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# Financial Risk and Return across the Grocery Supply Chain

## Abstract

In this paper we study the performance of the grocery sector's supply chain on stock markets in the USA, UK, and France over the last two decades. Using Total Shareholder Return (TSR) as an evaluation criterion and applying state-of-the-art financial valuation models, we show that the grocery sector's supply chain outperformed the stock market in all three countries, and this was driven by the larger players in the supply chain. Both retailers and their suppliers contributed to this abnormal return without one of them dominating the other in this regard. The positive abnormal return could be the result of efficiency gains, innovation, or technological threats to the sector. Although retailers allegedly have increased their power in the supply chain relative to suppliers, we don't see this power increase reflected in stronger stock market performance, at least in the US or in the UK. We attribute this phenomenon to a highly competitive retail market in which shoppers face low switching costs when choosing amongst retailers. We define this effect as 'retailer incontinence'. In France incontinence has been counteracted by legal regulation (Loi Gallant, issued in 1996) which de facto has protected retailer margins. Notwithstanding such environmental differences, our results show that the profiles of the grocery supply chains of the USA, UK, and France are remarkably similar, providing evidence for the globalization of the grocery sector and its supply chains.

*Key words: Manufacturer versus retailer performance, supply chain performance, retail power, grocery sector, international comparisons*

# 1- Introduction

## *Existing evidence*

As attested e.g. in the recent textbook by Cachon and Terwiesch (2003), empirical studies that analyze the performance of a sector's total supply chain and compare the contribution of its component actors are rare in the operations management literature. This is in stark contrast with the numerous theoretical papers that present micro-economic studies of the collaboration and/or competition between manufacturers and retailers. One notable exception is the very recent study by Lemmon, Randall and Solheim (2006) which examines Wal-mart's effect on the performance of their suppliers. These authors show that, mostly, performing suppliers firms do partner with Wal-mart and that, amongst these firms, benefits accrue to suppliers who have negotiating power with the retail giant. A Wal-mart partnership effectively screens out the weaker suppliers. Our paper can be seen to complement this contribution in that we look at the performance question not from a single firm, but from a much broader viewpoint of the total grocery supply chain and by comparing the two major parties in the chain.

Conventional wisdom, anecdotal evidence reported in trade journals (*Progressive Grocer* 1984-2001) and a number of academic studies find evidence for the growing power of retailers relative to manufacturers, particularly in the grocery industry (e.g. Corstjens and Lal 2000; Dobson 2005). Many studies report that manufacturers' costs of doing business with retailers has increased substantially via, amongst others, increased trade promotion spends and slotting allowances (Accenture 2001 & 2003; Krishnan & Soni 1997; Ramarao 2001; Shaffer 1991; Wilkie 2002). However, a number of theoretical studies have argued that these manufacturer financed trade costs could be beneficial to manufacturers via e.g. pay for performance mechanisms imposed by manufacturers on retailers (Ailawadi 2001; Dreze et al. 2003; Dukes et

al. 2006; Lariviere and Padmanabhan 1997; Silva-Risso et al. 1999). From a *theoretical* point of view therefore, one can state that retailers have probably gained vertical power in the supply chain, but that it remains unclear whether they have been able to transform this power gain into a performance gain relative to their suppliers.

From an *empirical* point of view, we are not aware of empirical studies analyzing the financial performance of a sector's supply chain, or of the grocery sector in general. The frequently mentioned constant sum game between retailers and manufacturers (e.g. Kumar 1996; Geyskens and Steenkamp 1999; Kuipers 2001) seems to imply a neutral performance of the total supply chain. The few studies on the relative performance of retailers versus manufacturers provide mixed evidence (Ailawadi 2001). A study at the category level (refrigerated juice and canned tuna) by Kadiyali, Chintagunta and Vilcassem (2000) shows that retailers appropriate a larger share of channel profits. However, the seminal nature of the two sector performance studies by Ailawadi, Borin and Farris (1995) and Messinger and Narasimhan (1995) is largely due to the fact that these authors could not find substantial evidence for a performance shift towards retailers notwithstanding their growing power. Bowman (1997) and Bloom and Perry (2001) provide evidence that large retailers, Wal-Mart in particular, reduce the profitability of their suppliers by lowering transaction prices and demanding higher service levels. These results, however, were not validated in a more recent matched sample analysis of Wal-mart and its suppliers (Lemmon et al. 2006).

### *Motivating our approach*

Our grocery sector's supply chain analysis differs substantially from existing studies. First, the latter were exclusively focused on the retailer versus manufacturer issue whereas our approach adds the supply chain perspective. Second, the existing papers were published over a decade ago and cover time periods ending in the late 80's. Our time period covers a 16 year period (1988-

2003) which starts where previous studies stop. Third, these studies were all based on US data. Substantial transformations have affected both retailers and manufacturers since then and many of these changes have occurred globally. Our data covers two major European markets, France and the UK, as well as the USA. This international perspective is fully new. Fourth, advances in modern financial theory allow a finer look at this relative performance issue and our study incorporates the latest valuation methods. The financial approach followed here contrasts with most studies of corporate or sector-wide performance. These typically take an "inside out" approach based on operational measures such as sales growth, market share, gross margin, supply cost, accounts payable or receivable, inventory turnover and/or firm profitability. Trends in operational indicators are indeed useful to understand aspects of the evolution of performance. But such analyses do not provide clear answers to the question of sector performance in terms of value added to shareholders. We now elaborate on these aspects in the following sections.

The emphasis on the shareholder value creation principle has become paramount in business: a firm is to be judged economically not only by its operational profitability, but also by the return it generates to its shareholders. Investors, when managing their investments, arbitrage across sectors. Implicit in their approach is a comparison of expected returns amongst different sectors in the economy or amongst different partners in a supply chain. The financial market approach appears valuable to us precisely because of a perspective that is both value based and external to particular industry sectors or supply chain partners. We believe that the shareholder viewpoint provides a useful and relatively objective commentary on the relative performance debate.

Although the vast majority of performance studies in the operations management area are of the "inside-out" type, a number of authors have recently examined operational issues from a shareholder viewpoint. Probably the major contribution in this area has been the work by Hendricks and Singhal (2003 and 2005). These authors show that supply chain disruptions do have both short term and long term effects on stock price. Another study that needs to be

mentioned in this regard is that of Chen, Frank and Wu (2005). These authors examined the effects of inventory level reductions in American companies on shareholder returns. They found that firms with abnormally high average inventories indeed present abnormally low stock returns, while firms with inventories that are slightly lower than average are associated with abnormally high returns. Another operations management area where firm valuation methodology has been introduced is the recent work by Girotra, Ulrich and Terwiesch (2006) on risk management of product portfolios in the pharmaceutical industry.

A number of major changes have affected the grocery industry and its supply chain over the last two decades. These beg for an examination of the relative performance issue on the basis of recent data and up-to-date methodology. Retail consolidation (e.g. Dobson, Waterson and Davies 2003; Stern and Weitz 1997) and internationalization (e.g. Leknes and Carr 2004), the further development of increasingly powerful retail owned brands (e.g. Ryan 2003; Steiner 2004), the continued massive number of new products introduced every year by manufacturers, the scope expansion of retailers by appropriating new product categories and services and their investment in improved technology are all major exponents of this substantial transformation. Furthermore, we also ought to mention substantial developments affecting the collaboration amongst retailers and manufacturers summarized under the heading ECR (Efficient Consumer Response) , e.g. Corsten and Kumar (2005). All these factors have generated momentum over our period of observation and have had a significant impact on the grocery supply chain and its constituent actors.

