

THE RISE AND FALL OF THE SIZE OF FIRMS

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Fabrizio Traù  
Centro Studi Confindustria  
Viale Astronomia 30  
00144 Roma  
Italy

***Phone: 00 39 06 5903536***

Fax: 00 39 06 5918348

Email: [f.trau@confindustria.it](mailto:f.trau@confindustria.it)

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## **Abstract**

This paper tries to cast a theoretical bridge between two important phenomena which have characterised the evolution of advanced capitalist countries over the second half of this century: namely, the shift from the so-called Golden Age to the “unstable” macroeconomic environment of the '70s and the '80s, and the reversal of the long run pattern of development of the size distribution of industrial firms, firstly oriented towards a growing relevance of big business, and then turning into what has been called “the re-emergence of small scale production”. Both phenomena seem to have had their turning point around the mid-Seventies. The aim of the paper is to find in economic theory the possible explanations of why they coincide, why in the face of *those* macroeconomic changes, business firms gave *that* answer to the organisation of productive activity.

**Keywords:** Golden Age, uncertainty, competition, information, managerial constraint, firm size.

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# THE RISE AND FALL OF THE SIZE OF FIRMS

## 1. The Question

All sorts of evidence shows that in industrial countries, the post-war period has been characterised by a major break in the evolutionary pattern of firms' size structure. In the course of the Seventies, the trend towards growing concentration (rising average size of enterprises) inherited from the pre-war period came to a halt, and underwent a sharp reversal. Since then – at least in terms of employees – the average size of firms began to fall, and the share of smaller firms began to rise. In a long-run perspective, a “V” pattern of the importance (of the weight) of smaller firms seems to be at work; in structural terms, this has represented one of the most relevant features of industrial development in the last 25 years<sup>1</sup>.

On “historical” grounds, it would be difficult to think of such an apparent discontinuity as independent of the important changes which have characterised the economic environment over the same period. Indeed, the economic literature has repeatedly stressed the relevance of many factors that have gradually (sometimes quite abruptly) modified the economic conditions which firms have to cope with when taking decisions. A broad sketch of the questions at issue may include the emerging need for product differentiation brought about by rising income levels (acting against large-scale product standardisation), the major technological breakthrough represented by “flexible” technologies (lowering the minimum efficient size of plants), the outbreak of job actions (fostering the de-centralisation of production towards smaller - less unionised - units), the oil shocks themselves (making energy intensive production, mostly associated to large-scale plants less convenient).

Yet even in a historical perspective there is more to the story. In particular, the above-mentioned explanations for “the re-emergence of small scale production” seem not to pay so much attention to the

important changes that have affected firms' behaviour at the macroeconomic level. Such a neglect (which largely mirrors the "natural" strive of macroeconomists towards short-term analysis) leaves, in particular, the role played by the exhausting of the "historical aberration" of the Golden Age somewhat blurred. That is, by the crisis of the economic regime which for a couple of decades (the Fifties and the Sixties) represented - through a steady growth of demand and exceptionally high investment rates - the engine of an unprecedented phase of economic growth of advanced industrial countries<sup>2</sup>.

From the point of view of this work, among the factors lying behind the "fall of the Golden Age" (GA) there are at least two major phenomena which have to be stressed as firms' changing behaviour is to be considered: namely, the strengthening of competition brought about by the rising importance of external demand (which in some respect may be considered as a consequence of the "success" of the GA itself), and the rising uncertainty (coupled with slower growth rates) which has followed the crisis of the Bretton Woods system and the abandoning of fixed exchange rates<sup>3</sup>.

As far as the first phenomenon is concerned, we can look at economic integration through international trade as being the "natural" outcome of the growth of the industrial sector in advanced countries. This turns out to be a quite substantial change - in terms of growing competition - with respect to the Golden Age growth phase, which, as Glyn et al. themselves suggest, "could be regarded as primarily domestically based" (1990, p. 51). As it relates to the second issue, it can be said that a most apparent difference between the GA years and the more recent phase of the economic development of advanced countries lies in the passage from a regime in which such economies were extensively regulated both externally and internally<sup>4</sup>, to a situation where financial liberalisation and globalisation create "enormous scope for destabilizing speculation which in turn leads to high volatility of both monetary and real variables" (Singh, 1997, p. 24).

Both factors have undoubtedly involved a deep alteration of firms' "environment", fostering a gradual tendency towards lower organisational complexity and diversification<sup>5</sup>. As has recently pointed out by Carlsson (1996) – without any explicit reference to the GA view – as international openness has grown substantially more rapidly than output in all the economically advanced countries in the post-war period, firms now have to face on average stronger competition (lower protection of the internal market) than before. Hence, "it has become increasingly difficult to compete... simultaneously in a wide variety of products... [so that] many companies have become substantially less diversified than they were" (pp. 70-71). But we may also mention, as a result of increased competition, the need for lowering (X-)inefficiencies within the firm, which are almost naturally associated with a larger input (employment) size per unit of output.

On the other hand, whereas diversifying can well help protect firms against market risks, as far as uncertainty takes the place of risk (according to a Knightian view), this no longer represents an appropriate strategy, for the need for flexibility becomes the crucial issue: "the more diversified the firm, *given finite capabilities* (...), the less likely it is to possess the unique competence required for survival in each business unit" (p. 81, emphasis added).

