Notes

Acknowledgements

1 See, in particular, Traù (1999, 2000, 2001).

Introduction

1 It is impossible to give a complete account here of the contributions on the matter. A very stylized picture of the state of the art at the end of the century may include: (i) empirical analyses developed within some international institutions (namely, OECD and ILO) in order to provide an adequately sound evidence for the phenomenon (especially in the light of an international comparison of its actual intensity): from this point of view, we can recall here (below, chapter 3) the works by OECD (1985) and Sengenberger *et al*. (1990); (ii) books such as those by Piore and Sabel (1984), and Best (1990), which represent an attempt to set the alleged changes within the framework of a "new paradigm" of industrial development; (iii) the birth of several scientific journals aimed at analysing the present state and the future of the small business sector in the industrial system (above all in this connection, *Small Business Economics*, directed by two leading scholars in the field, Z. Acs and D. Audretsch, who are also authors or editors of several books on the subject).
2 Examples of these sorts of analyses can be found in Sengenberger *et al*. (1990), Acs and Audretsch (1990).
3 The basic reference for approaching the Golden Age issue still remains the essay by Glyn *et al*. (1990).
4 Both factors are recalled in a contribution by Carlsson (1996, see more widely chapter 1 here), but without any reference to the Golden Age issue (on the other hand, no explicit reference to them is made in the above mentioned contribution by Glyn *et al*.). In a similar perspective, the question of uncertainty is also raised by Vercelli (1988).
5 On this point see, for instance, Schrader (1993).
6 See on the point a very recent paper by Kay (2001).

1 The Macroeconomic Context in Historical Perspective: Exogenous and Endogenous Changes in Firms' 'Competitive Environment'

1 As recently as the late 1970s, the empirical investigation carried out by Prais (1981) still led the author to conclude that "in the current … period [i.e. in the years following 1950] it appears that factors systematically favouring a relatively faster rate of growth by large firms have become dominant; these have combined with the general diffusion process to make for an unprecedented rate of increase in concentration, to which no limit can be seen at present" (p. 40).

2 In this connection a number of extremely interesting critical considerations were made by Meade (1968) in a review of Galbraith's 1967 book; owing to their exceptional relevance with respect to our analysis, we quote from that contribution below, in a more appropriate context (see section 1.2.5).
3 No attempt will be made here to review the literature on the subject; we will simply note the title of the volume edited in 1971 by Marris and Wood (*The Corporate Economy*), which tried to set forth a first assessment of the issue, including papers by some important theoretical scholars of the time. See anyway below (chapter 2).
4 It could be said that the bulk of organizational research acts as a catalyst drawing attention to the "problem" of large firms, thus favouring the recovery of the conceptual assumptions made by Berle and Means as early as the beginning of the 1930s. The obvious (basic) references to be made here are to Simon (1945) and Cyert and March (1963). For a more detailed analysis of the whole matter see chapter 2 below.
5 See Momigliano (1971, p. x, my own translation).
6 See again Momigliano (1971, p. viii, my own translation; emphasis added).
7 According to Engel's Law, this means a high degree of income elasticity of demand for manufactured goods. In particular, this phenomenon is enhanced by the specific relevance, *within* the manufacturing sector, assumed by the production of basic inputs and mass standardized goods – often associated with large firm size.
8 See specifically on this point the perspective opened by Richardson's analysis (1960), here analysed in chapter 2.
9 Actually, the need to stabilize upstream and downstream markets begins to appear as an organizational problem long before the second post-war period. As is argued by Kocka (1978) about German industry in the early years of the century, 'even the slightest upset in production meant massive losses; diversification into raw materials and transport allowed this risk to be minimized; diversification of this sort made it possible to calculate as fixed costs the charges which had hitherto been dependent on unforeseeable market changes; these strategies served the firms' repeatedly emphasized aim of seeking the greatest possible "market independence" ' (p. 560). As far as downstream industries are concerned, this is also linked to the relative incompleteness of the markets for intermediate inputs in the initial stages of industrial development. More broadly, it can be said that the emphasis put on fixed costs as a factor of risk *reduction* – seen from the quite opposite perspective of the late 1990s – highlights the enormous importance of the changes occurred in the "external" context to explain firm behaviour (see below, sections 1.2 and 1.3).
10 As noted by Carlsson (1996, p. 80), "During the first few decades of the post-war period, firms tended to diversify in order to reduce their exposure risk. This was the golden era of conglomerates". Indeed, the question was clearly perceived by economic analysts since the Golden Age years: in commenting the results of an empirical research by the Federal Trade Commission (*Industrial Concentration and Product Diversification in the Thousand Largest Manufacturing Companies*, US Government Printing Office, 1957), Edwards (1963, p. 119) stresses that "the bigness of the largest enterprises was derived partly from their spread across products and industries, rather than their dominance of single-industry markets".

