Management accounting change and the rise of Vespa (1884-1965)

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Received: 02 September 2020
Accepted: 15 July 2021

Abstract

This paper focuses on the manner in which the interplay of several external and internal forces can affect a company control-system architecture over time. As its object of enquiry, the Italian manufacturer Piaggio provides us with a glimpse of management accounting techniques across a century in a context of economic instability and political and social tensions in Italy.
The authors examine the contextual factors conditioning influences and their interplay with Piaggio costing techniques. The study suggests that accounting change was dependant on a complex set of relationships and preconditions.
The specificity of the company accounting controls was tied to the interplay of internal and external forces, for instance changes in the production motivated by the war requirements, the rise of fascism and protectionism, low market competition, high-skilled technicians, investment on innovation, low wages, and strikes of the workforce.
The findings highlight that the occurred developments and changes were carried out in order to enable the survival of the firm and to respond to specific managerial, behavioural, and organizational needs.

Keywords: Management accounting change, Cost accounting, Control system, Organizational change.

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Management Control (ISSN 2239-0391, ISSNe 2239-4397), 2021, 2, Special Issue
Doi: Doi: 10.3280/MACO2021-002-S1014

1. Introduction

Recent historical research has illuminated the miscellany of organizational and social variables that shaped the emergence of early cost accounting practices (Zan, 2004; Carmona, 2007; Carvalho et al., 2007; Loft, 2020). This work seeks to illustrate the extent to which internal and external forces can influence an enterprise's internal accounting practices. The manner in which the functioning of internal accounting can be affected by independent and unanticipated incidents is of interest, and the consequent altered possibilities for further organisational change. Moreover, it also seeks to explore the ways in which contextual factors can become embedded within an accounting system and continue to exert an influence long after their original ration has ceased to exist. The investigation undertaken here is, in essence, concerned with understanding the basis of management control systems' (MCS) evolution over an extended period of time within a particular context; the work may thus be viewed as an historical enquiry.

There is an ongoing debate in accounting history around the ways in which historical material should be gathered, interpreted, analysed and written. Lying at the heart of this debate is the perennial concern with 'objective/interpretive' modes of investigation (Carmona et al., 2004). The mainstream orthodoxy of accounting history, known as traditional accounting history, embraces the "objective" view of history looking backward in time in an attempt to discover origins. The alternative approach, known as new accounting history, promotes interpretive and critical stances to uncover the socio-political setting that issue, or give rise to, specific accounting practices (Carmona et al., 2004). Bisman (2012) highlights that, over time, accounting history investigations moved from theoretical and descriptive narratives (linked to the traditional accounting history framework) to studies applying more sophisticated and varied theoretical and analytical frameworks concomitant with the recognition of the episteme/s underlying new accounting histories which are linked to the new accounting history stream.

These theoretical and analytical frameworks are typically drawn from literature outside of accounting. For example, theories from economics such as agency theory and contracting cost theory, have featured significantly on a longitudinal basis (e.g. Roy and Spraakman, 1996; Spraakman and Davidson, 1998; Gwilliam *et al.*, 2000; Spraakman and Wilkie, 2000; Robb *et al.*, 2006; Keneley, 2008; Bujaki, 2010). Similarly, institutional theory has been well exposed (e.g. De Beedle, 2000; Richardson and Jones, 2007; Keneley, 2008; Romeo and Rigsby, 2008), as has the notion of social capital (e.g. Bryer, 1998; Cordery, 2006; Evans, 2010). In this context Miller and

Napier (1993) seek to emphasise the historical contingency of contemporary practices even if Gomes (2008) and Bisman (2012) highlight some criticisms about the use of contingency theory in accounting history.

The relationship between management accounting and the development of industrial businesses in several country in the 19th and the 20th centuries, particularly during the World War II post-war period, is still largely unknown (Carmona, 2007). Besides, Carmona (2007, pag. 906) points out that *"accounting history research published in international journals focuses overwhelmingly on the narrow time segment 1850-1940"*. This paper aims to address this gulf by providing an insight into management accounting practices in an organization from the end of the 19th century to the 1960s. In so doing, it responds to Carmona's (2004 and 2007) argument that there was a need to broaden the narrow time segment analysed by researchers to date.

In light of criticisms about the use of contingency theory in accounting history investigations, and in reply to Carmona's (2007) call for further investigations a time segment that goes beyond 1850-1940, this paper aims to explore some of the forces that influenced the evolution of MCS from the last decades of 19th century to the 1960s.

The paper identifies three main periods of analysis strictly linked to Italy's history: a) 1884 - World War I; b) years between the two World Wars and the rise of fascism c) World War II and the Miracolo Italiano (Italian "Economic Miracle") and the change of ownership of the company.

Utilizing archival materials and interviews, this paper examines the development of the company's accounting system with special attention to the period 1884, when Rinaldo Piaggio founded the company, to 1965. That year, because of Enrico Piaggio's death, the company passed under the control of FIAT. During that period the business moved from being an artisanal based manufacturer of naval furniture to a large-scale, industrial producer of shipboards, aircrafts, railway cars and especially light vehicles (principally two-wheeled motor scooters)[1].

[1] Today Piaggio & C. S.p.A. is the holding company for a group of companies manufacturing light vehicles, principally two-wheeled motor scooters, motorcycles, and bicycles. The company's most important product is still "Vespa" motor scooter, a model that became extremely popular in Europe after World War II. Piaggio is the European leader for motor scooters, with a market share just over 50 percent. The company is ranked third worldwide, with growing sales in India, China, Indonesia, Vietnam, and Latin America. Annual production of Piaggio motor scooters exceeds 850,000 vehicles and annual output of bicycles is approximately 500,000. The company operates subsidiaries in France, Spain, Argentina, Singapore, The Netherlands, Germany, Greece, Britain, and elsewhere, and markets its products through distributors in more than 60 other countries (Annual Report Piaggio & C. S.p.A 2019).

