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Valuation of Target Firms Acquired in the Food Sector During the 1996-2001 Wave

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Abstract

The paper studies valuation ratios of food companies that were part of mergers & acquisitions (M&A) involving at least one French company during the 1996 – 2001 period. Results converge to value the food company 1.1 to 1.4 times its turnover. There is no significant difference of "valuation to turnover" ratios among M&A involving only French firms and M&A involving companies from different countries. Corporate valuation may differ according to food sub-sector.

Introduction

From 1996 to 2001, an important wave of mergers and acquisitions (M&A) occurred in Europe and the US. It has coincided with an economic boom over the period. Declerck (1992) has shown the previous wave of M&A in US food industry in the 1980s was motivated by efficiency gains and market power benefits. The formation of the European single market since 1993 and the beginning of an economic boom from 1996 may have provided incentives for European corporations to merge.

Professionals often use the comparative method involving market-to-multiple ratios to value target companies. Since this paper is focused on the food sector, the

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objective is to value transactions made in M&A, using the market-to-multiple methods.

The paper is structured as follows. Section one reviews literature on the topic. Section two presents the concept, methodology, and data. Section three shows empirical findings about corporate valuation. Section four develops structural models in terms of economic relationship between valuation and turnover of food companies. Finally, conclusions are drawn.

1. Review of Literature

Goldberg (1983) mentions major motives for M&A including size, growth, economies of scale, profitability, market share, market power, synergy, acquisition of specific products, increased utilization of resources, and diversification. Declerck and Sherrick (1991) show that for food industries whose top-4-firm concentration ratio (CR4) is greater than 38%, profit appears to be increasing at an increasing rate with the degree of concentration. Throughout the decade, food firms in highly concentrated sectors may have been bought to take advantage of operating synergies (efficiency gains) and/or market power. Financial motives may explain high prices of deals and highly leveraged transactions in the late 1990s (Declerck, 1997).

Hudson & Herndon (2002) reported some strong increases in merger and partnership activity in the US food and agriculture sectors during the 1990s. Major motivations seem related to firm size, placement in the market channel, and research and development activities.

During the 1985-1994 period, Adelaja, Nayga, & Farooq (1999) used a two logit model and found that firm liquidity, leverage, profitability, growth in sales, stock, earnings capacity, percentage of common stocks traded in the stock market, and market-to-book ratio were statistically significant to explain mergers and acquisitions in the US food sector. However, activity or turnover ratio, firms' size, and price-earnings ratio were not statistically significant.

Ward & Jong-In Lee (2002) focused on mergers in the meatpacking industry. They observed that the merged firm achieved some synergies in procurement and got higher profits than rival firms did.

2. Concept, Methodology, Data And Relevance of the Sample

2.1 Concept and Methodology

Corporate valuation is usually based on financial characteristics of firms (Taussig & Hayes, 1968; Stevens, 1973). Comparative methods like the market-to-multiple methods use aggregates coming from corporate financial statements. Corporate value is equity value. It does not include financial debt. Corporate value may be related to a firm's ability to generate turnover, earnings before interest tax depreciation and amortization (EBITDA) and net profits (Taussig & Hayes, 1968; Stevens, 1973).

The analysis of empirical observations is completed by structural research using econometric tools to explain valuation of food companies.

2.2. Data

Data about target companies were obtained from the magazine "AGIA Alimentation." Every year, it reports information on mergers and acquisitions M&A involving at least one French food company. From 1996 to 2001, records show that there were 384 M&A with companies whose turnover exceeded 8 million euros. Data about corporate valuation are available for 100 of those transactions. Financial data such as turnover, EBITDA and net profit are released in the "Diane-SCRL" data bank for French companies, "Piranha" for non-French firms. Turnover is mentioned for every target company in the sample. However, data on EBITDA are only available for 29 target firms and data on net profits are only available for 25 target firms. So, the study is based on a sample of 100 M&A involving at least one French company.

2.3. Charasteristics of the sample

Companies in the sample exhibit a large variety of turnover--from 2 million euros for Château Citran to 14 billion euros for Grand Metropolitan.

