

**CRITIQUE OF THE CONCEPT OF FLEXIBILITY**  
**CRITIQUE DE LA NOTION DE FLEXIBILITÉ**

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*Abstract*

This monograph proposes a theoretical and methodological critique of the concept of flexibility. This critique is based on evaluation criteria of the concepts offered by the social sciences research methodology. Through this exercise, the concept of flexibility appears to be derived from the explanatory functionalist framework of variability and change, which is not able to interpret the firm and work transformations as the current literature is emphasizing.

*Keywords*

Flexibility, Concept evaluation, Variability and change, Firm and work transformations.

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# Critique of the concept of flexibility\*

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## Introduction

The concept of flexibility has played for decades a privileged role in the reflections and debates on the transformations of firms and work. On the one hand, it has acquired great importance in the various disciplines that study these transformations: economics, management, sociology, psychology, law, etc. On the other hand, it is used in numerous fields of study: J.-C. Tarondeau (1999b) explains that flexibility refers both to the strategies of the firm and to the operational activities, products, processes and technologies, to the organization, to work. Finally, the concept of flexibility seems to have both a descriptive and a normative value.

The absence of critique appears to be singular. Of course, critiques do exist about the “flexibilization” and its consequences - on the regulatory system, on the economic system, on working conditions and lifestyles - especially in labor law, sociology and work psychology contributions, but a critique of the *concept* in itself is still missing. The concept has not, to date, been subjected to the test of “falsification”. However, much time has passed since Karl Popper showed how the consistency of concepts and hypotheses depends only on their capability to resist the challenges to refute them<sup>1</sup>.

Our purpose in this contribution is purely theoretical and methodological. We follow Popper’s method by proposing an approach to the concept of flexibility aimed at evaluating its consistency. We will refer to the

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\* This text is the translation of B. Maggi, Critique de la notion de flexibilité, published by the *Revue Française de Gestion*, 2006, 162: 35-49. We are grateful to the Review for authorizing the translation.

<sup>1</sup> The falsificationist approach of this great philosopher of the science allowed completely overcoming the inductivist illusion of strengthening theoretical constructions through the accumulation of numerous confirmations. His critical reflection on the inductive method began in 1919, as he himself reveals: see K.R. Popper, *Conjectures and refutations: the growth of scientific knowledge*, New York: Basic Books, 1962.

evaluation criteria of the concepts traditionally proposed by the handbooks of methodology of the social sciences: the criterion of *extension*, concerning the more or less broad set of fields and situations to which the concept applies; the *clarity* criterion, concerning the objective determination of the concept; and the criterion of the meaning of the concept in the framework of the theory of which it is a part, i.e. its *systematic import*. Since this approach is proper to neo-positivist epistemology, as evidenced by the reference to C.G. Hempel<sup>2</sup>, on which it is usually founded, it seems particularly appropriate to the literature concerning flexibility, which almost entirely presupposes this epistemology<sup>3</sup>.

This contribution will highlight unresolved issues resulting from the concept of flexibility and, overall, its inadequacy for the interpretation of the transformations of firms and work as pursued by the literature under scrutiny. Thus, it appears that these gaps find their origin within the functionalist framework for the explanation of variability and change from which the concept derives. And this requires us to change the point of view, and to directly question the reflection on *variability*.

### **The definition of the concept**

The evaluation of a concept should begin with its definition(s). As far as the concept of flexibility is concerned, given its widespread diffusion, the need for postulating a definition does not appear relevant for the literature: usually, flexibility is more presupposed than defined. However, there is no lack of general definitions as well as reviews of the interpretations of flexibility, particularly within the managerial literature, and these definitions and interpretations show significant convergences.

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<sup>2</sup> C.G. Hempel, *Fundamentals of concepts formation in empirical science*, Chicago, University of Chicago Press, 1952; Id., *Aspects of scientific explanation and other essays in the philosophy of science*, New York: The Free Press, 1965; Id., *Philosophy of natural science*, Englewood Cliffs (N.J.): Prentice-Hall, 1966.

<sup>3</sup> We argue that any criticism of a concept or theory must first of all be conducted “within” their philosophy, i.e. by within the “way of seeing” that they presuppose, and not by different visions. For the same reason, we evoked the contrast between the falsificationist approach and the inductivist approach, a contrast that marked the neo-positivist debate of the first decades of the twentieth century.

