



The role and performance measurement of after-sales in the durable consumer goods industries: an empirical study

Performance measurement of after-sales

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Abstract

Purpose – To analyse the role of after-sales services in manufacturing contexts, and the related after-sales performance measurement systems.

Design/methodology/approach – An exploratory case study research was performed in the automotive, household appliance, IT and consumer electronics industries. The sample is made up of 48 firms with after-sales operations in Italy.

Findings – The role attributed to after-sales activities in the IT and consumer electronics and household appliance industries shows an orientation to improve company image, customer satisfaction and retention (marketing focus). A different situation characterises the companies studied in the automotive industry. In most firms, however, measurement systems are quite simple and short-term oriented, especially in the IT and consumer electronics and household appliance industries. The measurement of non-financial performance emphasises effectiveness rather than efficiency, and the automotive industry, on the whole, presents more advanced measurement systems, together with more integrated strategic management of after-sales. The household appliance industry, on the other hand, due to the significant presence of SMEs, is characterised by less sophisticated performance measurement systems.

Originality/value – Provides a representation of current empirical practices in after-sales role and performance measurement, a topic insufficiently covered by conceptual and empirical research.

Keywords After sales service, Manufacturing industries, Consumer durables, Financial performance

Paper type Research paper



The empirical research presented in this paper was carried out within a two-year research project, named After-Sales Advanced Planning (ASAP), undertaken by five Italian universities (Università di Bergamo, Politecnico di Milano, Università di Brescia, Università L. Bocconi, Università di Firenze), and involving several manufacturing companies. The authors acknowledge the financial support received from the Italian Ministry of the University, Scientific Research and Technology (MIUR). For more information about the ASAP Project, please refer to the official web site: www.progettoasap.org

Introduction and objectives

Manufacturers and retailers of capital and consumer goods can not consider their active role ends with the sale (Levitt, 1983), but rather must provide their customers with a set of supporting after-sales services, such as installation packages, technical advice for use, maintenance/repair, spare parts delivery, product upgrading, etc. The rationale for such needs and in general for integrating services into the core product offering is based on three main reasons, as pointed out by Oliva and Kallenberg (2003), concerning: after-sales economics, customer requirements, and competitive arguments.

First, from an economic perspective, the after-sales service market has been found in some industries, to be up to four or five times larger than the market for product sales (Bundschuh and Dezvane, 2003). Similar evidence is found by Wise and Baumgartner (1999) and Alexander *et al.* (2002), who state that after-sales may generate more than three times the turnover of the original purchase during a given product's life-cycle, and often provides a profitability higher than product sales. For instance, in 2002, 50 percent of Rolls-Royce's aero-engines business revenues came from service activities; similar figures are encountered in the elevator industry (Lewis *et al.*, 2004). Moreover, Gallagher *et al.* (2005) estimate the market of spare parts to be worth \$400 billion worldwide.

Second, a steady growth of customer service requirements occurred, pushing manufacturing firms to provide value added services and to outsource no-core services, in order to achieve higher flexibility and efficiency (Lojo, 1997).

Third, there is a competitive point. In a context of global competition and decreasing profit from product sales, after-sales service constitutes a profit source, and also a key differentiator for manufacturing companies. Gallagher *et al.* (2005) point to after-sales as a way to recover profits lost due to the fierce competition on sales prices of original equipment, representing at the same time "one of the few constant connections that customers have with a brand". Hence, after-sales is affected by and affects the brand image of a firm (Lewis *et al.*, 2004). After-sales is thus a potential source of competitive advantage for the firm (Armistead and Clark, 1992; Goffin, 1999). Therefore, most manufacturing companies are shifting from a traditional product-centric view, in which after-sales is considered a "necessary evil" (Lele, 1997), to a more innovative customer-centric view. However, unexploited opportunities still exist (Wise and Baumgartner, 1999; Gallagher *et al.*, 2005).

Finally, a fourth point can be added to the previous ones. As shown by the literature, the feedback information gathered from the after-sales unit may constitute an essential input to product and service development (Armistead and Clark, 1992; Cohen and Whang, 1997; Thoben *et al.*, 2001), to sales and promotion activities (Wise and Baumgartner, 1999; Gallagher *et al.*, 2005) as well as to marketing and customer relationship management (Anderson and Kerr, 2001; Ramaswamy *et al.*, 2002; Campbell, 2003).

The role attributed to the after-sales function shifts in favour of a more proactive one that considers after-sales a source of competitive advantage, a business opportunity and an information provider to other functions. As a consequence, the strategic role of after-sales, as well as its performance measurement, needs to be redesigned.

This paper[1] addresses two main topics through an empirical research carried out in three industries (automotive, household appliances, IT and consumer electronics). First of all, the role given to after-sales by manufacturers of durable goods is analysed. The research question addressed is:

RQ1. What is the role attributed by manufacturing companies to after-sales activities? Either a cross-functional process allowing feed-back for other functions (design, quality, production, sales and marketing), or a means to gain competitive advantage and customer retention, or a business that can provide profit to the company in the short term?

Second, the paper explores the practice of after-sales performance measurement. The research question addressed is:

RQ2. Which relative emphasis is given to financial and non-financial, as well as to short and long-term aspects of performance measurement?

The paper is organised as follows: the next section reviews the roles attributed to after-sales service; the third section presents after-sales performance measurement systems; the following one describes the research methodology; the fifth section provides and discusses the results of the empirical study and, finally, the last section provides some concluding remarks.

The role of after-sales service

As pointed out by Gallagher *et al.* (2005), the executives who manage the aftermarket business are frequently left out of sales and product discussions that reach decisions directly affecting its profitability and its capacity for serving customers". In order to evaluate "the total revenue stream that can be generated from the time original equipment is sold until it is retired from the field, and hence to maximise profit opportunities, joint programming and close communication is needed among after-market, sales and product-development teams. In the same perspective, the technical resources assured to the after-sales function should be increased. The updating and redesign of old spare parts, for instance (Gallagher *et al.*, 2005), represents an important opportunity for: protecting from competitors; standardising parts, thus reducing repair and substitution time and cost; improving the performance of parts. Therefore, a critical factor for fully exploiting the after-sales potential is cross-functional communication.

The integrated management of feedback information provided by after-sales may be crucial with respect to three areas:

- (1) *new product development and product/process redesign*: technical and reliability data coming from field usage and from maintenance activities can support the redesign of products and components, and the development of new products;
- (2) *sales*: information about the customer and the history of the products she/he owns, may support sales and promotion activities by commercial agents; and
- (3) *marketing*: all the information above can be employed to support the customer relationship management activities, with the aim of increasing customer satisfaction and its consequent loyalty over time.

It is worth noting that decisions made in product design and development phases are commonly acknowledged to influence up to 80-85 percent of total life cycle costs (Shields and Young, 1991). Thus, the information gathered along a product's life cycle can be very relevant in order to: reduce total life cycle costs; speed-up the product development and reduce time-to-market for new products (Stalk and Hout, 1990). On the other hand, careful attention to functional features and product quality cannot be superseded: therefore, concurrently to new product development it is useful to design an information feedback system to gather data from the field, to verify product performance and to support its evolution (Molenaar *et al.*, 2002; Waeyenbergh and Pintelon, 2002). Information management may create value by actively leveraging know-how, experience and judgment resident within and outside an organisation (Ruggles, 1998).

