## Stardust over Paris Gastronomic Restaurants\*

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#### **Abstract**

In this paper, we study if the leading French gastronomic guidebook, the "Guide Rouge Michelin," only rates the quality of food, as it claims, or if it also considers environmental variables when attributing stars. We then check how Michelin ratings affect the market, and more specifically, the price charged by restaurants. Using some simple econometric techniques, we find that a small improvement in environment boosts the probability of receiving Michelin stars. Since we also find that a Michelin star is associated to a high price premium stuck (independently of the quality of food), we conclude that expertise induces distortions in the market (JEL classification: D4, L15, L66).

#### I. Introduction

In modern societies, the supply of consumption goods is so diversified that attaining information on quality has become a very cumbersome task. For this reason, consumers often rely on experts to assess product quality at a relatively low cost. While simplifying choices, expertise also affects the structure of the market itself. This would not be harmful if experts clearly stated the criteria they use to define quality and stuck to them. Unfortunately this is not always the case. Ginsburgh (2003), showed that even expert opinions are, in many markets (movies, books and music), poor predictors of true aesthetic quality of the work.

In this paper, we question the role of expertise in gastronomy and, more specifically, test if the leading French gastronomic guidebook, the *Guide Rouge Michelin*, strictly rates the quality of food, as it claims, or if it also ranks restaurants attributing some importance to environmental variables. We then check how their ratings affect the market, and more specifically, the price charged by restaurants. This will allow us to capture, at least to some extent, the market failures that the guide induces.

To do so, we rely on the *Guide Rouge Michelin* (2001) for the Paris area. However, this guide appears to suffer selection bias as not all restaurants have the same prior probability of being listed. Even though 80.46% of all of the restaurants considered very good to excellent (according to the *Zagat survey* of consumers) are included in the Michelin guide, only 57.14% of Asian restaurants of the same quality are featured while 95.65% of all restaurants classified as "French haute cuisine" (*Zagat Survey*) appear in the Michelin guide. These statistics suggest that some discrimination exists and that some characteristics, independent of the quality of food, affect the likelihood of being listed in the guide.

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<sup>&</sup>lt;sup>1</sup> The *Red Guide* sells approximately 400,000 copies each year in France and almost one million worldwide according to its own estimates.

To overcome this problem, we analyze a larger sample and control for the selection bias. This is done by merging the information from the Michelin guide with the information contained in the *Zagat Survey*. The latter, which is based on consumers' opinion, provides evaluations for the quality of food, service and decor and, more importantly, makes available the price paid for a reference dinner for a larger number of restaurants. In aggregate, we collected information for 571 restaurants located in Paris *intra muros*.

The paper is organized as follows: section 2 reviews the literature on the role played by expertise in economics, section 3 describes the data while section 4 sets out the methodology, section 5 presents the results, and section 6 draws some conclusions.

#### II. The Role of Expertise

In recent literature, several authors have highlighted the fact that expertise might have unexpectedly perverse effects and might mislead consumers. Ginsburgh and van Ours (2003), for instance, have shown that being selected as the winning candidate of the Belgian Queen Elisabeth piano competition, ensures fame and prosperity. This would not be a major concern if they did not reveal, in the same study, that the probability of winning the competition depended on order of the artist's appearance during the final, which is determined randomly. Stated differently, economic success of performers is related to expert opinion, which is influenced itself by factors outside of talent.

In gastronomy<sup>2</sup> something similar occurs: guides' evaluations are very good predictors of economic success of restaurants but are not exclusively related to the quality of cooking. Chossat and Gergaud (2003), for instance, have shown that the ratings for cuisine, provided by Gault-Millau, are not only based on cuisine but are also positively influenced by the choice of wines in cellars and by the ambience of the setting.

This negative role of expertise has been denounced by several renowned chefs who have criticized these guidebooks. In particular, the most influential guide for French gastronomic restaurants, the *Guide Rouge Michelin*, is at the heart of a severe controversy. Talented chefs, such as former three-star chefs Alain Senderens and Antoine Westermann,<sup>3</sup> returned their Michelin reward, claiming that they renounced this luxury that suffocated them,<sup>4</sup> to allow more freedom to cuisine.<sup>5</sup> In other words, they accuse Michelin of forcing restaurants to invest in decor and venue, rather than in food excellence. Here again, this would not be a major problem if Michelin clearly stated that both decor and food were important. Nevertheless, Jean-Luc Naret, Director of the Michelin guides, claims that the stars are attributed to the plate and only the plate. He even asserts that the guidebook never incited chefs to invest in anything other than

<sup>&</sup>lt;sup>2</sup>In this field, expertise plays an important role since it provides information that could not be identified solely by customers at a reasonable cost. Indeed, guidebooks are supposed to frequently rate geographically-scattered restaurants to assess their performance. This induces large search costs, which could not be afforded by each single client.