11 It may be noted that "lateral" integration in this connection applies regardless of its responding to the emergence of scope economies among different activities.
12 The notion of M-form, whose formulation in descriptive terms dates back to Chandler (1966), was set out theoretically by Williamson in two successive contributions (1970 and 1971). Williamson's assumption is that "finite spans of control naturally require that additional hierarchical levels be introduced as the U-form enterprise expands" (1971, p. 346); as this has the effect of reducing the degree of control of managers and amplifying the problems as to the discretional behaviour of each hierarchical level, the firm is induced to adopt a structure (M-form) which is based on breaking down the previous unit into "natural decision units" with substantial decision-making autonomy. The new organization, which is thus made up of "quasi-enterprises" which are subject to a single strategic function, involves relatively lower information requirements (and therefore costs), in addition to a clearer definition of decision-making responsibilities. It has to be recalled in any case that on historical grounds the very first appearance of the M-form actually takes place as early as the 1920s, and coincides with the restructuring of General Motors (see on the point Sloan, 1963, especially chapters 4 and 14).
13 See the review by Hughes and Singh (1980) on this specific point; the importance of mergers in increasing the degree of industrial concentration had already been stressed, with reference to the English experience in the 1950s and 1960s, by Utton (1971).
14 The whole question can be included in the broader issue of the crisis of the so-called Fordist paradigm in many large-scale production types, as has been analysed by Piore and Sabel (1984). It is worthwhile to notice that, according to Piore and Sabel, the effects of mass production on industrial structure did not simply apply to market economies, but also to (formerly) planned economies of Eastern Europe as well as to many developing countries.
15 From here onwards the empirical analysis – unless otherwise specified – refers to a group of six industrial countries comprising France, (West) Germany, Italy, United Kingdom, United States and Japan.
16 As emphasized by Glyn *et al*. (1990, p. 51), "the Golden Age could be regarded as primarily domestically based".
17 The notion of X-inefficiency (first introduced by Leibenstein around the mid-1960s: see the synthesis in Leibenstein 1976) is here meant to recall the reduction of the degree of "in-built" inefficiency occurring when the competition mechanism is at work. See on the point also chapter 2 below.
18 In recent years a number of attempts aimed at (re)founding a theory of firms' boundaries based on *production* prerequisites has been developed, revolving around the notion of "competence" (for a full review of this issue, see Foss and Knudsen, 1996). This overall perspective includes different approaches, more or less centred on the analysis of some "knowledge capital" allowing the firm to achieve better results than its competitors. Competence is seen in this context as an asset which rests with *individuals*, but is really to be found in *organizations*, which are the basic subject of analysis ("firms are seen essentially as repositories of competence", Foss and Knudsen 1996, p. 1). Seen in this way, the possibility for firms to grow both vertically and horizontally is strictly linked to their abilities to develop *from within* (and dynamically) the

necessary knowledge. According to this view both "the death of the conglomerate" and "the need for a return to core business" (p. 3) are attributed to the impossibility to sustain permanent diversification as a long-term corporate strategy.

19 As has been noted by Singh (1997), there is a change from a situation in which "not only were they [the developed economies] subject to international capital controls under the Bretton Woods regime, [but] they also had a plethora of controls, regulations, and other restrictive practices in the domestic product, capital and labour markets" (p. 14), to a situation in which financial liberalization and globalization "create enormous scope for destabilising speculation which in turn leads to high volatility of both monetary and real variables" (p. 24).

20 As has been noted, 'under the Bretton Woods system, foreign exchange risk was borne by the public sector. With that system's collapse, foreign exchange risk was privatized' (Eatwell, 1995, p. 278).

21 'With the events of the 1970s and 1980s … the resulting volatility of world markets incorporated more elements of genuine uncertainty than "mere" risk' (Carlsson, 1996, p. 80).

22 In this case, the exact opposite occurs of what was said before (see section 11) about the tendency of firms to *increase* their degree of vertical integration when demand is particularly *stable* (that is to say when the downward rigidity of input use is *not* a major problem).

23 In particular, it can be noted that the slowing down of growth in the two more recently industrialized countries (Italy and Japan) is less evident, and that this is associated – in both periods – to a lower variance. As far as the United Kingdom is concerned, variability is simply measured by the standard deviation, owing to the very low value of the average. As can clearly be seen, in this specific case variability is in any case higher than in the second period in absolute terms, and is all the more so in relative terms (that is to say as against the average, which in the second period collapses).

24 In the years following 1973 the conditions which allowed the European countries to catch up with the United States (the leading industrial country in the first post-war phase) gradually disappeared, and at the same time a break in the structural link between output and productivity – according to a Kaldor–Verdoorn view – occurred. This means that the positive impact of technological progress on output growth is reduced, and vice versa. On this issue see Matthews (1982).

25 The fact that output growth is lower than productivity growth may be linked, in the more recent phase and especially in European countries in which the phenomenon is stronger, to the effects of restrictive policies due to need to meet the Maastricht criteria. But in a long-run perspective the crucial difference between the two phases lies in the very uniqueness of the Golden Age: as Kindleberger pointed out as early as in the 1950s (1958, p. 315), "the higher rate of growth has the prospect of slowing down"; that is to say "the Gompertz or S curve applies more or less roughly to growth problems. On only a small portion of it can geometric rates of growth be extrapolated, and then not for long". From this point of view, the endogenous component of the phenomenon re-emerges; we might even go as far as to say that the conditions under which firms' expansion reaches its

extreme must be considered absolutely anomalous and therefore cannot be repeated.

26 Indeed, as technological advances gradually allow the setting up of (flexible) manufacturing *systems*, which by their very nature are characterized by large minimum size, the question of indivisibilities comes back again. See for example on the point Mansfield (1992).

27 The point has been widely analysed by Carlsson (1989) and Carlsson *et al*. (1994), according to whom in the US – from the early 1970s to the mid-1980s – those industries most affected by the introduction of numerically controlled machines in production processes underwent a reduction in size (and vice versa). On the broader issue of the relation between firm size and technology see also Dosi (1988).

28 The term "unit" here is intended in the meaning suggested by Austin Robinson (1935); see on this specific point chapter 2 below (sections 2.4 and 2.6).

29 It needs to be stressed in this connection that in more recent years information technologies have spanned across the whole range of the internal activities (functions) of industrial firms. In such a way they have deeply altered the very boundaries of the various activities, making it difficult, in some cases, even to find any boundaries at all between them.

30 A reference can be made to the findings presented as early as the 1940s in a Symposium of the American Economic Association (see, in particular, the paper by Blair, 1948), as well as to many other contributions (see, among others, Pryor 1972, Sargant Florence 1954).

31 The question assumes major relevance in the Italian case, where a peculiarly high proportion of small-scale production units – tied to lagging industrial development – has been a decisive factor in pushing up the growth of the small business sector since the early 1970s (see below, chapters 3 to 5).

32 The perspective suggested by Ms Harrigan appears quite similar to that revealed by Meade's insights (see section 1.1). It also highlights some of the questions raised in chapter 2 of this book (see in particular sections 2.4 and 2.5).

33 For a comprehensive discussion about the methodological issues related to vertical integration measures see Maddigan (1981).

34 The values shown in Figure 1.6 correspond to the (simple) average of the values available at the sectoral level (at input costs – subject to exceptions – and at current prices). Calculations do not include a number of sectors structurally characterized by a limited possibility to break down individual production stages (see table C.2 in Appendix C).