The findings from this paper highlight that the developments and changes that occurred in the structure of MCS in Piaggio were carried out in order to enable the business to survive and respond to changes such as in products, company size, competitive strategy, market pressures and social and political transformations.

This paper initially provides a definition of MCS and introduces the contingency theory. Subsequently, there is a brief description of the archival and accounting records used for the purpose of this paper. Section five provides a brief a description of the company and the analysis of its MCS from the constitution of the company (in 1884) to the end of World War I. Section six provides a description of accounting practices during the two World Wars and section seven analyses control systems from the end of WWII to 1965 when ownership of the company changed. To make the evolution of control systems in Piaggio clearer, for each period an initial description of the key, relevant events in Italian history is provided. This is necessary to offer, given the lengthy period of this study, the socio-economic and political context in which management accounting changes occurred.

The paper concludes with a discussion of the broader implications of this study for the process of accounting evolution under the influence of contingent factors and provides some suggestions for further research.

2 The meaning of MCS

As authors such as Chenhall (2007) claim, the terms *"management accounting", "management accounting systems", "management control systems", "organizational controls"* and *"management accounting and control systems"* have been defined in different ways and sometimes used interchangeably. The reason for the diversity of definitions can be considered as lying within two main approaches 1) one that looks at control as one particular function within the several functions of accounting systems and 2) one that defines management accounting as a specific set of tools within the larger set of procedures and processes that comprise the "package" of management control systems (Otley, 1980).

As far as the first approach is concerned, accounting has been defined as *"the process of identifying, measuring and communicating information to permit informed judgments and decisions by users of the information"* (Drury, 2008 p.5). Accounting as a whole is traditionally subdivided into two branches: financial accounting and management accounting. Financial ac-

counting is concerned with the provision of true, fair and objective information about the overall organization to external parties. In contrast, management accounting is concerned with the provision of information to people within the organization to help them make better decisions and improve the efficiency and effectiveness of existing operations (Drury, 2008). In this context Horngren and Sundem (2007) have defined management accounting as the process of identification, measurement, accumulation, analysis, preparation, interpretation and communication of information that assists executives in fulfilling organizational objectives, a formal mechanism for gathering and communicating data for the ends of aiding and coordinating collective decisions in light of the overall goals or objectives of an organization.

This approach emphasizes that management accounting serves two primary functions: a decision-facilitating function and a decision-control or goal-congruence function (Baiman and Sivaramakrishnan, 1991; Zimmerman, 2005; Marchi, 2011; Marchi, 2015; Macchia, 2021). The decision-facilitating function involves using management accounting information for purposes of attention-directing, planning and coordination. The decision control or goal-congruence function involves the use of management accounting information for purposes of setting precise expectations, performance evaluation and compensation (Baiman, 1990; Lambert, 2001, 2007). The fact that management accounting is being used for both decision-making and decision-control purposes may give rise to potential trade-offs that may need to be addressed by managers (Zimmerman, 2005). In summary, according to this first approach, control is conceptualized as one among several functions of management accounting.

In contrast, a second approach defines management accounting from a more systemic perspective and hence the development of Management Accounting Systems (MAS). This is conceptualized as a subset of management tools within the broader realm of management control systems. Within this approach, MCS is a broader term that encompasses MAS, but also includes other control mechanisms such as personnel or clan controls. As understood in this approach, MCS refers to the process of influencing the behaviour of people as members of a formal organization (Flamholtz et al., 1985) and it is composed of a diverse set of practices intended to gain congruence between the organizational strategy and the organizational actors' goals and activities. In accordance with this view, for example, Bisbe and Otley (2004), following Otley and Berry (1994), have defined the term MCS as "*the procedures and processes that managers and other organizational participants use in order to help ensure the achievement of their goals and the goals of their organi-*

zations. Furthermore, according to this view, MCS encompass formal control systems as well as informal personnel and social controls (Ouchi, 1977; Otley, 1980; Chiapello, 1996)". In this broader sense, MCS refer to all devices used by organizations to manage, motivate, monitor, measure and sanction the actions of managers and employees.

In accordance with this view, management accounting refers to a collection of information-based measurement practices such as budgeting, product costing and project management or performance measurement. MAS refer to the systematic use of management accounting to achieve goals. Therefore, MAS refer to a specific subset of formal MCS which encompasses a collection of information-based feedback and measurement systems (Simons 1995) and this last broader definition of MCS is that utilised in this research.

3 The contingency theory

The contingency approach can be traced back to early studies by Burns and Stalker (1961), Thompson (1967), Lawrence and Lorsch (1967) Galbraith (1973) which focused on the impact of environment and technology on organizational structure. Contingency perspectives in management accounting emphasize how there is no a universally appropriate accounting system that can be applied equally in all organizations and in all circumstances. Rather, this approach suggests that the peculiar features of an appropriate accounting system depend upon the specific circumstances in which organizations find themselves (Otley, 1980). The successful design and implementation of a MCS depends on contingent factors such as organizational structure and size (Ouchi, 1977; Bruns and Waterhouse, 1975; Chenhall, 2003, 2007), environment, strategy, technology or culture (Chenhall, 2003, 2007). Contingency approaches claim that the appropriateness of different MCS depends on the setting of the business or better, by the context where the company operates.

