difference in 2005 than in 1974. In short, France has become culturally more homogenized.

These results on economic integration and culture could help to rise interest on the effect of economic policy on cultural and social structures. This development could have two major applications: first, understanding these effects is crucial to the new development of protectionism in politics, largely based on cultural considerations. Second, homogenizing cultures also affects the impact of public policies: they could be easier to implement, or have higher gains once we consider all the ways through which they modify consumer behaviors.

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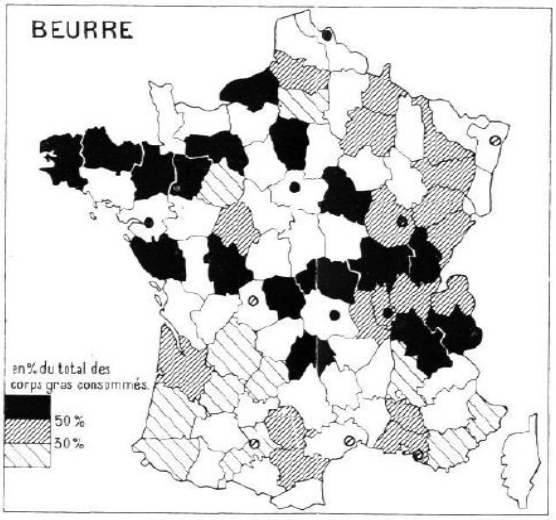
Appendix

A Localized Food Taste in France

France is characterized by persistent food cultures which differ across the territory. An example of these persistent differences is the divide in consumption of fat products: the North-West of France uses butter as a cooking fat, while the South-East of France uses olive oil. This divide is historical, as shown by the map of fat consumption in rural France in 1952 (see Figure 3). The map is darker as the share of butter in total fat consumption increases, and clearly shows the North-West to South-East divide in fat consumption. Scholars consider the divide as extremely persistent: individuals acquire their entire food culture and practices using the same cooking fat, which provides a very strong taste for meals cooked this way (Febvre, 1961). In fact, three fourth of French people cite butter as a marker of local identity (Poulain and Basdevant, 2001).

Figure 3: Fat Consumption among Farmers



Note: Map done by Lengellé, 1952 INSEE Survey, Hémardinquer (1961)

B Unconditional Convergence, 1974-2005

B.1 Unconditional Convergence of Budget Shares

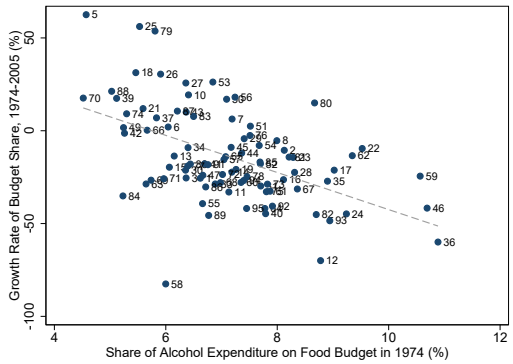


Figure 4: Convergence of Budget Share for Alcohol, French Departments, 1974-2005

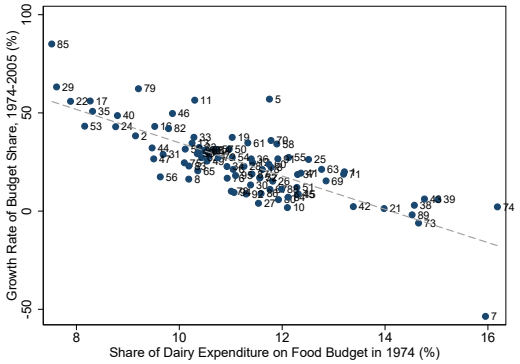


Figure 5: Convergence of Budget Share for Dairy Products, French Departments, 1974-2005

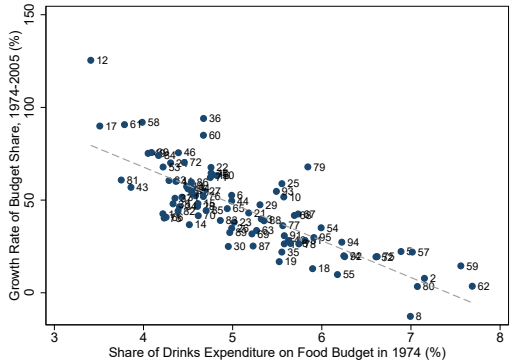


Figure 6: Convergence of Budget Share for Soft Drinks, French Departments, 1974-2005