Figure 1 shows that median turnover in the sample is 210 million euros, which is far above average turnover in the French food industry, amounting to 28 million euros (ANIA 2002). Such a difference is due to the fact that sample data comes from the economic and financial press, which is mainly interested in writing reports from companies of significant size. Further, a lot of acquiring companies, particularly private companies and/or family small and medium size firms (SMEs) often do not release information about deal value. So, they are not included in the sample.

In the population of the 384 M&A, about half of M&A involving at least one French food company were "international deals," which means deals involving a company outside France. The sample is more international: 71 transactions in the sample are "international deals" because they involve a French and a non-French firm. Only 29 transactions are "French deals," involving only French companies.

As presented in figure 2, food companies in the sample are classified according to 17 food sub-sectors identified by "AGIA Alimentation". The sample shows quite similar breakdown of companies over those 17 sub-sectors to the population of the 384 M&A. Due to small amount of data over the 17 sub-sectors, no statistical test has been made.

The sample proportion of deals involving a French firm and a non-French firm increases from 14% in 1996 to 100% in 2001. Not only there are more "international M&A" in the sample than in the population, but the trend to more international deals increases through the time period as shown in figure 3.

For 26 out of the 71 "international M&A" in the sample, targets are French companies, while for the 45 other deals, targets are non-French companies. French companies have acquired companies mainly in other EU countries, in the USA, in Eastern Europe, and particularly Poland. Such high number of international transactions is specific to the 1996-2001 wave of M&A.

More than 70% of M&A in the sample are horizontal: acquirers buy targets in the same business activity.

Therefore, the sample mainly includes horizontal mergers and acquisitions involving a French firm and a non-French firm.

3. Empirical Findings about Corporate Valuation

Observations about corporate valuations are made for the whole sample in the food sector in distinguishing "French M&A" which only involve French firms from "international M&A" involving French and non-French firms. Further, since there exists sufficient data to infer conclusions, it is possible to pay some special attention to the wine and spirit sub-sector and the retailing sub-sector, which exhibit the largest number of deals in the sample.

3.1. Valuation in the food sector: "French M&A" versus "international M&A"

Corporate value is related to turnover, EBITDA and net profits, even though data about EBITDA are missing.

Table 1 presents valuations ratios for the whole sample of 100 food target companies. Table 2 exhibits valuations ratios for the 29 "French M&A" in the sample. Table 3 shows valuations ratios for the 71 "international M&A" in the sample. Table 4 compares valuation ratios for "French M&A" with the ones for "international M&A". Figure 4 presents valuation ratios for "French M&A" and "International M&A".

The "valuation to turnover" ratio is available for all 100 M&A, while the "valuation to EBITDA" ratio and the "valuation to net profit" ratio are not always available because of missing data.

3.2. "Valuation to turnover" ratio

The "valuation to turnover" ratio seems a relevant market-to-multiple ratio to value corporations because:

- it exhibits a small standard deviation, hence showing low dispersion around mean value;
- its standard deviation is lower than the standard deviation of the valuation to EBITDA ratio and the valuation to net profit ratio;
- it is computed for every M&A in the sample while the other valuation ratios are computed for part of the deals because of missing data.
- mean and median values are very closed and confirm the low dispersion of observations.

Figure 5 exhibits that relationship between valuation to turnover ratio and target turnover is quite stable no matter the size of target firms.

Median "valuation to turnover" ratios are larger than mean ratios. For the whole sample, the median ratio is 1.23 while the average ratio is 1.7. Median ratios are more relevant since they are less influenced by extreme values, particularly very high valuations: For instance, LVMH paid 10 times the turnover of Château d'Yquem in order to acquire it in 1999.

The median "valuation to turnover" ratios are similar for the "international M&A" and all M&A in the sample: A food company is worth about 1.3 times its turnover. The average ratio is lower for the "French M&A" is worth 0.86. However, Student tests show no significant difference of "valuation to turnover" ratios in "French M&A" and "International M&A".