Contingency research tries to explain the appropriateness of MCS by examining the attributes of design and use of the MCS that better fit the contextual factors within which the organization operates. Firms that reach a fit or congruence between MCS and the contingent factors are then more effective (Otley, 1980; Goold and Campbell, 1987; Duncan and Moores, 1989; Dent, 1990; Chapman, 1997)[2].

[2] For an overview on contingency theory see the seminal work of Otley (1980), for a

MCS change has been the subject of many professional and academic studies which have produced lists of several factors that it is believed influence management innovation implementation. Otley (1980) and Fisher (1995) suggest "contingent variables are ill-defined" in the literature and relationships and causality among these variables are unknown. Nevertheless, Anderson (1995) and Anderson and Young (1999) classify factors that lead to implementation of MCS according to five classes: *individual, organizational, task, technological and external environment factors*[3].

Individual characteristics are related to procedures and processes that deal with people issues (Chenhall, 2003) e.g. disposition toward change, commitment, involvement, education, informal support, individual attitudes, and, more generally, people interrelationships issues.

Organizational factors are related to the process and the environment within the organization (Chenhall, 2003) e.g. internal communication, incentive compensation schemes, consensus on objectives, formalization, training investments, centralization.

Task characteristics are related to factors which address the work to which the innovation is applied (Kallunki and Silvola, 2007) e.g. employees autonomy and responsibility, uncertainty or lack of goal clarity of the task.

Technological factors are related to practical knowledge of applying the conceptual design of a management innovation within an organizational context (Liu and Pan, 2007). Cavalluzzo and Ittner (2004) define technological issues as the ability of an existing information system to provide required data and develop appropriate measures, e.g. complexity for users, information quality, compatibility with existing systems.

External environment factors are related to the demands on the organization by external forces (Krumwiede, 1998) e.g. heterogeneity of demand, competition, environmental uncertainty.

Contingency theory is usually investigated by quantitative techniques (Fisher, 1995). In response to Otley's (2016) invocation, this paper will study factors influencing MCS change over time following a qualitative approach aiming to provide greater detail; this is the challenge of this paper, especially when considering also the extended period of time involved.

categorization of factors see Fisher (1995) and for a critical review of findings from contingency-based studies over the past 30 years see Chenhall (2003 and 2007) and Otley (2016).

[3] This kind of taxonomy in broad factors has its origin in Anderson (1995), but it was designed on the Rogers' (1983) model of organizational change and innovation where management consideration of an innovation is motivated or constrained by some factors, specifically circumstances in the firm's external and internal environments and by characteristics of the individual.

4 Research method

In illustrating how contingency factors can influence internal accounting practices over an extended period of time, we selected Italy for several reasons. First, the country is well known as the origin of double-entry bookkeeping, a topic which has received considerable attention from both Italian and non-Italian accounting historians (Antonelli et al., 2006; Carmona, 2007). Nevertheless, few published works have examined costing activities in Italian industrial enterprises since the 17th century (Bergamin Barbato et al., 1996; Carmona, 2007) especially the economic and social forces that contributed to designing the architecture of management control systems[4]. Second, for Italy the 20th century represents a period of significant social and political changes and movements towards industrialisation; developments which might have been expected to be linked with changes in the use of accounting. Third, in the segment of time under analysis, Italy experience two world wars, the rise of fascism, the economic boom, political tensions and deep social transformations.

In illustrating how forces internal and external to an enterprise can influence internal accounting practices, we have selected a manufacturing company, Piaggio, for several reasons. First, because of the richness of data contained in its archive that cover the entire period for which the business remained under the control of the Piaggio family (1884-1965) and beyond. Second, Piaggio archives provide us with a glimpse of management accounting across a century in the context of economic instability and political and social tensions that characterized Italy in the segment of time under analysis. Third, over the last 20 years, the Piaggio archives have been examined by economic and business historians, resulting in the publication of a number of major studies of various aspects of the company's history, particularly the

[4] One explanation for this is that, for much of the 18th and 19th centuries, the economy of Italy was heavily reliant on agriculture (Galimberti and Paolazzi, 1998; Ginsborg, 2003; Carmona, 2007). Industrial development, prior to the Unification of 1861, was restricted largely to small-scale textile operations, especially wool and cotton, and confined to Lombardy, Piedmont, Tuscany and Campania (For other details of the industrialisation process in Italy from the 18th century see Caizzi (1965), Are (1974), Mori (1978) and Castronuovo (1980). While other industrial activities were conducted, the fragmented nature of markets consequent on the political division of the country prior to unification in 1861 hindered innovation and the development of large scale industrial operations (Antonelli et al. 2006). In the immediate aftermath of unification, industrialisation, which tended to concentrate in the north of Italy, was held back by the lack of both a modern infrastructure and modern services, and it was not until the last years of the 19th century that Italy began to experience an industrial revolution (Galimberti and Paolazzi, 1998; Antonelli et al., 2006; Carmona, 2007; De Cecco, 2011).

works of Quagli (1998 and 1999) and Fanfani (2001a and b). Nevertheless, until now, no management or accounting historians have examined the company's records for evidence of potential links between contextual factors and accounting control developments over almost a century (1884-1965).