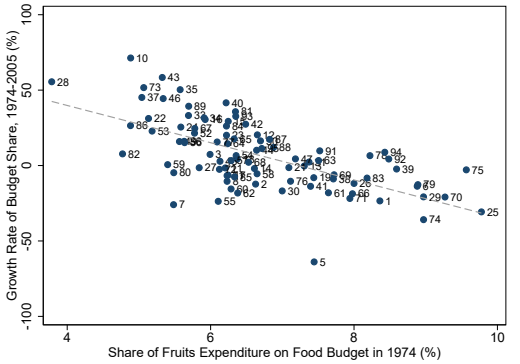


Figure 7: Convergence of Budget Share for Fruits, French Departments, 1974-2005

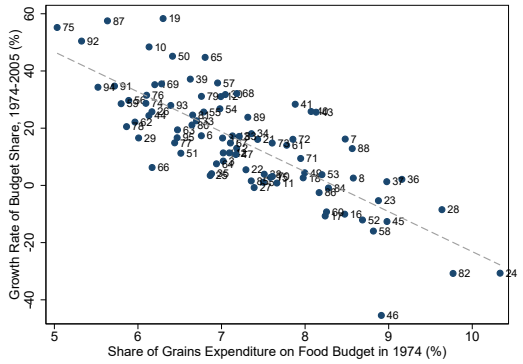


Figure 8: Convergence of Budget Share for Grains, French Departments, 1974-2005

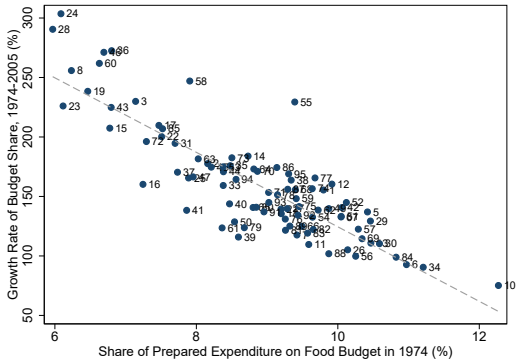


Figure 9: Convergence of Budget Share for Prepared Food, French Departments, 1974-2005

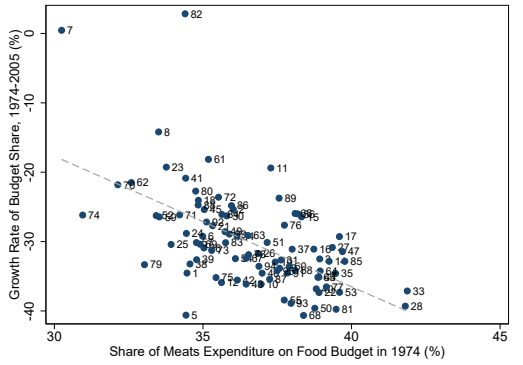


Figure 10: Convergence of Budget Share for Meat Products, French Departments, 1974-2005

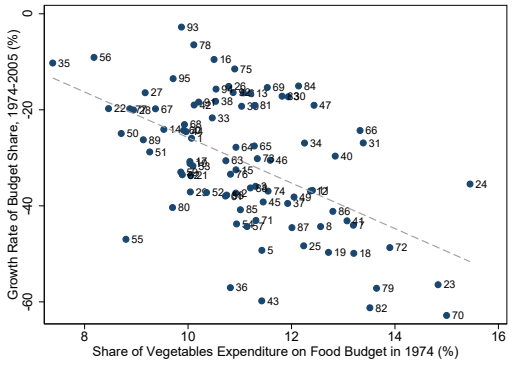


Figure 11: Convergence of Budget Share for Vegetables, French Departments, 1974-2005

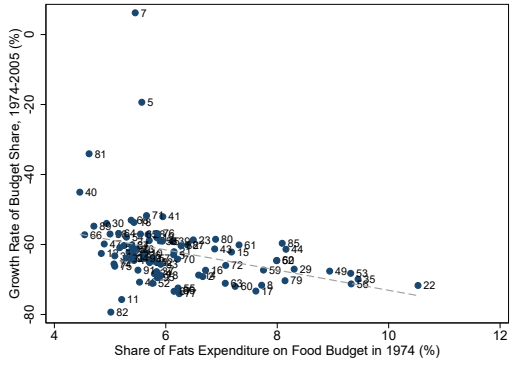


Figure 12: Convergence of Budget Share for Fat products, French Departments, 1974-2005