35 A much deeper empirical investigation of the phenomenon analysed here – referring to the four European countries we consider in our analysis – can be found in Arrighetti (1999), whose findings – based upon a different data-set – show a more remarkable fall in the Adelman Index for both Germany and the UK.

36 "Such acquisitions thus reflect the same phenomenon that appears to underlie most friendly takeovers in the 1980s: firms buying other firms or a closely related industry" (p. 44).

37 Properly, the dynamics of self-employment (commonly observed in similar contexts – see, for example, Davis and Henrekson, 1999) measures the

performance of *that* part of self-employment working not only without any employees, but also without resorting to *other* self-employed co-workers. As on the basis of this data the analysis would simply be limited to freelance workers, we consider here the *whole* of self-employment (including co-workers in firms which also make use of employees). Even without considering the problems posed by the lower reliability of estimates concerning freelance self-employed, this figure identifies more precisely (when set against total employment) all those people who work as *entrepreneurs* within firms.

38 Obviously the whole question must be evaluated also taking into account the "pressure" exerted by the very existence of high levels of unemployment on the propensity to self-employment. For a review of this problem see, for example, Meager (1992).

39 When considered in relation to the decreasing trend shown by total unemployment in absolute terms (see section 1.2), such trends show how the creation of new firms accompanying the de-verticalization process is probably linked to spin-off effects (the growing number of self-employed is paralleled by a *decreasing* number of employees).

40 The case which is being made can be highlighted by considering the importance taken on – as the corporate economy reached its climax – by state-owned firms in the Italian case.

41 For a deeper discussion of Simon's analysis about the matter see below, chapter 2.

42 In organizational terms, the above mentioned change recalls the difference made, following Burns and Stalker (1961), by J. Woodward (1965, pp. 23–5) about "mechanistic" systems (characterized by a "well developed command hierarchy through which information filters up and decisions and instructions flow down") as opposed to "organic" ones (which are "more adaptable" and where "jobs lose much of their formal definition"). Most relevant, from the point of view of our work, is the conclusion according to which "mechanistic systems are appropriate to stable conditions and organic systems to conditions of change", for the former are more suitable for standardized production, whereas the latter give a better answer to "one off"-type production, aimed at meeting customers' individual requirements. The question is also recalled by Postan (1967, chapter XI).

2 A Theoretical Framework

1 See here, for instance, Simon (1945), Papandreou (1952), Boulding (1952).

2 For a general overview of the whole question see Hughes (1987).

3 The fact that according to this view there is a difference (organizational slack) between total resources and what are defined as the "total necessary payments" (corresponding to the cost of settling disputes) implies that firms always pay a price for abandoning the optimizing behaviour typical of an agent acting in a perfectly competitive market. Such behaviour is prevented by the fact that, unlike what normally happens in a perfectly competitive market, its decision-making system depends on a *whole series* of individuals, each of whom has *its own* utility function.

4 See the definition given by Alchian and Demsetz (1972); but in a very similar view see also the basic assumptions of the "principal–agent" approach (for all, Jensen and Meckling, 1976).
5 "A workman does not move from Department Y to Department X, because the price in X has risen enough relative to to the price in Y to make the move worthwhile for him. He moves from Y to X because he is ordered to do so" (Coase, 1972, p. 63). It can be noted that such a view appears very close to Marx's analysis (see Putterman, 1986); a very similar point of view can also be found in D. Robertson (1928).
6 Of course, growth may nonetheless bring about lower costs simply as a consequence of the possible emergence of *scope* economies.
7 See Cyert and March (1963).
8 From our point of view, a general formulation of this principle (see, for instance, Williamson, 1993) may be that insofar as contracts cannot escape from incompleteness, opportunistic behaviour – as it is allowed by bounded rationality – makes way for vertical integration, so as to put transactions under the control of the entrepreneur's authority. The higher assets' specificity (that is, the degree in which parties are mutually dependent for their investments), the stronger the incentive to integrate.
9 The condition for both situations (the integrated versus the non-integrated "multi-firm" economy) to be indifferent on "technical" grounds would be that the total amount of inputs (of costs) required for producing a given output were the same. For *overall* costs to be identical in the two situations, the costs of transacting among (small) decentralized agents should also equal the costs borne by the integrated firm for "transferring" intermediate inputs internally across the different stages of production. Transacting costs include the search for information (below, section 2.4) and the sum of the mark-ups which (small) firms in the "intermediate" phases of the production chain add to their unit costs. The tightening of competiton, in this context, may tend to squeeze "intermediate" firms' mark-up towards zero (the market option involves the absence of any market power), but it can hardly contribute to determine any differences between the two systems of production as it relates to "technical" costs: *all* firms, be they vertically dis-integrated or not, are pushed to minimize costs. On the other hand, increasing market turbulence raises the costs for gathering information. In a static perspective, unless exceptional changes on technological grounds are admitted (leading to higher technical efficiency for smaller-scale plants), "economizing" will produce fairly similar results in both cases. The only relevant effect which vertical dis-integration may involve could stem – more or less according to some "Stiglerian" view – from the existence of *dynamic* economies arising from growing *specialization* (as this is brought about by the sheer decomposition of the production process). But this should in turn require a quite substantial *expansion* of the market: however, whereas it is certainly true that *some* markets for products have experienced a strong expansion, on average the "fall" in the size of firms has been paralleled, as we have seen, by the ending of the Golden Age, that is by a sharp reduction (jointly with rising average volatility) in the output rate of growth of the major industrial economies.
10 The authors explicitly refer to works by Powell (1990) and Loasby (1994).