4.1 Sources of the investigation

Sources or archival material constitute a crucial theme in the debate between traditional and new accounting historians (see Fleischman and Tyson, 1997; Carmona et al., 2004). The first base their work on the use of original and primary data, in contrast to secondary, archival material (Carmona et al., 2004). In this respect Carmona et al. (2004, p. 42) argue that a "careful investigator, irrespective of the particular approach embraced […] should always seek to prosecute original and primary sources except when these are not accessible (in which case a clear disclaimer should be made)". Thus, following that recommendation, in this paper we have used accounting records and other documentary sources such as notes deposited by various managers over the time, significant memoranda, minutes of meetings, some interviews of company employees (in over 14 hours of taped interviews, as reported in Table 1) identified basing on their centrality (decision making authority or responsibility in MCS design) and other secondary sources.

Tab. 1 – Case study interviews, number of meetings, duration of each interview

Interviews	**Number of meetings**	**Duration of each interview (in minutes)**
Director of Accounting department (contact person)	2	100
Employee 1 of Accounting department	1	130
Employee 2 of Accounting department (now retired)	3	300
Employee of Technological and operational support department	1	110
Director of Antonella Bechi Piaggio Museum	2	120
Employee of Commercial and marketing department	1	90

The survival of cost accounting records for Piaggio and other documentary sources, especially records deposited by various top managers from the study period, make it possible to piece together key aspects of the MCS of the company and the extent to which it changed over the time. As with many such historical studies, it is not always possible to provide precise details of the use made of the information generated. However, the relationship between changes in managerial approach and accounting is clearly observable from the surviving archival records supported by interviews and the secondary literature.

Unfortunately, details about the economic performances of the company, for instance the amount of total revenues, are not available because the Italian Civil Code law 216 introduced and regulated the profit and loss statement only in 1974.

4 .2 The Archives Fonds of Piaggio

The archives of Piaggio, Located in the Archivio Storico "Antonella Bechi Piaggio" (ASP) in Pontedera (Pisa), contain over 150,000 documents, comprising 4,000 files, includes nine sections with over 3,700 records and a series of unnumbered records, covering the entire period for which the business remained under the control of the Piaggio family and beyond. The company has recently given the Archives a vast cross-section of human resources documentation that contains the details of all the employees and managers who worked at Piaggio from 1917 to the 1970s. Over the last decade, about 150,000 documents, essentially from the Pontedera and Genoa factory offices, have been classed in 13 archive fonds.

The Historical Archives comprise the following sections: 1) Acts and Deeds; 2) Managing Director's files; 3) Lanzara; 4) Human Resources section; 5) Marketing section; 6) Iconography; 7) Production and design; 8) O.M.A.O.; 9) Sarpi; 10) Gilera section; 11) Filippetti section; 12) Confindustria section and 13) Lanzara section miscellany (see table 2 – www.sidrea/accounting-change-vespa).

Although several books have survived over time, only Acts and Deeds, Managing Director's files, Lanzara and Lanzara section miscellany fonds are deeply analysed here because these records contain rich examples management accounting practise, for instance cost allocation techniques.

5. Period I: 1884-World War I

Piaggio was established in 1884 by Rinaldo Piaggio, a rich marquis landowner, who erected a factory in the industrial periphery of Genoa. Ownership of the business was passed on from one generation to another through several generations of the Piaggio family. In 1999 Morgan Grenfell Private Equity acquired Piaggio, in 2003 the ownership of the company passed to Immsi S.p.A and in 2006, Piaggio was floated on the Milan Stock Exchange, becoming a public company (see Table 3).

Tab. 3 - Ownership of Piaggio, 1884-present

	Birth and death		**Ownership of Piaggio**	
Family Piaggio				
Rinaldo Piaggio	1864	1938	1884	1938
Armando Piaggio (son of Rinaldo)	1901	1978	1938	1964
Enrico Piaggio (son of Rinaldo)	1905	1965	1938	1965
Umberto Agnelli (son-in-law of Enrico)	1932	2004	1965	1993
Giovanni Alberto Agnelli (son of Umberto)	1964	1997	1993	1997
Private Equity funds				
Morgan Grenfell Private Equity			1999	2003
Immsi S.p.A			2003	2005
Listed at the Milan Stock Exchange			2006	present

Rinaldo Piaggio was a local merchant who owned a timber sawmill. This was classified "by steam operation" in 1882 and, as such, was among Genoa's most modern mechanized installations. Three years later, in 1903 Piaggio expanded its activity and acquired a new factory in Finale Ligure.

That was a significant period in Italian history. The country was just taking off industrially, its start having come later than that of the major European nations (Galimberti and Paolazzi, 1998). The Great War caused a rise in demand for traditional transport such as ships and trains and, at the same

time, opened a revolutionary frontier, aeronautics; in 1915 Piaggio started building wings and fuselage for new aircrafts.

During World War I, the two Piaggio factories, Sestri Ponente and Finale Ligure, were refitted to manufacture weapons. The factories also began to make motor boats and especially airplanes pushed by the state that considered this rising sector strategically important. The new factory at Finale Ligure manufactured boats, the older factory at Sestri Ponente principally repaired and maintained war planes, but both factories were soon converted to mass-produce airplanes.

The resulting massive growth at Piaggio saw the company continue to pursue its policy of vertical integration production which had begun to take shape before hostilities commenced. This expansion of Piaggio reflected the desire of the company's owners to make the company less reliant on external suppliers.

The company suffered little competition, its activities were based on the job-orders coming from the state, its major customer, and prices were established discretionally by the company itself. As revealed in some memoranda in the archives (ASP, ACTS AND DEEDS, FILZA 110/1), the company used a rudimentary direct costing system where costs were computed considering only variable material and labour costs (paid by the piece). The price was established discretionally and the contribution margin was considered the main indicator. The performances of the company were considered satisfactory and management had little reason to focus on reducing or monitoring costs, or again, planning, controlling and improving efficiency. That activities were considered time consuming, inessential and of low benefit at that time.