While transformation in the retail and manufacturing sectors over the past decades has not been limited to the USA, the academic evidence on the relative performance of these sectors is based nearly exclusively on US data. The immediate relevance of such studies to other countries must on scientific grounds at least be questioned. This is why we studied, in addition to the USA, two of the most active European countries from a retail and manufacturing perspective, the UK and

France. We thereby reply to the question on the relative performance of manufacturers and retailers, and of their supply chains, on both sides of the Atlantic. Although global trends do exist for the grocery sector, the rate at which these trends have materialised has differed in France, the UK and the USA. Furthermore the economic and regulatory environments for retailers and manufacturers, and for their stock markets, differ in these countries as well, with commensurate impact on performance. We review these trends in greater detail in the next section. The international dimension of our study allows us to investigate how global the grocery industry really is. Do investors, when they consider commitments in the grocery industry, make strong differences in assessing the risk profile of the grocery retail sector relative to that of the grocery manufacturing sector, and do they view these risk profiles in the US, the UK and France as different?

### *Two key perspectives: (R+M) and (R-M)*

The paper focuses on two aspects of the stock market performance of the grocery industry: i) the total supply chain performance (which we denote R+M); ii) the relative contribution of retailers versus manufacturers to the performance of their supply chain (which we denote R-M). We believe the total supply chain perspective (R+M) is original as we are not aware of any empirical study taking explicitly a supply chain view in assessing the sector's stock market performance. The relative performance view (R-M) is rather intriguing and topical because much has been made – including in several of the papers mentioned earlier - of increasing retailer power in the grocery industry.

The international dimension of our study drives the third issue addressed in the paper. We investigate how global the grocery industry really is. Do investors that contemplate investments in the grocery industry view the risk profiles of the US, UK and French grocery sectors as different, or how do they assess the risk profiles of retailers and manufacturers in this regard?

## *Summary of results*

Our analysis has generated the following key results:

1) **R+M**: Stock returns of the grocery sector's supply chain have out-performed the market over the 16 year period of study (1988-2003). Hence, the sector has progressed beyond normal expectations over a long period. This is a remarkable and very strong result as such performance is hard to evidence.

2) **R-M:** Both retailers and manufacturers contributed towards the total supply chain performance, neither sector dominating the other in this regard. In particular, it is not the case that retailers have benefited more than manufacturers; the latter have thus been able to counter retailers' increase in channel power through other means (product innovation, scale, …).

3) **Large firms:** The abnormal returns of the supply chain are largely due to the larger firms (both manufacturers and retailers).

4) **Dynamics**: Over time, during the 16 year time period investigated, the abnormal returns of retailers and manufacturers didn't differ in the US and the UK, but they did in France where retailers benefited from regulation in the form of the so-called Loi Gallant (introduced in 1996). Hence, local performance differences that appear are mainly due to major differences in local legal contexts.

5) **An emerging hypothesis of "retailer incontinence":** A major hypothesis emerges from our analysis. Notwithstanding increasing retailer power our results show no gradual performance improvement over time of retailer over manufacturers in the US and the UK. We propose ***retailer incontinence*** as a driving force for this apparent paradox: this hypothesis states that retailers are indeed getting more powerful relative to manufacturers, but that they are unable to exploit this power due to their inability to build up monopolistic power in competitive retail

markets. In France, regulation allowed retailers to achieve a degree of power they could not achieve on their own; the French exception thus paradoxically confirms the rule. This hypothesis rests on the low switching costs that consumers face when deciding amongst retailers in their shopping choices. These low switching costs lead to low customer loyalty and an inability for retailers to turn power into superior value.

6) **Risk profiles and the "global grocery supply chain convergence hypothesis"**: Our results show remarkably similar investor perceived risk profiles across US, UK and France for the total supply chain, manufacturers as well as for retailers. This convergence in risk profiles across sectors and geographies is evidence for an emerging global retail sector (on the manufacturing side this was considered already to be the case), and hence - and this is new - of an emerging global grocery supply chain.

***Outline of the paper*** As a way of understanding the context, section 2 provides evidence for the many changes that have affected the retail and manufacturing sectors in the USA, France and the UK over the last two decades. Section 3 presents our financial valuation methodology and our data. Section 4 discusses the results of our analysis. The last section indicates possible directions for future research.

## 2- Main trends affecting the grocery sector over the last decades

We now describe some of the main trends that have affected retailing and manufacturing in the grocery sector over the last two decades. These pertain to the apparent power shift in favour of retailers, the increased concentration witnessed over this period, the increased importance of private label, and the increased internationalization of the retail sector. We then examine factors that are less commonly mentioned such as manufacturers' new product activity and retailer

scope. We close with a final comment on the economic diversity that appears when one looks beyond the USA.

***Power and Concentration***

The increased power of retailers, their increased concentration and by implication their improved profitability, has over the last years been a recurring theme in the community of practitioners (Cappo 2003; Kumar 2005; Mitchell 2004). The results of a yearly study by *Progressive Grocer* (Figure 1) found

[Figure 1 about here]

that strong and continued perceived power gains had been achieved by USA retailers over their suppliers (*Progressive Grocer* 1984-2001). The comparison of retailer and manufacturer concentration ratios provides further evidence for the relative increase in retailer power. Retail trade, both in the USA and in Europe, was less concentrated than the manufacturer sector (Tables 1 and 2). Nevertheless, using the Herfindahl index for our sample of companies in the grocery industry, the growth in retail concentration over our period of observation is greater than that observed in manufacturing (Table 3). Note that due to the fact that Datastream does not contain sales data of de-listed companies, we relied on market capitalization when computing the Herfindahl indices.

[Tables 1, 2 and 3 about here]

***Private Label***

The increase of private label (retailer owned brands) has been another factor that favors the performance of retailers. Between 1995-2002, the market share (in value) of private label in the French, UK and US grocery industries increased by 47%, 26% and 38% respectively (Sources: IRI, Europanel, Euromonitor, and Private Label Manufacturers Association). Over our

observation period, the positioning of retailer owned brands has followed the trajectory of: 'cheap and nasty', to 'cheap', to 'par quality' and sometimes even 'destination'. This evolution has led private labels to assume a triple role for retailers: differentiation, bargaining power vis-à-vis manufacturers, and improved profit margins (Corstjens and Lal 2000; Mills 1995). It has certainly amplified the retailers' power gains in the grocery supply chain.

***Internationalization***

Retailers have also accelerated their internationalization (Table 4). This process started much earlier for manufacturers, and was already well established by the 1980's (Bartlett and Goshal 1989). A recent study of the 50 largest retailers and manufacturers in the USA and Europe showed that the average retailer was established 40 years later than the average manufacturer (Corstjens and Steele 2007). While most manufacturers started international operations before World War II, retailer internationalization has largely happened during the last few decades or is still nascent. Thus the increase in the manufacturing industry's internationalization, over our time horizon, has been less spectacular than that experienced by a much younger retailing industry.