<sup>&</sup>lt;sup>3</sup>Another former three-star and renowned chef, Joël Robuchon, even states that Michelin's image is in bad shape and refuses to allow his restaurants to be listed in the guidebook, considering that they do not match with *the passeist and ostentatious criteria used by the Michelin* (Cited by J-C Ribaut in *Le Monde*, June, 3, 2005).

<sup>&</sup>lt;sup>4</sup>V. Noce in *Libération* citing Senderens, September, 23, 2005.

<sup>&</sup>lt;sup>5</sup>J-C Ribaut in *Le Monde* citing Senderens, June, 3, 2005.

#### III. The Data

The dataset used covers all Paris restaurants scrutinized in the Zagat Survey<sup>7</sup> in 2002. An average price charged for a reference dinner and drink (tip included) is available for each restaurant on the basis of the cost declared by clients. The guide also provides information on the quality of food, decor and service on the basis of a scale ranging from 0 to 30 points. This information is merged with the information that is available in the Michelin guide (2001).8 Apart from the type of restaurants and the geographical origin of food, Michelin provides a rating ranging from zero to three stars to stress the quality of food. At the same time, it distinguishes between 5 levels of comfort using a "forks and spoons" symbol (F&S thereafter) attributed according to the following criteria: furnishings of the establishment, service, cleanliness and upkeep of the surroundings. When the establishment gets red F&S instead of black ones, it means that it is especially pleasant (i.e. a three red F&S has a better environment than a three black F&S but less than a four black F&S). In aggregate, there are 11 distinct components for the environmental variable. If we look at the two-way frequency table of environmental ratings (the number of F&S) with respect to quality of food (number of stars) as declared by Michelin (Table 1), we see that the two variables are highly correlated. For example, all three-star restaurants have never less than four F&S and no starred restaurant has less than two F&S.

#### **Insert Table 1 here**

The association between the quality of the environment and that of food seems obvious, and one can cast doubts on the independence between the attribution of stars and the environmental variables.

## IV. The Methodology

The first goal of this paper is to understand if the attribution of Michelin stars is related to non-artistic determinants, such as comfort. To test for this, we regress the number of stars on the quality of the environment (i.e. the number of stars on the F&S categories) and on some exogenous characteristics, to control for heterogeneity. There is an endogeneity problem since both ratings are attributed by the same guide at the same moment. Hence, we need to find good instruments for the environment. In this paper, we use the percentage of starred restaurants in the neighborhood. Why do we expect it to be a good instrument? The answer is straightforward: starred restaurants are almost all located in very nice neighborhoods of Paris. There is, then, necessarily a direct relation between the concentration of starred restaurants and the environment (given the role of the neighborhood in the attribution of F&S). To capture this effect, it is interesting to look at a map of Paris (categorized by arrondissement), identifying the concentration of starred restaurants and compare it to the average price of housing.

<sup>&</sup>lt;sup>6</sup>More precisely, Michelin stars would be based on five criteria: "the quality of the products, the mastery of flavor and cooking, the "personality" of the cuisine, the value for the money, the consistency between visits." Source: www.michelinguide.com/ratings.html.

<sup>&</sup>lt;sup>7</sup>Zagat is the world-leading provider of consumer survey-based gastronomic guidebooks. It rates the distinct qualities of a restaurant-food, decor and service--based on consumers' input. Its premise is that rating a restaurant on the basis of thousands of experiences is inherently more accurate than relying on a single reviewer.

<sup>&</sup>lt;sup>8</sup>We use a one year out-of-date Michelin guide since current prices are affected by the existing stars.

<sup>&</sup>lt;sup>9</sup>The correlation coefficient is 84%.

## **Insert Figure 1 here**

## **Insert Figure 2 here**

Most of starred restaurants are located in the Western part of Paris, which is also the most expensive area in terms of housing prices.

Obviously, to be a good instrument, the percentage of starred restaurants in a neighborhood should not be correlated with the quality of the restaurant (in terms of number of stars attributed) that cannot be explained by the environment (i.e. the percentage of restaurants in the neighborhood should be independent of the error term when we regress the number of stars on the environment). This should be guaranteed by construction, since the Michelin F&S incorporate a neighborhood component.