3.3. "Valuation to EBITDA" ratio

The median "valuation to EBITDA ratio is about 14.5. The ratio is slightly superior for "international M&A" for which it is worth 15. Gaps between median and mean valuation to EBITDA ratios are similar to those found with valuation to turnover ratios. Again, the average valuation to EBITDA ratio is greater and is worth about 19.5.

According to student tests, "valuation to EBITDA" ratios in "French M&A" and "International M&A" do not significantly differ even though ratios are higher for the "French M&A" than for the "international M&A".

3.4. "Valuation to net profit" ratio

The median "valuation to net profit" ratio is about 23.6. In that case, the ratio is slightly superior for "French M&A".

As it is the case for the valuation to turnover and EBITDA ratios, gaps between median and mean "valuation to net profit" ratios are similar to those found with valuation to turnover ratios. Again, the average "valuation to net profit" ratio is greater and is worth about 29.

Student tests, expressed in table 4, show that the "valuation to net profit" ratio in "French M&A" does not significantly differ from the one in "International M&A".

3.5. Valuations according to food sub-sector

Figure 6 shows valuation to turnover ratios per sub-sector. Due to the lack of data per sub-sector, it seems difficult to characterize valuations per sub-sector, except for the wine and spirit and the retail sub-sector.

3.5.1. Valuations in the wine and spirit sector

Table 5 compares valuation ratios in the wine and spirit sector with the ones in other food sub-sectors. Table 6 shows valuation ratios in the wine and spirit sector

In table 7, student tests show that "valuation to turnover" ratios in the wine and spirit sub-sector significantly differ from valuations in the other food sub-sectors, except for "international M&A" because of lack of data. But in the sample, the "valuation to net profit" ratio and "valuation to EBITDA" ratio do not significantly differ in the wine and spirit sub-sector from those in the other food sub-sectors.

Second, mean "valuation to turnover" ratio for the "French M&A" in the wine and spirit sub-sector amounts to 4. So, it is three times larger than it is in the food sector. However, dispersion of figures is important from 0.7 to 10.

Third, median "valuation to turnover" ratio for the "French M&A" in the wine and spirit sub-sector amounts to 2.5. So, that figure is only 1.7 times its value in the food sector globally. Further, median figure for "international M&A" is higher and amount to 3.5, that is about 2 times its value in the whole food sector.

Fourth, dispersion of "valuation to turnover" ratios among "international M&A" is larger than for "French M&A" between 0.34 and 6.14.

Fifth, the valuation to EBITDA and net profit ratios in the wine and spirit sub-sector do not exhibit different patterns from those in the food sector. Such contrast

with the patterns observed for the "valuation to turnover" ratio infers that profitability is higher in the wine and spirit sub-sector than in the food sector globally.

3.5.2. Valuations in the retail sub-sector

Table 8 presents "valuation to turnover" ratios in the food retail sub-sector versus other food sub-sectors. First, using Student tests shows that "valuation to turnover" ratios in the retail sub-sector significantly differ from valuations in the whole food sector, except for "international M&A".

Second, mean "valuation to turnover" ratio for the "French M&A" in the retail sub-sector amounts to 0.6. It is three times weaker than it is in the food sector globally. However, the dispersion of figures is important, may be according to the type of business. Because of limited data, it is not possible to test significant difference between general and specialized retails. But, it is possible to notice some transactions:

- 0.27 for targets in general retail,
- 1.5 for targets in specialized retail, like Fauchon and Picard Surgelés which was sold off by Carrefour.

Third, median "valuation to turnover" ratio is 0.47 in the retail sub-sector, that is also is three times weaker than it is in the food sector globally. Specialized retails present much higher median figures than general retail.

Fourth, because a lot of data about EBITDA and net profit are missing, it is not possible to comment the valuation to EBITDA and net profit ratios.

4. Structural Results

Structural results try to explain valuation of target firm as a function of turnover. First, a statistical linear model is built in order to explain corporate valuation (yt) in function of its turnover (x_t).

Equation (1) $$y_t = ß_1 + x_t ß_2 + \varepsilon_t$$

However, OSL results present heteroskedasticity even using White's heteroskedastic consistent covariance matrix in order to take heteroskedasticity into account. So, the structural relationship is tested:

- by generalized least squares estimation (GLS),
- by a model with "multiplicative heteroskedasticity".