[Table 4 about here]

The accelerated international expansion of retailers provides further support for their increased vertical power. We note again that it is less clear whether this process of international expansion has actually improved the relative economic performance of retailers. Although internationalization provides more vertical economic power for retailers, the early phases of this process are very costly essentially due to investment and learning costs. Most retailers that have expanded internationally have tended to be more profitable in their home markets than in the foreign markets they entered (Corstjens and Steele 2007).

***New Product Activity***

The extensive and on balance unsuccessful new product activity by manufacturers during our period of observation should have provided retailers with stronger bargaining position vis-à-vis manufacturers. Studies done in the late 90's by Ernst &Young in the USA and AC Nielsen in Europe show that around 80,000 to 100,000 new products (stock keeping units) are introduced each year by branded consumer goods manufacturers in countries like France, the UK and USA (Ernst & Young et al. 1998; Ernst & Young and AC Nielsen-Bases 2000). Defining success of new products by the weak criterion of '*still being on the retail shelves 2 years after introduction'*, new product success, according to these studies, is situated anywhere between 4 and 10% depending on product category, new product characteristics and marketing support. This massive sub-optimal new product activity by manufacturers and the relative shortage of retail shelf space lends further support to the hypothesis that retailers should have outperformed manufacturers over our period of observation.

***Retailer Scope***

Over our observation period retailers have expanded their *scope* by offering more 'product categories' to their shoppers. Banking and insurance services, telephone services, car sales, travel services and real estate services are some examples of retailers' scope expansion. Although some manufacturers have introduced adjacent categories to their traditional product categories (organically or by mergers and acquisitions) this has occurred on a very limited scale. It would therefore be likely that this cross-selling to their shoppers has improved retailers' financial performance and thereby favored their performance relative to manufacturers.

***Additional Factors Affecting Performance***

Additional factors supporting retailers out-performance over manufacturers during our period of observation are the use of more sophisticated technology in the management of the retailers' logistics and in-store activities (EDI, scanning, and other IT tools). The use of loyalty systems

during our period of analysis, aimed at increasing consumer's switching costs, should also have reinforced retailer performance (Bell and Lal 2006).

***Economic diversity when looking beyond the USA***

How have retailers and manufacturers performed internationally? Previous studies have focused exclusively on the USA; however, the French, UK and US grocery scenes are substantially different. The three countries differ in terms of their industry concentration, regulatory environment, and the importance of private label in the retailer's assortment.

Retail *concentration* is highest in France and lowest in the USA. Growth in concentration has been steepest in France and the USA and slowest in the UK (Table 2). Given a relatively constant concentration (albeit at a high level in many product categories) on the manufacturer side, one would expect retailers' excess performance over manufacturers to be stronger in the USA and France, and weaker in the UK.

France has seen stronger retail regulation over our observation period relative to the UK and the USA; the latter countries have been more liberal in their regulatory activities. In order to try to protect smaller players (both manufacturers and retailers) from being crushed by huge players in a concentrating French retail market, the 1996 Gallant Law effectively limited new store openings and price wars by excluding certain types of manufacturer support to retailers to be passed on to the final consumer. Government intervention of this type has been much stronger in France than ever seen in the UK or in the USA. It resulted, at the time of the French legislation's introduction, in retail price increases as well as strong increases in the stock value of French retailers.[i] We therefore might expect the out-performance of French retailers over their suppliers to be stronger than for their UK and US counterparts (Rey and Tirole 2000). In addition, given the fact that private label increases retailer differentiation, bargaining power as well as margin, we would expect once more French retailers to outperform their suppliers more

so than their Anglo-Saxon colleagues. Overall this leads us to hypothesize that all retailers have started to outperform manufacturers, but none more so than French retailers.

# 3- Methodology and Data

In this section we present the so-called Sharpe-Fama-French-Carhart 4 factor performance methodology (SFFC) that we apply to examine the returns of retailers and manufacturers. We then describe our data sample.

## *Financial valuation models*

Finance researchers have identified four important characteristics or so-called *risk factors* that explain differences in total shareholder returns of stocks or portfolios in competitive equity markets. The first and also best-known risk factor is due to Sharpe (1964) and Lintner (1965) who identified *the market risk coefficient or "beta"* as providing a major explanation for the price of any equity stock. Beta measures the correlation of the volatility of an individual stock's returns with the volatility affecting the overall market (RMRF). By straightforward linear averaging, stock portfolios also have a beta.

For some time, stock pricing models remained one-dimensional. Fama and French (1993) made a fundamental contribution by finding that, in addition to the *market risk factor (or beta),* portfolios constructed to mimic two other risk factors, one associated with *size (SMB)* and the other with *book-to-market ratios (HML),* were also able to capture strong common variation in returns. *SMB* is the average return of a portfolio of small size equities minus the average return of a portfolio of big size equities; *HML* is the average return of a value portfolio (high book-to-market ratio) minus the average return on a growth portfolio (low book-to-market ratio). *HML* is also referred to as the *value versus growth factor*.

The Fama and French model was further improved by Carhart (1997) with the addition of a fouth factor, *the UMD or momentum factor*. The variable *UMD* (Up Minus Down) mimics the return over a month of a portfolio which sells the bottom 30% worst performing stocks over the previous 11 months and buys the top 30% best performing stocks over the same previous 11 month period,. Researchers and practitioners disagree over whether momentum over a given time period should be positive or negative. For example, buying best performing stocks may pay off in the short term, but in the long term today's worst performing stocks might do better. Investors pursuing contrarian strategies would buy bad performing stocks (which offer good prospects) and sell stocks that performed well over the recent horizon (but might no longer do as well in the future).

The Sharpe-Fama-French-Carhart (SFFC) performance methodology amounts to regress the returns generated by a particular equity, or by a portfolio of equities, on these four market risk factors. This yields a model that can be formalized as follows:

$$(1) \qquad R_t = \alpha + \beta_1 (RMRF_t) + \beta_2 (SMB_t) + \beta_3 (HML_t) + \beta_4 (UMD_t) + \varepsilon_t \ ,$$

where $R_t$ is the excess return to some asset (equity or portfolio) in month *t*, $RMRF_t$ is the month *t* value-weighted market return minus the risk free rate, $SMB_t$ and $HML_t$ are the two Fama and French size and book-to-market factors, while $UMD_t$ is Carhart's momentum factor, again in period t. The monthly average abnormal return is captured by the constant term $\alpha$.