Iansiti and MacCormack (1997) suggest that most companies are shifting from a "product centric" form to a "knowledge centric" one: knowledge and information management have become, in fact, critical success factors (Drucker, 1993; Nonaka, 1991). Nonetheless, the role that the after-sales service organisation may carry out in a product life cycle perspective is often overlooked by manufacturing companies.

From the customer point of view a similar shift occurred, from the need for a product to the need for a functionality or for the fulfilment of a requirement. Companies, therefore, must offer not just a product, but a utility package made of a core product, its "packaging, and a bundle of related services. This set can be named extended product (Thoben *et al.*, 2001). Notable industrial examples of extended products are Xerox, which shifted from a copier manufacturer to "the document company" (Xerox, 2001), or Dell, that succeeded in a highly competitive market thanks to a wide and customised service offer and to its direct model (Magretta, 1998). More recently, car manufacturers are moving from the sale of a product (car), to the fulfilment of the need for mobility, providing new ways to access the product (leasing, long rental, car pools, etc.). The provision of services allows the revenue and profitability during the product life cycle to be increased. For instance, Cohen *et al.* (1997) stressed the importance for manufacturing firms to consider after-sales service revenue jointly with the product sales revenue, on a full ownership life-cycle basis. On the other hand, the importance of assessing the costs incurred by the customer – either a business or a private one – with a life-cycle horizon, arises: thus the diffusion of the total cost of ownership approach, which aims at understanding the overall cost of buying particular goods or services from a particular supplier (Ellram, 1995).

Cohen and Whang (1997), moreover, developed a product life-cycle model to study the strategic choices facing manufacturers of durable goods in the design of the product-service bundle. In addition, Wise and Baumgartner (1999) focused on the need to "go downstream" (i.e. to perform customer service activities and/or to be involved in distribution activities) for product manufacturers, since activities like after-sales services allow higher revenue and profit than product sales. They identified four downstream business models, summarised as follows:

- (1) *Embedded services*. Hi-Tech or "smart" products may embed some services or functionalities traditionally performed by human resources in the customer organisation, thus allowing the customer to save time or labour costs (e.g. by automating activities that were previously done manually).

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- (2) *Comprehensive services.* By selling the product, the manufacturer enjoys a strong position that can be exploited by selling “suites” of services to its customer. Typical examples are the financial services that manufacturers of capital goods (or cars) may offer to their customers. General Electric, for instance, developed a “comprehensive-services” business model, in which its financing branch (GE Capital) provided services for financing the investment and for managing the operations and maintenance of capital goods such as locomotives.
 - (3) *Integrated solutions.* This business model includes the launch of a high variety of products (e.g. accessories) and services in order to satisfy customer needs.
 - (4) *Distribution control.* This model entails the manufacturer entering the customers’ business, by moving forward in the value chain to gain control over lucrative distribution activities. A notable example is Coca-Cola, which in the nineties decided to consolidate its independent bottlers into an integrated distribution network, purchasing or acquiring control of the large majority of them. The control of its distribution channel allowed Coca-Cola to increase its bargaining power against direct customers (retail chains and supermarkets) and to extend its dominance of the vending-machine segment.

It is noteworthy to point out that after-sales plays a key role in supporting marketing activities to enhance customer loyalty, and thus to increase profitability in the long term. A growing number of firms face the need to jointly manage products and services not easily distinguishable, that constitute a continuum between tangible and intangible (Raimondi, 2005). Therefore, it is fundamental to proactively create and maintain a direct relationship with the final user over time (Frambach *et al.*, 1997): this is the only way to fully understand customers’ present and future needs, whether they are explicit or implicit.

In conclusion, we can suggest three different roles that can be given to after-sales by companies. First of all, it may be considered as a cross-functional process allowing feed-back for other functions (design, quality, production, sales and marketing), that is particularly useful for product and process development (Product and Process development focus). Second, after-sales may constitute a business that gains significant revenues and profit in the short term (Sales and Profitability focus). Finally, it may play a strategic role in the long term, impacting on customer satisfaction, brand loyalty and company image and assuring future sales of new products (Marketing focus).

The performance measurement systems

The scientific literature on performance measurement systems provides notable examples of integrated frameworks, coupling financial and non-financial, long-term and short-term measures (among others Keegan *et al.*, 1989; Kaplan and Norton, 1992, Kaplan and Norton, 2004; Olve *et al.*, 1997; Neely *et al.*, 2002): nonetheless, their application to after-sales service is almost absent. Literature dealing with after-sales service, on the other hand, presents a highly fragmented picture, with no specific focus on performance measurement systems. The various contributions (e.g. Cohen and Lee, 1990; Armistead and Clark, 1991; Cohen *et al.*, 1997; Cohen and Whang, 1997; Supply

Chain Council, 2003) lack a systemic approach linking strategy, supply chain configuration and performance measurement systems. An integrated reference framework for after-sales performance measurement has recently been proposed by Gaiardelli *et al.* (2005). The framework integrates some relevant models in literature (Lynch and Cross, 1991; Kaplan and Norton, 1992; Supply Chain Council, 2003) applying them to after-sales activities. The framework is articulated in four levels: the business area, the process level, the activity level, whose performance measures are focused on the short term, and the development and innovation level, which considers a long-term perspective.

At the strategic business area level, the overall after-sales financial performance is considered. It can be measured by indicators such as operating profit, ROA, ROI, etc. It is important to stress that the financial results are generated both by market results (market share, market penetration, etc.) that impact on revenue, and by the efficient consumption of resources (costs). The second level of the framework is the process one. According to Lynch and Cross (1991), process performance can be measured with regard to customer satisfaction, flexibility and productivity. The third level considers the performance of the after-sales organisational unit in dealing with its specific activities. It is useful to distinguish between front office activities, impacting directly on customer satisfaction, and back office ones, which are responsible for efficiency and lead times. Five performance dimensions at the activity level are considered: reliability, responsiveness, internal lead times (which are mainly measured by non financial indicators), waste, costs and assets utilisation (which are mostly evaluated through financial indicators). Finally, the fourth level of the framework proposed by Gaiardelli *et al.* (2005), assesses the development and innovation dimension (Kaplan and Norton, 1992), aiming at capturing the drivers of future competitive and financial results.

From the analysis of literature, it becomes clear that in order to evaluate after-sales performance comprehensively, different levels of analysis (business unit, processes and activities, organisational units) as well as different performance dimensions (financial and non-financial, effectiveness- and efficiency-oriented, short-term and long-term oriented) have to be taken into account.