11 As Robinson's view is specifically concerned, things are obviously to be considered as more complex. See in particular section 2.4 below and section 5.1 in chapter 5.
12 'A mythical visitor from Mars, not having been apprised of the centrality of markets and contracts, might find the new institutional economics rather astonishing. (…) For almost all of the inhabitants would be employees, hence inside the firm boundaries [,] organizations would be the dominant feature of the landscape. (…) Our visitor might be surprised to hear the structure called a market economy. "Wouldn't 'organizational economy' be the more appropriate term?" it might ask' (Simon, 1991, p. 28).
13 From this point of view, wages reflect the willingness of employees to "bear the brunt of … uncertainty as to what actions will be chosen".
14 This reflects a basic scepticism about the possibility of controlling the behaviour of employees through enforcement mechanisms (such as those envisaged in principal–agent models), due to the huge amount of resources that would be required for a similar purpose (on this point see also Chang and Singh, 1997). More generally, this has to do with a view according to which "the attempts of the new institutional economics to explain organizational behaviour solely in terms of agency, asymmetric information, transaction costs, opportunism and other concepts drawn from neoclassical economics ignore key organizational mechanisms like authority, identification, and coordination and hence are seriously incomplete" (Simon, 1991, p. 42).
15 Such a way of looking at organizational behaviour seems to get close to Ouchi's (1980) treatment of the role of "clans" (indeed, Ouchi explicitly refers to Simon's 1945 book), according to which within an organization the incongruence among the objectives of different agents and ambiguity in performance evaluation can be minimized by the "organic solidarity" stemming, as a "form of mediation", from the unavoidable dependence of individuals on each other.
16 This seems to be especially relevant in view of the fact that, as we know, the tendency to reducing organizational complexity (to reducing size) has been quite intense in large companies, where such principles had played a very important role in the course of the Golden Age of industrial development.
17 A similar point may be raised starting from the perspective of the relationship between "formal" and "real" authority inside organizations. As is suggested – even if in a quite different context than ours – by Aghion and Tirole (1997), who explicity refer to Max Weber, it can be said that the ownership of an asset does not necessarily confer *real* authority, in terms of an effective control over decisions. This view – which can be considered quite at odds with the hypotheses put forth, for example, by theorists like Hart and Moore (1990) – hinges upon the principle that the administrative staff of a bureaucracy may exert *in its turn* a quite substantial control over the "bureaucratic machinery", even in the absence of any ownership of (non-human) means of production. The key role in this context is played by asymmetric information: "formal" authority can prevail *only* when owners ("principals") have adequate information about the projects which are proposed by subordinates ("agents"). An important point here is that "a principal who is overloaded with too many activities … and therefore has little time to acquire the relevant information on each activity loses effective control and involuntarily

endorses many sub-optimal projects" (Aghion and Tirole, p. 3); from the point of view of the present work this means that as far as the amount of "relevant" information gets greater because of the growing complexity of the problems to be taken under control (for instance, as a consequence of rising uncertainty), the efficiency of organizations may tend to fall. This specific issue is at the root of the analysis developed in section 2.4 below.

18 Malmgren calls this kind of information "controlled information"; Richardson terms it 'technical information'.

19 Indeed, "provided its efficiency … in controlling its primary data does not fall" (Malmgren, 1961, p. 416).

20 It has to be stressed in this connection that also the *overall costs* of gathering information may anyway rise even in the face of *falling unit* (per message) costs, when the number of messages rises. And this is just what actually happens, since firms have now to face an often overwhelming *amount* of messages, which need more and more resources simply to be *processed*.

21 A fairly similar point can be found in Arrow (1984, p. 145), when observing that the strongest constraint in the acquisition of information "is the limitation on the ability of any individual [of the human mind] to process information".

22 From this point of view it can be said that the rate of development of internal "coordinating ability" affects the *speed* at which firms can expand. A wider analysis of the whole question can be found in Traù (1996).

23 The whole question raised above is paid more specific attention in chapter 5 (section 5.1.2).

24 Properly, in this connection we have to take into account that the managerial role does not simply coincide with *control* (managers are also required to innovate, to find new market opportunities and so on). And, indeed, the lack of such capabilities appears to be the most significant force acting against new (small) firms' expansion.

25 For a proper discussion about the whole matter see for instance Brewer (1994, ch. 4).

26 "The appropriate support for a physical structure is a perfect diagram of the forces tending to destroy it" (Haire, 1959, p. 276). Or, in more "analogical" terms, "a deer cannot grow as big as an elephant and still look like a deer; it has to look (something) like an elephant to support the elephant mass" (p. 274).

27 A similar point is raised by Radner (1992), who shows how the secular rise in the size of US firms since 1900 has been paralleled by a regular increase in the share of the labour force devoted to "managing" activities (broadly defined as those where people are involved in "figuring out what to do, in contrast to do it", p. 1387).

28 This is also partially due to the fact that it is not that easy to simply "buy" resources from outside, because of the existence of something like a Penrose constraint ("efficient" organizational resources can only ripen *inside* the firm). Insofar as it acts on the "speed" of the growth process (see section 2.4.2), this specific effect entails some lag in the rhythm of expansion of internal input endowments with respect to the rise of coordination costs. As Marris (1964) puts it, "organisation must be created where none existed before, recruits must be found, new tasks undertaken and new delegation-patterns developed.

It is axiomatic that such planning can only be undertaken by existing members. If an organisation is to remain efficient, it cannot possibly expand at an indefinitely rapid rate merely by infinitely rapid recruitment" (p. 114).

29 The market price of externalized inputs may be lower or *equal* to the cost of producing them internally.

30 As we saw in chapter 1, this seems not to be true for Japan (see Figure 1.5), with respect to which, however, we do not have at disposal data about *firms*.

31 Macroeconomic changes have to be considered in turn as endogenous with respect to the forces leading to the exhausting of the Golden Age.

32 In other words, the firm cannot absorb rising unit costs (involved by the passage from π_1 to π_2) by rising output prices.

33 In a rather similar perspective the relationship between information costs and the internal organization of firms (viewed in its turn as closely related to size) has been recently addressed on theoretical grounds by Casson (1996). Starting from the premise that "organisational structure can be explained as the outcome of attempts to minimise information costs", Casson shows that smaller firms will "specialise" in volatile environments (more precisely, in environments "which have a single major source" of volatility), whereas larger ones will tend to operate in relatively stable environments (i.e. those in which "no source of volatility is sufficiently large to dominate the others"). This is linked to the fact that small units rely less than large enterprises on complex routine procedures (which require a "consultative management style"), and are on the contrary characterized by an "autocratic" style of management, grounded upon the belief that the entrepreneur possesses "the key information relevant to the decision" (pp. 329–30).