Since some heteroskedasticity exists, the variance of the regression errors may be directly related to the dependent variable.

So, the GLS estimator is found in applying least squares to the transformed model:

Equation (2) $$y_t/x_t = ß_1 (1/x_t) + ß_2 + \varepsilon_t/x_t$$

The variance of the transformed disturbance is constant. Results are shown in table 9. The estimated coefficients of the dependent variables are highly significant at more than 1%. The coefficient estimates are not biased.

A model with "multiplicative heteroskedasticity" is carried out. The various components of the variance are related in a multiplicative fashion.
Each variance of errors (s_t^2) is an exponential function of explanatory variable and the model is given by a mean equation:

Equation (3) $$y_t = ß_1 + X_t ß_2 + \varepsilon_t$$

In this case, variance parameters are suggested to be in the form of the following variance equation:

Equation (4) $$s_t^2 = \exp (ß_1 + X_t ß_2 + \varepsilon_t)$$

The estimate of the intercept coefficient will be biased, but the estimate of the slope coefficient remains unbiased.

Results are shown in table 10. Here, the estimated coefficients of the dependent variable (turnover) are highly significant at more than 1%, but the intercept coefficient is not statistically different from zero.

Results in table 9 and 10 are consistent and show that a company is worth about 1.1 to 1.4 times the turnover of food company.

5. Conclusion and Perspectives

Results show that a food company is worth about 1.1 to 1.4 times its turnover, 15 times its EBITDA, 24 times its net profit.

Student tests show no significant difference of valuation in "French M&A" and "International M&A".

Valuations in the wine and spirit sector exhibit significantly larger figures than valuations in the other food sub-sectors. A wine and spirit company is worth about 2.5 to 4 times its turnover.

In contrast, a retail company is worth only 0.5 to 0.6 times its turnover. However, specialized retail firms seem to be valued at higher levels.

Further research could be done to compare corporate valuation in Europe and North America. Such research would be very useful since the 1996-2001 period exhibits increasing international M&A among companies from different countries.

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Figure 1 Turnover of target food companies in the sample from 1996 to 2001

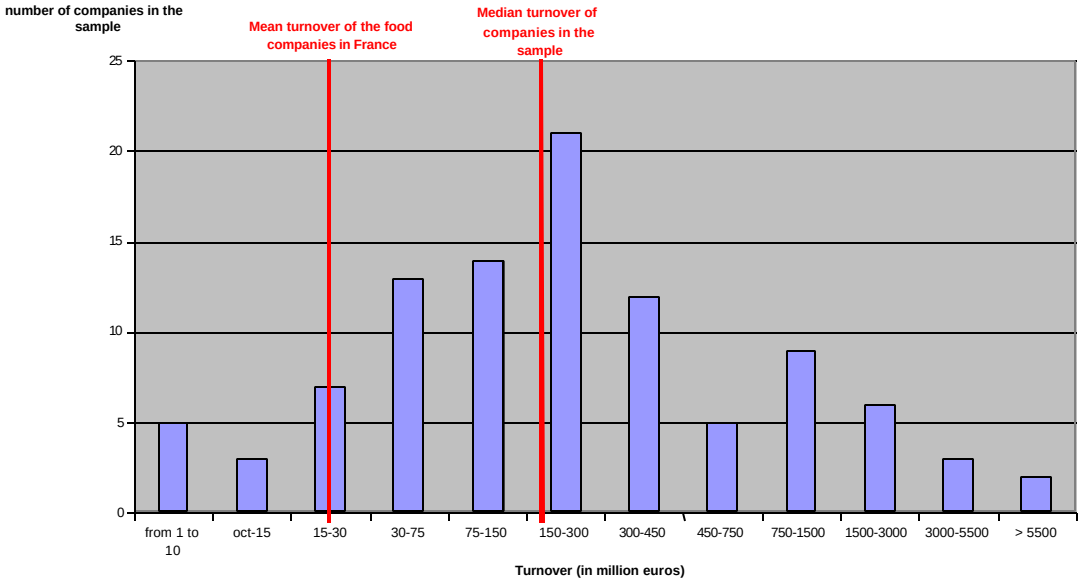

Figure 2 Mergers and acquisitions the sample and in the population according to 17 food sectors