Research design and sample

Research methods and tools

The research examined after-sales strategy, operations and performance measurement systems of a sample of companies operating in Italy and belonging to three industrial sectors: automotive, domestic appliances and IT and consumer electronics. The Italian market was chosen for the relative ease of gathering information by the researchers. Several considerations, moreover, guided the choice of the three industrial sectors examined which are among the most important manufacturing sectors for durable consumer goods, with a life-span for the final customer ranging from one to 20 years. In particular:

- the automotive industry plays a key role in European society and its economy and contributes noticeably to the welfare and prosperity of the EU countries. In this context, after-sales services have become increasingly important as sources of differentiation and profit: it accounts for about 20-25 percent of the whole revenue, and up to 40-50 percent of profit (Craemer-Kühn *et al.*, 2002);

- owing to the introduction of new EU regulations (e.g. No. 1400/2002, No. 2000/53/CE for automotive, extension of warranty to two years for all the industries), relevant changes are occurring for all players across the supply chain in the EU market;
- most top European players in the household appliances industry have operations in Italy, which constitutes an important market. Moreover a relevant share of the European production of appliances and components is manufactured in Italy;
- although the IT & consumer electronics industry includes a very low number of Italian companies, it is an important industry worldwide. Moreover, due to its similarity with household appliances in the distribution and sales channels and in after-sales operations, it seemed very useful to compare the two industries; and finally
- a significant knowledge of the businesses (Perona and Sacconi, 2004; Brun *et al.*, 2004; Miragliotta *et al.*, 2003; ASAP, 2005a,b) helped the researchers to perform the data gathering and analysis, as well as to attract companies' interest.

To study the research issues described in the previous sections, a multiple case study research was undertaken (Yin, 1994). Around 70 companies were contacted by the research group, and 48 of them agreed to take part in the research. The choice of case studies is supported by the exploratory nature of this research. Moreover, the research design moved from the purpose of performing: an in-depth analysis of the role of the after-sales organisational units; and a comparison in order to point out cross-company and cross-industry differences. Therefore, both detailed case studies, requesting several interviews with different managers inside the company (18 companies), and less detailed ones, based on one or two interviews (30 companies) were carried out.

The analysis was carried out through a guideline consisting of a detailed questionnaire. It involved several informants in the companies, including the after-sales managing director, the manager(s) in charge of after-sales in Italy, the spare parts warehouse and material planning managers, and the customer care manager. When questionnaires were filled out by managers on their own, data reliability and consistency were then checked by researchers. In detailed case studies researchers also resorted to the analysis of secondary sources, such as company documentation, corporate web site, specialised press. The use of several informants and different data sources allowed for triangulation, to check the internal consistency of data (Voss *et al.*, 2002).

The case study was organised in six main areas, described as follows:

- (1) *General characteristics of the industrial sector.* This includes general company data, turnover, number of employees, type of customers and markets served, organisational structure and contractual relationships between the company and the other service supply network actors (suppliers and customers).
- (2) *Product features.* This deals with the characteristics of the products manufactured and commercialised, including information about time-to-market, technologies, product reliability and availability, main failure causes, life cycle duration.

- (3) *Strategies and processes.* This focuses on the role of the after-sales function within the company's organisation, on its strategic objectives and on the processes performed. Moreover, the section addresses the organisational configuration of the assistance network (ownership, control, territorial diffusion, etc.).
- (4) *Logistics and spare parts management.* This investigates the after-sales logistics network structure and operations. In particular, the section includes questions about the logistics network structure, the inventory management policies, the forecasting techniques as well as the presence and structure of reverse logistics flows.
- (5) *Performance measurement systems.* This investigates the economic responsibility of the after-sales organisation, the time perspective and frequency of performance measurement, the adopted metrics. The focus is on the operative measures tracked by the companies and by the service network to assess time, quality and cost performance.
- (6) *Information systems.* This aims at identifying the information systems adopted and their main functionalities. Particular attention is devoted to the assessment of the degree of information integration between the manufacturers and the service network.

In the section "Empirical findings" we describe the results concerning areas 1, 3 and 5.

Sample description

The research sample is described in Figure 1. The number of companies belonging to the automotive industry in the sample (25 percent, lower than the two other industries) reflects the higher market concentration in this sector.

The sample is uniformly distributed in terms of company size, measured by the number of employees in Italy: around one third of companies have less than 50 employees, between 50 and 250 employees and more than 250 employees, respectively. However, the companies analysed are not homogeneous in terms of the product supplied. In the automotive industry sub-sample, in fact, about 66 percent of companies address the mass market segment, 25 percent the premium one, while about 8 percent address luxury market niches. In the domestic appliances sample, two thirds of the sample manufactures home appliances, about 24 percent heating systems and the

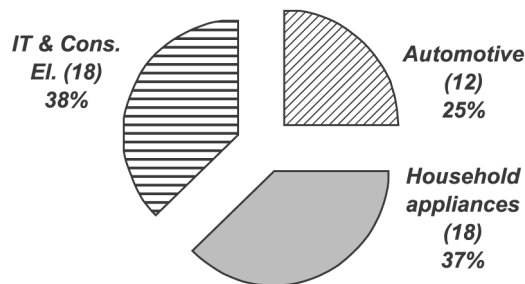


Figure 1.
Research sample (48 firms)

remaining part addresses the outdoor appliances segment. Finally, the IT and consumer electronics sub-sample is composed of about 75 percent of consumer electronics companies and 25 percent of IT companies.

In the household appliance sub-sample, companies' headquarters are mainly based in Italy (60 percent of firms), while in the two other industries they are usually located abroad (70 percent of automotive companies and 80 percent of IT and consumer electronics ones).

Empirical findings

This section reports the results of the empirical research, addressing three main areas: the role of after-sales services in relation to competitive strategies; the measurement of after-sales financial performance; and the measurement of after-sales non-financial performance.

Although the research was performed through case studies, the sample size allows for a quantitative evaluation and graphical, descriptive, representation of data. Therefore, quantitative comparison between the industries will be made, although the purpose of this section is descriptive and no statistically significant validation of relationships between data are going to be proposed. Data stem from the 48 case companies: for certain information, some companies may have been discarded due to unavailable or unreliable data. Examples taken from the case studies will also be provided.

Company strategy and role of after-sales

All the sample firms claim that after-sales is either important or fundamental for their success on the market. They assign different strategic objectives to the after-sales activities, both financial (revenue growth, profitability), and non-financial (customer satisfaction and loyalty, company image, improvement of product quality etc.). According to the declared objectives, companies' after-sales strategies have been classified into three main roles: marketing focus; sales and profitability focus; and product and process development focus. Figure 2 provides the resulting picture, for the overall sample and for each industry. Comments on the results appear below.