When we apply the methodology to the valuation of portfolios, the excess return, $R_t$, can be defined as either the difference in the portfolio return minus the risk free rate, or as the difference between the return of two portfolios. This gives us two types of performance-attribution regression models, of which the first compares a portfolio's performance with that of the total market, while the second directly compares the performance of two portfolios. In the first case, a non-zero *alpha* coefficient ($\alpha$) points to an *abnormal (or excess) return* of the

portfolio: the portfolio's return differs from what it ought to be to compensate for the four risk incurred (and measured by the four risk factors $\beta_i$, i = 1,… ,4). In the second case, a positive alpha is evidence for the superior performance of a portfolio over the other one in ways that cannot be explained by their differences in their four risk factors. This provides investors with a so-called *arbitrage opportunity*. Neither the abnormal return nor the arbitrage opportunity can last too long: if the SFFC valuation methodology is correct (which is the assumption of modern finance theory) then at some point prices will be corrected in such a way that the abnormal return an its associated arbitrage opportunity disappear. Assuming that the SFFC model correctly prices portfolios, exhibiting a portfolio with an abnormal return over a period of several years is thus empirically difficult as it is evidence of a pricing imperfection that was not quickly arbitraged away by investors seeking to benefit from arbitrage opportunities. The other assumption is that the SFFC itself is incorrect, and that the pricing misspecification is due to a systematic risk factor distinct from the four SFFC risk factors. The identification of such a risk factor would then lead to a refinement of the SFFC model.

The SFFC model was recently used by Gompers, Ishii and Metrick (2003) to study the effect of corporate governance practices on TSRs. In particular, these authors analyzed the TSR differences between two portfolios, one comprising stocks of firms having been identified exogenously as presenting good governance practices, and a second one corresponding to a portfolio of poor governance stocks. They were able to show that good governance stocks did indeed provide investors with a return premium. The Gompers et al. (2003) methodology applies when one searches for effects of changes whose timing cannot be defined precisely. Under such conditions traditional event studies like those of Hendricks and Singhal (2003 & 2005) cannot be applied. As the relative power shift to retailers cannot be precisely dated in time, we applied the Gompers et al. (2003) methodology when examining return differences amongst retailer and manufacturer portfolios.

We checked our SFFC regressions for omitted variables (Ramsey reset test) and time-series induced autocorrelation of the residuals (Durbin Watson d-statistic).

## Data

Our study examines grocery retailers and manufacturers listed on the French, UK and USA[ii] stock markets over a 16-year period ranging from January 1988 through December 2003.[iii] In order to avoid survivor bias, we considered all grocery retailers and manufacturers quoted at some time during this period. Thus our sample includes equities quoted during the entire period, equities which were newly quoted during this period, and equities which de-listed.

We obtained monthly return data for the primary listings of each company from Thompson Datastream (TDS). This database was also our source for exchange rates, risk free interest rates, market value data and industrial classification data. Many researchers use TDS for its broad and deep coverage of non-USA equity markets as there is no comparable source in terms of number of markets covered and the number of securities covered in each market. However, as there have been some issues with data integrity, it is very important to carefully screen TDS data before analysis (Ince and Porter, 2006). For example, TDS repeats the last valid data point for de-listed firms, rather than reporting no data as in CRSP. Thus, for each firm, we used the delisting date (TIME) to set to missing all values after the delisting date. We also had to deal with currency conversion issues. For example, French equities which de-listed before the euro report market value in French francs, while currently quoted French equities report the market value in euros. In addition, we carefully screened the data for extremely high values. When we found strange values we contacted TDS for an explanation and corrected the data if necessary. Finally, we also checked the comparability of our USA findings with the results of a matched CRSP sample (91% coverage), and found virtually identical results. This is in line with Ince and Porter (2006) who also found that, after careful screening of the TDS data, inferences drawn from TDS data and CRSP data are similar.

We constructed two industry portfolios for each country, one consisting of grocery manufacturers and the other of grocery retailers. The grocery manufacturer portfolio consists of companies that operate in the following industrial sectors (Datastream level 6 classifications): food processors, household products, personal products, soft drinks, or tobacco. Companies in the grocery retailer portfolio belonged to one of the following industrial sectors: discount stores or food & drug retailers.

Each country was analyzed separately in its local currency. After removing foreign and secondary listings, the USA[iv] sample consisted of 102 publicly quoted retailers and 229 manufacturers, a total of 331 companies. The sample size for the UK[v] and France[vi] was 140 companies (40 retailers and 100 manufacturers) and 116 companies (26 retailers and 90 manufacturers) respectively. The USA and the UK have a similar proportion (approximately 30%) of publicly quoted grocery retailers, while France has a lower proportion of retailers (22%). This may be due to the fact that French retailing is more concentrated in the hands of families, many of whom have chosen to keep their retailing activities private. One will also notice that the database is roughly equally split amongst USA and European firms.

Table 5 provides summary statistics of the data used in our analysis. Following standard financial empirical research (e.g. Anderson and Reeb, 2003), data for these statistics are calculated by taking for each company the time-series average over all months from January 1988 – December 2003, and then averaging these time-series averages across companies. It is worth noting that the majority of these listed companies are small; the size distributions are therefore skewed as can been seen by comparing the mean and median values. The very small minimum values are due to the bankruptcy of a handful of small companies.

[Table 5 about here]

We further observe in Table 5 that the time-series averages of monthly TSRs in our sample depend considerably on the country. Our total grocery sample performed best in the USA and France, and worst in the UK. This is not due to a higher total market return in these countries. The average total market return for the USA, France and the UK was 1.05, 1.74 and 1.67 % respectively. Table 5 also shows the average monthly TSRs for retailers and manufacturers separately for each country. The only significant difference is found in France, where retailers performed considerably better than manufacturers both in terms of mean and median TSRs ($t = -1.54$, $z = -2.36$).

Finally, a great difficulty encountered in our study pertained to the computation of the risk factors for the European countries. We obtained the values of RMRF, SMB, HML and UMD for the USA from Kenneth French's website. However, for European stocks, none of these factors are commonly available. Hence, a major task consisted in calculating RMRF, SMB, HML, and UMD for the UK and French markets ourselves using the definitions of Rouwenhorst (1999).

# 4 - Analysis and results

### *R+M: the grocery supply chain outperforms the market during the 1988-2003 period*

To analyse the stock market performance over the 1988-2003 period of grocery retailers and their suppliers, as well as of the supply chains they form together, we constructed a portfolio consisting of the grocery retail stocks along with those of the manufacturers – which are their suppliers. Because the sector is rather well defined, we consider this combined portfolio to be a good proxy for capturing supply chain effects. Please note that we took a simple 50/50 average of the retail and manufacturing portfolios. The results of the analysis appear in Table 6. The most remarkable result of our paper is that over this 16 year period **and in all 3 countries** the

grocery supply chains show abnormal returns even after controlling for the standard risk factors: market risk, size, momentum, and growth vs value issues.

[Table 6 about here]

A number of hypotheses can be derived to explain the above performance. However they depend on the assumption one makes regarding market efficiency as authors such as Fama (1998) and Gompers et al. (2003) have discussed. Under the assumption of imperfect markets (including financial ones), an abnormal return indicates a deviation of stock returns compared to returns that "reward for risk", i.e. be consistent with the stock's risk exposure as measured by its "loading" on the 4 standard risk factors. In that case, the abnormal return is due to factors that played out and could not be expected a priori. If one makes the assumption of perfect markets then the abnormal performance must be due to the presence of a $5^{th}$ risk factor, the grocery supply chain, distinct from the first 4 standard risk factors, which "has a price and needs to be rewarded."