But in the present context uncertainty pushes towards a more general propensity to limit investment as well. Rising costs of bearing foreign exchange risk (previously borne by the public sector), of monitoring (more volatile) prices, of facing (wider) demand fluctuations and the like, mean that evaluating future returns to investments becomes more and more difficult, so that the "option value of waiting" undergoes a sharp increase. That is, "short termism in the private sector is the rational private response to macroeconomic instability" (Buiter et al., 1997, p. 14). And since the larger the investment, the higher its sunk costs, investment will be discouraged as far as its amount gets greater.

Yet, such factors leave almost unquestioned a more general issue: that is, from which overall *theoretical* standpoint do we say that such trends in the underlying economic forces (at the micro and macroeconomic level) should have pushed firms to behave the way we have actually observed? Which “model” of firms’ behaviour, in other words, do we have in mind when discussing such a change? Or, even more radically, can we find *any* theoretical explanation (given “historical” circumstances) for “the rise and fall of the size of firms”?

## 2. The “Managerial” Vision

Continuing corporate growth, perceived as a “natural” outcome of the industrial development process itself, called in the third quarter of this century for the emergence of a large body of theoretical literature about large-scale (managerial) firms’ behaviour. Since the early ’50s, reflection upon the (growing) organisational complexity of the firm was at the root of important theoretical contributions which highlighted the basic weakness of the traditional theory of the firm in coping with the decision process of (non-sizeless) economic agents<sup>6</sup>. By the end of that decade, and more and more extensively in the following, the overwhelming evidence that the large corporation was gathering importance within the industrial system in all industrial countries led to several attempts to set up an interpretation of its functioning on theoretical grounds<sup>7</sup>.

A major feature of the “managerial” view consists in its assumption that within the firm agents act economically, but *following quite different rules with respect to the market*. It shows important more differences from recent treatments of the problems involved by intra-firm conflicts among (different types of) agents, present important differences. Indeed, it not only appears at variance with the development of “property rights” theories (according to which the firm is simply a “nexus of contracts”)<sup>8</sup>, but it also departs quite clearly from the basic Coasian view (*infra*, section 3). Although it shares

some common features (that is, acknowledging the existence of an “authority principle” inside the firm<sup>9</sup>), it goes far beyond in the latter’s implications. The point here is that the very nature of the firm as an organisation - its being constituted by different “groups” characterised by different motivations as to what kind of goals the firm has to pursue – creates the conditions whereby new functions may be integrated *even in the absence of any attempt to reduce (minimise) costs*<sup>10</sup>. That is, according to the managerial view, firms may choose to expand even if transaction costs are *not* higher than the costs of carrying out the same activity “inside the skin” of the firm: they get larger just because growth is the long-run driving force of complex organisations *as such*.

An implicit issue in this context should be that firms must benefit from some sort of market power (even if they do not minimise costs, they are not inexorably driven to failure by the sheer strength of the market selection mechanism). So, at any one size level, they may be larger than required by market efficiency rules. In a “Carnegie Mellon” view<sup>11</sup>, it can be said that activities carried out within (large scale) firms are affected by their very nature by some degree of “organisational slack”. We can express this point with the words of Williamson (1964) as well: “managerial discretion models...are intended to apply... where competitive conditions are not typically severe” (p.39).

As we know, from this point of view the GA regime provided for many years the “ideal” environment within which managerial capitalism could thrive: long-run stability in prices, in exchange rates, in the growth of (internal) demand and so on, may be considered the “natural” driving forces for managerial (growth-maximising) behaviour to be implemented. And as far as the institutional side is concerned, strong market regulation largely contributed to keep looser the limits set by “market control” on corporate behaviour.

But in this connection an important change is represented by the rise of competition. As it asks for lower prices, this brings to the fore the necessity to reduce *costs*. And whatever the goals of the firm may be, when profit margins are squeezed below some “sustainable” level, then *all* firms do minimise costs. As Reder put it in 1947, “in a fiercely competitive situation [the firm]...may be unable to stand any inefficiency whatever. It is when profits turn into losses that management discovers how much inefficiency it has been tolerating and strives to eliminate it” (p. 453).

Hence, we are to expect that, as competition becomes tougher, “excessive” size will tend to disappear. Firms will first of all reduce (X)inefficiencies due to low competitive pressure, and then “strive to eliminate” all the functions which involve a higher level of costs than could be attained by simply applying to the market. And indeed, we know that as far as competition has increased, it has been paralleled by a tendency towards a *fall* of the size of large firms.

We can then say that “managerial” behaviour is not consistent any more (or less than before) with the “new” competitive environment. But it is not consistent with an “uncertain” environment, either. Discretion as such requires the possibility to make choices between alternatives, which in turn calls for adequate information; and were information is inadequate (either by being limited or not processable in the time available to take decisions) “managers” might be bounded to make sub-optimal choices with respect to their utility function. In fact, their decision process may be thwarted by the impossibility of getting a reasonable evaluation of the economic implications of long-run growth (i.e. their own goal); and as far as growth raises sunk costs (which means higher rigidity), it will be discarded in favour of more “shortsighted” objectives.

Therefore, whereas managerial theories represent a very effective theoretical framework for understanding why a long era of growing size of firms did actually take place, they cannot interpret what happened later (simply, in the new context managerial discretion can

only apply within narrower boundaries). We then need some other theoretical view which can help us explain how firms began to behave after the GA regime came to an end.

### **3. Transaction Costs and Beyond**

As a general rule, we can say that according to transaction cost (TC) theories firms (organisations) take the place of the market when at the margin “market” costs are higher than the costs of keeping an activity “inside” the firm. Internal organisation is the answer to market (relative) inefficiency, due to the existence of bounded rationality, asset specificity, and opportunistic behaviour of agents<sup>12</sup>.