Tarondeau (1999a) defines flexibility in terms of “propensity [of a system] to transform itself to improve its integration into an environment and thereby increase the probability of survival”. He adds that “the flexibility of a system placed in an uncertain environment is defined and measured: a) according to the number of states that it is able to assume in order to achieve its prescribed purposes, and b) according to the cost and the time employed for the change of states” (Tarondeau, 1999a; 1999b). Reix (1997) defines flexibility as: “a) Flexibility is a means of coping with uncertainty; b) it translates the firm’s propensity to respond to new conditions, to develop a capacity for learning using additional information; c) it can express itself in terms of extension of the potential field of possible decisions or in terms of ease of change of a state; d) its value is comparable to an option value”.

Gerwin (1987; 1993) notes that flexibility has generally been proposed as an adaptation response to the uncertainty of the environment, and more precisely as a set of responses to different manifestations of uncertainty. De Toni and Tonchia (1998) find, in their wide review of the literature, that flexibility is defined as: a) characteristic of the relationship between a system and its environment, where it operates as an absorber of shocks provoked by uncertainty; b) degree of homeostatic control of a system, i.e. as a degree of cybernetic adaptation; c) capacity for change and adaptation.

These definitions tend to shape the “general characteristics” of flexibility and seem to converge in identifying them in the *capacity for adaptation* and in the aim of *facing uncertainty*.

However, many authors prefer to highlight the existence of different manifestations or aspects of flexibility. For example, Mandelbaum (1978) distinguishes a *flexibility of state*, which allows the system to be “stable” and to function despite the change, and a *flexibility of action*, which allows to face the change by changing the state. Slack (1983) in turn distinguishes a *flexibility of “level”*, concerning the number of states that the system can reach, and a *flexibility of “response”*, concerning the time of change of state. Zelenovich (1982) highlights an “exogenous” nature of flexibility when it concerns the adaptation

of the system to environmental changes, and an “endogenous” nature regarding the use of technological opportunities within the system. In the same way, Tarondeau (1999a) contrasts *external flexibility* with *internal flexibility*.

Finally, while most definitions emphasize the adaptation to an uncertain environment, Gerwin (1993) proposes to consider not only a defensive flexibility but also a *proactive flexibility*, which is capable of modifying the environment. In the same direction, Mariotti (1994) contrasts the *static flexibility* of passive adaptation with both the *inter-temporal flexibility*, which allows a better opening to the evolutions of the environment and to the learning and innovating processes, and with the *flexibility of dynamic efficiency*, which acts on the environment in order to transform it by modifying the reactions of strategic interdependence. Cohendet and Llerena (1999) also distinguish *static*, reactive flexibility and *dynamic*, temporal, proactive flexibility.

This brief summary of the definitions of the concept of flexibility, though not exhaustive, highlights some of the most indicative proposals. It will be the basis for our analytical discussion; for now, it is noteworthy to emphasize the convergence regarding the meaning and the purpose of flexibility, as well as the most relevant gaps.

First, the attention the literature devotes to the definition of the concept, thus specifying the characteristics of flexibility, overlooks - in general - the specification of the other fundamental concept in all definitions: that of *uncertainty*. Mariotti (1994) is partly concerned with distinguishing an “objective” uncertainty, based on “lack of information”, and an uncertainty deriving from “cognitive limits” of the subjects of the decision<sup>4</sup>.

Second, these definitions do not refer - in general - to the etymology of the term “flexibility”, while the etymological reference should always be necessary for the definition of a concept. Shouldn’t we start from the realization that in languages of Latin origin, but also in English, flexibility (fr. *flexibilité*, it.

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<sup>4</sup> The distinction between objective and subjective aspects of uncertainty, sometimes proposed by some authors, nevertheless appears unsustainable: uncertainty has a meaning since it regards, in the decision-making process, the state of knowledge of the decision-maker.

flessibilità) derives from *flexum*, supine of *flectere* (to fold)? Flexible is said of what easily bends and, by extension, of what adapts to different conditions, to different circumstances<sup>5</sup>. Now, the etymology legitimizes the definitions of flexibility in terms of adaptation. On the contrary, problems arise for the definition of “proactive flexibility” proposed by Gerwin (1993), or when Mariotti (1994) evokes the etymology to criticize the “passive” vision of flexibility and proposes an active or “dynamic” declination of the concept, also proposed by Cohendet and Llerena (1999). In these cases, are some improper characters forced into the concept of flexibility? Would they require a different concept? Or would it be necessary a change of point of view?