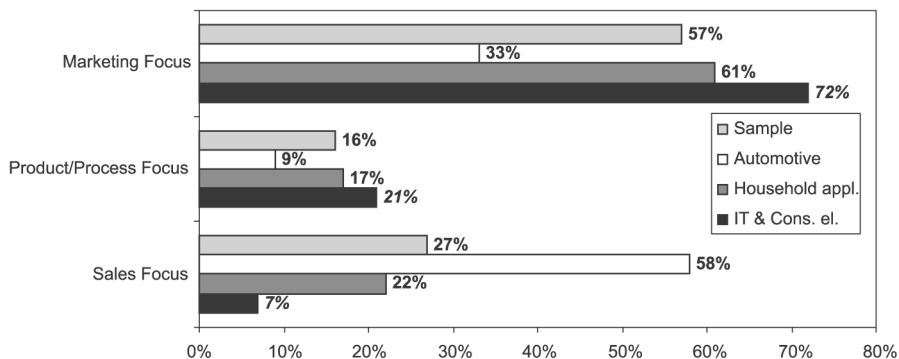


Figure 2.
Role of after-sales service

Note: Available data: 44 firms, 4 firms discarded

Marketing focus. Overall, more than half of the sample firms consider the main role of after-sales to be that of supporting marketing activities. In this case, after-sales service acts upon the differentiation of the offered service mix and on service quality as a critical competitive factor. Thus, the most widespread objectives (customer satisfaction, customer loyalty, company image) are oriented to customer retention, and therefore to increasing the sales of new products in the long term. As shown by Figure 2, the large majority of firms in the IT and consumer electronics and household appliance industries belong to this profile, while only 33 percent belong to the automotive sector.

Sales and profitability focus. In this profile, after-sales service aims at increasing revenues in the short term through the sale of services and accessories. 27 percent of the sample companies pursue this after-sales strategy. In particular, 58 percent of companies belonging to the automotive industry declare a sales and profitability focus, through maintenance and assistance services. In IT and consumer electronics on the other hand, this objective seems much less relevant.

Product and process development focus. Only 16 percent of companies put the highest emphasis on the role of information feedback from the field on product and process quality and design issues. In the IT and consumer electronics and household appliance industries this objective seems more relevant than in that of automotive.

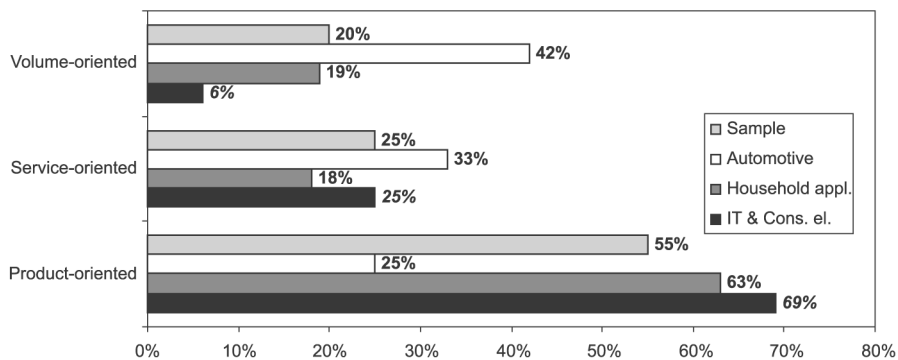
Data show that different after-sales roles are pursued in different industries. In the automotive sector, for instance, one third of the companies is oriented to a marketing focus, while 58 percent declare a sales and profitability focus. This evidence is consistent with the features of the macro-segments that form the automotive sector. In fact, all the enterprises following a marketing focus belong to the premium and luxury segments, while the ones oriented to a sales and profitability focus operate mostly in the mass market one. Indeed, in the two segments, the strategic objectives pursued and the role of after-sales service are different. In the premium and luxury segments after-sales, even though it generates high revenues and profitability, has a significant role in terms of service quality and differentiation. On the other hand, in the mass market segment, where cost control and economies of scale are fundamental leverages to assure the survival of the enterprises, the profitability of after-sales plays a crucial role. It is noteworthy to point out that, in general, in the automotive industry the profit generated by after-sales service is often higher (20-25 percent) than the one obtained with the product sales (0-2 percent). This explains the focus on sales and profitability assigned to after-sales service by the majority of the sample. In terms of the product and process development focus, the low priority given to this role by automotive companies may be explained by the fact that in this industry the information feedback from after sales to the R&D is more advanced than in other sectors, thanks to IT infrastructures and supply chain coordination. Single brand dealers (the vast majority, at least in Italy) ensure reliable and smooth information sharing between different actors in the service chain. Therefore, these activities being performed widely by all competitors, the attainment of a competitive advantage is not attached to this objective. Moreover, in multinational companies, due to the centralisation of R&D activities at the headquarters, the after-sales managers of the Italian subsidiaries may not have complete knowledge of the information flows towards the R&D function.

In the IT and consumer electronics and household appliances industries a large majority of firms belong to a marketing focus profile. The reason for this evidence in the IT and consumer electronics is probably due to the very short product life cycle, that leads enterprises to focus on service differentiation in order to obtain customer satisfaction and brand loyalty. The fact that in these industries after-sales operates mostly by multiple brand dealers is another reason why great emphasis is put on image and marketing objectives by the manufacturing company, in order to influence customer behaviour. In terms of sales and profitability focus, the low residual value and the fast obsolescence of products in these industries lead to a limited importance of after sales service, due to the fact that often it is more advantageous to substitute the old product with a new one, instead of repairing it, especially in the case of IT and consumer electronics. With regard to product and process development focus, the low value could be explained by the fact that feedback information from after-sales is often untimely and unreliable, because it is provided by a technical assistance network, mainly constituted of third parties, that might adopt opportunistic and non-collaborative behaviour.

Not only after-sales roles, but also firms' competitive strategies were assessed through case studies. Particularly, firms' competitive strategies were classified, according to the relative relevance agreed on issues like product innovation, product quality, customer satisfaction, volume growth, entering new markets, differentiation, sustainability etc. Three main company strategy profiles were defined:

- (1) *product-oriented companies*, which consider product innovation and quality as main competitive factors;
- (2) *service-oriented companies*, pursuing a strategy focused on product and service differentiation; and
- (3) *volume-oriented companies*, which follow a strategy based on economies of scale and cost leadership.

Figure 3 shows that for more than half the sample, the main priority is given to product innovation (Product-oriented strategy). Comments on data in Figure 3 appear below.



Note: Available data: 44 firms

Figure 3.
Companies' strategic goals

Product-oriented companies. This is the most common profile (55 percent of firms). Two out of three companies in the household appliance and consumer electronics industries give product features the highest priority: on the other hand, only one out of four companies in the automotive industry agrees on the same priority.

Service-oriented companies. In total, 25 percent of companies declare orientation to service as a main competitive priority. The highest value (33 percent) is in the automotive industry, where this strategy may be seen as a differentiator against cost and volume-oriented strategies. Among household appliance companies, only 18 percent choose this strategic priority.

Volume-oriented companies. On average, one out of five companies pursue this strategy. However, the largest share of automotive companies (42 percent) belongs to this category. These companies give the highest priority to sales volumes (growth, market share, new geographic markets), and compete on costs. The issue of volume is less important in the other industries, especially in IT & consumer electronics.