Yet, the fall in the average size of firms which the last 25 years has witnessed has, in fact, reflected a constant tendency towards *lower* organisational complexity, *sub specie* of a gradual increase in market exchanges as compared to intra-firm transactions. For TC theories to work in this connection, then, we should find that the gains from “using the market” have indeed considerably risen over the same period (at least in relative terms), all over the industrialised world. Conversely, the organisational capability of (efficiently) governing internal transactions must have fallen relatively. In the face of rising competition and market uncertainty, how could a (relatively) higher efficiency of the “market option” have been achieved?

As far as the first issue is concerned, it would appear almost tautological to say that - inasmuch as the degree of market regulation in most countries has been gradually eroded in the same years as vertical dis-integration has taken place - the widening of market transactions is but a consequence of stronger competition. As prices have been generally cut by market pressure, firms in the final stages of the production chain may well have found an incentive - other things being equal - in applying to the market for purchasing intermediate inputs, thereupon externalising the activities which have become more costly as compared to market offer.

Nonetheless, things *cannot* have remained equal, just because - as it has already been stressed - stronger competition applies to lower *internal* inefficiencies within *all* firms (that is it tends to reduce the costs of carrying out the activities “inside the skin” of integrated firms as well). On the whole, whilst it says nothing about what happens to the costs of transacting through the market, an increase in competition says anyway very little about what happens to efficiency *within* organisations<sup>13</sup>.

On the other hand, as it relates to uncertainty, the TC view seems indeed not to have much more to say than if the environment is characterised by growing “turbulence”, the costs of keeping prices and demand fluctuations under control (and possibly facing faster technological change) should *rise*, thus creating a further incentive to bring activities inside the firm.

The (implicit) predictions of the “standard” TC view, therefore, seem on the whole not to fit with the *actual* direction of structural change. Yet, in order to discuss what may have happened to the changing boundaries between market and hierarchy, we still have to consider the role played by some more factors that, in the TC view, appear to be rather neglected.

From this point of view, we can firstly simply try to extend the basic Coase-Williamson paradigm, by taking into account some more ways whereby uncertainty may affect firms’ behaviour.

For a start, we can draw attention to the framework suggested by Carlton (1979), whereby “vertical integration can be regarded as a means of transferring risk from one sector of the economy to another. Firms have an incentive to integrate to insure a supply of input to satisfy their ‘high probability’ demand” (p. 190).

This means that insofar as “upstream” producers within an industry must set the price of their output (i.e. the input for “downstream” producers) over the level corresponding to marginal cost - as they bear the risk of having unsold stocks in a context of fluctuating demand - “downstream” producers may be induced - in order to pay for their inputs a lower price, i.e. at cost - to integrate. On the other hand, as *they* would in this case bear the risk of having unused input stocks, they may nonetheless choose to settle for a *partial* integration, corresponding to the production of inputs which they are “certain” to need - and then enter the market as far as it is required by rising demand.

This framework helps in highlighting how vertical integration within an industry may be affected by variations in the “degree of predictability” of final demand. *Ceteris paribus*, in the outlined perspective “downstream” firms would set their boundaries according to the range of demand fluctuations. Size would be a function of the need for “flexibility”<sup>14</sup>.

But a successful way of coping with an uncertain environment may also be achieved through a quite different way of looking at market relationships among firms; in particular, this can be done by acknowledging the central role which can be played in the face of pervasive uncertainty by firms’ *cooperation*. In fact, insofar as uncertainty arises “from the problems of matching production processes to shifts in demand in intermediate and final product markets, and increase considerably to the extent that products are either customised or new... the avoidance of producing unsaleable stock or allowing demand to go unsatisfied requires *responsive* linkages within the chain” (Deakin and Wilkinson 1995, p. 97, emphasis added). This means that a productive system may find a way of meeting uncertain market conditions neither recurring to competition nor to vertical integration: in such perspective, “the notions of *cooperation* and *networks* can then be added as a third and,

until recently, comparatively neglected set of alternatives” (p. 99, emphasis original)<sup>15</sup>.

The outcome of “cooperative” behaviour - which can be further buttressed by the role institutions can play in fostering trust among economic agents - will be an organisational form which is both “flexible” and “efficient”: vertical integration, as well as coordination through the market, may make way for an *integrated* system of *independent* firms. In this sense, its strengthening may “naturally” push towards lower average size of firms.

Both the “solutions” to market uncertainty recalled here are grounded on the possibility of firms to relying on a sound “system” of market relationships with other firms. This highlights a specific point, i.e. that monitoring the market does not exhaust the activities that firms have to carry out when setting up market relations: spot transactions represent but a small fraction of overall market exchanges which firms are involved in, even for running their *current* activity. As a market relation system develops, vertical *dis*-integration may turn out to be wholly compatible with an increasingly “turbulent” environment.

As has been stressed by Simon (1991), “New Institutional” theories (broadly including T.C. analysis, principal-agent models and the property rights approach) retain “the centrality of market and exchanges” (p. 26). In the N.I. world, the firm is still viewed as a surrogate for market imperfections - at their very root, N.I. theories are aimed at explaining what happens as economic agents try to offset some failure in the “natural” way of making transactions throughout the economic system.