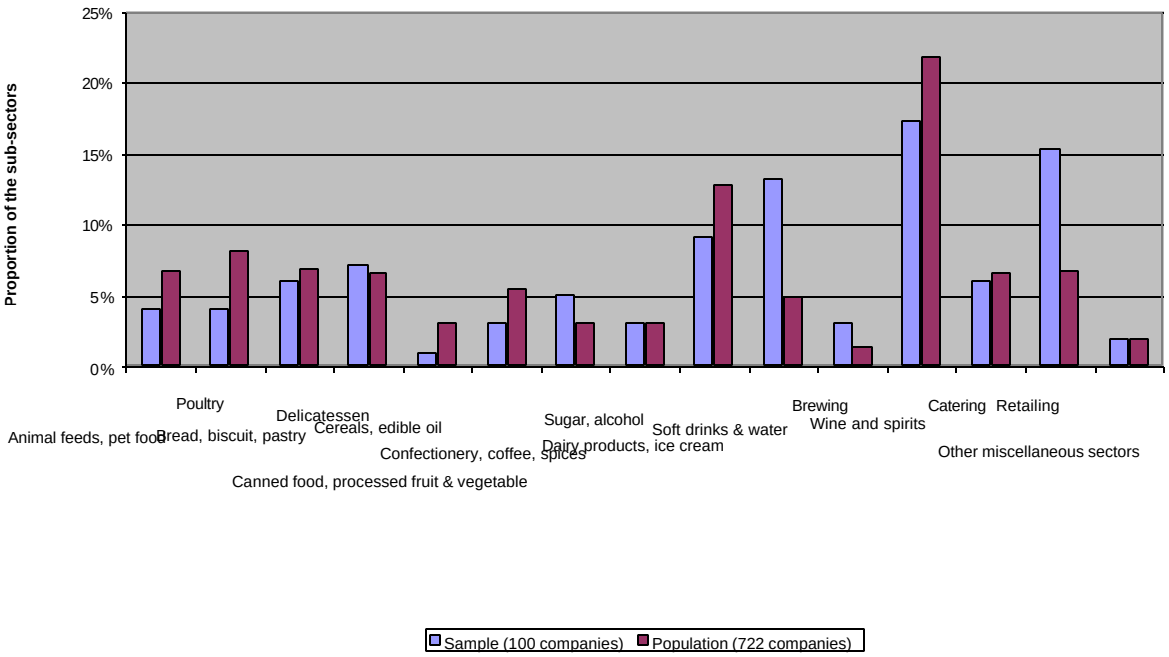

Figure 3 Proportion of mergers and acquisition involving French and non French firms in the sample