In the automotive industry, company strategies seem consistent with the market segments served. In fact, companies belonging to the mass market segment generally pursue a volume-oriented strategy, consistent with a global market characterised by high concentration and overcapacity. On the other hand, firms operating in the luxury and premium segments mainly follow a service-oriented strategy, which improve customer satisfaction and brand loyalty by offering a wide range of services (extended warranties, tailored-made maintenance programmes, etc.). In addition, in the automotive industry high product and technology innovation are a *conditio sine qua non* to survive. Thus, a strategy focused on product features, such as style, quality, safety, reliability and consumption, does not represent a distinctive and differentiating factor, except for some luxury or premium brands.

In the household appliance industry, companies must consider variable life duration of products for the end users (e.g. small appliances vs refrigerators) and variable opportunities for service (e.g. small appliances vs. air conditioning or heating systems). In particular, for some product segments, the limited product life cycle, the poor residual value and the relatively low price of a new product drive customers to prefer substitution to repairing a product, reducing the importance given to services and giving priority to product quality and reliability.

Finally, in the IT and consumer electronic industries, product innovation is the key competitive factor, as demonstrated by the significant diffusion of the product-oriented strategy. Besides, although consolidation and concentration of world players is in progress, companies with a niche market or a national market are still able to make a profit, through product and service differentiation. This explains, on the one hand, the very limited diffusion of the volume-oriented strategy and, on the other hand, the fact that 18 percent of enterprises adopt a service-oriented focus.

Table I couples companies' strategies with after-sales roles according to our classification. Of all possible couples (nine), the six most representative are illustrated in Table I.

Overall, one third of the sample couples a product-oriented strategy with an after-sales marketing focus. This is the main orientation in the IT and consumer electronics (46 percent) and household appliance industries (31 percent). On the other hand, one third of firms in the automotive sector couples a volume strategy with a sales

Company orientation	After-sales focus	Sample (%)	Automotive (%)	Household appliances (%)	IT and consumer electronics (%)
Product	Marketing	32	17	31	46
Service	Marketing	15	17	13	15
Volume	Sales	12	33	6	0
Product	Sales	12	8	19	8
Service	Product	7	0	6	15
Service	Sales	5	17	0	0
Other		17	8	25	16
Total		100	100	100	100

Table I.
Company and after-sales
strategies

Note: Available data: 41 firms

and profitability focus in after-sales. Moreover, in the household appliance industry 19 percent of companies couple a product orientation with a sales focus in after-sales. No firm couples a volume strategy with an after-sales marketing focus.

The wide diffusion of product-oriented strategies with an after-sales marketing focus in IT and consumer electronics and household appliances is consistent with the fact that for some sectors (such as small appliances, PC, mobile phones) the competitive advantage is based on product quality and innovation, as a consequence of limited product value, low residual value and short life cycles. It is not only the scarce opportunities for sales of services that drive this attitude, but also the fact that technical assistance is outsourced to third parties, that are usually family businesses serving different brands. Service level and quality might not yet be considered only order “qualifiers”, but rather critical success factors influencing customer retention, much more than for automotive companies.

In the automotive industry, the product-oriented strategy and marketing focused after-sales coupling is widespread in the premium and luxury segments, where the competitiveness depends on strength and image of a brand provided by high quality and technologically innovated products as well as high-quality services. The high diffusion of a service-oriented strategy with an after-sales marketing focus is not surprising, due to the focus of both strategies on services. The couple volume-oriented strategy with a sales and profitability focus in after-sales, on the other hand, is diffused in the mass market segment of the automotive industry, where after-sales allows recovery of the profitability that competition and aggressive market moves may erode on car sales. Quite surprisingly, very few companies in the household appliance industry declare themselves to be volume-oriented with a sales and profitability focus in after-sales: this might mean that strong competition on costs is just the starting point, while firms try to differentiate through product functionalities, aesthetics and technology. In the same industry, 19 percent of firms follow a product-oriented strategy with a sales and profitability after-sales focus, due to the fact that even though the competitive factors are based mostly on product features, after-sales services may play a significant role, especially when the life cycle and the residual value are important (for instance refrigerators or heating and air conditioning systems).

Finally, in all sectors the role of information feedback of after-sales service is rather neglected. For household appliance and consumer electronics products the nature of the assistance network (multi-brand dealers) and the rather loose information integration lead to a slow and mildly reliable information feedback. This might prevent its contribution to product quality or the design of new products whereas in the automotive industry the information feedback from after-sales to the R&D is very advanced and consequently it does not represent a priority.

Performance measurement: financial aspects

With regard to the economic responsibility assigned to the after-sales service unit, Figure 4 shows that after-sales constitutes a cost centre in 63 percent of the sample, while for 37 percent of enterprises it is a profit centre.

The situation in the household appliance sector reflects the sample average, while it is more extreme for the IT and consumer electronics, where only 15 percent of firms give economic responsibility of a profit centre to after-sales. The automotive industry on the other hand presents a completely different picture: consistent with the high diffusion of a sales and profitability focus (Figure 2), after-sales is a profit centre for almost three companies out of four.

It appears that companies which assign a marketing focus to after-sales, mainly in IT and consumer electronics industries, consider it as a cost centre, due to the fact that the emphasis is on non-financial aspects, such as customer satisfaction. By contrast, companies focusing on sales and profitability consider after-sales mainly as a profit centre. Therefore, we can say that when after-sales is a profit generator in the short term, it becomes a profit centre. By contrast, it is a cost centre either when the emphasis is on long term, or when after-sales plays a traditional role (mainly technical assistance).

Figure 5 analyses the time perspective in the evaluation of after-sales profitability. Once again, data show a strong difference among the automotive industry and the two others. A long-term perspective (three to five years), in fact, in the measurement of after-sales profitability prevails in the automotive sector (50 percent of companies). By contrast, in the household appliances, IT and consumer electronics sectors, between 60 percent and 70 percent of companies adopt a short-term perspective (up to one year). That appears to contradict the after-sales marketing focus that prevails in these

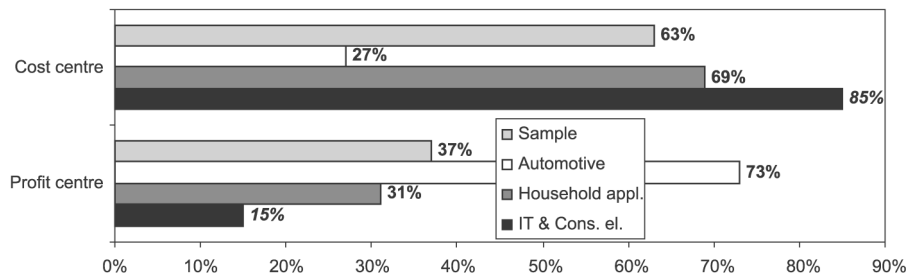
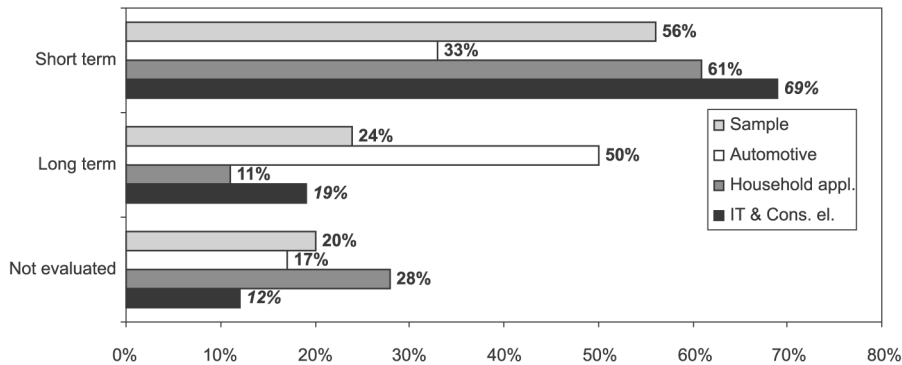


Figure 4.
Financial responsibility of
the after-sales
organisational unit

Note: Available data: 40 firms



Note: Available data: 46 firms

Figure 5. Time horizon in after-sales profitability measurement

industries: a short-term perspective will not allow assessment of the long-term effects of service activities on customer loyalty (and consequent profit).