But is it possible to retain such a view of economic behaviour in a world which appears to be much more a sum of *organisations* (where “the larger part of a modern economy’s business is done”), than a sum of market relationships? In Simon’s view, it is not<sup>16</sup>; and understanding “what makes organizations work as...they do” means

first of all exploring what people living within organisations are motivated by. In this respect, attention must be paid to several more factors than those which N.I. theories generally take into account. From the point of view of this work, in particular, it may be of some interest to consider the relationship linking “authority” and “loyalty”.

According to Simon (1945 and 1991), the authority principle (which also represents a central feature of Coase’s analysis) is the channel through which the basic incompleteness of the employment contract is implemented. A basic issue in this framework is that for the employer, a way for reducing uncertainty is to delay employees’ commitments to the time when the required action will be called for; that is, “the orders will not be issued until some time after the contract is negotiated” (1991, p. 31)<sup>17</sup>. However, in this connection it happens that - more than specifying concrete actions - commands often do not get far beyond a broad definition of the guidelines for future action, so that “for the organization to work well, it is not enough for employees to accept commands literally” (p. 32). This means that the functioning of (complex) organisations hinges upon the fact that the acceptance of the authority principle for the employees extends up to the point that they will take initiatives *on their own* in order to meet the organization’s objectives. In other words, employees contribute to the achievement of firms’ goals much more than “the minimum which could be extracted from them”.

Yet, it is not even the level of rewards which can determine employees’ effort, because of the basic difficulties in attributing the success of the firm to individuals. Much more than this, it is “loyalty” (in terms of identification with organisational goals) which motivates people to assume responsibility - and not to simply “follow the rules” - for achieving results<sup>18</sup>.

Even if it is difficult to evaluate the role that any “structural” changes in motivation may have played in affecting the ability of organisations to carry out economic activities, it can nevertheless be acknowledged

that the last quarter of the century has witnessed a sharp change in the perception of authority and loyalty on the part of people working within organisations<sup>19</sup>. Such being the case, Simon's insights deserve attention: vertical dis-integration may have been influenced by the weakening of one of the strongest forces operating to bring the organisation together<sup>20</sup>.

#### **4. Information, Organisational Complexity, “Internal” Resources**

As the impact of uncertainty and competition upon the costs of transacting through the market has to be dealt with, some further insights may be drawn by approaching the question from the point of view of *information* costs.

In this perspective we can first of all acknowledge that for business firms a more uncertain environment has meant a higher need for information. As we have seen (section 1), due to rising short-term volatility of prices, interest rates and demand, firms have had to devote more and more internal resources to monitoring markets, in order to take their signals under control. In this sense, the cost of using the market (in terms of gathering adequate information) for the individual firm should have undergone an *increase*<sup>21</sup>.

Following Malmgren (1961), we can observe in this respect that in the presence of uncertainty about the future state of events, putting any activity under the control of the organisation in order to “reduce the fluctuations in required information” – as would be required by the Coase-Williamson paradigm – is subject to an important restriction: this can be expressed, in Malmgren's words, as “internal knowledge is definitive in forming its expectations only if the firm is in no way dependent upon expectations and plans *elsewhere in the market*” (p. 408, emphasis added).

From this point of view Malmgren pays much attention to the framework provided by G.B. Richardson (1960), and in particular to the emphasis he put on the relevance which the control of information

can assume in managing what happens *outside* the boundaries of firms. According to this view, a crucial issue is represented by the fact that firms' control only applies to information about variables which are *independent of the market*<sup>22</sup>. Hence, as firms also have to cope with “secondary information” (which relates to what happens “outside their skin”, or anyway to what they cannot take directly under control), the “usual state of affairs” is *incomplete* information, that is firms can only decide on a *limited* amount of information with respect to that “dispersed” throughout the economy.

This way of looking at the role of information in business behaviour has a major implication: “the more stable the secondary information,... the larger the firm can become” (Malmgren 1961, p. 416)<sup>23</sup>. And since secondary information becomes *less and less* stable as uncertainty becomes higher, we can expect that in the face of rising uncertainty (rising information costs, or less information available) it will become more and more difficult for the firm to expand its size.

In particular, this sort of problem will be intensified when available time gets shorter, for “the imposition of a time limit means that decisions will be based on a *restricted quantity* of information, *or the firm will have to employ more specialists in information collection*” (Malmgren 1961, p. 409, emphasis added). The last point is especially relevant, for it sheds some light upon the central role played by the *width* of the overall *amount* of information to be faced – much *more* than its *cost* – in limiting the possibility for firms to control the environment they belong to. The crucial issue here lies in the overwhelming *scale* that the explosion of (more or less) relevant “news” has reached (quite often just owing to the fall out of new information technologies): given the time span over which they can take their decisions, firms are simply less and less able to process a growing *volume* of news, whatever the cost of information collection may be<sup>24</sup>.

Insofar as available time to take decisions has *actually* become shorter - owing to the tendency towards a constantly *changing* market environment - firms should have been driven to *enlarge* the number of specialists in information collection. The point here is that in our framework rising uncertainty is coupled with stronger *competition*. That is, at the same time as firms have to deal with a more complex environment, they *also* have to *economize*.

This leads us very close to a question which has been for a very long time at the root of the more general debate about the existence of a “managerial” limitation to the size of the firm. The question relates to the fact that a trade-off can be assumed as being constantly at work between the firm’s capability to raise efficiency (to lower costs), and its ability to carry out its activities at a given scale. Such a trade-off stems from the existence of a basic (exogenous) constraint depending on the availability of *internal* managerial resources, which at any one time sets a structural limit to the efficiency which can be obtained in the face of the need for *constantly* making adjustments to changing market conditions<sup>25</sup>.