Up to now, we have talked about the attribution of stars for restaurants in the same neighborhood. A central question still remaining is then: how do we define neighbors?

### A. Defining neighbors

To define neighbors, we identify the geographical coordinates of all restaurants  $^{10}$  and compute the distance between all pairs of observations. The maximal distance between two restaurants in the dataset is 18.5km, the largest minimum distance is 1.67km and the smallest maximum distance is 9.34km. Several strategies could then be adopted to define neighbors. In general terms we attribute proximity spatial weights in accordance to the function:

$$w_{ij} = \begin{cases} 0 & \text{if } d_{ij} \notin [l_b, u_b] \\ 1/d_{ii}^f & \text{if } d_{ii} \in [l_b, u_b] \end{cases}$$

where (i, j) denotes a pair of locations,  $d_{ij}$  denotes the Euclidean distance between restaurants i and j,  $l_b$  and  $u_b$  denote the lower and upper bound of the specified distance band, respectively, and f denotes a positive friction parameter. In this analysis, the friction parameter will be set to one, since in a big city like Paris, the direct transportation cost is basically independent of distance traveled while time expended depends linearly on distance. The total cost can thus be considered linearly with the distance traveled. Finally, the values in the weighting matrix are standardized in order to ensure that the sum of all elements per row equals one. In what follows, a restaurant i is considered as a neighbor for restaurant j if the distance between i and j does not exceed 3.7 km, i.e. the median distance.

It is now easy to calculate the average number of starred restaurants in the neighborhood of each restaurant (weighted by the distance) by multiplying the weighting matrix (W) by the vector identifying the starred restaurants (called STAR). In other words, the frequency of starred restaurants in the neighborhood of each restaurant is defined by  $W \cdot STAR$  (vector WSTAR). By construction, the elements of WSTAR are positive, and we take the natural logarithm of WSTAR

<sup>&</sup>lt;sup>10</sup>The coordinates are available in decimal degrees from maporama.com and are converted into distances ( km ) to the equator and to the greenwhich meridian through the formula:  $distance = \frac{6378.137 \cdot \pi \cdot degrees}{180}$ .

<sup>&</sup>lt;sup>11</sup>We made calculations using four other definitions of neighbors and got comparable results.

in our econometric specification to work with elasticities rather than unit changes.

#### B. Attribution of stars: does environment matter?

General specification

The specification we use to test if environmental variables influence the attribution of Michelin stars is:

$$Stars_{i} = \theta_{1,0} + Environment_{i1}\theta_{1,1} + Cuisine\,\theta_{1,2} + \sum_{j=3}^{p} x_{ij}\theta_{1,j} + \varepsilon_{1i}$$

$$\tag{1}$$

Where Stars is the variable quantifying the number of stars attributed by Michelin, Environment is the environment as described by Michelin (F&S), Cuisine is a variable proxying the quality of food and  $x_{ij}$  are control variables. The variable Stars is codified into four categories: zero, one, two and three awarded stars. The variable Environment is codified into eleven categories depending on the number (and color) of F&S attributed. Clearly, this equation should be estimated using an ordered probit (or logit) given the characteristics of the dependent variable. The environment has to be instrumented because it is most probably endogenous.

Unfortunately a standard two-step methodology cannot be routinely applied since there is a selection problem in the instrumented variable: we only have information on the environment for those restaurants that are listed in the Michelin guide. Stated briefly, to correct for this bias, we use a "Heckman Selection" type procedure in the first step of the estimation procedure. This is explained in detail in the following sub-section.

The variable Cuisine, which is assumed to proxy the objective quality of food, is readily available from Zagat and ranges from 0 (very poor quality) to 30 (excellent quality). For consistency with the Michelin Guide, this variable is taken from the 2001 Zagat guide (instead of the 2002 edition). Since consumers may be influenced by the Michelin awards while assessing the quality of food offered in a restaurant, this variable could be endogenous as well. This would not be a major problem (since we are not interested in the estimated coefficient associated to the quality of food) if the perception of the quality (of food) was not highly correlated with the environment, which it most likely is. To correct for this, we clean the Cuisine variable from the influence of the environment (i.e. both decor and service). 12 This is done by regressing Cuisine on Decor and Service, 13 and by taking the residuals. The application of this cleaned cuisine variable has two effects. First, the correlation between Cuisine and environment should be significantly reduced, and the problem of endogeneity should not spread on the coefficient associated to the environment. Second, since the variables Cuisine, Decor and Service have most probably been influenced in a similar way by the Michelin stars (since they are all rated by the same clients), the residuals of the regression of the first variable on the two others should be cleaned of a large part of the common endogenous component.