We will return later on these questions, while evaluating the concept on the basis of the three methodological evaluation criteria already mentioned: the extension, the clarity, and the systematic import.

### **The extension of the concept**

Some authors seem to put on the same level the “types”, the “dimensions” and the “fields” of flexibility (Browne *et al.*, 1984; Tarondeau, 1999b), probably to highlight its “multiform nature”. However, these are different aspects that have to be considered separately, if we refer to the three criteria for evaluating the concepts.

The criterion of extension, as we have anticipated, concerns the areas and situations in which the concept is used: the extension is therefore greater the more the concept applies to numerous classes of situations. The literature agrees in recognizing a broad extension of the concept of flexibility, even when the contributions are focusing on a single set of situations. In the literature devoted to overcoming the model of the Fordist firm, the concept appears central to the discussion of change in strategies and relationships between

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<sup>5</sup> Le Robert, *Dictionnaire historique de la langue française*; Collins Cobuilt, *English language dictionary*. Tarondeau (1999b) uses the fable “The reed and the oak” as a metaphor to highlight the property of adaptation. According to Reix (1997) the idea of flexibility “intuitively” refers to the propensity to adapt.

firms, technologies and management practices and organization of production systems, forms and contents of work.

Tarondeau (1999a; 1999b) details a list of areas covered by the concept. On the one hand, he considers the firm's strategy - where flexibility can affect all the firm's "functions" (research and development, finance, etc.), the use of resources within the firm and the external relations with partners - and the operational activities. On the other hand, he points out that, both for strategic decisions and for operational decisions, flexibility encompasses the large fields of products, processes and organization. With regard to products, flexibility applies to design as well as to manufacturing. With regard to processes, it applies to technologies, equipment and machines. With regard to the organization, it applies to the relationships between the subsystems of the firm and to the use of human resources, as well as to relations with external partners. Finally, flexibility may also concern work: in a "quantitative" sense, when referring to volumes and work relationships, and in a "qualitative" sense, when referring to its content.

This extension of the concept of flexibility is certainly impressive. Nevertheless, it may be questioned whether it always concerns the relationships between the firm and its environment. The answer is affirmative when we refer to strategies, operational decisions, technological and organizational choices, and human resources policies. But when we refer to the relationship between the firm and its partners and contractors, it would be necessary to take into account the possibility of "rigid demands" addressed to them, so that they are flexible to adapt to the demands expressed by a "lead company" - a case well illustrated, for example, by the changes in the automotive industry. And, when flexibility is referred to work, it would be necessary to distinguish the policies of the firm and the norms of labor law and the flexibility of the subjects that must adapt to these policies and these rules, which are (to them) as "rigid" as the previous ones. Overall, both the level and the unit of analysis have to be carefully considered, in order to assess the extension of the concept applied in

the different areas of the firm: otherwise, there is the risk of attributing to the latter a flexibility belonging to other levels or other units of analysis.

### **The clarity of the concept**

The extension is, in principle, related to the level of abstraction of the concept. The more the concept is abstract, the more it is necessary to translate it into less abstract “dimensions” and into “empirical indicators”, to allow its “measure”<sup>6</sup>. The second evaluation criterion, the clarity criterion, concerns this aspect: the potential capacity of the concept to descend along the abstraction scale to reach an operational definition with objective indicators. This evaluation must obviously be related to the extension.

Many contributions focus on the dimensions and measures of the concept of flexibility. However, this analytical focus is not covering the whole extension of the concept. As Tarondeau (1999b) points out, the question is less treated in relation to the flexibility of business strategies - where indicators are presented in terms of possible options or capacity, propensity to change, but for which measures are not detailed - while there is larger literature focusing on the flexibility of production systems. Let's analyze some examples.

Regarding the flexibility of strategies, Sanchez (1995) identifies two main dimensions and their sub-dimensions: a) “resource flexibility”, i.e. the capacity for flexible use of resources in order to pursue alternative courses of action in response to the competitive environment; b) “coordination flexibility”, i.e. coordination of available resources.