Yet, the point which needs to be stressed in this connection is – as it was first pointed out by A. Robinson (1934 and 1935 [1931]), and later recalled in an early writing by O. Williamson (1967) – that such a constraint acts *quite independently* of whether the firm is expanding its activity or not - that is, it does *not* emerge as a consequence of the growth process, but simply as a consequence of the need for keeping the organisation together<sup>26</sup>. It means that if by any (“historical”) chance things get more complex (that is more resources are required, so to speak, for any “unit of decision”), the firm cannot maintain the scale of its operations, assuming that a constant efficiency level has to be maintained.

It may be of some use to stress the difference between this way of looking at the “managerial constraint” and the basically static view which characterises the more “traditional” ways of approaching the

issue, among which we may include the Neoinstitutionalist approach itself. An example of such an approach may be found in Coase's own words, when observing that "as more transactions are organised by an entrepreneur, it would appear that the transaction would tend to be either different in kind or in different places. This furnishes an additional reason why efficiency will tend to decrease as the firms gets larger" (1937, p. 397). The point here is that the degree of efficiency of organising transactions inside the firm is deemed to depend on some limit set by the difficulty of coordinating activities as they become more and more "scattered" on physical or merceological grounds. From this point of view it is interesting to quote from Coase's conclusion that "changes like the telephone and the telegraph which tend to reduce the cost of organising spatially will tend to increase the size of the firm. All changes which improve managerial technique will tend to *increase* the size of the firm" (emphasis added).

Yet, what we know about the developments of the "managerial technique" over the last thirty years brings us say that in the face of an enormous *increase* in the power to deal with organisational complexity, as has been brought about by new technologies, a major *fall* of the size of firms has occurred. That is, as we have recalled, (large) firms' size has not simply stopped growing – it has substantially *shrunk*. In order to explain this point we need a theory which can account for the fact that in the face of rising "environmental complexity" firms – given available resources – cannot even *maintain* the size level that they had *already achieved* (that they were *previously* able to manage), even in the context of a relevant relaxation of any organisational constraint.

It is in this connection that Robinson's insight may represent a key to explain how, given the observed changes in external conditions, firms have literally *inverted* their previous pattern of behaviour. On the one hand the need to become more competitive – seeking higher productivity – pushes towards labour shedding, so that the average size of firms in terms of employees (other things being equal) tends to

fall. On the other, the growing environmental complexity raises the amount of organisational resources which are required for the firm to work (that is other things do *not* remain equal). In other words, firms have to deal with *both* the problem of minimising costs (stressed by rising competition) *and* the problem of adapting (brought about by rising uncertainty).

Since it has to devolve more resources than before to evaluating the information which is required for simply running its *current* activity, *and at the very same time* it has to lower its overall costs, the firm is forced in this context to *reduce its own complexity*. That is, it will try to *re-equilibrate* the balance between internal managerial resources and the scale of activity *at a lower size level*.

The passage from “hierarchies” to the market (the expansion of inter-firm transactions) means, in structural terms, an overall increase in the *number* of “transacting” units; other things being equal, a given number of large organisations gives way to a higher number of smaller ones. Indeed, evidence suggests that a major facet of the “re-emergence of small scale production” lies in the uprise of a strong impulse to *new* firm formation.

As we have seen (*infra*, section 3), a basic premise for a reorganisation of business activity along such lines lies in the functioning of the market mechanism itself (be it strengthened by inter-firm cooperation or institutional enforcement of “trust” or whatever). But apart from how efficient transacting through the market may be, a specific point in this connection is what makes new (smaller) firms able to cope with the task of “substituting” once and for all (larger) vertically integrated units. More precisely, the question may be put in terms of what does actually enable smaller firms - at least potentially - to carry out inside *their own* skin the activities which were previously carried out within a large firm *as efficiently* as it did. In even more direct words, where do the “organisational capabilities” required for implementing such “new” tasks come from?

The most obvious answer is that they just come from the dis-integrated large unit itself. That is to say, “firms are brought into existence by firms”. This clearly represents a quite different perspective from that which assumes firms “naturally” originate (entering the market) by virtue of the sheer strength of some economic opportunity (mainly boiling down to positive expected profitability). In our perspective, the *preliminary* condition for a new firm to become established is given instead by the fact that a world of hierarchies did *already* in fact exist. In other words, the very birth of smaller units is made possible by the *previous* existence of some managerial capability “dispersed through the economy”, which has already been developed within *another* (larger) organisation.

As suggested by Tuck (1954), any organisation is in fact characterised by a given distribution of (individual) ranks, which is determined by the maximum number of immediate subordinates that a single individual can control. Yet, it may happen (and in Tuck’s view it *normally* does) that as a consequence of some process of personal advancement inside the hierarchy, at any one hierarchical level the actual number of individuals is higher than it would be compatible with the “ability to control” available at the closest rank above. Therefore, a “surplus” of individuals (of capabilities) may occur. But in turn “surplus individuals are available to operate as heads of *independent* firms of... smaller size” (p. 13, emphasis added). Such being the case, a process can be set up which leads to the reconciliation of the above divergence through the emergence of “independent firms widely ranging in size”.

Tuck’s analysis helps to focus a central theme in the perspective outlined above: in a world characterised by rising “environmental complexity” (i.e. by rising costs of managing firms’ activities *at any one hierarchical level*), it may well happen that the capabilities of each rank of controlling its immediate subordinates gets lower. This would determine at the next rank below a surplus of individuals, who

may in turn be able to manage “new” organisations up to the size corresponding to the number of subordinates they were *already* in charge of controlling. From this point of view the availability of the “ability to control” sets an important premise for new “independent” firms of smaller size to be created<sup>27</sup>.