The  $x_j$  control variables are dummies identifying: i) if a restaurant is seen by Zagat as a "classical" French food restaurant, ii) if it is specialized in any specific type of food (seafood, meat, cheese, vegetarian, organic, hamburger or pizza), iii) the origin of the cooking (Asian, North American, Latin American, European-non French and Regional French food) and, iv) the arrondissement where the restaurant is located.

<sup>&</sup>lt;sup>12</sup>By regressing the variable *Cuisine* on *Decor* and *Service* and by taking the residuals. The variables *Decor* and *Service* are, as *Cuisine*, available in the Zagat survey.

<sup>&</sup>lt;sup>13</sup>All three come from the 2001 Zagat guide.

The instruments chosen to correct the bias, which is due to the endogeneity of the environment variable, are InWSTAR (the log of the weighted average of the percentage of stars in the neighborhood of each restaurant) and "arrondissement" dummies. 14 The methodology we adopt is very similar to 2SLS except that in the first step of the estimation method a Heckman selection type model is used instead of a linear regression.<sup>15</sup> The second step is a classical ordered probit with bootstrapped standard errors. Two variables have been used to tackle the selection<sup>16</sup> problem: uniformity in opinions and limited participation in the survey. These two variables are readily available from the Zagat guide and are proxies for the reputation of the restaurant. The first is a dummy that is equal to one if opinions are highly homogeneous and the second is a dummy that is equal to one if only a very limited number of customers reviewed the restaurant. Obviously if the reputation of a restaurant is well established, Michelin cannot afford not considering it in the guide. For this reason we expect restaurants with a large number of very homogeneous opinions to have an increased likelihood of being selected in the guide. At the same time, we do not see any credible reason why these two variables would, at least in the short-run, influence the environment and, more specifically, the location of restaurants. This selection effect seems to be confirmed by the data. Among the restaurants cited in the guidebook (and perceived as at least good by consumers), 66% could be considered as well-known (many votes and homogeneous opinions) while only 34% could not. Conversely, among the restaurants of the same quality category not cited in the guidebook, 41% are well-known and 59% are not.

#### C. Price formation

As far as price formation is considered, Rosen's (1974) Hedonic Price Modelling is commonly used when products are vertically differentiated. Hedonic prices are defined as the implicit prices of attributes and are revealed to agents from observed prices of differentiated products and the specific amounts of characteristics associated with them. The relation that we estimate is of the type:

$$\ln p_i = \sum_{j=1}^k z_{ij} \theta_{2,j} + \varepsilon_i \tag{2}$$

where z are k explanatory variables. These variables are, on the one hand, the quality indicators (Michelin ratings, Zagat Survey perceptions of the quality of food, decor and service) and, on the other hand, the characteristics of the restaurant (the ethnic origin of food, the venue, the location of the restaurant and some specificities in the food). For the sake of parsimony, we will not use all the available variables (more than 100) in the final estimation but will rather use the most significant ones. For this purpose we run a stepwise regression and keep only variables that turn out to be significantly different fom zero at a 5% level. The estimated standard errors are robust to heteroskedasticity, allowing for the variance within and between arrondissements to differ.

<sup>&</sup>lt;sup>14</sup>Note that not all arrondissement dummies turn out to be interesting instruments. To avoid overidentification problems we keep only those that provide non-redundant information. These dummies are those identifying the 4<sup>th</sup>, 7<sup>th</sup>, 15<sup>th</sup>, and 17<sup>th</sup> arrondissements.

<sup>&</sup>lt;sup>15</sup>We decided to use a linear regression instead of an ordered probit, given that the number of ordered classes (11) is large.

<sup>&</sup>lt;sup>16</sup>I.e. variables that influence the presence in the Michelin guide but not the environmental variables.

<sup>&</sup>lt;sup>17</sup>We checked if changing the criteria of the procedure modified the results, and it does not.

#### V. Results

The influence of the environment on the attribution of stars is highly significant. It seems that the critique of the reluctant chefs is confirmed by the data. In Table 2, we present the results associated with the estimations related to the determinants of stars. In the first column we present the results of the probit model used to explain the selection in the guidebook. In the second, we present the first step of the instrumental variables estimation where the inverse Mills ratio, coming from the probit model, has been introduced to control for the selection bias. Finally in the third column we present the result of the second stage of the estimation, in which the environmental variable has been instrumented.