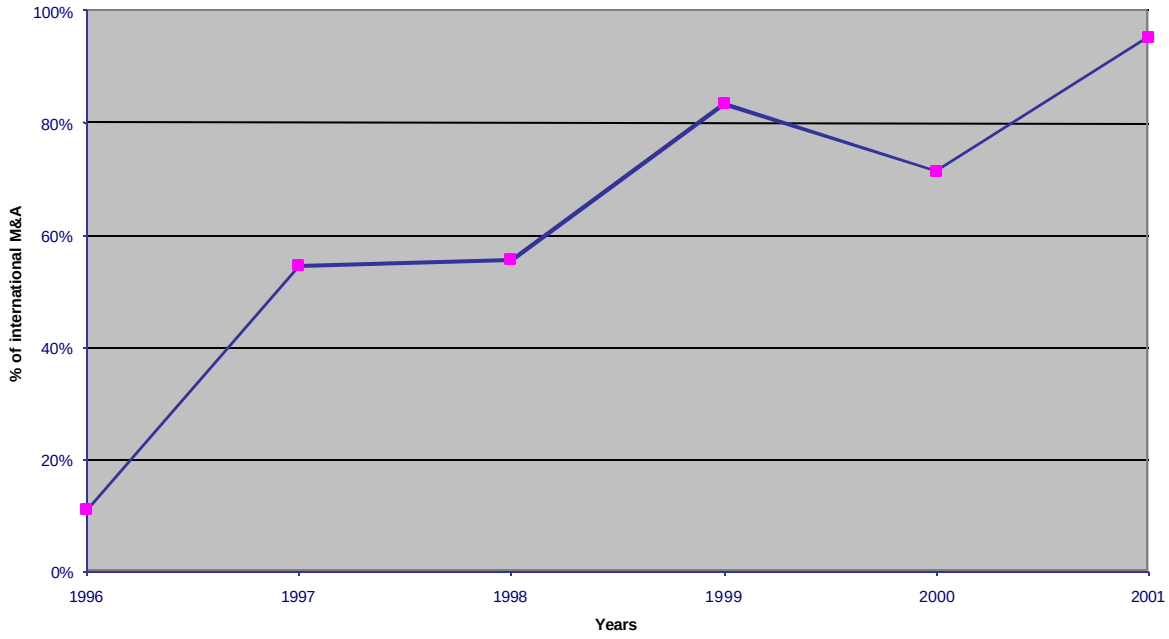

Figure 4 Valuation ratios for "French M&A" and "international M&A"