## 5. Searching for Biological Analogies

An extremely powerful analogy for analysing the observed changes in the growth pattern of firms can be found in the theory of growth of living organisms developed by population ecology - and in particular in the so-called “*r* and *K* selection” approach. From this point of view it can be observed that, broadly speaking, populations may develop according to two quite distinct evolutionary patterns, which reflect the degree of “stability” of the environment they live in.

If we define as “*r*” (the “biotic potential”) the capacity of a population to increase, and as “*K*” (“carrying capacity”) the population size that an area has the resources to support, we can say that in *stable* habitats populations will spend most of their time near *K*, whereas in *unstable* habitats they will not – in particular, when conditions are favourable, they would be growing towards *K*, whilst as conditions shift to be unfavourable (that is *K* drops), they may turn out to reveal *overcrowded*. Such a pattern implies that, relative to a “stable” habitat, a “fluctuating” one will lead towards higher reproductive rates, which in turn will lead to smaller offsprings and hence smaller adults, and will involve a greater probability of death due to environmental fluctuations.

In a very stylised form, it can therefore be said that where *K* selection is at work (stable environment), the overall size of the population will be steady, few offspring will be generated, and they will become large, which will be generally associated to a long life. Where *r* selection (fluctuating environment) prevails, then the population itself will tend to fluctuate, and in order to compensate higher development

constraints – which in turn involve a shorter life as well as a smaller size of organisms – a much higher number of offsprings will be generated<sup>28</sup>.

The analogy between these two patterns of development of living organisms and the two different patterns of firms' behaviour outlined above is quite impressive. We can further develop the analysis of how biological analogies can help us look at the factors which affect the “passage” from large to small scale organisational structures. Following the work carried out by Mason Haire in the Fifties (see Haire 1959), in particular, it is possible to find more linkages with the perspective opened by Robinson's view.

The basic starting point is the observation of the (long-run) relationship between biological organisms' growth and *shape*. Organisations, like living organisms, spend most time and effort in “holding the thing together as a single working unit” (p. 303); that is, they have to devolve a given amount of their internal resources simply to *living*. This suggests that a bigger size would bring about a growing pressure upon the existing structure (the “skeleton”) of the organisation (the organism) itself, which in turn would require a reshaping of its internal structure, according to the principle that - as happens in living organisms - the organisation is expected to become stronger where the forces tending to hamper its activity are greater<sup>29</sup>.

On empirical grounds, Haire observes that as an organisation gets larger, a rapid increase in the proportion of people allocated to administration (*control* and *coordination*) occurs – that is, the proportion of new people absorbed by *staff* functions grows at an increasing rate, whereas the rate of growth of those absorbed by *line* functions declines<sup>30</sup>. This involves a relevant *change* in the internal shape of the organisation itself, reflecting the need for facing its increasing *complexity*. Specifically, *such* a pattern of change suggests that coordination and control are the functions where the “disruptive” forces are focussed.

From the point of view of the present work, this way of looking at the relationship which links size and organisational shape draws attention to a specific issue; the fact that – consistent with a “Robinsonian” view – the need for coordination rises *more than proportionally* as organisations become larger. If we approached the question through the words of Robinson himself, we might say that “a mistake made by a platoon commander demands only an instantaneous ‘As you were!’ A mistake by an Army Commander may require days of labour to set right. In just the same way the problem of organising a large firm grows in complication as the firm grows” (p. 41).

But the distinction suggested by Haire between “line” and “staff” (as it relates to the changing pattern of firms’ workforces in the course of growth) also helps us to highlight a further issue, namely “the shortsightening” of firms’ capability to think about their own development process. Provided growing “risk and fluctuations” push towards *lower* organisational complexity (i.e. lower size), in the course of downsizing (as when size becomes bigger) firms’ internal shapes will by no means remain unchanged.

As we have seen (section 3), due to the fact that a growing share of transactions (previously managed inside firms) shifts towards the market – therefore making stronger the need for collecting relevant information – a growing share of the overall workforce will be involved in “line” activities, aimed at simply monitoring what in the market actually happens at any one time. Given available resources, this involves in turn that the share of “staff” people – i.e. those usually devoted to look at (“to *plan*”) the activities of the firm in a long run perspective – will be correspondingly *reduced*. This seems to be a very effective mechanism whereby the capability of firms to deal with *more* than short period issues becomes locked in some sort of a vicious circle: the less the firm can rely upon (the ripening of) its *internal* resources to evaluate the “environmental risk”, the less the very premises for future expansion can be set up, so that activities will

be more and more confined within the narrower boundaries of short-term “optimal” allocation of resources. And again, the question appears quite close to Robinson’s view, when stressing the distinction (with reference to line and staff activities) “between the work of organising *current* production and *the work of thinking ahead* and *planning* improvements in the methods of production and organisation” (p. 42, emphasis added).

## 6. To Conclude

Over the last quarter of this century the macroeconomic environment in advanced countries has seen a relevant break in its structural parameters. The upsurge of foreign exchange risk, the sharp increase in the volatility of interest rates (including higher *real* interest rate levels), an unprecedented need for monitoring rising prices, and – on the market side – the joint effects of rising competition and more and more fluctuating demand (including the fading away of mass production) have on the whole determined a “new” framework within which firms have had to set their production strategies.