Regarding the flexibility of production systems, Browne *et al.* (1984) propose eight dimensions: a) “machine flexibility”, concerning the modifications of the machines necessary to produce a set of elements of the product; b) “process flexibility”, i.e. the ability to produce a set of elements; c) “product flexibility”, i.e. the ability to change sets of elements; d) “routing flexibility”, i.e. the ability to cope with interruptions; e) “volume flexibility”, i.e.

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<sup>6</sup> In this regard, the necessary reference is to P.F. Lazarsfeld, Evidence and inference in social research, *Daedalus*, 1958, 87, 4: 99-109.

the ability to operate at different volume levels; f) “expansion flexibility”, the ability to increase the level of production; g) “operation flexibility”, or ability to change the order of operations; h) “production flexibility”, concerning the universe of the elements that can be produced by the system. Specific measure indications correspond to each dimension.

Gerwin (1987) identifies seven dimensions concerning: the mix, the variation of the range and the functional changes of the products, the use of the equipment, the volumes, the materials to be transformed, the sequences of the process; and for each of these dimensions the author indicates possible measures. The same dimensions – developed by Gerwin and Tarondeau (1989) and by Gerwin (1993) – appear to be better articulated with respect to the criterion of clarity of the concept in a previous contribution (Gerwin, Tarondeau, 1984) which focuses on two levels of translation of the concept in dimensions: three dimensions at a first level, concerning the flexibility of “product”, “process” and “input” are broken down into subdimensions of lesser abstraction, such as the diversity of products, their renewal, their modification, the volumes and states of the process, etc.

Literature reviews (Gupta, Goyal, 1989; Sethi, Sethi, 1990; De Toni, Tonchia, 1998) highlight both the convergence about the conditions of change and environmental complexity, and the combinations of the criteria adopted to identify the dimensions: the type of change (quantitative and qualitative), the extent of change, the time frame (short, medium and long term), the type and degree of *alea* to be faced, etc.

Finally, with respect to work, flexibility affects both the legal rules on labor relations – field of study of Labor law – with, obviously, a variety of solutions in different countries (Veneziani, 1992; Supiot, 1999), and the organizational rules, with particular focus on the transformations of production processes and tasks, the integration of functions, and the mobility of workers (Terressac, 1992). Regarding the management, Tarondeau (1999b) distinguishes: a “quantitative flexibility”, or elasticity of staff and wage, and a “qualitative flexibility”, concerning the extension of the qualifications and skills of the

employees and their internal mobility. On the one hand, flexibility is made possible by atypical work and by the use of fixed-term work, self-employment, and outsourcing. It applies to the volume of work, and is measured in terms of number of employees, costs and terms of variation. On the other hand, flexibility is exercised on the content of the work, the definition of tasks, the skills and abilities of workers.

This series of references is sufficient to allow some comments regarding the criterion of clarity of the concept.

Even the authors who have been proposing dimensions and measures express dissatisfaction: for example, Gerwin (1987; 1993) notes that “in spite of the need no well-accepted operationalizations exist”. Regarding the flexibility of the strategies, Tarondeau (1999b) notes that it is “difficult to aggregate [the indicators] in order to establish a global flexibility scale”, and that the possibility of measuring “optimal flexibility” is missing: this is not a problem of marginal relevance for a literature aiming to be normative and not just descriptive. Also for the flexibility of the production systems, according to De Toni and Tonchia (2001), the existence of different dimensions would only lead to partial measurements, which would have to be combined for a unitary classification considering jointly: a) the “objects” of the change (volumes, products and processes), and b) the “characteristics” of the change (conditions of the initial state and type of transition, short and long term).

While we concur with these criticisms, it is also necessary to accept that different authors propose different translations of the concept into dimensions, sub-dimensions and measures, and to finally admit that this exercise is not complete. However, the concern regarding the clarity of the concept is probably excessively stressed: it would denote, if we follow Hempel’s approach, an “operationalist” attitude, the attribution of a pre-eminent, if not exclusive, importance to the operative determination of the concept. The evaluation of clarity has to be related to the evaluation of both the extension and the systematic import of the concept of flexibility.