34 It seems important to stress here that an excess of *entrepreneurial* supply (in the sense suggested by Tuck) may be quite compatible with an overall shortage of *managerial* resources.

3 Empirical Analysis I: Employment Shares and Absolute Employment Growth at the Size Level for Firms and Establishments: Six Industrial Countries in Two Different Phases of Industrial Development

1 This analysis culminated in the proposition – by Sabel and others – of the model of "flexible specialization". See, in particular, Piore and Sabel (1984). A (very) critical reconsideration of the whole matter can be found in Landes (1984); an attempt to envisage the question within the framework of a wider theory of competitive adaption can be found in Best (1990).

2 In terms of original calculations, the OECD analysis provided evidence, with reference to various industrial countries, about the trend of manufacturing employment shares in four size classes, drawn from various sources. The report also surveyed available statistical evidence about the impact of firm entries and exits on net job creation.

3 The analysis comprises the G7 Group with the exception of Canada – that is, the four largest European economies, United States and Japan. Each country is paid specific attention in a chapter of the book; overall results are illustrated in a synthesis by the editors.

4 It has to be noticed in this respect that the German data exclude firms with less than 20 employees.
5 It may be added in this connection – as the authors themselves point out – that an increase in employment, even in absolute numbers, says nothing about the *output* weight of small units, for it may simply reflect a change in production techniques (a shift along the production function) for any given output level. The literature on the subject, nonetheless, seems to provide some evidence about the existence of a positive relationship between employment and output trends (especially as it concerns the "other side" of the question, that is the falling output weight of *large* businesses). See on the point Dunne and Hughes (1992) and Henley (1994) as to the British case, and Traù (1994) about the three other large European countries included in the above mentioned analysis (namely France, Germany and Italy), in addition to the UK.
6 Relevant problems affect, in particular, German data (where data referring to years prior to 1976 cannot be compared to those referring to later years, owing to differing boundaries of the population and to the absence of information about firms with fewer than 20 employees), Japan (where data are taken from the OECD 1985 Report, which in turn did not take them from Business Censuses, but simply from Labour Force Surveys series), France (where data are indirectly drawn from the reconstruction made by Didier and Malinvaud, 1969 and Didier, 1982). See on this point also the criticisms by Storey (1994, chapter 2).
7 Among the few attempts to provide evidence about the role played by the small business sector in developing countries we can recall here the Annual Conferences held by the International Council for Small Business (as an example, see with reference to Asian emerging economies the papers presented at the Conference held in Naples in June 1998).
8 See in this respect Schwalbach (1994), who analyses (for the whole economy) the lowering of average size in 12 European countries in the first half of the 1980s, Traù (1994), who observes the phenomenon over the whole 1980s, and Acs and Audretsch (1993), who extend the analysis to some countries from Eastern Europe. On the whole, such studies confirm – as to the areas and periods they refer to – the existence of an overall employment shift towards smaller-sized units.
9 See among others, apart from the study by Marsden included in the ILO Research (chapter 6), Stanworth and Gray (1991), Dunne and Hughes (1992), Hughes (1993), Robson and Gallagher (1994), Henley (1994), and the many contributions by Storey (for a synthesis see Storey 1994, in particular chapter 2). Indeed, the attention paid to the role played by the small business sector can be traced back to the late 1960s, when the so-called Bolton Report was published (see Bolton, 1971). Obviously, at that time the findings of the report (even if they were cautious about future developments) could not but testify the falling importance the small business sector was then experiencing: "The small firm sector is in a state of long-term decline, both in size and in its share of economic activity" (Bolton, 1971, p. 342).
10 In the study by Henley (1994) such evidence is buttressed by other evidence showing a fall, over the period 1980–87, in concentration measured on a gross output (sales) basis.

11 The degree of coverage of the population shows a sharp upturn in 1984, due to methodological changes in the logic of data collection (this is especially true below the threshold of nine employees). This problem is enhanced by other problems pertaining to the existence of discontinuities in sectoral boundaries, in particular within manufacturing. See anyway on this point Dunne and Hughes (1992), and the Appendix A at the end of this book.
12 See among others Fritsch (1993), Schwalbach (1994), Stockmann and Leicht (1994).
13 See Sengenberger *et al*. (1990, chapter 3). Even more than the limited amount of information provided in the paper what has to be stressed here is the rather baffling assertion by the author that – in the face of a spectacular stability in the employment shares of small firms and establishments over the whole period considered – "employment in small and medium-sized establishments with fewer than 200 employees showed a considerable increase in the 1970s", p. 115).
14 Actually, even the study by Amadieu in the ILO Research (see Sengenberger *et al*., 1990, chapter 2) simply collects data from these previous studies, so that on empirical grounds the phenomenon does not extend beyond 1981.
15 It has to be stressed that this hypothesis – frequently addressed by literature – is in conflict with the view according to which the small business sector is *structurally* characterized by a higher degree of "flexibility" with respect to exogenous shocks, *be they positive or negative* (see on this point the model suggested by Mills and Schumann, 1985, and, for a more recent contribution relative to the Italian case, Ferrando and Ganoulis, 1999).
16 Main references may include Barca (1985), Contini and Revelli (1992), Traù (1997 and 1998). A synthesis of some of the issues addressed in Contini and Revelli (1992) can be found in an English-language version in Contini (1984); the above mentioned papers by Traù summarize broader evidence provided in wider works published in Italian.
17 In Italy business censuses are taken every ten years, in the first year of any decade.
18 Properly, as we will more widely show below, direct comparisons between Italy and Japan are actually thwarted by the lack of data about *firms* for the latter; in this connection also see Appendix A.
19 See Sengenberger *et al*. (1990, ch. 5).
20 Data refer in this case to firms; for we are here below the threshold of 100 employees, the difference with establishments should not be decisive.
21 See on this point below, section 3.4.
22 See again Sengenberger *et al*. (1990, ch. 7).
23 The sectoral breakdown of the data-set broadly corresponds to the three Isic (Rev. 2) digits. Adaptions are made in order to make comparisons with the (OECD) Stan data-base possible.
24 The group includes, other than small economies such as Luxembourg and the Nederlands, even Liechtenstein.
25 Data contained in the report come – depending on the countries they refer to – from information drawn both from Census data and from surveys referring to (wider or narrower) firm sets belonging to the whole population (this also involves the wide use of estimation about size bands not covered by original data). As a consequence, "the degree of harmonisation of the

national data sets received by Eurostat is such that direct comparisons between countries can only be made in a very limited number of cases". (…) "For example, the unit used, the coverage by sector and/or size and the definition of a variable may vary from one country to another" (Eurostat, 1994, vol. 2, p. 4).