#### **Insert Table 2 here**

From Table 2 we see that the uniformity in opinions and the number of surveyors can help identify discrimination among selected and non-selected restaurants. This means that there is probably a reputational effect that increases the likelihood of being listed in the guide. Since the inverse Mills Ratio is significant, there would have been a bias if the issue of sample selection were not treated. As far as the instrument is concerned (Ln(WSTAR)), we see that it is highly correlated to the environment. We also get the confirmation of Michelin's preference for traditional French gastronomy and aversion for ethnic and French regional food. Finally, the instrumented environment is related to the number of attributed stars. This corroborates the idea that Michelin experts are not insensitive to the environment (neighborhood, venue, service and decor) while attributing stars. To give an idea of the size of effect, we present, the marginal effects of a unit change in the environmental variable on the probability of receiving one, two or three stars in Table 3. These effects are calculated for both a median and a mean restaurants (i.e. restaurants with a median or mean value in each dimension).

A unitary increase in environment for a median restaurant will boost the probability of receiving a star by 17%, the probability of receiving two stars by 11% and the probability of receiving three stars by 1%. Likewise, it will increase these three probabilities by 10%, 4% and 0.2% for an average restaurant.

#### **Insert Table 3 here**

As far as the price equation is concerned, the influence of Michelin is clear. Looking at the results of the estimated hedonic price equation, presented in Table 4, we see that simply being featured in the Michelin Guide is associated to a price premium of about 9%. This premium increases by about 27% when a restaurant is awarded its first star.<sup>18</sup> It is worth noting that additional stars have no further effect. Finally, we see that if the percentage of starred restaurants in the neighborhood doubles, the price increases by 7%. If we combine this result with the fact that the awards attributed by Michelin are partly due to environmental variables, we understand that the guide creates market distortions. More precisely, if we rely on marginal effects calculated at median values, we could say that a "median" restaurant will increase its price by 7% if its environment improves marginally (i.e. if the Michelin F&S improve by half unit<sup>19</sup>) even holding the quality of the food constant.<sup>20</sup> Similarly, if we consider an average

<sup>&</sup>lt;sup>18</sup>To read properly the coefficient we have to exponentiate the estimated coefficient and remove 1.

<sup>&</sup>lt;sup>19</sup>I.e. by moving from black to red.

restaurant, we could say that the price increase for a similar change would be slightly more than 3%.<sup>21</sup>

#### **Insert Table 4 here**

Table 5 (in the Appendix) reproduces the ranking of the 100 most underpriced restaurants in Paris intra-muros (for the year 2002) according to our estimated hedonic price residuals. *Bistrot d'Albert* is the most underpriced restaurant in the sample, followed by *Creperie de Josselin* and so on. For further reference, we also provide the price category of the restaurant<sup>22</sup> as well as the Michelin number of awarded stars and Zagat ratings for the quality of the cuisine. Underpricing (measured as  $1 - p_i/\hat{p}_i$ ), gives information about the distance between the observed price ( $p_i$ ) and the fair price (linear prediction of the hedonic price:  $\hat{p}_i$ ). An underpricing of 50% means for instance that a meal in restaurant i is sold at half the price of a comparable meal in a restaurant with similar characteristics.

#### VI. Conclusion

This paper questions the role of expertise in gastronomy, focusing on the role played by the *Guide Rouge Michelin* in Paris. Our main finding is that Michelin inspectors, contrary to their claims, are heavily influenced by the environment when evaluating chefs' performance (i.e. the quality of the cooking). This creates market distortions, since Michelin awards substantially affect the prices restaurants charge, even when food quality is unchanged.

Our results tend to prove that the Red guide overcompensates chefs who invest heavily in their setting (and location) and undercompensates those who strictly focus on cuisine quality. In light of these results, it is clearer why some renowned chefs prefer to return their Michelin stars rather than adhere to a series of seeminlgy irrelevant criteria (that imply heavy investments). We can conclude that in the case of gastronomy, or at least for the Parisian market, expertise creates some adverse selection, and some talented chefs are, by lack of financial capacities, driven out of the market.

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<sup>&</sup>lt;sup>20</sup>The calculation is simply 0.17\*0.24+0.11\*0.23+0.01\*0.25.

<sup>&</sup>lt;sup>21</sup>The calculation is simply 0.10\*0.24+0.04\*0.23+0.00\*0.25.