Quite surprisingly, moreover, a significant number of companies (20 percent on overall) do not measure after-sales profitability. Three possible explanations can be provided for these figures: where after-sales represents a cost centre, profitability may not be evaluated; some of the studied companies, in particular in the automotive industry, are subsidiaries of multinational groups. In some cases it may be possible that after-sales profitability is not evaluated by the single subsidiary, but only on an aggregate level by the firm headquarters; and moreover, in the household appliance sample there is a significant number of SMEs, (mainly small appliance assemblers): these firms usually pay less attention to performance measurement at a function or process level:

Company 1 – Financial performance measurement of after-sales activities

Company 1 is the Italian branch of a successful European group, one of the world's leading automobile and motorcycle manufacturers in the premium sector. As a main strategic orientation, the company can be considered product-oriented. The company supports its profitable growth thanks to the strength and image of its brands, provided by high quality, technologically innovated, safe and reliable products and by a complete set of services. After-sales service in the company has a marketing focus, with a commitment to service quality; after-sales, thus, constitutes a profit centre. This role has affected the after-sales performance measurement system, which has been built focusing mainly on financial aspects. The main indicators measuring the financial performance are: revenues, equity, long term debt, net profit/loss per year, equity ratio on industrial operations, cash flow, cash flow on capital expenditures, and equity ratio on financial operations. The main competitive results evaluated are volume growth, market share and customer satisfaction.

Performance measurement: non-financial aspects

The first interesting empirical evidence is that 8 percent of the companies interviewed do not have a structured measurement system of non-financial performance of the after-sales organisational unit. Moreover, 19 percent of companies do not have structured measurement systems of non-financial performances of their technical

assistance network, i.e. of the actors (mostly independent licensed third parties) that physically provide after-sales services to the final customers.

Figure 6 describes the relative importance of performance dimensions: 64 percent of companies declare the main targeted area by measurement systems is effectiveness of after-sales service – measured, in general, towards the direct customer (either the dealer, the assistance centre, the foreign subsidiary or a distributor) through service level indicators, or towards the end customer through satisfaction indexes. Only 13 percent of the sample put the highest emphasis on the efficiency dimension. The remaining 23 percent of firms have a balanced perspective, giving high priority to both areas. The picture appears to be similar in all industries, with the automotive industry showing a slightly higher focus on efficiency.

Among the measures of effectiveness, further analysis concerns the emphasis put on different performance areas. Results are shown in Figures 7 and 8. Figure 7 shows the importance given to measures concerning the time dimension, such as service delivery lead time, spare parts delivery lead time, lateness, and so forth. Only one third of firms (42 percent in the automotive industry) puts high emphasis on this area (i.e. it measures several indicators, about different processes).

Figure 8 deals with the quality and service delivery areas, considering a wide array of indicators encompassing: spare parts availability from stock, number of parts kept

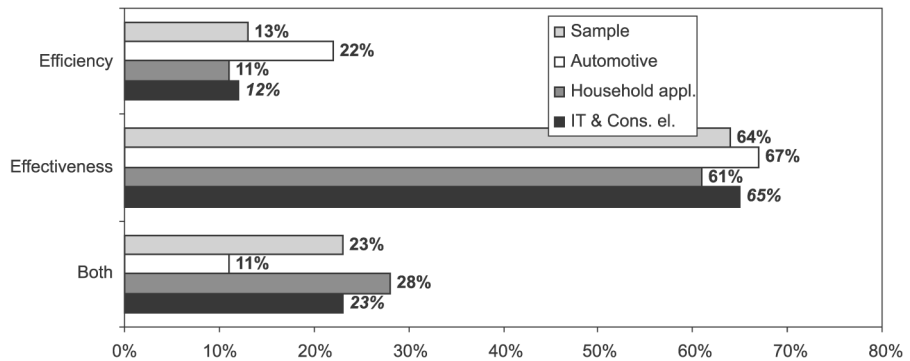


Figure 6.
Relative importance of non-financial performance measurement dimensions

Note: Available data: 44 firms

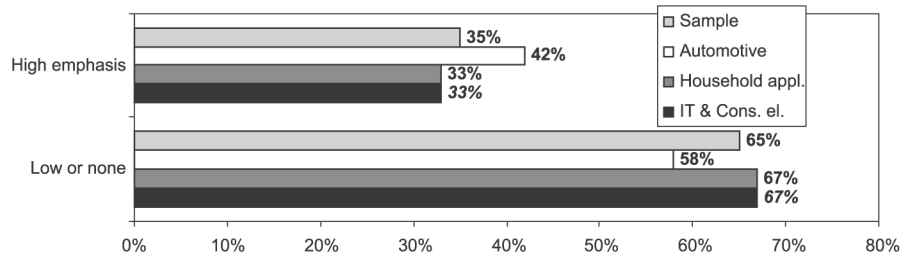


Figure 7.
Emphasis on after-sales performance measurement: time dimension

Note: Available data: 48 firms

in stock, human resources politeness and training, number of complaints, percentage of immediate answers at the call centre, etc. Overall, one firm out of four gives high emphasis to these areas. The percentage reaches 33 percent in the automotive industry, where service quality may reach a strategic importance (see Figure 3). The more traditional vision in the IT and consumer electronics industry is confirmed by the low percentage of firms giving high emphasis to this dimension.

Data presented in Figures 7 and 8 seem to contradict those illustrated in Figure 6, which shows that 87 percent of the sample declare effectiveness to be a very important area of performance measurement. In fact, most firms measure only a few, aggregated indicators in a structured way. Moreover, quite surprisingly a small but significant share of firms (between 6 percent and 20 percent according to the performance area and industry) do not measure any operative indicator in one or both areas:

Company 2 – Measuring after-sales efficiency and effectiveness.