6. Period II: Years between the two World Wars and the rise of fascism

The inter-war years were tumultuous in a country wounded by the war and experiencing an extremely complex political, social and economic scenario which fostered the rise of the fascist regime (Galimberti and Paolazzi, 1998; Cinquini, 2007). Like other post-war states, Italy suffered from serious economic difficulties in the post-war period. Unemployment, reconverting military industry to civil industry and the return of war veterans were immense problems. Those on fixed incomes were particularly affected by the economic crisis and the inflation caused by enormous military expenses. The effects of the Russian revolution were also being felt (Cinquini, 2007). While the new Italian parties with greater ties to popular interests (Catholics and

Socialists) failed to reach a political consensus. The result was a period of social instability (known as the 'Red Biennium' of 1919-1920) with many strikes and factory occupations. Fascism[5] developed against this background and started a period of repression of any opposition to the regime.

Afterwards, in the years of the Great Depression, state intervention in the Italian economy developed and became stronger. During the period 1931-1936, as a consequence of bank reform and collapses (1929-1931), the foundation of IMI (Istituto Mobiliare Italiano, in 1931) and of IRI[6] (Istituto per la Ricostruzione Industriale) in 1933 were established with direct dependence on the government.

The Italian industrial system was subject to an organic role of the state in financial intermediation and industry that survived the regime. Between 1937 and 1942 state intervention increased, characterised first by autarchic economic policy (as a consequence of the Abyssinia War[7] in 1935) and, second, by the war economy (Toniolo, 1980; De Cecco, 2002).

After an initial description of the main relevant historical events in Italy during this period, it is of value to analyse Piaggio's experience in this second time frame.

[5] In 1922 (October), the 'march on Rome' by the fascist militias signalled the beginning of the fascist era in Italy and the election of Benito Mussolini as Prime Minister (Galimberti and Paolazzi, 1998; Ciqnuini, 2007). The fascist era was marked by the diminished role of the members of Parliament, the dissolution of opposing political parties and trade unions, the control of newspapers and the institution of a Special Court for State Defence against any opposition (Cinquini, 2007).

[6] IMI was founded in 1931 for the purpose of relieving the banking system of the pressure that arose from the large demand for loans on the part of enterprises, by granting them long-term loans. This action was, however, insufficient and the situation of the banks, which also owned shares in firms, deteriorated until 1933 when IRI was instituted (r.d.l. no. 5, 23 January 1933) in order to cut the ties between banks and industry. IRI bought the shares from the banks with the intention of giving them back to the private entrepreneurs after restructuring the firms, thus holding the shares temporarily.

After the war, the proposal to dismantle IRI was supported by the liberals, parts of big business and of the Catholic world and it was favored also by the representatives of the American government. Nevertheless it failed, not because of the private capital necessary to absorb such a large part of Italy's industry but simply because it was considered unachievable by politicians and economists. Rather, the prevailing opinion was that, thanks to their original formula, the State Holdings could make an important contribution to the industrial development in two spheres where they would essentially overcome the limits faced by private capital, and at the same time act to stimulate it (Galimberti and Paolazzi, 1998; Nardozzi, 2003). In 1937 IRI became a permanent institution and survived to 2002 (Galimberti and Paolazzi, 1998; Nardozzi, 2003; Cinquini, 2007).

[7] After the conquest of Abyssinia, heavy trade sanctions were imposed on Italy by the League of Nations and Italy started a time of government protectionism and autarchic policies. On the Italian economy during fascism see Toniolo (1980) and De Cecco (2002).

On 1917 Piaggio definitive entered the aeronautics sector, investing resources in technology development and skilled personnel, besides increased its size by acquiring a new factory with all its equipment and running orders and established itself in Pisa.

In the years between the two wars Piaggio had three factories in Italy (Sestri Ponente, Finale Ligure and Pisa) and it was considered one of the major Italian companies in terms of size, employee strength, production volumes and turnover. The end of World War I had a marked effect on economic development and the years of conversion from a war-driven to a peacetime economy were extraordinarily difficult.

The diversification of the production into various types of transport helped shield Piaggio from the worst of the post-war crisis, but the uncertainty of the time persuaded the owner to look for a financially solid partner with strong finance and management skills, and in 1920 the company reincarnated as Piaggio & Compagno. The new company witnessed a new phase of expansion as a result of having the best technicians of the time and modernised plants for aeronautical, rail and ship fitting construction.

On 1917 Rinaldo Piaggio bought a new factory in Pisa and transferred the production of railway cars and wheeled vehicles there. Piaggio bought another factory, a car works in Pontedera, began to build airplane engines there and produced engines under license from more established manufacturers, and then began designing its own. In the 1920s and into World War II, the various Piaggio factories were turning out some of the most advanced flying boats in the world, as well as airplane engines, small planes, bombers, passenger and cargo planes capable of transoceanic flights, as well as railway cars and stainless steel locomotives.

Consequently, the factories were bomb targets, both in the First and the second World Wars and the Pontedera plant was completely destroyed in World War II, having been not only bombed by the Allies but mined by the Germans as they retreated. When the war ended, Piaggio had virtually nothing left (Fanfani, 2001b).

When the founder Rinaldo Piaggio died in 1938 the production in his factories in Liguria and Tuscany had crossed the 160 million liras mark and share capital value rose from 22.5 million in March 1938 to 52.5 in November of the same year (Fanfani, 2001b).