<sup>&</sup>lt;sup>22</sup> Where 1 means very expensive (i.e. more than 90€ for a reference dinner), 2 means expensive (between 60€ and 90€), 3 means affordable (between 30€ and 60€) and 4 means cheap (less than 30 €).

 ${\it Table~1} \\ {\bf Distribution~of~Michelin~Ratings~for~Environment~and~Cuisine~(percentages)}$ 

				Number of f	forks and spoons		
stars		0	1	2	3	4	5
Number of st	0	90.86	3.50	4.28	1.17	0.19	0
	1	0	0	17.86	60.71	17.86	3.57
	2	0	0	8.33	16.67	45.83	29.17
	3	0	0	0	0	80	20

Figure 1
Percentage of Starred Restaurants

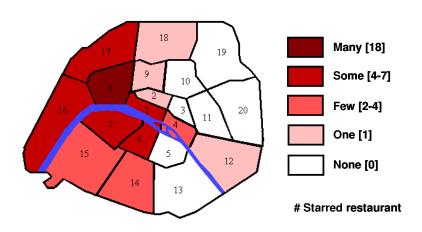


Figure 2

Average price of housing



Table 2
Environment and Michelin Stars

Environme	ent and Mic	helin Stars	
	Selection	Environment	Stars
Environment			1.102***
			(4.46)
Cuisine	$0.098^{***}$	0.049	0.142***
	(3.45)	(1.30)	(2.76)
Ln(WSTAR)	0.011	0.697***	_
	(0.05)	(6.83)	
Seafood	0.723**	-1.202*	0.258
	(2.06)	(1.83)	(0.53)
Special Food	-0.612**	0.943	-0.634
	(1.97)	(1.31)	(1.31)
Asia	-1.285***	0.244	-0.584
	(4.51)	(0.43)	(0.17)
North America	-0.352	-0.257	-5.443***
	(0.51)	(0.91)	(9.48)
French Regional	-0.364**	-0.080	-0.028
	(2.20)	(0.33)	(0.06)
Bistrot	-0.437***	-0.649**	-1.327
	(3.36)	(2.52)	(0.38)
Africa	-1.132**	-0.901	-6.840***
	(2.34)	(1.25)	(9.44)
Middle East	-1.309**	-1.071**	-5.857***
	(2.20)	(2.74)	(8.60)
European	-0.346*	-1.069***	0.132
	(1.68)	(3.61)	(0.07)
Uniformity	0.265**	-	_
	(2.13)		
Unfrequently Reviewed	-0.323**	_	_
	(2.44)		
Inverse Mills Ratio	_	-0.968**	_
		(2.37)	
Constant	0.081	4.122***	_
_	(0.15)	(11.52)	
Observations	559	239	239
Estimation method	Probit	OLS	Ordered Probit
R-squared or Pseudo R-squared	0.12	0.24	0.28

Notes: Absolute value of z statistics in parentheses

<sup>\*</sup> significant at 10%; \*\*\* significant at 5%; \*\*\* significant at 1%

 Table 3

 Marginal Effect of Environment on # of Stars (dStar/dEnv.)

	One star	Two stars	Three stars
Mean	0.10	0.04	0.00
Median	0.17	0.12	0.01

Table 4
Hedonic Price Equation

Hedonic Price Equa	ation
In Michelin (zero stars)	0.089***
	(4.46)
One Michelin Star	0.240***
	(8.77)
Two Michelin Stars	0.227***
	(3.35)
Three Michelin Stars	0.248**
	(2.70)
Haute Cuisine	0.173***
	(3.34)
Ln(WSTAR)	0.067***
	(6.16)
Cuisine	0.031***
	(12.71)
Decor	0.024***
	(10.04)
Water view	-0.487***
	(22.25)
Scandinavian	-0.249***
	(11.68)
German	-0.534***
	(22.06)
Italian	0.084**
	(2.12)
Tea	-0.247***
	(3.12)
Sandwich	-0.533***
	(10.09)
8th Arrondissement	0.055***
	(4.84)
11th Arrondissement	-0.091***
	(5.48)
Cellar	0.319***
	(14.44)
Seafood	0.113***
	(4.25)
Constant	4.895***
	(82.63)
Observations	566
R-squared	0.74