Now, the application of the concept to numerous fields should imply levels of abstraction common to all these fields, consistently with the theory that proposed the concept. The various dimensions and empirical indicators proposed, on the contrary, appear to be heterogeneous, based on multiple definitions of flexibility, even opposite ones (passive, active, static, dynamic, internal, external, etc.), more related to the particular characters of different fields than to a unitary theory. It is in this perspective that it is more appropriate to evaluate the operational translations of the concept. And this leads us to consider the criterion of systematic import.

### **The systematic import of the concept**

According to Hempel, concepts should not be considered separately from the theories to which they belong. If we evaluate them in relation to the contribution they offer to understand and explain phenomena, then we should carefully take into consideration their collocation as components of a theory, that is their *systematic import*. The operational translation of concepts is necessary for empirical research, but it cannot be separated from the evaluation of their theoretical meaning.

Now, very few authors who utilize the concept of flexibility to interpret the transformations of firms and work are concerned with evaluating its theoretical value. Nevertheless, there are citations of theoretical references, although sporadic and synthetic. The “contingency theory of the organization” is cited to highlight the role of flexibility of the firm coping with environmental uncertainty, for example by Gerwin (1993). The approach that explains the behavior of the company in relation to the use of resources (“resource-based view”) is also mentioned, for example by Sanchez (1995) who refers to it to develop its dimensions regarding the flexibility of the resources and their flexible coordination, or by Tarondeau (1999a; 1999b) who refers to it in combination with the theory of “organizational ecology” to support the adoption of the concept of flexibility for reflecting on business strategies. The approaches of the “organicist view of the organization” opposed to the

“mechanists view of the organization” and of the “socio-technical system” are also cited, in particular by Tarondeau (1999b) as a reference for reflecting on flexibility in the fields of work organization.

What is the place and import of the concept of flexibility in these theories? What is the theoretical meaning in relation to the current uses of the concept, its extension and its clarity? What is its primary source? To assess the systematic import of the concept of flexibility, it is necessary to answer this type of questions.

First of all, it is necessary to situate the cited theories. We follow a chronological order. The theory of the “socio-technical system” is proposed by the Tavistock Institute of Human Relations at London, and specifically by Emery and Trist (1960). It interprets the variability of the social structure of the firms in terms of adaptation to the technology, and through the latter to the environment. The theory that contrasts the “mechanical system” and the “organic system” is due to Burns and Stalker (1961): it presents the organizational characteristics on a scale of variability that allows to evaluate the best adaptation to different environmental situations. These two theories stand out in the perspective of the “new human relations” - after the first Human Relations proposed by Elton Mayo and his school in the years 1930-1940.

The “contingency theory” is introduced with this name by Lawrence and Lorsch (1967) to highlight the dependence of organizational efficiency on the nature of the environment and the ability to adapt to it. The concept of “contingencies” actually expresses the set of exogenous constraints on the organizational structure: a large strand of literature shares and develops this point of view, considering the adaptation of the structure to the environment, but also to technology (Woodward, 1965; Perrow, 1967), or to numerous “context” variables (Pugh *et al.*, 1968; 1969). The contingency-based perspective is widely utilized, and it is already existing, before the denomination of contingency theory, in previous approaches, such as the already-mentioned new human relations. The “resource-based view” appears at the end of the 1970s (Pfeffer, Salancik, 1978) and focuses on “resource dependence”,

interpreted according to two dimensions: the control of resources and their influence on the organization. Many scholars identified in this approach a discontinuity with respect to the contingency-theory perspective, since the organizational strategies adopted to reduce dependence are interpreted as strategies that would not just adapt to the demands of the environment. Actually, the idea of resource dependence is only a development of some element of a great classic of organizational thought – Thompson’s theory (1967) – however, the resource-based theory does not adhere to the general framework of Thompson’s theory, and remains anchored to the contingency-theory perspective. Contrariwise, the theory of “organizational ecology”, founded in particular by Hannan and Freeman (1977; 1989), moves away for various reasons from the approaches mentioned above. First of all, it proposes an “ecology of the populations of organizations”: the unit of analysis is the “population”, not the individual organization. In addition, the relationship between these groups of organizations and the environment is not interpreted in an adaptive way, but in terms of “natural selection” processes: therefore, this theory is opposed to any approach relying on contingent and rational adaptations<sup>7</sup>.