Company 2 is the Italian branch of one of the world’s leading automakers, offering a full range of models from mini-vehicles to large trucks. Company 2 is a service-oriented company, aiming at customer satisfaction, retention and loyalty in the long term. After-sales has a marketing focus, and its performance measurement and control system mainly focuses on operative aspects, both at the company and the assistance network level. Several indicators of efficiency and effectiveness are monitored. Depending on the process they refer to (logistics, after-sales business development, customer relationships, technical assistance), they are related to customer satisfaction, flexibility or to service productivity. Regarding after-sales activities, a wide set of metrics can be found to evaluate service quality (e.g. transportation damages on delivery, number of order-lines fulfilled, percentage of requested parts available, total number of claims received, number of unanswered customer calls) and responsiveness (e.g. warehousing service level, customer calls abandon rate, response and repair time, number of late deliveries of parts). Internal lead times (e.g. warehousing loading and unloading time, procurement response time, diagnosis time, transport time, invoice delivery time), costs (e.g. spare parts and technical assistance costs, cost of picking errors, transportation damages on supply) and assets utilisation (e.g. stock available per month, stock rotation index, number of technical reports per employee) are also monitored.

The frequency of reporting of non-financial performances was also assessed. Figure 9 shows that a large majority of firms, more than two out of three, reports performance on a monthly basis (or even more frequently in a few cases). The share is higher (80 percent) in the automotive and IT and consumer electronics industries. Remembering that questions refer to after-sales operations in Italy, the figure may be explained by

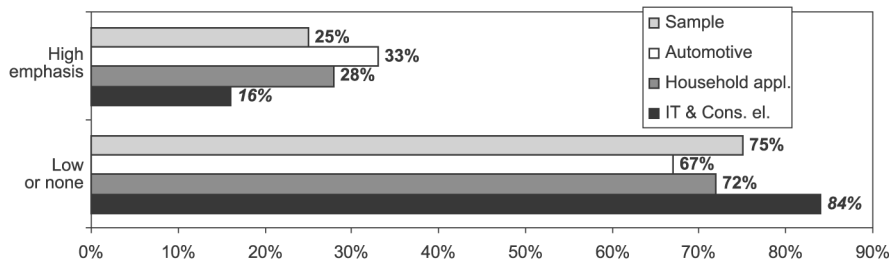
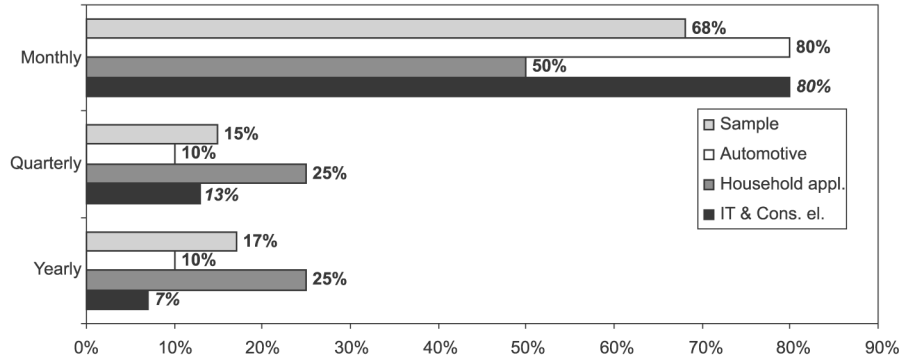


Figure 8. Emphasis on after-sales performance measurement: service level and quality dimensions

Note: Available data: 48 firms



Note: Available data: 41 firms

Figure 9.
Frequency of reporting of
non-financial performance

the fact that in these industries Italian subsidiaries have to provide performance data regularly to their headquarters. In the household appliance industry, on the other hand, a larger part of the sample (50 percent) has a lower reporting frequency (quarterly or yearly). A possible explanation rests, once again, in the larger presence of SMEs in this industry, which has less sophisticated and structured performance measurement systems and usually adopt less advanced management control and reporting systems.

In addition, all the groups of firms reporting non-financial performance on a yearly basis except one attach low or no emphasis on both the areas analysed in Figures 7 and 8. Among the firms reporting performance monthly, indicators such as average service delivery time, spare parts delivery time, number of complaints, rate of complaints solved and immediate responses (for call centres), and after-sales employees' productivity are the most diffused. The automotive industry sub-sample leads in terms of the number of performances measured (as it is implied by Figures 7 and 8): most companies belonging to this sector keep a monthly track of the incidence of lateness in service delivery, or the stock fill rate, and collect detailed measures of customer satisfaction and complaints, response time of call centres and so forth. By contrast, in the IT and consumer electronics industry monthly reporting usually concerns only few indicators (average service delivery time, percentage of instances of delivery time lower than a threshold, number of complaints); finally, companies with monthly reporting in the household appliance industry (a smaller share, as shown in Figure 9), stand in the middle in terms of number and type of indicators measured.

Another issue addressed in the empirical research concerns the obstacles encountered by companies in after-sales performance measurement. Figure 10 shows that the main problem, highlighted by 41 percent of firms, is in the collection of information.

This problem can be related to the fact that in the industries analysed the after-sales service provider is in most cases different from the manufacturer (dealers and assistance centres are small independent firms, licensed by the manufacturer). Thus, it may prove difficult for the manufacturer to gather reliable data to assess performances, because:

- the independent service providers are in most cases small, often family businesses (at least in Italy) and they may lack the resources and capabilities for strategic management;
- performance measures (especially service-oriented) may be used as a contractual weapon by the manufacturers against the licensee, rather than to monitor and improve customer service; and
- customer satisfaction is filtered by the technical assistance network, and so it is more difficult for the product manufacturer to assess.

The obstacle labelled “structure of service” may be related to the same factor, i.e. the service delivery system structure is not designed to ease performance measurement, and also to the fact that the service itself may not be designed to ease data collection in general.

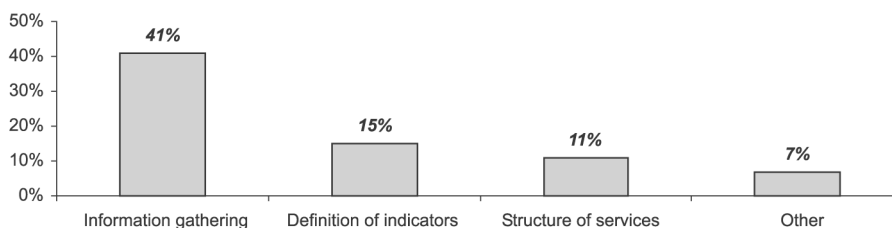
Finally, it is worth pointing out that 15 percent of companies (belonging to the household appliance but also to the automotive industry) find it difficult to identify the right indicators to measure what is really relevant for the business.

As a final piece of empirical evidence, it should be added that incentive systems related to after-sales performance have a high diffusion only in the automotive industry (82 percent of companies), as a consequence of a more structured management style. Only few companies in the other industries are implementing these kinds of systems.

Concluding remarks

The paper addresses the role of after-sales service in durable consumer goods industries, and the related after-sales performance measurement issues. In a context of global competition and decreasing profit from product sales, after-sales service stands as a key competitive area for short-term profit, long-term customer retention and for product quality and design improvement. A strategic approach to the management of after-sales is thus needed. Structured data collection and performance measurement systems, cross-functional (to the quality, sales, marketing and logistic functions) and cross-organisational (to the other supply chain actors involved in production and after-sales activities) feedback systems are among the management tools that have to be implemented to respond adequately to the new competitive challenges.