Note: Robust t statistics in parentheses

<sup>\*</sup> significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

# Appendix

 ${\it Table~5} \\ {\it Top~100~of~the~Most~Underpriced~Restaurants}$ 

Top 100 of the Most Underpriced Restaurants							
Name	Address (Arrondissement)	Underpricing Cat.	Zagat	Michelin			
Bistrot d'Albert	150, bd Péreire (17)	48.32% 4	21	0			
Creperie de josselin	67, rue de Montparnasse (14)	45.63% 4	17	0			
Germaine (Chez)	30, rue Pierre Leroux (7)	42.31% 4	15	0			
Le Port du Salut	163 bis, rue St-Jacques (5)	38.82% 4	12	0			
Paparazzi	7 bis, rue Geoffroy-Marie (9)	37.11% 4	16	0			
Au Pied de Fouet	45, rue de Babylone (7)	36.79% 4	13	0			
Chartier	7, rue Faubourg-Montmartre (9)	36.29% 4	9	0			
Clown Bar	114, rue Amelot (11)	35.35% 4	18	0			
Bouclard (Le)	1, rue Cavallotti (18)	33.30% 3	20	0			
Agape(L')	281, rue Lecourbe (15)	32.24% 4	17	0			
New Jawad	12, av Rapp (7)	32.14% 4	16	0			
Le Président	120, Faubourg du Temple (11)	32.14% 4	12	0			
Cloche des Halles (La)	28, rue Coquillière (1)	31.67% 4	17	0			
Babylone (Au)	13, rue de Babylone (7)	31.66% 4	14	0			
Marianne (Chez)	2 rue des Hospitalières St-Gervais (4)	30.68% 4	14	0			
Dix Vins	57, rue Falguière (15)	30.56% 4	16	0			
Au Petit Lutétia	107, rue de Sèvres (6)	29.31% 3	16	0			
Coco de Mer	34, bd St-Marcel (5)	28.27% 3	16	0			
Impatient (L')	14, passage Geffroy-Didelot (17)	27.87% 3	20	0			
Polidor	41, Monsieur-Le-Prince (6)	27.19% 4	11	0			
Cour de Rohan	59-61, rue St-André-des-arts (6)	26.35% 4	14	0			
Le P'tit Troquet	28, rue de l'Exposition (7)	26.31% 3	18	0			
Café Terminus	Concorde St-Lazare 108, rue St-Lazare (8)	25.77% 3	17	0			
Café Beaubourg	100, rue St-Martin (4)	25.17% 4	10	0			
Perraudin	157, rue St-Jacques (5)	24.63% 4	12	0			
Loir dans la Théière (Le)	3, rue des Rosiers (4)	24.20% 4	13	0			
Bouillon Racine	3, rue Racine (6)	24.04% 3	13	0			
Café Flo	Printemps, 64, bd Haussmann (9)	24.01% 4	10	0			
Café du Commerce (Le)	51, rue du Commerce (15)	23.45% 4	10	0			
Mathusalem (Le)	5 bis, bd Exelmans (16)	23.35% 4	17	0			
Bistrot d'André (Le)	232, rue St-Charles (15)	23.13% 4	13	0			
Epi Dupin	11, rue Dupin (6)	23.10% 3	22	0			
Bacchantes (Les)	21, rue de Caumartin (9)	23.02% 4	14	0			
A Priori Thé	35, Galerie Vivienne (2)	22.93% 4	13	0			
Languedoc (Le)	64, bd de Port-Royal (5)	22.71% 4	18	0			
Béatilles (Les)	11 bis, rue Villebois-Mareuil (17)	22.61% 3	19	1			
Maupertu	94, bd de La Tour-Maubourg (7)	22.58% 3	18	0			
Café de Vendôme	Hôtel de Vendôme 1, place Vendôme (1)	22.57% 3	16	0			
Filoche	34, rue du Laos (15)	22.54% 3	17	0			
Fontanarosa	28, bd Garibaldi (15)	22.46% 3	18	0			
Bistrot St. Ferdinand	275, bd Péreire (17)	21.88% 4	14	0			
Délices d'Aphrodite	4, rue de Candolle (5)	21.07% 3	19	0			
Bath's	9, rue de La Trémoille (8)	20.99% 3	19	1			
Baron Rouge (Le)	1, rue Théophile Roussel (12)	20.35% 4	9	0			
Bistrot de l'Olivier	13, rue Quentin Bauchart (8)	20.27% 3	18	0			
Biche au Bois (A la)	45, av Ledru-Rollin (12)	20.23% 3	21	0			
I Golosi	6, rue de la Grange-Batelière (9)	20.22% 3	20	0			
Chicago Pizza Pie Factory	5, rue de Berri (8)	19.97% 4	6	0			
Unicago Fizza Fie Faciory	5, rue de Delli (6)	13.3170 4	O	U			