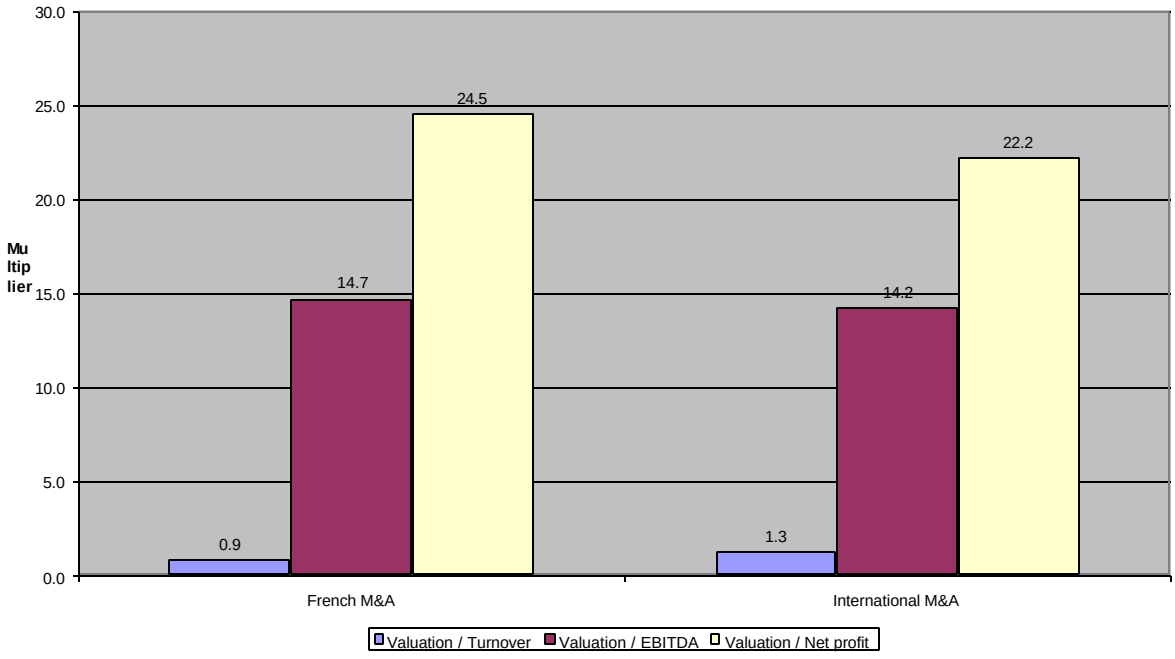

Figure 5 Valuation of target food companies in the sample according to turnover

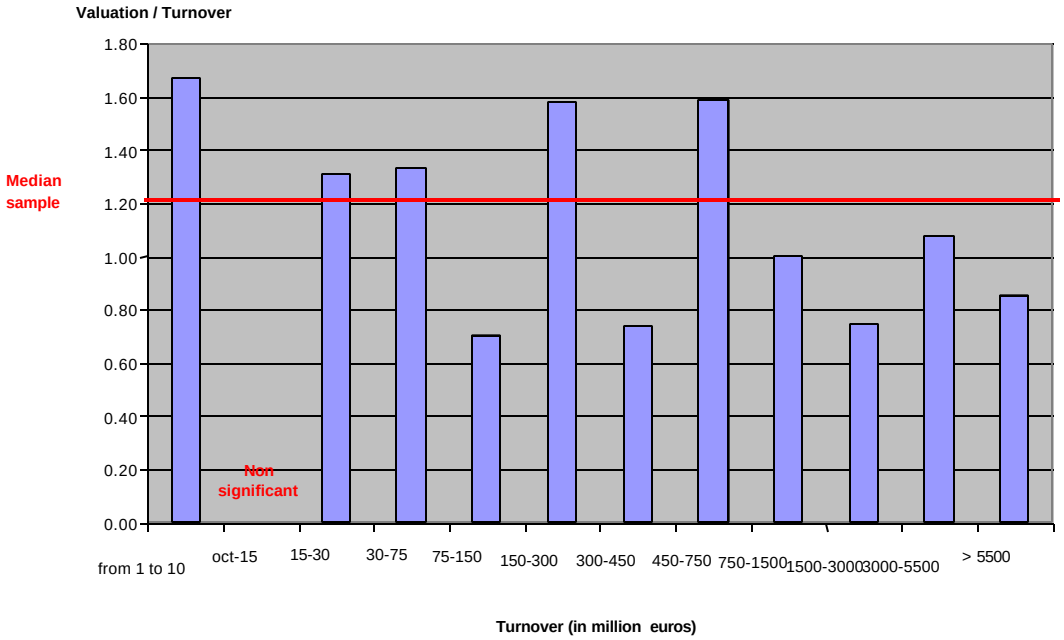

Figure 6 Valuation to turnover ratio per food sub-sector

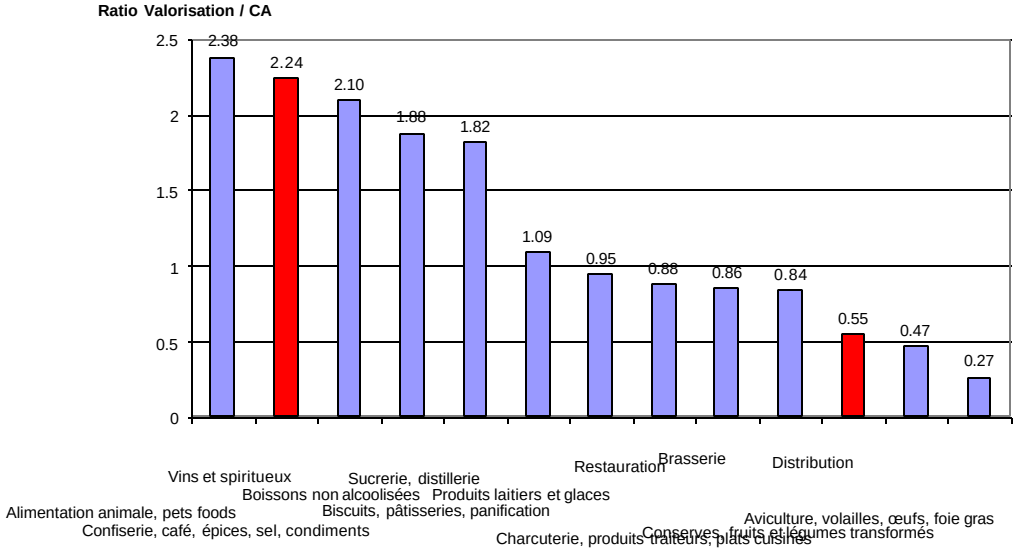

Table 1 Valuation ratios for the whole sample of 100 food target companies

	Valuation / Turnover	***Valuation / EBITDA***	***Valuation / Net profit***
Number of observations	100	29	25
Mean value	1.7	19.5	29.15
Median value	1.23	14.47	23.6
Standard deviation	1.81	17.75	16.78