We first list three factors that might be causes for the abnormal returns observed. We then return to our two hypotheses on perfect markets, which the finance literature has difficulty distinguishing in any case. The first factor that might contribute to abnormal stock performance lies in the multiple process improvements that have affected the supply chain over the time period of study and have improved the collaboration between retailers and suppliers. These are best summarized under the heading "Efficient Customer Response" (ECR), already referred to earlier in the paper. ECR meetings annually draw thousands of managers, mostly from the grocery industry, to meet and discuss emerging best practices and to reduce competitive frictions between them. Indeed the clear aim of ECR is to improve the benefits to the consumer. Examples of such practices are vendor managed inventories (VMI), category management, and lean supply chains.

The second factor likely to contribute to abnormal performance is innovation. This has been alluded to in Section 2, especially the huge activity on the side of manufacturers in terms of new product introductions. Of course, on the retail side the key innovation has been to the introduction of multiple formats aiming at different consumer segments and the use of information technology in store operations and shopper interface, increasing shopping convenience with the aim to increase purchase flow and margins. Finally, category management has become the law of the land, aimed at avoiding redundancies and gaps in the retailers' offer.

The third factor we ought to mention in this regard concerns the emergence of e-business during the period of our observation. This emergence has hugely impacted both the supply chain process, from more accurate observations on consumers of shopping behaviors to more effective and leaner collaborations in supply. For retailers this has, especially over our period of study, represented considerable uncertainty aimed at the heart of retail activity, namely bypassing the store. This alternative e-business channel has substantially increased risk for retailers, and for manufacturers too, who were faced with the need to review their relations with their traditional retail partners as well as with greater price transparency.

It is our hypothesis that these three factors, which were particularly active over the last two decades, may indeed have combined to create abnormal supply chain returns. The next step in this research is then to more precisely identify the root causes generating this abnormal performance. We limit the scope of this paper to a few first attempts at such explanation. In this paper we indeed limit our aims to provide evidence for a phenomenon of abnormal returns in the grocery supply chain and, next, to motivate some hypotheses as to why this abnormal performance may have arisen in the first place. Deeper examination of the phenomenon is left for further research.

Having stated three fundamental reasons for the abnormal performance, we return to the interpretation of the observed abnormal performance under our two different assumptions regarding market perfection. If markets are assumed imperfect, then one must conclude that the abnormal returns result from a superior performance of the grocery supply chain not anticipated at the beginning of our time period. The logical candidates for this abnormal performance are improvements in supply chain effectiveness (e.g. through ECR initiatives) and substantial innovation, which was more successful than expected at the beginning of the period of observation. If on the contrary, markets are assumed perfect, then the abnormal performance must correspond to a $5^{th}$ risk factor. The emergence of e-business and innovation might then come into play. This e-emergence created considerable risk for both retailers and manufacturers. Indeed, retailers saw threats arising from an alternative distribution channel, whereas for manufacturers e-business implied greater price transparency and uncertainty about their future route to the final consumer. This additional risk led investors to demand greater return according to the classic risk-return relationship.

Furthermore innovation in the supply chain could also have contributed to the fifth factor, in a recent paper, Hou and Robinson (2006) build on Schumpeter's creative destruction argument and argue that sectors that are very innovative are inherently more risky for investors . Hence, under perfect markets, Hou and Robinson would expect that greater innovation in the grocery supply chain to lead investors to require greater returns.

Our first analysis of the observed abnormal performance is built around four questions. The first examines how our two supply chain partners contribute to the abnormal performance. The second question asks the same question not from a chain actor viewpoint, but from a size viewpoint: do larger firms contribute more to the abnormal performance than smaller firms, or do smaller ones – typically the more innovative ones – contribute more? Our third question examines this phenomenon over time and verifies whether the excess performance lasts

throughout the 16-year period examined, or whether it is more prominent at one of its extremes. We conclude with an international comparison of our results.

### *Retailers do not contribute significantly more to supply chain abnormal performance than manufacturers*

Table 7 shows the four factor performance attribution regression results of the retailer portfolio (R), the manufacturer portfolio (M), and their difference (R-M) for each country. The strongest result here is that there is, notwithstanding an excess return in the supply chain, no statistically significant difference in the performances of the retailer and manufacturer portfolios, and **this holds for all 3 countries studied.** For the US, this continues a trend already observed by Messinger and Narasimhan (1995). For the other countries, the results are new. Hence, notwithstanding their growing power (evidenced in Section 2), retailers have not been able to capture more of the abnormal return than their suppliers. The result is made stronger by the fact that the performances of the two players relative to the market differ in the three countries studied. In the UK retailers appear to have enjoyed excess returns over the period studied, but manufacturers not, perhaps underlining a weakness of the UK manufacturing sector. In the US the opposite is true. In France, with a different context that we will explain shortly, both sectors have outperformed the market, but none significantly more than the other. Our results thus show that retailers and manufacturers, who are interdependent, have been able to translate their interdependence into a positive sum game in terms of supply chain returns.

[Table 7 about here]

To evidence this joint interest further, we also examined the correlation between the retail and manufacturer returns. In all three countries, we found a significant positive correlation of the unadjusted TSRs (France 0.45, UK, 0.67 and USA 0.65). It is possible that the statistically significant correlation between the returns of retailers and manufacturers may not be so much due to the intrinsic complementarity of the two sectors' returns, but to their correlation with

another set of exogenous variables, such as the four SFFC risk factors. To explore this possibility we investigated the correlation between the returns of the retailer and the manufacturer portfolios after correcting them for the 4 SFFC risk factors using Zellner's seemingly unrelated regression approach. The last column of Table 7 exhibits the residual correlation. In each country, as well as for the pooled analysis, the correlation of residuals remains positive and significant. Thus, the risk–adjusted total shareholder returns in the manufacturer and retail sectors also move in the same direction. From a stock market viewpoint, retailer and manufacturer returns are clearly complementary. The frequently mentioned constant sum game between retailers and manufacturers (e.g. Kumar 1996; Geyskens and Steenkamp 1999; Kuipers 2001) is thus contradicted by our results, at least taking the viewpoint of financial investors. Our results provide further support for the findings of a recent empirical analysis of the mutual benefits for both retailers and manufacturers of ECR projects (Corsten and Kumar 2005).

Finally, we observe that all beta values are less than 1, confirming the defensive nature of the grocery sector for investors. What is more remarkable, and perhaps surprising, is that the beta values for manufacturers, although numerically lower, do not significantly differ from those of retailers. Again, this is evidence for a "supply chain effect."

### *The large players drive the results*

We pursue the examination of the superior supply chain performance by examining the effect of size. Economic advantages due to scale in operations or in increased bargaining power vis-à-vis suppliers should accrue more to larger retailers. Increasing retail concentration also implies faster growth for the larger retailers since they drive the concentration movement. Economies of scale might also be present amongst manufacturers. On the other hand, smaller firms are

typically more innovative and also more risky. These two aspects are controlled for by two of the SFFC risk factors.