The empirical research described in this paper depicts the current state of these issues in three durable goods industries (automotive, household appliances, IT and



Note: Available data: 46 firms

Figure 10.
Main obstacles
encountered in after-sales
performance measurement

consumer electronics), analysing after-sales operations of 48 companies in Italy. Table II summarises the main empirical findings, with comments below.

Concerning the role of after-sales (addressed by the first research question tackled by this paper), the automotive industry presents different features compared to the other two industries. Production overcapacity and globalisation push for concentration and fierce competition on cost in order to gain market share (volume oriented strategy). Due to small profits made through product sales, a sales and profitability focus is most often assigned to after-sales service, in order to increase companies' revenue and profitability. Companies operating in niche segments (e.g. luxury and premium segments), trying to differentiate from this mainstream orientation, focus on service (pre- and after-sales) as a competitive priority: after-sales may then be oriented to improve companies' image and customer retention rate.

In the household appliance and consumer electronics industries, on the other hand, the competitive priority is on product quality and innovation, while after-sales is mostly oriented towards improving company image and customer loyalty (marketing focus). It should also be noted that the automotive sector offers wider after-sales business opportunities than the two other sectors, where both service requirements and supply are less developed, and the contacts between the service provider and the end customer are less frequent. Therefore, in the automotive industry after-sales constitutes mainly a profit centre, while by contrast it is usually a cost centre in the two other sectors. In conclusion, data suggest a consistency between the role assigned to the after-sales service and the company strategy. Moreover, the different pictures in

Area	Aspect	Automotive	IT and consumer electronics	Household appliances
Role	Companies competitive priority	Volume or service	Product	Product
After-sales performance measurement	After-sales focus	Sales	Marketing	Marketing
	Economic responsibility	Profit centre	Cost centre	Cost centre
	Time perspective	Long-term (or short-term)	Short-term	Short-term
	Relative importance of performance dimensions	Effectiveness	Effectiveness	Effectiveness
	Time indicators	High or low emphasis	Low (or high) emphasis	Low (or high) emphasis
	Quality and service level indicators	Low (or high) emphasis	Low emphasis	Low emphasis
Frequency of reporting	Monthly	Monthly	Monthly	Monthly or lower
Main obstacles		Gathering information	Gathering information	Gathering information

Table II.
Summary of the empirical findings

the industries analysed reflect special characteristics in product features, product life cycles, consumer behaviours and industry competition.

The second research objective was to analyse the after-sales performance measurement practice in the same industries. First of all, it has to be stated that there is very little empirical research work that addresses this issue (Cohen *et al.*, 1997, 2000): a merit of this work is, therefore, to shed some light, through exploratory case research, on the after-sales performance measurement practice.

Despite the acknowledged importance of after-sales activities, 20 percent of firms do not evaluate after-sales profitability, and, especially in the household appliances and IT and consumer electronics, a short-term perspective prevails (up to one year). This appears to be in contradiction with a long-term marketing focus of after-sales, also prevailing in these sectors. This empirical evidence suggests that a consistency between the strategic approach to after-sales management and performance measurement is not yet widespread in industrial practice. Moreover, performance measurement systems do not appear to be very structured and articulated, with an emphasis on the short term. Most often, a small set of indicators is measured, which are not integrated in a structured framework. Possible explanations of this evidence may be provided by the fact that Italian subsidiaries are in some cases only sales companies and by the diffusion of multi-brand, family-business assistance networks. Exception to this picture is provided by quite a large portion of the automotive industry sub-sample, in which a long-term orientation and a more structured approach to after-sales performance measurement are common.

With regard to non-financial performance, most firms are oriented to monitor effectiveness rather than efficiency, consistent with the role assigned to after-sales service. Performance measurement systems, nonetheless, appear quite simple and seem to be based on a small number of operative indicators, especially in the household appliance and IT and consumer electronics industries. The main reason could lie in the fact that after-sales services are physically provided by independent third parties (licensed or not). It then becomes quite complicated to collect reliable and timely data from the field, since these data may be used as a contractual weapon by the manufacturer with the service provider. Therefore, the household appliances and IT and consumer electronics companies tend to score low on the emphasis (number and importance of indicators measured) on both time and service level/quality dimensions. A larger portion of companies belonging to the automotive industry, on the other hand, emphasise non-financial performance, especially on the time dimension, perhaps thanks to more structured performance measurement systems and to tighter relationships with mainly mono-brand dealers.

Reporting frequency is usually monthly in the automotive industry, IT and consumer electronics industries, whereas a lower frequency is reported in half the companies belonging to the household appliance industry. A monthly frequency is encountered in the case of multinational companies (Italian or foreign based), while a lower one is typical of SMEs.

Almost half of the sample companies, regardless of their industry, identify the main obstacle in collecting timely and reliable information from the field (final customer or technical assistance network). The intermediation role of third-party dealers and technical assistance centres, their relationships with product manufacturers and the

integration between the assistance networks' and manufacturers' information systems may be the cause of those problems or, conversely, act as enablers in this issue.

In conclusion, the automotive industry appears to be the most advanced in terms of after-sales performance measurement systems, in terms of their structure, reliability and exploitation of the information gathered, due partly to higher information integration between manufacturers and dealers. Detailed case studies show that in this industry it is possible to find best practice firms, that move towards a more integrated view of after-sales: encompassing a process and supply chain perspective; coupling internal with customer-oriented indicators; and defining performance indicators oriented to the identification of causes as well as results. By contrast, the household appliance sample, in which there are several SMEs along with multinational companies, shows less sophisticated performance measurement systems, with a lower reporting frequency.

Finally, the empirical evidence suggests that most firms do not fully exploit the potential of after-sales feedback to the product (and process) design process, and significant improvement opportunities exist, in particular in the household appliances, IT and consumer electronics.

It should be noted that this research work is subject to some limitations. First of all, the number of cases analysed is insufficient for statistical significance: a survey-based research should follow in order to assess whether the results presented in this paper could be generalised. Moreover, although the research involved some of the most important world players in each industry, the case studies addressed only the Italian after-sales operations: in the future case studies should also involve corporate heads of the after-sales function, in particular in the automotive and IT and consumer electronics industries, in order to gather complementary information.

Finally, it seems quite clear that several factors contribute to explaining the differences among and within industries, such as product features and complexity, life cycle stages, product duration at the end user, regulatory environment, firm size, ownership and control etc.. This paper gives only preliminary insights on the influence of those aspects, which should be addressed more thoroughly in future research.

Note

1. This work was developed and written jointly by the authors. Nevertheless, the Introduction and objectives, Research design and sample, Empirical findings – performance measurement: financial aspects sections are largely the work of Paolo Gaiardelli. The role of after-sales service, Empirical findings – company strategy and role of after-sales, the work of Lucrezia Songini; and The performance measurement systems, Empirical findings – performance measurement: non financial aspects and Concluding remarks are the work of Nicola Saccani.

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