The company continued to grow and the policy of using advanced technology and a skilled workforce in both engine and aeronautical production began to reap benefits. In these years Piaggio was building not only trains,

ship fittings, aircraft engines and aircraft but also trucks, trams, buses, funicular railways and aluminium locking systems, often reaching high points of excellence.

Similarly to what happened during the World War First, the state was Piaggio's major customer, placing significant orders. As revealed in some memoranda in the archives (ASP, ACTS AND DEEDS, FILZA 210/12) prices were established by the company itself guaranteeing adequate profits.

In conjunction with the fascist government and World War II, Piaggio increased its production mainly because of the military orders by the state and in 1943 it counted over 12.000 employees (Quagli, 1999).

Again, as during the Great War years, the company suffered little competition and profit performances were considered satisfying. Management had little reasons to focus its efforts on reducing or controlling costs, nevertheless they paid attention in improving production efficiency considering the job orders coming from the state which were referred to a large range of products but of small batch size.

Even if Piaggio increased its size by acquiring new factories, the conversion from a war-driven to a peacetime economy were extraordinarily difficult. The political and economic uncertainty of the time and technological advances, the company did not change its MCS which continued to be based on variable material and labour costs computations.

7. Period III: from World War II to the change in ownership, moving through the Miracolo Italiano (Italian "Economic Miracle")

The controls of the Fascist economy were dismantled relatively quickly post 1945 and a return to free trade, in particular, was rapidly achieved (Graziani, 1972). Since World War II the Italian economy has had very variable growth. In the 1950s and early 1960s, the economy was booming, with record high growth rates, including 6.4% in 1959, 5.8% in 1960, 6.8% in 1961, and 6.1% in 1962 (Zamagni, 1997; Nardozzi, 2003). This rapid and sustained growth was due to the financial aid coming from the European Recovery

Program (or Piano Marshall)[8], the opening of new industries, cheap and unlimited stock of labour force and the liberalization of the economy[9] (Zamagni, 1997; Nardozzi, 2003). The Italian economy experienced an average rate of growth of GDP of 5.8% per year between 1951-63, and 5.0% per year between 1964-73 (Craft and Toniolo, 2008).

The doubling of Italian GDP between 1950 and 1962 had a massive impact on society and culture (Nardozzi, 2003). Largely rural and excluded from the benefits of modern economy during the first half of the century, Italian society was suddenly flooded with a huge variety of cheap consumer goods, such as automobiles, televisions and washing machines. From 1951 to 1971, average per capita income in real terms trebled, a trend accompanied by significant improvements in consumption patterns and living conditions.

The boom lasted almost uninterrupted until the Autunno Caldo (Hot Autumn)'s massive strikes and social unrest of 1969-70 which, combined with the later 1973 oil crisis, gradually cooled the economy; it has never returned to its heady post-war growth rates (Paolazzi and Galimberti, 1998).

The peak of the Miracolo Italiano was reached in 1958-1963 when Italy turned into an industrial economy, but there were emerging tensions that threatened instability, notably the potential conflict between sustaining growth on the basis of low wages and demands for higher consumption resulting from the successful economic development (Nardozzi, 2003; De Cecco, 2011). In 1963, at the end of the "economic miracle", monetary policy suddenly turned restrictive in the face of mounting balance of payments disequilibria and inflation pressures (De Cecco, 2011). These latter were driven by the first significant wage push in fifty years, in the context of the abatement of unemployment and a resurgence of union militancy. The policy reaction was successful in stopping wage increases and in avoiding a much feared devaluation, and the economy managed to return to an equilibrium (albeit slower) growth path until the beginning of the next decade (Nardozzi, 2003; De Cecco, 2011).

[8] In the years 1948 to 1951 Italy received from the United States 1.5 billion dollars, amounting to 2 per cent of GDP, to support the recovery of the country and to modernize industrial plants, especially in the electrical, steel and metals sectors (Fauri, 2010). Again, the European Recovery Program added impetus to the move towards trade liberalization and the European Payments Union (Galimberti and Paolazzi, 1998; Crafts and Magnani, 2011).

[9] The key blow against «external» protection was the decision to join the new, free-trade oriented international monetary system taken by Alcide De Gasperi (the italian prime minister) in October 1946 and ratified the following. Italy subsequently joined GATT (General Agreement on Tariffs and Trade) and the OECD (Organisation for Economic Co-operation and Development), and participated in the related schemes for European free trade and cooperation that would lead to the creation of the European Common Market.

World War II caused enormous damage and directly involved Piaggio and its strategic war production and entailed the total destruction of most of its factories. Italy too was destroyed after World War II, subjected as it was to near-famine, unemployment, and inflation. In 1945 the environment was completely new compared to 1938. The conversion from wartime to peacetime production had a profound effect on the production of metal-machinery companies and Piaggio had also lost its African factories. In Italy, Armando Piaggio slowly began the job of rebuilding necessary to restart aeronautical production and rail and ship fitting. Aircrafts, designed by Casiraghi and D'Ascanio were developed, such as the small, flight instructor P148[10], and this permitted a partial recovery to take place.

On 1964 the company split into Piaggio & C. (in Genoa and Pontedera factories) and I.A.M. Rinaldo Piaggio. This was the final step in a lengthy process of product differentiation that had seen Enrico Piaggio produce two and three wheelers on the one hand and his brother Armando in the aeronautical sector on the other. The following year Enrico Piaggio die. At the time of his death Piaggio had over 10,000 employees and was experiencing a great deal of tension between the company and its workforce that was striking to obtain the increase of their wages.