[Table 8 about here]

Table 8 presents our results. In the first comparison, we divide the sample in two, the biggest firms (both R and M) in one portfolio, the other half falling in the second portfolio. The second comparison involves the top 10% firms in terms of capitalization and contrasts their results with those obtained by the bottom 10% in the market. These comparisons are consistent and confirm a size effect beyond the one already controlled for by the SFFC model. These results confirm the much touted power rationale for the retail sector over this time period, at least using the lens of the financial markets and with a twist. Indeed power ought to generate greater benefits for the larger players, something our empirical analysis confirms. Size matters, beyond what the SFFC model predicts. It appears that the larger manufacturers are equally advantaged; they appear fully able to defend themselves. Could it be that supply chain advantages are available only to the larger players like Walmart, Target, Home Depot, Tesco, Carrefour, Unilever, L'Oréal, P&G, …? Indeed, our analysis suggests that smaller players are unable to tap into these advantages. We underline that the three factors that we posited as being responsible for the grocery supply chain's excess performance - ECR, innovation, and e-commerce - do play out to the advantage of the larger firms.

## *Dynamics of performance over the period 1988-2003*

Increasing retailer power, coupled with a more rapid increase in concentration in retail than in manufacturing evidenced in an earlier section and summarized in Figure 1, raises the issue of a temporal evolution of the abnormal returns. Specifically, we tested, through an 'event study'

approach, the change in the abnormal returns over the time period studied. To verify the stability of our results, we estimated the parameters of the performance equation over the first 11 years and used those estimates to forecast the returns in the last 5 years. We subsequently used those forecast to compute abnormal returns as the difference between the actual and the forecasted returns. The results are evidenced in Table 9.

[Table 9 about here]

The difference in the abnormal returns is not significant in the US and the UK; in France retailers have a significantly lower abnormal return than manufacturers over the last 5 years. To explain these different results, we formulate the "**incontinence hypothesis":** though retailers have increased their **vertical power** relative to suppliers, their limited **horizontal power** has not allowed them to transform their increased supply chain power into differential value performance relatively to manufacturers. The basis for this hypothesis resides in the low switching costs experienced by consumers when choosing amongst retailers for their shopping decisions. There are other sides to this coin: it is likely to be the case that retailer differentiation is not great, that customer loyalty to their retailers is low, and that successful retail formulas are easy to copy. All three explanations contribute to retailer incontinence. The results in the UK and the US support the incontinence hypothesis, especially when one examines, e.g., the growing power of retailers as evidenced in Figure 1. France in this regard offers us a different picture that deserves explanation. This country experienced a regulatory environment favorable to retailers over our period of observation. What is remarkable however is that even in this environment suppliers shared in the supply chain gains and were able to display abnormal performance.

In France, the 1996 Raffarin and Gallant Laws aimed to protect smaller retailers by forbidding their larger retailers to pass along to consumers the price reductions they negotiated with

suppliers. This legislation effectively protected retailers from price wars and pricing below cost (P. Rey and J. Tirole 2000). Both of these factors initially reduced competition amongst existing retailers resulting in immediate increases in their share prices. However, the protection offered by the Raffarin and Gallant regulations did act as a price umbrella for hard discounters, mostly German owned discounters such as Aldi and Lidl with much lower cost structures. These hard discounters aggressively communicated their low retail prices based on their lower cost structure and expanded their physical networks of stores.. They conquered substantial market share from the existing retail sector that the legislation sought to protect. The regulation, as not untypical, had a perverse effect that was even more costly than the phenomenon it was trying to limit. This explains the negative abnormal return for French retailers as evidenced in Table 9.

### *Converging internationally*

Examining the international aspects of our results, we noted that the pattern of performance (both R+M and R-M) did not differ significantly across the 3 countries examined. This similarity is a remarkable result. Let us add that our data sample is skewed towards smaller companies, reflecting normal business demography and local characteristics. Similarities in risk profiles across countries would be expected for manufacturers also because they are a more mature and global sector. Retailers, being more local operators and in an earlier stage of industrial development, might be expected to show a more heterogeneous risk profile across the 3 countries of our sample.

Actually, Tables 6 and 7 show remarkable similarities of the risk profiles of retailers and manufacturers across our 3 countries. More specifically, betas are all significant and less than 1 in every country, for all players and for the total supply chain. In each country, the retailer beta is higher than the manufacturing beta. The range of beta values is relatively small (0.57 to 0.80),

the grocery sector being viewed by investors as a defensive investment opportunity in every country. The pattern of significance of all coefficients is a bit more similar for manufacturers than for retailers, but the difference is slight. The quantitative values are similar across countries, with the supply chain values falling in the middle between the values for retailers and manufacturers.

The major difference then resides in the alphas of retailers and manufacturers, more than in the risk profile loadings. This is a strong and surprising result as far as the retail sector is concerned. It indicates that the retail sector has come of age, and globally so.

# 5 – Areas for further research

Several areas for future research can be identified from the above results. The first major area for research concerns a full explanation of the superior returns of the grocery supply chains over the period studied. So far, we have identified that the results are due to the larger firms in the supply chain, and that the contribution of retailers and manufacturers contributed differentially to this phenomenon across the countries studied. We also saw that the situation in France was quite different from that in the US and the UK, due to regulation intended to be favorable to the (smaller) retailers. From a financial perspective, the question arises as to whether this abnormal performance is in fact not a specific risk premium affecting the grocery supply chain. This premium might find its origins in very rapidly evolving global supply chains justifying a risk premium for investors invested in such shares. Alternatively, one can adopt the superior performance route, which then locates the abnormal performance inside the corporations. The follow-up research then takes the form of improved supply chain practices in the grocery sector. What then is the contribution made by substantial product innovation over the period generated by manufacturers, and the process and format innovations introduced by retailers? Or does the

origin of the performance lie in the economies of scale that result from globalization? Or, finally, is it largely an ECR story?

The second major avenue we wish to point out concerns "the convergence hypothesis". This hypothesis states that the risk profiles of the retail and manufacturing sectors are very similar across the three geographies studied. This is the globalization aspect of the convergence hypothesis, which certainly deserves to be explored further. In particular, we here have only examined the grocery sector in three major countries. It would be interesting to see which results remain when one goes outside the grocery sector to other sectors such as clothing and footwear, consumer electronics, or household appliances and house wares, B2B or when one goes to other countries.

A third area for further research would explore "the incontinence hypothesis" which deals with retailers' inability to translate their increasing vertical power into superior shareholder returns due to their insufficient ability to differentiate horizontally from other retailers. From an industrial organization (IO) point of view, retailing can thus be seen as an effective mechanism to redistribute to the final consumers any 'excess' profits generated by the manufacturing sector. This leads to a different view on retailers as actors in society that not only distribute goods and services, but that also assume a consumer welfare role. The hypothesis also explains why retailers, including the larger ones, in their search for differentiation have continued to innovate. Retailers' suffer from an inability to capture the gains from innovation; these have largely flown to consumers in terms of an improved offer and reduced prices. In this context, and from a public policy angle, a question that arises is whether regulators might generate further consumer welfare gains by improving the bargaining position of retailers relative to their suppliers.

From a business perspective, the question faced by retailers consists in finding effective ways to build customer loyalty. The emergence of powerful retail brands might be one such way. It is likely the case that brand building is relatively easier for larger firms. A contrario, the question

arises as to the future of the smaller retail firms and their contribution to the future development of the sector. What are the factors that will allow the smaller firms in the grocery sector to survive? One of the traditional answers in IO has relied on innovation. If this is so, is it also the case that the nature of innovation in smaller firms is of a different nature than that in bigger firms?