B.2 Robustness Check: Measurement Errors

Table 10: Counterfactual Measurement Errors in the Hypothesis of Non-Convergence

	Budget Shares					
	Mean		Maximum		Error on Initial Share	
Broad categories	1974	2005	1974	2005	Mean	Maximum
Alcohol	0.07	0.06	0.11	0.1	30%	85%
Dairy	0.11	0.14	0.16	0.18	33%	75%
Drinks	0.05	0.07	0.08	0.1	35%	61%
Fats	0.06	0.02	0.11	0.06	35%	93%
Fruits	0.07	0.07	0.1	0.09	32%	77%
Grains	0.07	0.08	0.1	0.1	26%	65%
Meats	0.37	0.25	0.42	0.35	30%	41%
Prepared	0.09	0.23	0.12	0.31	33%	55%
Vegetables	0.11	0.08	0.15	0.1	23%	59%

Note: This counterfactual analysis reproduces the measurements errors needed to obtain the convergence graphs of Appendix B.1 in case of no real convergence. We assign the growth rate of the smallest share to all French departements, assuming the smallest share is the least contaminated by measurement errors.

B.3 Unconditional Convergence of Prices and Income

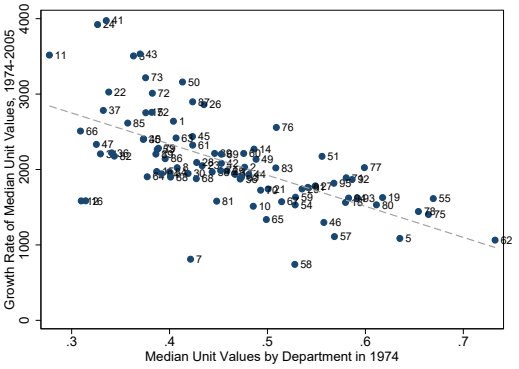


Figure 13: Price Convergence for Alcohol, French Departments, 1974-2005

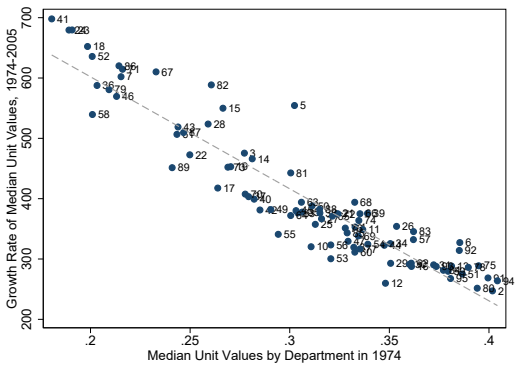