We can analyze the place and the import of the concept of flexibility in these theories. Flexibility is the cornerstone and the core of the new human relations approaches. These are the approaches that specifically propose the “rigidity/flexibility” *continuum* to explain the variability of the organizational structure and its adaptive propensity: we will analyze this point in the following paragraph. Flexibility is no longer a central concept in contingentist approaches, where it is used to explain aspects of structural adaptation even though it derived from the proposals of the human relations. Organizational ecology, aimed at proposing an evolutionary theory focusing on the level of the populations of organizations, makes no reference to the concept of flexibility.

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<sup>7</sup> For a critical comparison of theories in the field of organization studies, from the 1960s, see Maggi, 2003/2016, part I, chapter 2.

Thus, these theories converge - except for the organizational ecology, which does not appear to be a suitable reference - towards a vision of adaptation of the organizational system to environmental constraints, where flexibility is the main manifestation of adaptive behaviors. The theoretical meaning of the concept of flexibility is therefore consistent with most current definitions, but the proposals to use this concept in “active”, “proactive” or “dynamic” sense appear to be inconsistent, rather contradictory: probably, in these cases it would be preferable to use another concept, given that they do not refer to an adaptation.

Finally, let's consider the extent and clarity of the concept in relation to its systematic import. The current extension may seem wider than the initial theoretical proposals, but nothing prevents the broadening of a field of application of a concept if this does not become contradictory to its systematic meaning. As for the articulation of the concept in terms of dimensions and indicators that have been developed, many of them seem to move away from the original systematic meaning and hang from the idea of flexibility - i.e., of adaptation - towards changes, options, variations, which can allow a better adaptation. Then, the idea of flexibility seems to become a general assumption, which justifies *a priori* whatever modification, either responsive, adaptive or even “proactive”: this contradicts the theory. Once more the question arises: would not be the case to look for - in a different theoretical framework - another concept that can be better articulated in dimensions and indicators of change and variation?

It seems necessary to deepen the evaluation of the systematic import of the concept of flexibility, taking also into consideration its source and its development: it is necessary to understand from where it originates and what its theoretical path has been.

### **The sources and the development of the concept**

We have premised that the definition of a concept must first of all take into account its etymological meaning, and we recalled that “flexibility” means

*“variable adaptation* to different conditions and circumstances”. Now, this meaning is perfectly consistent with the fundamental orientation of *functionalism*, as assimilated by the human and social sciences (Merton, 1949). According to the functionalist view, the structure of the system, whether rigid or flexible, can only adapt to the environment - better, to its meta-system - to respond to the functional needs of the system itself.

If we can say that “managerial researchers have been concerned about this concept [of flexibility] since the 1970s” (Cohendet, Llerena, 1999)<sup>8</sup>, the study of the organization - of functionalist orientation - started much earlier to develop a reflection on flexibility. The starting point dates back to the first Human Relations. Researchers from Elton Mayo’s laboratory highlight, with the Hawthorne research, that the deviation from the Taylorist rigid program can be, rather than a deviance to correct, an element to be valued when it allows better functionality. In this way, they pave the way to the perspective of flexibility, in contrast with the “classic model”. They see the firm as an organic system. The inner part of the system is both a “technical organization” and a “human organization”. Human organization is “individual” and “social”, and as a social organization it involves a “formal” part and an “informal” part (Roethlisberger, Dickson, 1939: 551-568). This interpretation is well known. But for the purposes of this reflection it is noteworthy to point out that in this interpretation the human part - flexible - has to adapt to the technical part - rigid - according to the functional logic of the system. Moreover, the inner part of the organization must fit, as a whole, the outside economy. Here lies the source of the concept of flexibility with respect to the firm and the work.

Those early human relations, during the 1930s-1940s, are not yet interested in the variability of organizational solutions. Rather, they appear looking for the more functional way - still a “one best way”. The new human relations that have developed since the 1950s do not change the basic

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<sup>8</sup> It is starting from this date that the widespread diffusion of information technologies creates the basic conditions for the crisis of the Taylorist-Fordist model of the firm, and consequently the quest for the so-called “flexible” solutions concerning the transformations of firms and work.

characteristics of this perspective. However, they make an important change, precisely because they become interested in the variability of the system, and they explain it by adopting the “rigidity/flexibility” dimension as criterion of analysis. This dimension is codified in the early 1960s by three contributions, almost contemporary.