Table 2 Valuation ratios for the 29 "French M&A" in the sample

	Valuation / Turnover	***Valuation / EBITDA***	***Valuation / Net profit***
Number of observations	29	15	16
Mean value	2.01	24.07	31.38
Median value	0.86	14.71	24.50
Standard deviation	2.79	24.71	16.98

Table 3 Valuation ratios for the 71 "international M&A" in the sample

	Valuation / Turnover	***Valuation / EBITDA***	***Valuation / Net profit***
Number of observations	71	19	21
Mean value	1.56	14.97	23.89
Median value	1.35	13.03	18.88
Standard deviation	1.08	7.80	16.07

Table 4 Comparison of valuation ratios for "French M&A" and "international M&A"

	Valuation / Turnover	***Valuation / EBITDA***	***Valuation / Net profit***
Student t-statistic	1.14	0.78	1.46
p-value of the test (%)	13.3%	22.6%	8.1%

Table 5 Valuation ratios in the wine & spirit sectors and in other food sub-sectors

	''French M&A''			''International M&A''			Total		
	Turnover	*Net profit*	*EBITDA*	*Turnover*	*Net profit*	*EBITDA*	*Turnover*	*Net profit*	*EBITDA*
Student t-statistic	**3.37**	**0.41**	**1.87**	**2.06**	**2.68**	**NA**	**3.62**	**2.22**	**1.39**
p-value	**1.2%**	**72.4%**	**12.5%**	**7.6%**	**2.2%**	**NA-**	**0.3%**	**4.0%**	**17.9%**
Significant Not significant	**S**	**NS**	**NS**	**NS**	**NS**		**S**	**NS**	**NS**

NA = Not available data

Table 6 Valuation ratios in the wine & spirit sectors

	''French M&A''			''International M&A''			Total		
	Turnover	*Net profit*	*EBITDA*	*Turnover*	*Net profit*	*EBITDA*	*Turnover*	*Net profit*	*EBITDA*
Mean value	**2.54**	**23.53**	**13.45**	**1.89**	**13.33**	**NA**	**2.14**	**20**	**14.23**
Median value	**4.07**	**29.74**	**14.28**	**2.43**	**16.99**	**NA**	**3.52**	**20.13**	**14.27**

NA = Not available data

Table 7 Valuation ratios in food sub-sectors, except for the wine & spirit sectors

	''French M&A''			''International M&A''			Total		
	Turnover	*Net profit*	*EBITDA*	*Turnover*	*Net profit*	*EBITDA*	*Turnover*	*Net profit*	*EBITDA*
Mean value	**0.78**	**25.00**	**8.89**	**1.12**	**25.01**	**NA**	**1.05**	**25.56**	**11.83**
Median value	**0.89**	**26.21**	**9.01**	**1.39**	**30.54**	**NA**	**1.25**	**30.83**	**12.17**

NA = Not available data

Table 8 Valuation to turnover ratio in the retail sector versus other food sub-sectors

	Retailing sector	Other food sectors
Median value	0.47	1.60
Mean value	0.65	2.07
Standard deviation	0.04	2.1
Student t-statistic	4.72	
Critical value (p-value)	0.001%	

Table 9 Statistical estimates for valuation to turnover model by GLS estimation

Dependent variable	Estimated coefficient	Standard error	Student t-ratio	Critical value (p-value)
Turnover	1.125	0.125	9.02	1.00
Intercept	33.127	6.72	6.72	1.00

Table 10 Statistical estimates for valuation to turnover model with "multiplicative heteroskedasticity"

Mean equation

Dependent variable	Estimated coefficient	Standard error	Student t-ratio	Critical value (p-value)
Turnover	1.398	0.158	8.865	1.00
Intercept	11.609	21.47	0.541	0.706

Variance equation

Dependent variable	Estimated coefficient	Standard error	Student t-ratio	Critical value (p-value)
Turnover	0.0054	0.00046	11.73	1.00
Intercept	9.223	0.1966	46.90	1.00