The scooter industry dipped somewhat in the late 1950s, as wages rose and many consumers spent their money on cars instead of two-wheelers. Production remained high[11] thanks to Vespa, the most famous scooter produced by Piaggio, and Ape, a three-wheel van, though by the end of the 1970s the company was hampered by labour disputes. Strikes held down production to about three-quarters capacity in 1979, though sales were nevertheless close to $500 million, and Piaggio turned a profit. Costs increased as the company spent more on developing new models, and also spent money on acquisitions

[10]The P.148 is an all-metal low-wing cantilever monoplane with fixed tailwheel landing gear. It offers room for two occupants in side-by-side seating as well as an optional third seat. The prototype first flew on the 12 February 1951 and, after testing by the Italian Air Force, was ordered into production for the air force primary training schools.

[11] For instance on July 1964 Piaggio manufactured daily an average of 282 Vespas model 50 N, 111 Vespas model 90 and model 50s, 268 Vespas model 125, 100 Vespas model 150, 65 Vespas model 150GL, 57 Vespas model GS for a total amount of 883 Vespas. Again, Piaggio produced 146,5 Ape model 150 and model 175, and 0,5 Pentarò. Globally, in 1964 the company manufactured 33.667 Ape, 364 Pentarò and 210,917 Vespas (ASP, FONDO LANZARA, FILZA 515/9). That volumes represented a significant increase compared to 1961 when Piaggio produced 186.140 Vespas, 24.403 Ape, 1.260 Pentarò and moreover in 1962 when the company manufacturing 156.103 Vespas, 21.721 Ape, 771 Pentarò (ASP, FONDO LANZARA, FILZA 243/1).

such as Gilera, a leading Italian motorcycle manufacturer. Foreign sales still made up more than 40 percent of Piaggio's business in 1964 (Quagli, 1999).

Piaggio's expansion survived the difficult 1960s, for instance tensions with the workforce because of numerous sacking of employees and in 1966 when a disastrous flood hit the Pontedera factory (Quagli, 1999). As a mono-sector company it went through the normal ups and downs but, in times of real crisis, it always managed to react quickly with openness to innovation and excellent technical capability (Quagli, 1999; Mazzanti, 2003). At the beginning on 1970s Piaggio increased the size of its workforce which in 1972 amounted to 8.290 employees (Quagli, 1999).

Even if, from 1946, Piaggio started changing its competitive strategy becoming a mass production company[12], its MCS were still rudimentary and based on job-orders, focused on variable material and labour costs, traditionally recommended for the manufacture of highly customized products in low volume and a heritage of Piaggio's activities in the railway and aeronautics sectors. Thus, MCS was inadequate for large volume productions as was the case of the company after the war. Job-order costing is required in organizations where each unit or batch of output of a product or service is unique, creating the need for the cost of each unit to be calculated separately. Piaggio was a mass production manufacturer and the use of job-order costing had some disadvantage in terms of efficiency, because the company could not to compute in advance the cost of the product, conversely, it was available only at the end of the work generating a delay of more than two months in fixing the price.

Furthermore, Piaggio was becoming a mass production manufacturer and had thousands of customers, several of them price sensitive (the days when the state was the main customer and the company could fix prices at its discretion were far away). Consequently, the company needed to know its costs before the end of production. Indeed, considering that Piaggio was a mass producer of homogenous products and repetitive assembly work, the adoption of a MCS based on standard cost would have been preferable in term of efficiency. However, the scarce attention addressed to standard costing computation (and variances) was consistent with the scepticism concerning its use typical of scholars during that period, as highlighted by Coda (1970, p. 6).

Following the job-order costing system, Piaggio administrative offices in Genoa issued a formal authorization for production requisition indicating

[12] In 1946 Piaggio produced 2.484 Vespa and the production increased gradually over time, 61.881 in 1950, 171.200 in 1953 and 220.823 in 1956 (Quagli, 1999).

volume (usually some thousands of units), models (for instance Vespa, Ape, spare parts) and the time of the delivery of the production. The absence of an administrative office in Pontedera, near the factory, was another cause of delay in computing costs and fixing prices increasing inefficiencies.

Cost leadership was one of the main concerns of the new competitive strategy of Piaggio. Its products were cheap and addressed to a mass customer base, thus the company started the implementation of a new system to monitor expenditures. Research into efficiency was based on the control of variable costs, indeed direct labour, materials and external supply; conversely monitoring and research for efficiency of fixed cost was quite scarce. Two main factors can explain the behaviour of Piaggio in this respect. First, the company was experiencing an ongoing market expansion over the period 1946-1964 and the increase of volume leads a company to concentrate its efforts in retraining variable costs per unit because since the rise of production leads to a reduction in fixed cost per unit. Despite the fact that the incidence of fixed costs was high, Piaggio employed direct labour hours as cost driver to assign common costs (for example machinery depreciation, indirect labour costs like the administrative workforce that increased over the time consequent to Piaggio's growth) which were usually fixed in nature. In 1946 mark-up of common costs were impressive: 260% in 1948, 297% in 1949 and 471% in 1962 that was 4,7 liras of common costs each lira of direct labour cost (APS PIAGGIO, FONDO LANZARA, FILZA 158/1 and 243/1).

In some circumstances, for instance for the computation of the sale price of the product, Piaggio made exclusively use of variable costs referred to the production, indeed the prime cost, excluding common costs referred to other activities not linked to the manufacture work. In determining the prime costs, Piaggio considered costs of labour, material and external supplies.

The scarce interest in monitoring fixed costs, moreover those not linked to the manufacturing costs for instance for the administrative department, could have been motivated by the greater power of accounting in mobilizing organizational action and power within the company. Potentially, this could have been the source of social and administrative struggles and resistance to change. Conversely, the focus on variable costs, especially on raw materials and labour, could generate low level of conflicts (Bernardi, 1987; Dalli, 1996; Quagli, 1999).