26 The data-set at the heart of the analysis by Ehrlich (1985) is published in Ehrlich *et al*. (1982).

27 This means that the fall in average size is strongly affected by a diminishing employment weight of smaller establishments (which, in itself, is a structural feature of the early phases of the industrialization process).

28 Simply, in this case 'the administrative requirements of a centralized economic control system played a dominant role. This system cannot function efficiently on the basis of small-scale, autonomous economic units; the command of relatively small enterprises by plan directives became more and more difficult' (Ehrlich, 1985, p. 294).

29 German data have been collected up to 1990. From this point of view the belief has prevailed that the collapse of former DDR in Western Germany has involved a *structural* difference in nature of the new entity with respect to BRD, such to make any comparison over time basically meaningless.

30 It is *extremely* important to stress that, in particular as it concerns *firms*, the definitions adopted by National Statistical Systems (Business Censuses) show important cross-country differences. This basic heterogeneity suggests not to rely too much on cross-country comparisons referring to *levels* (this is very much true even in the case of "officially" harmonized data such as those provided, for example, in *Enterprises in Europe*, see Appendix A); nevertheless this problem does not affect intertemporal comparisons within any given country – i.e. the main object of our analysis.

31 Calculations have been replied excluding from the first size band firms with fewer than ten employees (that is, those included in the range more subject to discontinuities in the business register series); the basic absence of differences in results between the two subsets leads us in this case to evaluate this effect as negligible. The problem represented by business registers discontinuities, anyway, has to be borne in mind in the following of this analysis, in particular as it relates to the United Kingdom, where it assumes special relevance. This question is addressed on general grounds in Appendix A, and pointed out in following chapters whenever it may involve any effects on empirical results.

32 In the German case differences in the coverage of population across time as it concerns artisan units (excluded in 1962, included in 1990, available in both versions in 1977) have required – in this graph as well as in following ones – two different calculations, so as to make possible comparisons across both periods.

33 The cross-references between Isic codes and industrial activities are contained in Appendix C.

34 The question of the behaviour of firms as compared to plants is paid specific attention in chapter 5.

35 See again on this point Appendix A.

36 For the same reasons recalled above German data referring to the 1970s are presented in two distinct versions (either including or excluding artisan firms).

37 In Table 3.1 the sectoral breakdown is lower than in Figure 3.2 owing to the need to compare different countries.
38 It is important to stress here that comparisons among the changes showed in figures can be made only *within* a given country, because the number of years referring to each phase differs according to individual countries.
39 The term "contribution" here simply refers to the sign in the observed variation.
40 As a matter of evidence, medium-sized firms (those with 100 to 500 employees) do not play such a role as well.
41 As to Germany, employment falls above the threshold corresponding to 500 employees since years *preceding* 1977 – which involves a fall in total manufacturing employment. This seems not obvious; but it is consistent with data provided by National Accounts (OECD source), which also show a certain reduction in the number of employees in the period involved.

4 Empirical Analysis II: The Number of Business Units and their Average Size over the Long Run: Models of Industrial Development

1 Properly, the possibility of "transitions" *internal* to each size interval also have to be taken into account in this connection.
2 This way of approaching the question can also help us to specify the relationship between the changes occurring in the shares of employment and those which occur in the shares of *firms* – simply, the latter do *involve* the former, that is on the one side firms' transition across size classes takes place through the "hiring or firing" of workforce; on the other firms' entries (exits) coincide with the entries (exits) of their employees.The difference between considering employment as against firms merely boils down to taking into account the actual "weight", in economic terms, of the observed business units.
3 Under the threshold corresponding to ten employees jumps in business registers make it often quite difficult to distinguish changes in the number of existing units from discontinuities in the degree of coverage of the population. Therefore, some calculations hereafter are also provided with reference to the population of units with more than ten employees only.
4 Data referring to Japan exclude the Food and Tobacco industries (Isic codes 311 to 314), due to their rather anomalous behaviour in the "Restructuring" years (when they are characterized by a sharp rise in their average size vis à vis a general fall in size in *all* other industries). The point here is that the single value corresponding to codes 311–314, owing to their very high weight in terms of employment, would completely offset the opposite dynamics of other industries, thereby altering quite sharply the overall trend for the manufacturing sector as a whole. See for a detailed view Figures 4.1 and 4.2 below.
5 See section 4.3 below and Appendix A.
6 Sectors have been aggregated in both figures in order to achieve a common breakdown for different countries (the original national breakdowns having been heterogeneous). Some differences in sectoral breakdown persist in figures referring to firms with respect to those referring to plants.