**Table 1**

**Concentration in Manufacturing in USA (2002) and France (2000)**

**(% of Total Sales of Top Brands)**

| Category (USA, 2002) | % of Total Sales by Top 5 Brands | Category (France, 2000) | % of Total Sales by Top 4 Brands |
|---|---|---|---|
| Beer | 55 | Animal Food | 81 |
| Carbonated Soft Drink | 48 | Beer | 85 |
| Chips | 65 | Biscuits | 44 |
| Chocolate Candy | 21 | Chocolate | 38 |
| Convenience/Still Water | 55 | Edible oil | 84 |
| Cookies | 33 | Ice cream | 58 |
| Crackers | 49 | Margarine | 100 |
| Energy Drinks | 84 | Mineral water | 68 |
| Frozen Meals | 59 | Pasta | 66 |
| Ice Cream | 39 | Soft drinks | 61 |
| Natural Cheese | 51 | Spirits | 65 |
| Non-Chocolate Chewy Candy | 34 | Tea and coffee | 68 |
| Refrigerated Orange Juice | 92 | Tobacco | 100 |
| Regular Gum | 50 | | |
| Shredded Cheese | 51 | | |
| Whole Bean Coffee | 77 | | |

Sources:
- USA (2002): *Information Resources Inc*., InfoScan data for total food, drug and mass merchandise (excluding Wal-Mart)
- France (2000): *Agreste*, statistics from the Ministry of Agriculture, Paris, 2003

**Table 2**

**Changing % Shares of the Top 5 FMCG retailers in France, UK and USA (1995-2003)**

| Country | 1995 | 2003 | Change |
|---|---|---|---|
| France | 50 | 81 | +62 % |
| UK | 60 | 64 | +7 % |
| USA | 20 | 32 | +60 % |

Source: AC Nielsen, BCG and McKinsey

**Table 3**

**Change in Herfindahl indexes of the grocery manufacturing and retail sectors over the 1988-2003 period in France, UK and USA (indices based on market capitalization)**

| | Manufacturers | Retailers |
|---|---|---|
| France | 88 % | 103% |
| UK | 48% | 119% |
| US | 67% | 132% |

Source: Datastream

**Table 4**

**Retailer Internationalization: 10 largest international retailers in 1995 and 2004**

**(in billion US $ of international sales)**

| Top international retailers (1995) | International Sales (in billion US $) | Top international retailers (2004) | International Sales (in billion US $) |
|---|---|---|---|
| Tengelman | 16 | Wal-Mart | 63 |
| Metro | 13 | Ahold | 54 |
| Carrefour | 10 | Carrefour | 46 |
| Ahold | 8 | Metro | 33 |
| Ito Yokado | 7 | Auchan | 20 |
| Promodes | 7 | Schwartz | 17 |
| Safeway (US) | 4 | Delhaize | 17 |
| Price-Costco | 3 | Aldi | 16 |
| Wal-Mart | 2 | Tengelman | 15 |
| Sainsbury | 2 | Rewe | 15 |
| **Cumulative International Sales** | **72** | | **296 (+311%)** |

Source: *Lebensmittelzeitung*, Annual Review of the Retail Sector (1996-2005)

**Table 5**

**Summary Statistics across All Companies in our Sample**

| Country | Units | Mean | Median | Standard Deviation | Max. | Min. |
|---|---|---|---|---|---|---|
| **Market Value** | | | | | | |
| **France** | millions € | 808.33 | 73.48 | 3005.73 | 23118.42 | 1.90 |
| **UK** | millions £ | 732.01 | 41.63 | 1935.17 | 12382.66 | 0.16 |
| **USA** | millions $ | 2567.47 | 151.82 | 10191.65 | 111905.80 | 0.01 |
| **Average Monthly Total Shareholder Return** | | | | | | |
| **France** | % | 1.52 | 1.30 | 2.22 | 20.60 | -2.52 |
| **UK** | % | 0.94 | 0.99 | 2.35 | 12.09 | -8.13 |
| **USA** | % | 1.70 | 1.38 | 3.84 | 31.56 | -13.87 |
| **Average Monthly Total Shareholder Return of Grocery Retailers** | | | | | | |
| **France** | % | 2.50 | 1.71 | 4.10 | 20.60 | -1.93 |
| **UK** | % | 0.96 | 1.18 | 1.76 | 5.11 | -6.65 |
| **USA** | % | 1.56 | 1.27 | 5.21 | 31.56 | -13.87 |
| **Average Monthly Total Shareholder Return of Grocery Manufacturers** | | | | | | |
| **France** | % | 1.24 | 1.17 | 1.14 | 5.95 | -2.52 |
| **UK** | % | 0.94 | 0.93 | 2.56 | 12.09 | -8.13 |
| **USA** | % | 1.76 | 1.42 | 3.05 | 22.89 | -9.13 |

**Table 6**

**Four Factor Performance-Attribution Regression Results on Equal-Weighted Total Supply Chain, Retailer and Manufacturer Portfolios 1988 – 2003**

| Country | *Adj. $R^2$* | $\alpha$ | RMRF | SMB | HML | UMD |
|---|---|---|---|---|---|---|
| **France** | 0.41 | **0.95 (0.002)** | 0.70 (0.0001) | 0.21 (0.024) | 0.13 (0.019) | 0.04 (0.402) |
| **UK** | 0.50 | **0.53 (0.047)** | 0.69 (0.0001) | 0.31 (0.0001) | 0.07 (0.239) | -0.17 (0.002) |
| **USA** | 0.58 | **0.57 (0.010)** | 0.74 (0.0001) | 0.47 (0.0001) | 0.37 (0.0001) | -0.08 (0.078) |

The significance level appears in parentheses.

**Table 7**

**Four Factor Performance-Attribution Regression Results on Equal-Weighted Grocery Retailer and Manufacturer Portfolios 1988 – 2003**