Such changes, in particular (marking the end of the so-called Golden Age of industrial economies), have made it tougher to evaluate future returns to investments; at the same time they have compelled firms to become more cautious about their involvement in non-core business activities. On the other hand, we know that over roughly the same period a major change in the firm size structure has *actually* occurred, which has taken the shape of an employment shift from large-scale units towards smaller-sized ones (involving in most cases a reduction in the average size of firms and establishments).

These two phenomena represent related facets of the same long run process of structural change. In this connection, this paper has tried to highlight *which* theoretical framework may be addressed in order to identify the mechanisms whereby the first phenomenon has affected the second one – the starting point of the analysis being that a *single*

theoretical view has to be adopted to explain firms' behaviour *both* in the course of the Golden Age *and* afterwards.

Some of the (admittedly few) categories which the box of tools of microeconomics can make available to the economist in such a context have been reviewed in the paper. Building in particular on the work by Malmgren, Richardson and Robinson, it seems possible to set the basis of an overall consistent framework aimed at understanding the changing logic of firms' behaviour across the passage from the Golden Age to the "new" phase of industrial development starting in the mid-Seventies.

We can try to (quite roughly) summarize the view set forth as follows: *i)* insofar as uncertainty takes the place of risk, the need for processing (and making use of) a *growing* amount of information about what happens outside the boundaries of their business pushes firms to develop more complex monitoring routines; *ii)* this process raises the amount of managerial resources which are required at any one time to "hold the firm together"; *iii)* insofar as managerial resources are exogenously limited, this goal *cannot* be pursued owing to the pressure which the *structurally* higher degree of competition brought about by the globalisation process sets to firms' efficiency standards (pushing, conversely, towards labour *shedding*); *iv)* in order to face both challenges, firms are driven to reduce the degree of complexity of their organisational structures, i.e., to choose which functions have to be kept within their boundaries and those which have to be externalised<sup>31</sup>; *v)* this leads to lower average size of firms, to falling employment shares of larger organisations, and to an uprise in the rates of new firms' formation.

From the point of view of the theory of the firm, this path reflects a model of firm behaviour we can broadly define "Robinsonian", insofar as it hinges on the principle that the "optimal" organisation of economic activities is a function of the *external* context. In this view, a crucial condition is the difference between "stable" and "unstable"

market environments (where “stable” denotes a low degree of uncertainty and competition, and “unstable” the opposite). Whereas in the first case the “economies of planning” overcome the advantages which may be drawn from “flexibility”, in the second things work the other way round: lower organisational complexity is the efficient answer to market instability<sup>32</sup>. This means, in more general terms, that no one *single* optimal model of firms’ behaviour can fit *any* market conditions – that is, “*optimising*” may mean *setting up quite different organisations in different macroeconomic contexts*. Provided that an excess of “entrepreneurial supply” is available (so that a gradual implementation of intermediate markets can develop), *this* is the way whereby transacting through the market may become an efficient solution of the “problem” of production.

In Robinson’s own words (1935, pp. 85-86):

“where an industry is subject to considerable changes of demand, due either to permanent changes of taste on the part of consumers, or to changes of the methods of production caused by improvements in the thing produced, or in the technique of producing it, that firms will be strongest which can best face the problems of reorganisation and adaptation. The more elaborate a firm is, the more highly specialised in equipment, the better adapted in lay-out to the existing rhythm of production, the more expensive and difficult will be its re-equipment, the more complicated the task of moving and adjusting to their new functions heavy and capricious pieces of machinery”.

On the other hand:

“the smaller firm may be never so well adapted, but will be never so ill adapted, and will enjoy, therefore, a certain

advantage where changes of product are frequently necessary, and reorganisation is expensive”.

So that (p. 102, emphasis added):

“Our argument so far [leads] us to the conclusion that the existence of risks and fluctuations leads in general to smaller units, and in particular to smaller technical units, *than would be economical were production carried out continuously and evenly.*”

An interesting feature of the framework outlined above is that firms’ behaviour in the face of the passage from a “stable” and “safe” environment to a turbulent and competitive one shows a remarkable similarity to that followed by living organisms in adapting to similar changes within the ecosystems they belong to. From this point of view, Robinson’s (theoretical) approach to the analysis of business firms’ behaviour can be viewed, by and large, as the translation within an economic framework of the “alternative” between the two evolutionary models outlined in section 5.1. We might say that ‘even if they have been observed within utterly different contexts’ two quite analogous phenomena have been given quite similar explanations on theoretical grounds.

## Notes

1. Evidence about the matter has been provided in several studies since the early '90s. A review of current literature, as well as an attempt to develop an empirical assessment of the matter on the basis of an original data-set (spanning from the early '60s to the mid-'90s) can be found in Traù (1999a). It has nevertheless to be borne in mind, in this connection, that in the late '90s a new merger wave has began to spread in many industrial countries, which may have altered, at least in some contexts, the long run pattern outlined above. Whatever the future development of such tendencies, from this point of view it has to be stressed that the present analysis refers to a specific phase of the industrial development of advanced capitalist countries.
2. For an extensive analysis of the “Golden Age model” see Glyn *et al.* (1990).
3. This section simply summarizes a wider analysis of the phenomenon developed – both on theoretical and empirical grounds – in Traù (1999b).
4. “Not only were they subject to international capital controls under the Bretton Woods regime, they also had a plethora of controls, regulations, and other restrictive practices in the domestic product, capital and labour markets” (Singh, 1997, p. 14).
5. Organisational complexity here does not mean productive complexity. Each “flexible” machine may be in itself quite complex.
6. See here for instance Simon (1945), Papandreou (1952), Boulding (1952).