7 This is at the very root of the rapid response of Italian industry to the changing "competitive environment" after the Golden Age came to an end, which led to a noticeable increase in the economic weight of small businesses in the manufacturing sector (see on this point in particular Arrighetti, 1999). It has also to be clarified that such a trend is not to be considered at variance with our findings about the evolution of employment shares at the size-class level (see Figure 3.2d in chapter 3). In this respect Figure 4.1 simply shows that the average *scale* at which manufacturing activities were performed was *already* falling in many industries in the Golden Age years, even in the face of a *relative* reduction in the contribution smaller-sized firms gave to employment (which can be more than offset by a parallel decrease in the average size of units belonging to the – larger – size classes increasing their employment shares).
8 Section 4.4.3 shows that in the Golden Age years average size for firms up to 100 employees (micro-firms *included*) did *rise*; this means that increases in size actually occurred *below* the threshold of 10 employees. As we will argue, this has much to do with the backwardness of the Italian industrialization process as late as the 1960s, involving a quite large weight of micro-units which still had to grow to achieve the minimum efficient size.
9 Establishments' behaviour in Italy is in such respect akin to the observed trends for firms.
10 Figure 4.3 refers to units with more than ten employees, so as to compare "technical" units belonging to that part of the industrial system which should be relatively independent of national specificities as it regards size structure. When performed with reference to the whole size distribution, the overall tendency outlined above appears less clear-cut (in a number of industries variance flattens), but in the majority of cases it results confirmed.
11 With respect to more recent years, the question is dealt with – even if simply referring to *firms* – in a paper by Geroski and Gugler (2001), who show the absence of any convergence in size within European manufacturing to the mid-1990s.
12 Figures referring to the United Kingdom raise some relevant questions as to their statistical reliability. These problems stem from the rather muddled organization of business registers in the UK, and especially from the important changes occurring over time in data collection as well as in the definition of the variables included in business censuses (see on the point Appendix A). Whilst on the whole data referring to average size (as well as those relative to *employment* shares) involve in themselves some sorts of compensation of possible jumps in the coverage of the entire population of business units, data referring to the *number* of such units may show quite anomalous changes from time to time (especially with regard to the first historical phase analysed here). All empirical evidence provided in this secion has to be evaluated in the light of these basic problems; as it happens in Figure 4.4, in some cases the calculations exclude UK figures.
13 The question has some relevance on theoretical grounds; see on this point chapter 2 (section 2.3).
14 As mentioned above (see note 12), Table 4.4 does not include UK figures.

15 It is worth noting that at the size-class level changes in the number of firms over time may involve changes in firm size *in addition* to entries and exits relative to the *whole* size distribution.
16 As we have seen, Japanese data are only available for establishments.
17 On the other hand, the very coincidence itself, in the "Restructuring" phase, of a growing number of firms and a general fall in their average size suggests that for the most part the wider boundaries of the population of business units are due to entries of new *small* ones.
18 It is worth recalling here what we observed in section 4.2.2 above about the tendency of average size to decrease in some Italian industries even during the Golden Age period.

5 Firms versus Plants: a Closer Examination of their Different Behaviour in the Face of Structural Change

1 See Penrose (1980, p. 13).
2 This does not necessarily mean that changes depending on the latter are necessarily greater than those depending on the former.
3 As is well known, even the problem of the "simple" relationship between scale and returns, since Sraffa's (1926) attack on the Marshallian tradition, is still far from being resolved. Even if the question as to what extent technological factors do actually affect (plant) size goes far beyond the boundaries of this work, we can recall here the basic inconclusiveness of the debate about the shape of long-run cost functions: on both theoretical and empirical grounds no clear-cut conclusion about the existence of a precise functional relation (of any kind) between size and returns can be found in the current literature (an attempt to synthesize the whole question can be found in Traù, 1996). This leads in turn to a "looseness" in any hypotheses about the actual impact of changes in available technology on plant size (that is, on the economic advantages of investing in large as opposed to small plants, or vice versa).
4 The same can be said as it relates to any differences across countries in the observed trends in plant size.
5 As we recalled in chapter 1, the question was explicitly addressed in a symposium of the American Economic Association in the late 1940s. On that occasion Blair (1948) wrote that "as a result of new decentralizing techniques in the field of power, material, machinery and transportation, technology is now tending to promote a smaller, than a larger scale of operations" (p. 151). A similar view was set forth just a few years later by Jewkes (1952), arguing that "we need not assume that the technical equipment of industry consists of large and indivisible blocks. If that were true the variety in the size of factories would not be so great as it actually is. (…) The equipment of industry is still broken up into a large number of relatively small pieces, and from the technical point of view might perhaps, without loss, be broken up further" (p. 251).
6 This question can also be viewed in the light of what has been observed in chapter 3 about the long-run behaviour of absolute employment levels in both small plants and small firms (i.e. largely the same thing): the overall

stability of such levels – as opposed to the "rise and fall" of employment in *large* units – testifies in itself that some *economic* convenience of small-scale *production* has been *constantly* at work over all phases of industrial development.

7 See on this specific point chapter 2.

8 It can be noted that this is, in fact, what most contributions on the subject – clearly influenced by a view which attributes to the firm the role of a simple production function – seem to imply (see, for example, Stigler 1939, Mills and Schumann 1985, Carlsson 1989).

9 This seems to have been especially true in the Italian experience, where external administrative functions have become the rule in the organization of economic activity in a large part of the industrial sector.

10 As has been observed in chapter 2, the key point here is that uncertainty means that the firm (given its overall size) has to process a larger *amount* of relevant information; the question as to the *cost* of such information comes in a sense afterwards, and has a less significant role.

11 As to the latter, it could even be hypothesized that technology might have played no role at all, inasmuch as organizations can grow on their own even in the face of a fall in the size of each of their constitutive elements (provided their overall *number* grows accordingly).

12 It needs to be stressed, in this respect, that taking this view would mean assuming the working at a microeconomic level of macroeconomic "laws" such as those described by Kaldor (1966) and Baumol (1967). This cannot be considered to be straightforward, for – as is well known – the mechanisms explaining the setting up of *dynamic* increasing returns in those theories act through the *aggregate* behaviour of agents.

13 Measurement issues are paid explicit attention in Appendix B at the end of this book.

14 See on this point chapter 3.

15 As we have said repeatedly, this has to be related to the degree of "maturity" of American industry as compared to the Italian.

16 A similar view about the role played by "administrative" economies as opposed to "production" ones, has been recently raised by Pryor (2001), who suggests comparing the changes in number of establishments as against firms – through the ratio of the former to the latter – in order to infer the existence of any difference in their trend, for "the costs of production are more often associated with establishments, while the costs of organization are tied to the firm as a whole" (p. 368). Unlike what has repeatedly been stressed in these pages both on theoretical and empirical grounds, however (see in particular chapters 2 and 4), Pryor argues that investment in information technologies may have *lowered* coordination costs, having made an *increase* in the average size of firms possible due to a higher ability to manage more establishments than before. On empirical grounds, anyway, Pryor's findings – starting from similar methodological premises – are similar to those provided in Figure 5.3: for those firms with more than 99 employees, the ratio of plants to firms in the entire private sector (excluding agriculture) presents a relatively low value at the beginning of the 1960s (9.8 per cent), reaches a peak in the early 1980s (15.3 per cent) and falls to 12.5 per cent in 1997.