| Country | Excess Return | *Adj. $R^2$* | $\alpha$ | RMRF | SMB | HML | UMD | Residual Correlation |
|---|---|---|---|---|---|---|---|---|
| **France** | Retailers – Risk Free | 0.24 | **1.16 (0.025)** | 0.78 (0.0001) | 0.13 (0.415) | 0.13 (0.151) | 0.07 (0.435) | 0.19 |
| | Manufacturers – Risk Free | 0.46 | **0.73 (0.003)** | 0.62 (0.0001) | 0.29 (0.0001) | 0.13 (0.004) | 0.02 (0.654) | |
| | **Retailers – Manufacturers** | 0.02 | 0.43 (0.414) | 0.15 (0.227) | -0.16 (0.301) | 0.01 (0.936) | 0.05 (0.575) | |
| **UK** | Retailers – Risk Free | 0.40 | **0.66 (0.069)** | 0.80 (0.0001) | 0.44 (0.0001) | 0.07 (0.378) | -0.15 (0.042) | 0.44 |
| | Manufacturers – Risk Free | 0.45 | 0.40 (0.127) | 0.57 (0.0001) | 0.18 (0.010) | 0.07 (0.239) | -0.19 (0.0001) | |
| | **Retailers – Manufacturers** | 0.04 | 0.26 (0.441) | 0.23 (0.006) | 0.25 (0.006) | 0.002 (0.974) | 0.04 (0.579) | |
| **USA** | Retailers – Risk Free | 0.45 | 0.47 (0.134) | 0.80 (0.0001) | 0.53 (0.0001) | 0.32 (0.004) | -0.08 (0.197) | 0.33 |
| | Manufacturers – Risk Free | 0.52 | **0.67 (0.002)** | 0.69 (0.0001) | 0.42 (0.0001) | 0.43 (0.0001) | -0.07 (0.092) | |
| | **Retailers – Manufacturers** | 0.03 | -0.20 (0.533) | 0.11 (0.192) | 0.11 (0.212) | -0.11 (0.328) | -0.01 (0.906) | |
| **All Pooled** | Retailers – Risk Free | 0.33 | 0.46 (0.196) | 0.81 (0.0001) | 0.33 (0.0001) | 0.14 (0.009) | -0.01 (0.819) | 0.31 |
| | Manufacturers – Risk Free | 0.46 | **0.81 (0.0001)** | 0.62 (0.0001) | 0.27 (0.0001) | 0.16 (0.0001) | -0.05 (0.038) | |
| | **Retailers – Manufacturers** | 0.02 | -0.35 (0.322) | 0.20 (0.0001) | 0.06 (0.292) | -0.02 (0.726) | 0.04 (0.310) | |

The significance level appears in parentheses.

**Table 8**

**Results of Alternative Size Specifications on Performance-Attribution Regression of Total Grocery Supply Chain Portfolio**

| Country | Size Specification | *Adj. $R^2$* | $\alpha$ | RMRF | SMB | HML | UMD |
|---|---|---|---|---|---|---|---|
| **France** | Top 50% | 0.49 | **0.94 (0.001)** | 0.64 (0.0001) | 0.09 (0.240) | 0.16 (0.002) | 0.003 (0.944) |
| | Bottom 50% | 0.05 | 1.32 (0.193) | 0.82 (0.001) | 0.32 (0.297) | 0.08 (0.672) | 0.17 (0.314) |
| | Top 10% | 0.45 | **0.83 (0.015)** | 0.70 (0.0001) | -0.06 (0.564) | 0.21 (0.001) | 0.04 (0.512) |
| | Bottom 10% | 0.02 | -0.41 (0.864) | 0.71 (0.199) | 1.39 (0.072) | -0.54 (0.224) | 0.04 (0.933) |
| **UK** | Top 50% | 0.47 | **0.51 (0.061)** | 0.61 (0.0001) | -0.06 (0.444) | 0.20 (0.001) | -0.13 (0.017) |
| | Bottom 50% | 0.43 | 0.55 (0.122) | 0.76 (0.0001) | 0.69 (0.0001) | -0.05 (0.507) | -0.20 (0.005) |
| | Top 10% | 0.35 | **0.65 (0.068)** | 0.61 (0.0001) | -0.19 (0.043) | 0.37 (0.0001) | 0.02 (0.817) |
| | Bottom 10% | 0.25 | 0.48 (0.546) | 0.87 (0.0001) | 1.41 (0.0001) | -0.22 (0.216) | -0.35 (0.032) |
| **USA** | Top 50% | 0.67 | **0.56 (0.001)** | 0.80 (0.0001) | 0.25 (0.0001) | 0.35 (0.0001) | -0.03 (0.0001) |
| | Bottom 50% | 0.36 | 0.54 (0.156) | 0.69 (0.0001) | 0.70 (0.0001) | 0.41 (0.002) | -0.12 (0.100) |
| | Top 10% | 0.45 | **0.79 (0.002)** | 0.76 (0.0001) | -0.10 (0.163) | 0.20 (0.029) | -0.03 (0.614) |
| | Bottom 10% | 0.01 | -0.07 (0.954) | 0.47 (0.129) | 0.72 (0.036) | 0.58 (0.172) | 0.24 (0.326) |

The significance level appears in parentheses.

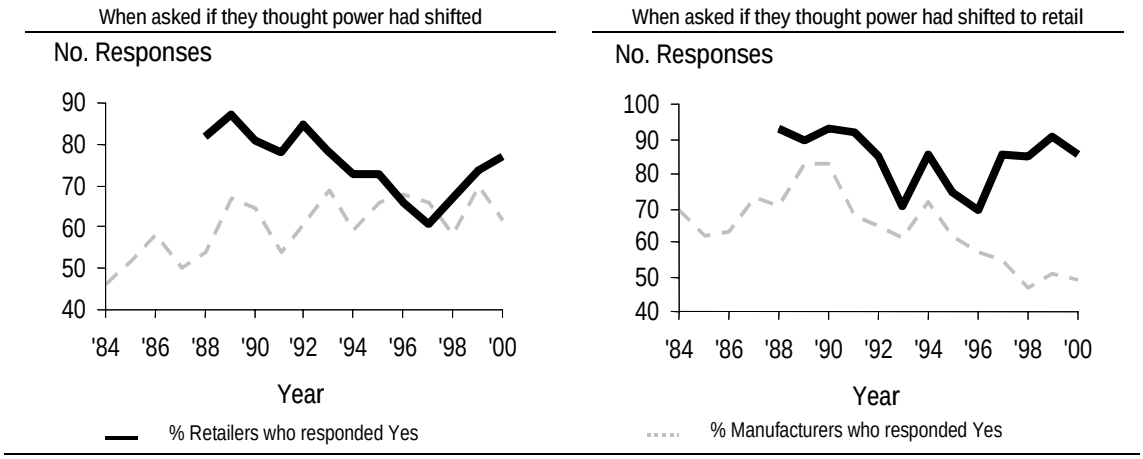
**Table 9**

**Event Study Results**

| Average residuals last 5 years (1999-2003) | Retailers | Manufacturers | Diff (t-test) |
|---|---|---|---|
| US | 0.49 | 0.51 | Not significant |
| UK | 1.09 | 1.32 | Not significant |
| France | -1.22 | 0.11 | Significant (t = -2.07) |

**Figure 1**

***Perceptions of the Balance of Power***




Note: The data after 2000 is not comparable to the data from previous years
Source: Progressive Grocer, Annual Review of the Grocery Industry, 1984-2001.

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[i] However, this did not prevent the further concentration of the French retail market due to a merger within the top six players, nor did it protect the small retailers as it also created an opportunity for the hard discounters.

[ii] Initially we included Germany in our analysis. However, we had to remove this country due to the very small number of German retailers listed on the stock market. The lack of publicly quoted German retailers and manufacturers (there are also fewer manufacturers listed on the German stock market as compared to the US, UK and France) is presumably due to the fact that German companies were, in general and until recently, financed predominantly by banks rather than the stock market .

[iii] This time period was chosen because of the availability of data needed to construct the factors used in the time series regression models for the European countries.

[iv] USA stocks quoted on NYSE, AMEX or NASDAQ exchanges.

[v] UK stocks quoted on all UK exchanges covered by Datastream.

[vi] French stocks quoted on all French exchanges covered by Datastream.

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