7. It goes without saying that all the so-called managerial models hinge upon work done by Berle and Means (1932) about thirty years earlier. For a general overview of the whole question, see Hughes (1987).
8. 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 (Jensen and Meckling, 1976).
9. “A workman does not move from Department Y to Department X because the price in X has risen enough relative 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). Such a view appears indeed very close to Marx’s one (see Putterman, 1986), but a very similar point of view can also be found in D. Robertson (1928).
10. Of course, growth may nonetheless bring about lower costs as a consequence of the emergence of *scope* economies.
11. See Cyert and March (1992 [1963]).
12. 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 (i.e. the degree in which parties are mutually dependent for their investments), the stronger the incentive to integrate.
13. 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) decentralised 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 (*infra*, section 4) and the sum of the markups which (small) firms in the “intermediate” phases of the production chain add to their unit costs. The tightening of competition, in this context, may tend to squeeze “intermediate” firms’ markup down to zero (the market option involves the absence of any market power), but it can hardly contribute to 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 minimise costs. On the other hand, increasing market turbulence raises the costs of gathering information. In a static perspective, unless exceptional changes on technological grounds are admitted (leading to higher technical efficiency for smaller scale plants), “economising” 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 *specialisation* (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. Whereas it is certainly true that *some* markets for products have experienced a strong expansion, however, on average the “fall” in the size of firms has been paralleled, as we have seen, by the “fall of the Golden Age”, that is by a sharp reduction (along with rising average volatility) in the output rate of growth of the major industrial economies.

14. Similar insights about the effects of demand uncertainty upon the division of labour among firms - generally coupled with some analysis of costs rigidities - can also be derived from the

contributions of Mills and Schumann (1985), Carlsson (1989) and Das et al. (1993). On more explicit “Stiglerian” premises see also Contini (1984).

15. Such a line of reasoning explicitly refers to the works, among others, of Powell (1990), and Loasby (1994).
16. “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” (p. 28).
17. From this point of view, wages reflect the willingness of employees to “bear the brunt of...uncertainty as to what actions will be chosen”.
18. Such a way of looking at organisational 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 organisation, the incongruence among the objectives of different agents and ambiguity in performance evaluation can be minimised by “organic solidarity” stemming, as a “form of mediation”, from the unavoidable dependence of individuals from each other.
19. This seems to be especially relevant in view of the fact that, as we know, the tendency towards a reduction in organisational complexity (to reducing size) has been quite intense in large companies, where such principles must have played a very important role in the course of the “size-rising” phase of industrial development.

20. A similar point may be raised starting from the perspective of the relationship between “formal” and “real” authority inside organisations. As suggested - even if in a quite different context than ours - by Aghion and Tirole (1997), who explicitly refer to Max Weber’s view, 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 turn* 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 higher because of the growing complexity of the problems to be taken under control (for instance as a consequence of rising uncertainty), the efficiency of organisations may tend to fall. This specific issue is at the root of the analysis developed in section 4 below.
21. It has to be stressed that the *overall* costs of gathering information may rise even in the face of *falling unit* (per message) costs, when the number of messages rises. And this is just what happens, since firms now have to face an often overwhelming *amount* of messages, which need more and more resources simply to be *processed*.

22. Malmgren calls this kind of information (“technical” in the words of Richardson) “controlled information”.
23. Indeed, “provided its efficiency...in controlling its primary data does not fall” (p.416).
24. A similar point can be found in Arrow (1984, p. 145), when observing that the strongest constraint on the acquisition of information “is the limitation on the ability of any individual [of the human mind] to process information”.
25. The point has been given much attention, in particular, in the context of the problems involved by the *growth* process: both in Kaldor’s (1934) and in Penrose’s (1958) view (or even in the framework developed by G.B. Richardson, 1964), for example, it is assumed that firms are bounded in the possibility to (efficiently) grow by the rhythm at which they are able to develop (to “ripen”) adequate *internal* managerial resources. 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.
26. “Co-ordination is... a function of the degree of change, since I myself would conceive of certain kinds of change requiring co-ordination even in a stationary state” (Robinson, 1934, p. 250). In the words of Williamson (1967, p. 125), “customers come and go, manufacturing operations break down, distribution systems malfunction, labor and material procurements are subject to the usual vagaries, all with stochastic regularity, not to mention minor shifts in demand and similar disturbing influences of a transitory nature”. A similar view can be found in Boulding: “even on the assumption of simple homeostasis of the balance sheet, things happen to assets which are not under the direct control of the firm and therefore compel the firm to adopt a course of countervailing action. (...) An economic

organization which simply sits down with a pile of assets will find, after a few years, that the assets are crumbled into decay” (1958, p. 72).

27. In this connection we have to note 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 as the most binding force acting against new (small) firms’ expansion.
28. For a fuller discussion, see for instance Brewer (1994, ch. 4).
29. “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” words, “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).
30. A quite similar point is raised by Radner (1992), who shows how the secular rise in the size of U.S. 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 doing it”, p. 1387).
31. Such a choice being in fact bounded by their actual competencies.
32. In a rather similar perspective the relationship between information costs and the internal organisation of firms (viewed in turn as closely related to size) has been recently addressed theoretically 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 characterised by an “autocratic” style of management, grounded upon the belief that the entrepreneur possesses “the key information relevant to the decision” (pp. 329-330).

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