8. Discussion and conclusion

By using accounting records and other documentary sources, this paper

has examined the evolution of accounting practices and structure of internal control at the Italian manufacturer Piaggio over almost a century. The period considered is from its founding in 1884, to the change in its ownership in 1965, and has provided some insights into the forces that conditioned (or did not) the management accounting systems architecture of the company.

In this respect, the paper has shown that MCS in Piaggio were initially based on job-orders and batch production with a special focus on variable costs. Over time, this progressively evolved toward more sophisticated systems based on the allocation of overhead costs by cost centres using an increasing number of allocation bases; these were initially restricted to the hours of direct labour and later enlarged (for instance to the volume of raw materials) to gain efficiency especially in mass production.

The analysis of the structure of control systems adopted in Piaggio in the three time segments under investigation (a) 1884-World War I; b) years between the two World Wars and c) World War II, Miracolo Italiano and the change of ownership of the company shows that changes in MCS architecture were motivated by the influence of some internal and external forces.

During the first and the second period the structure of the control system appears affected by the size of the company (small and based on an artisanal business), the influence of state orders that guaranteed adequate profits to the company, the change in production caused by the war and the limited market. All these factors, mainly linked to external circumstances, made the use of monitoring activities based on job-orders and batch production system adequate in the company's early years. Conversely, the third period saw the rise of a different architecture of MCS and other contextual factors appeared (Table 4).

First of all, Piaggio passed from a small-scale artisanal business into a much larger industrial concern increasing its size and production. Some of the forces that supported this process can be traced to increased sales due, for instance, to the end of protectionism that had characterized the fascist period, the economic aid from the European Recovery Program and in general terms to the expansion of the Italian economy after World War II. The rise in production demanded a more sophisticated MCS to gain efficiency, but its design was shaped by several forces such as the scarcity of raw materials, calls for wage increases followed by strikes and the intervention of trade unions to support the workforce.

Tab. 4 - Contingency factors and MCS implemented

Period under analysis	MCS employed	Contingent factors
Period 1: 1884-1918	Job order system based on vertical integration Direct costing	• Industrial sector expansion • Little market competition (strong market position of the company guaranteed by state orders)
Period 2: 1919-1945	Job order system based on vertical integration Direct costing	• Political uncertainty - autarky • Market expansion in African colonies • Little market competition (strong market position of the company guaranteed by state orders)
Period 3: 1946-1965	Two stage cost allocation system (based on two stages for overheard costs) Full costing	• Size increase • Changes in organization structure • Changes in competitive strategy • Changes in technology (production diversification) • Social tensions and strikes • Resistance to change • Market expansion

The factory in Pontedera and the headquarter in Genoa were among the sources of the inefficiency of the company because of their roles in delaying the internal communication flows and Piaggio did not start using data processing machines before 1957. Again, on some occasions Piaggio attempted to rationalize and monitor costs in a more effective way, for instance by putting more emphasis on fixed rather than variable costs, but management (in spite of pressures coming from the Piaggio's consultancy firm) preferred stopping these attempts because they could generate internal conflict among the personnel and resistance to change.

The findings from this paper highlight that the developments and changes that occurred in the structure of MCS in Piaggio (mainly based on cost accounting calculation procedures) were carried out in order to enable the business to survive and respond to changes such as in products, technology, company size, competitive strategy, market pressures and social and political transformation that characterized the period under analysis and more in general Italy in the last century. The Piaggio case suggests that management accounting practices result from local responses to specific managerial and organizational needs.

The first period saw a fit between the MCS used by the company and the

contingency factors present in that period and the management was quite satisfied with the system used even if very basic, rudimentary and not so precise.

The second period saw an evolution of the company. The state continued to be the main customer of the company even if its orders were referred to a large range of products in small batch sizes and the use of job order costing started to be less efficient as the fit between MCS and contingent factors decreased.

The third period saw a deep transformation of the company from artisanal based production to a mass production with several products showing a significant mismatch between the MCS used until that time and the contingent variables that were influencing the company both internally and externally. To reach a new fit Piaggio implemented a new MCS no longer based on job orders but on the calculation of full costing.

The paper contains some limitations due, for instance, to the use of a qualitative approach. This is often criticized because results are not generalizable and replicable (e.g. Cooper and Morgan, 2008)[13]. Cooper and Morgan (2008) highlight that those factors are present only in natural science. The same authors point out that case studies are useful in raising questions, highlighting issues, developing and testing theory and providing a guidance in solving problems. In this case, the longitudinal case approach, based on archival data, was the only feasible approach to use in analysing the weight of internal and external pressure on the evolution of MCS over a long time period.

Again, several investigations (e.g. Fisher, 1995, Anderson, 1995, Chenhall, 2007) shows relationships among contingent variables in management accounting change process but it is beyond the scope of this article to delineate the exact interrelationship among the contingent factors.

In spite of potential limitations due the use of qualitative research this paper is of relevance for practitioners who are facing a period of great instability and deep changes in the internal (for instance by the increase of mergers and acquisitions because of the financial and economic current crisis) and external context (due for instance to the political tensions experienced in recent years).

Further avenues of research can investigate in the features of MCS after the death of Enrico Piaggio, the change of ownership and the control of Fiat which, as revealed in the Piaggio Archives, caused several changes in cost accounting and more generally in MCS.

[13] For more insights about case study research in management accounting see Cooper and Morgan (2008).

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