Figure 14: Price Convergence for Dairy Products, French Departments, 1974-2005

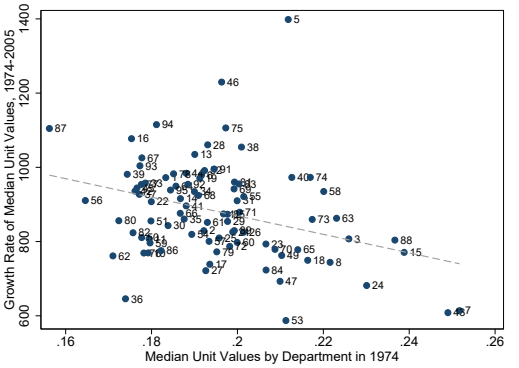


Figure 15: Price Convergence for Soft Drinks, French Departments, 1974-2005

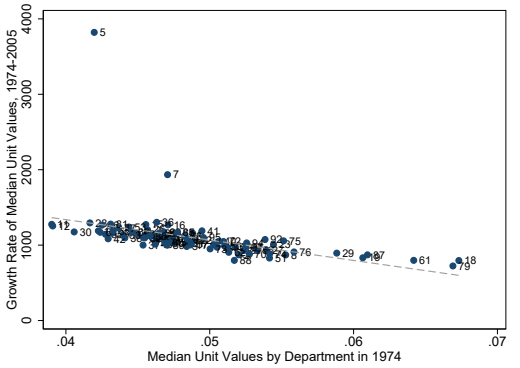


Figure 16: Price Convergence for Fruits, French Departments, 1974-2005

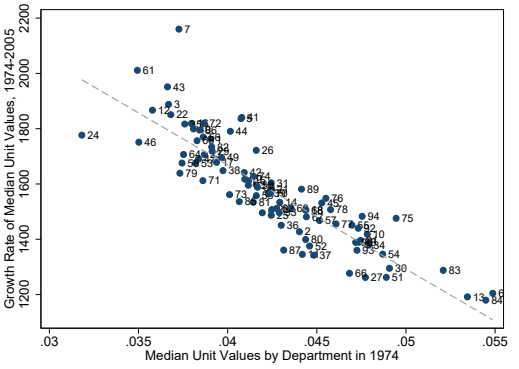


Figure 17: Price Convergence for Grains, French Departments, 1974-2005

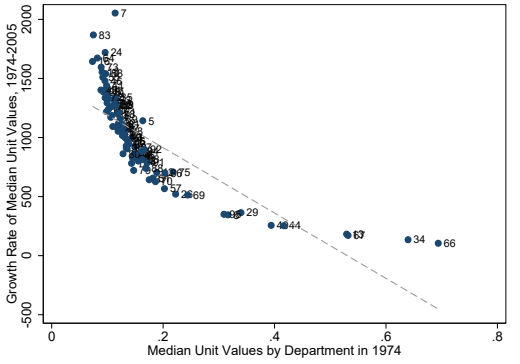


Figure 18: Price Convergence for Prepared Food, French Departments, 1974-2005

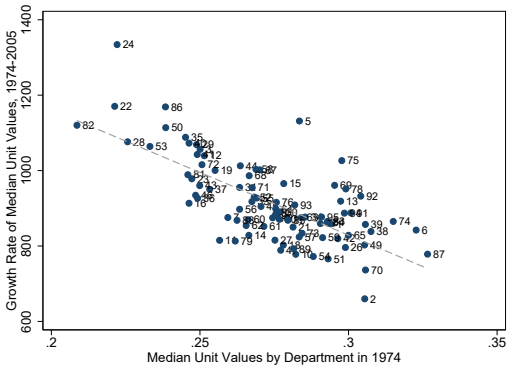


Figure 19: Price Convergence for Meat Products, French Departments, 1974-2005

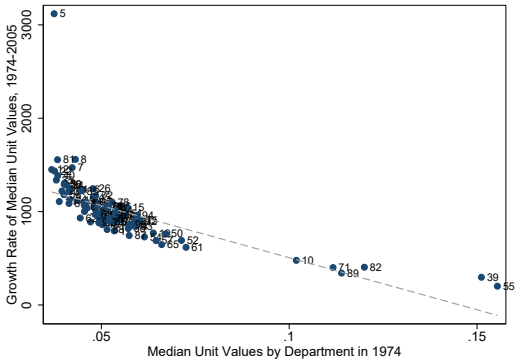


Figure 20: Price Convergence for Vegetables, French Departments, 1974-2005

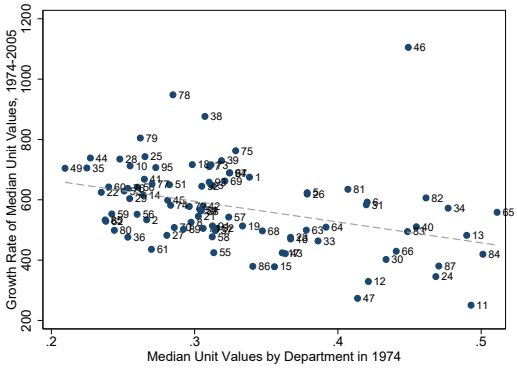


Figure 21: Price Convergence for Fat Products, French Departments, 1974-2005

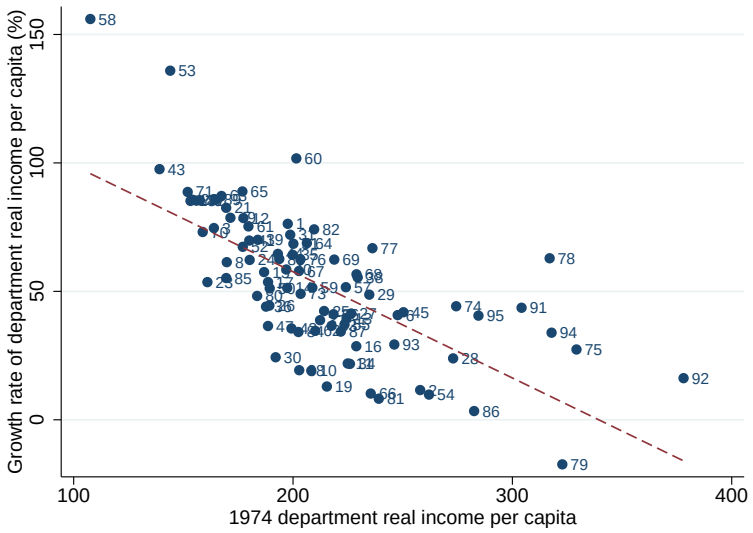


Figure 22: Income per capita growth in function of baseline year, French Departments, 1974-2005