Le Petit Niçois	10, rue Amélie (7)	19.90%	3	18	0
Espace Sud-Ouest/Chez Papa	29, rue de l'Arcade (8) among others	19.62%	4	12	0
Livingstone	106, rue St-Honoré (1)	19.49%	3	13	0
Lescure	7, rue de Mondovi (1)	19.19%	4	12	0
Cigale (La)	11 bis, rue Chomel (7)	18.96%	3	17	0
Le Réconfort	37, rue de Poitou (3)	18.92%	3	15	0
Petrossian	18, bd de la Tour-Maubourg (7)	18.92%	2	19	1
Ferme des Mathurins	17, rue Vignon (8)	18.79%	3	16	0
Café Max	7, av de la Motte-Picquet (7)	18.78%	3	13	0
Allobroges (les)	71, rue des Grands-Champs (20)	18.75%	3	20	0
Avant Goût (L')	26, rue Bobillot (13)	18.49%	3	22	0
Café Marly	93, rue de Rivoli (1)	18.29%	3	12	0
Nouveau Village Tao-Tao	159, bd Vincent Auriol (13)	17.94%	4	17	0
Le 404	69, rue de Gravilliers (3)	17.28%	3	17	0
Ostréade (L')	11, bd de Vaugirard (15)	16.89%	3	15	0
Clos des Gourmets (Le)	16, av Rapp (7)	16.86%	3	21	0
Muses (Les)	Hôtel Scribe 1, rue Scribe (9)	16.79%	3	22	2
Mauzac (Le)	7, rue de l'Abbé de l'Epée (5)	16.24%	4	16	0
Bistrot du Peintre (Le)	116, av Ledru-Rollin (11)	16.17%	4	12	0
Chien qui Fume (Au)	33, rue du Pont-Neuf (1)	15.96%	3	14	0
Erawan	76, rue de la Fédération (15)	15.82%	3	18	0
Auberge Aveyronnaise	40, rue Gabriel Lamé (12)	15.70%	3	15	0
Findi	24, av Georges V (8)	15.39%	3	13	0
Mirama	17, rue St-Jacques (5)	14.73%	4	19	0
Bristol (Le)	Hôtel Bristol 112, rue du Fbg-St-Honoré (8)	14.71%	1	25	2
Entrepot	7, rue Francis de Pressensé (14)	14.70%	3	11	0
Os à Moelle (L')	3, rue Vasco-de-Gama (15)	14.39%	3	22	0
Berry's (Le)	46, rue de Naples (8)	14.37%	3	14	0
Café d'Angel (Le)	16, rue Brey (17)	14.36%	3	16	0
Coffee Parisien	4, rue Princesse (6)	14.10%	4	12	0
Omar (Chez)	47, rue de Bretagne (3)	13.99%	4	16	0
Etoile Marocaine	56, rue Galilée (8)	13.84%	3	19	0
Amuse Bouche(L')	186, rue du Château (14)	13.64%	3	18	0
Le Petit Mâchon	158, rue St-Honoré (1)	13.32%	3	13	0
Daru	19, rue Daru (8)	13.09%	3	14	0
Auberge des Dolomites	38, rue Poncelet (17)	13.00%	3	18	0
Higuma	32 bis, rue Ste-Anne (1)	12.90%	4	14	0
Ferme St-Hubert	21, rue Vignon (8)	12.85%	3	16	0
Bistrot d'Hubert (Le)	41, bd Pasteur (15)	12.73%	3	17	0
Pamphlet (Le)	38, rue Debelleyme (3)	12.59%	3	19	0
Ampère (L')	1, rue Ampère (17)	12.46%	3	12	0
Il Cortile	Hôtel Castille, 37, rue Cambon (1)	12.43%	2	19	1
Bastide Odéon (La)	7, rue Corneille (6)	12.23%	3	20	0
Café Indigo	12, av George V (8)	12.21%	3	11	0
Clément (Chez)	17, bd des Capucines (2)	12.15%	4	10	0
Foujita	41, rue St-Roch (1)	12.02%	4	17	0
Café Charbon	109, rue Oberkampf (11)	11.79%	4	8	0
Café Runtz	16, rue Favart (2)	11.75%	3	15	0
Ballon des Ternes (Le)	103, av des Ternes (17)	11.73%	3	14	0
Braisière (La)	54, rue Cardinet (17)	11.47%	3	20	1
Byblos Café	6, rue Guichard (16)	11.47 %	3	16	0
Je ThéMe	4, rue d'Alleray (15)	11.43%	3	18	0
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