17 In such case German 1960s data may be directly compared with data referring to later years, since the lack of information about small artisan firms for years following 1977 only affects those units with fewer than 20 employees.
18 Positive values of OE correspond to *(a)* positive variations in firm size coupled with variations in plant size which are either negative or positive and lower; *(b)* negative variations in firm size coupled with variations in plant size which are both negative and lower. Negative values of OE correspond to *(a)* negative variations in firm size coupled with variations in plant size which are either positive or negative and greater; *(b)* positive variations in firm size coupled with variations in plant size which are both positive and greater.
19 This has obviously to be evaluated in the light of the fact that in the US case the "firm" is defined in a somewhat broader sense than it is in the case of Germany and Italy.

6 Concluding Remarks

1 Incidentally, it can be noted that the basic unpredictability of this last question has much to do with the policies imposed by international institutions upon developing countries – traditionally encouraging patterns of development that are relatively intensive in large-scale organizations, vis à vis a structural scarcity of large-scale organizational capacity. On this specific point see an illuminating contribution by Olson (1987). For a broader view on the topic also see the May 2001 Special Issue of the *Cambridge Journal of Economics* on African Economic Development (vol. 25, no. 3).
2 As to the specific need for distinguishing between "real" and "financial" size aspects (generally treated in literature in a quite confusing way), a basic reference can be found in Marx's distinction between industrial *concentration* (pertaining to the organization of *production*) and *centralization*, which, according to Marx, refers to the financial property of economic units: "centralization may result from a mere change in the distribution of already existing capitals, from a simple alteration in the quantitative grouping of the component parts of the social capital" (Marx, 1977, vol. 1, chapter 25, p. 779).
3 Empirical evidence shows quite clearly that both retailing and finance have been characterized over recent years by a strong tendency towards concentration (generally reflecting the existence of increasing returns) – that is, just the opposite of what our empirical analysis has revealed with reference to manufacturing activities.
4 See, for example, on this point the contributions collected in Colombo (1998).

Appendix A: Building a New Data-Set on Industrial Structure: Six Industrial Countries from the Early 1960s to the Mid-1990s[1]

1 The data-set described in this Appendix was constructed between 1998 and 2000 by a research group formed by Annalisa Armanni, Anita Guelfi, Raffaella Sadun and Fabrizio Traù. All members of the group have worked in

close cooperation in the course of the period over which the data-set has been planned and implemented. The final draft of this section (Appendix A) has been written by Anita Guelfi and Raffaella Sadun.

2 Actually, Eurostat provides a common definition of "enterprise" which should be adopted by each single country. However, this definition is very general and does not really force the national statistical offices to improve the degree of harmonization of required statistics which is, therefore, very poor.

3 Some countries do include self-employment, some others do not.

4 See Eurostat (1994), vol. 2, p. 4.

5 It also provides data on gross value-added and output, which are not considered in the present research project.

6 See section A.3 below.

7 The six countries are the same as those analysed in the wider empirical analysis carried out at the international level previous to this work (see Sengenberger *et al*., 1990 – referred to in the text as ILO Research).

8 In the case of Italy, data from 1971 onward have been directly provided by the National Institute of Statistics.

9 This was the case for French firms and US establishments in 1977. After careful verification, some changes have been introduced in the original data-set as refers to French employment in the smallest firms. These data looking unrealistic, they have been replaced with specific estimates. No adjustment was required for US data.

10 With the sole exception of the 1963 Census.

11 Actually, some statistics on firms have also been compiled in Japan since 1960. These data are derived from the establishment census, but the way data are aggregated to obtain firm statistics looks particularly unreliable and unclear. For further details, see Guelfi and Traù (1999, p. 94).

12 For these countries, the definition of *enterprise* appears roughly consistent with that provided by Eurostat, according to which: "The enterprise is the smallest combination of legal units that is an organisational unit producing goods or services, which benefits of a certain degree of autonomy in decision-making, especially for the allocation of its current resources. An enterprise carries out one or more activities at one or more locations. An enterprise may be a sole legal unit" (Eurostat, 1994, vol. II, p. 5).

13 Note, however, that the concept of *establishment* does not coincide with that of *local unit*. Indeed: "The industrial establishment is, ideally, an economic unit which engages, under a single ownership or control, in one or predominantly one kind of industrial activity at a single location … The local unit comprises all the industrial activities carried on under a single ownership or control at a single location; it differs from the establishment in that nothing is said about the range of those activities" (United Nations, 1963, p. 14).

14 The data cross-check consists in a comparison between the total (i.e. relative to the entire manufacturing industry) actual value of each size class and the total value obtained after the estimation of missing data. Such procedures can be applied only if the distribution of the values relative to the entire manufacturing industry follows the predefined size-class criteria. Whenever a difference emerges between actual and estimated totals, an iterative procedure takes place, according to which the values are adjusted within single sectors.

Appendix B: Measuring Firm Size

1 Indeed, studies of such a kind are normally carried out by making use of all sorts of size measures; anybody having had anything to do with them is aware of how difficult it actually is trying to get a synthetic view of their empirical findings.
2 One of the studies mentioned in our survey of empirical research (namely that of van Ark and Monnikhof, 1996, see chapter 3 above) goes as far as publishing some estimation of (both gross and net) output values at the size-class level, with reference to five of the six countries analysed in this book (data refer to firms or establishments alternatively, according to source availability). Our view is that this attempt has to be considered overly ambitious as far as a fairly sound reliability of basic data has to be guaranteed, insofar as the collection of output data calls for an extremely wide use of estimation procedures, especially as it concerns smaller size classes.
3 As we have seen in chapters 3 and 4 in relation to employment, in the two historical periods covered by our analysis, two quite different total employment trends in absolute numbers can be observed (in almost all countries, a growth during the course of the Golden Age and a decrease in the "Restructuring" period).
4 Relevant discontinuities in series make it almost impossible to obtain reliable comparisons with data referring to subsequent years. In the present case, data do not refer to a panel, but simply to the population of firms with more than 20 employees in Italian manufacturing as it results from Business Registers in each year.

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