The functionalist sociologist A.W. Gouldner (1959) proposes to overcome the separation between the “rational model” of the “science of administration” and the “natural-system model” identified by previous sociological research. He directly criticizes the eclectic use of the two models and the concept of “informal organization” proper to Mayo’s school of human relations. Instead, he states the complementarity of the two models in order to interpret the variability.

F.E. Emery and E.L. Trist (1960) insist on the one-dimensional interpretation of organizational variability in their famous contribution in which they propose the concept of “socio-technical system”. The dichotomy that Gouldner wants to overcome is, on the contrary, reaffirmed by this contribution in terms of contrast between “closed system” and “open system”. For the authors of the Tavistock Institute, for any given technology, the structural solutions can be multiple. Among these, the rigid solution is justified only when the technology requires specialized skills. And it is just a matter of choosing the most functional solution among the flexible ones.

The third contribution is due to T. Burns and G.M. Stalker (1961), sociologists at the University of Edinburgh. It is the most cited contribution, probably because they do not propose a dichotomy between rigidity and flexibility but a *continuum*, suggesting that real-world organizational solutions are situated at intermediate levels between the two poles: the “mechanical system” suitable for situations of stability with rigid solutions, and the “organic system”, suitable for dynamic situations with flexible solutions.

It is also noteworthy to highlight that the rigidity/flexibility *continuum* appears to be strengthened, in the two European contributions, through its coincidence with the “certainty/uncertainty” *continuum*. The concept of

uncertainty, derived by the London researchers from the systems' theory, and by the Edinburgh researchers from microeconomics, propose a significant support for explaining flexible adaptation needs. But it should be noted that according to the functionalist orientation, uncertainty is seen as an attribute of the "outside" of the system, more evoked than investigated, to which the "inside" can only adapt. Even the certainty/uncertainty axis is based on a single dimension, such as and in parallel with the rigidity/flexibility axis, hence it does not add new elements to explain variability.

This one-dimensional interpretation of the variability of the system as an adaptation to technology and the environment is adopted by the following contingent approaches, including those previously mentioned. This perspective, however, appears unsatisfactory in Woodward's research (1965), which is unable to explain the similarities between the two poles of the technological *continuum*; and it is contradicted by the research of the Aston Group (Pugh *et al.*, 1963; 1968; Child, 1972), which abandons the concept of flexibility along its path. Finally, Perrow (1967), while proposing a typology of technology and detailing its relations with the structure, openly states the inadequacy of the rigidity/flexibility *continuum* for the interpretation of organizational variability. These critiques come from within the contingency theory.

The assessment of the systematic import of the concept of flexibility thus leads to a fundamental issue. Initially proposed by Human Relations to interpret the functional adaptation of the organizational system, the concept of flexibility has been the basis for the interpretation of the variability of this adaptation. But the evolution towards the interpretation of variability - the true core of the organization studies and the cornerstone for understanding change - has fostered a progressive disinterest for flexibility, even within the theoretical perspective in which it originated.

## Perspectives

The critique of the concept of flexibility that we have proposed, based on the criteria of evaluation of concepts, help us to understand the theoretical statute and the utilization of such concept. Important questions emerge by comparing such utilizations, upon which it is necessary to reflect. On the one hand, the concept derives from an interpretative approach that has shown its limitations and that has been overcome; it is widely adopted in order to interpret the transformations of firm and work, but it has proved inadequate to explain the variability of the system, that is, the modalities of its change. On the other hand, the changes that require an interpretation - dynamic, intertemporal, proactive - impose to go beyond the idea of adaptive variability. Finally, the theoretical meaning poses problems to the extension and clarity of the concept: its application to many different fields appears to be possible only through numerous additional qualifications. The operative proposals are various, they appear derived from different qualifications of the concept rather than from its theoretical meaning, they seem destined to translate into indicators and measures the forms and times of change rather than flexibility.

The need for overcoming the functionalist and contingent theoretical framework and the vision that such a framework presupposes thus emerges. This means also developing other concepts, more suited to understand the transformations of firms and work, capable of satisfying the interpretative needs highlighted by the current literature on flexibility. Now, this choice that seems to be appropriate is not difficult. Non-functionalist contributions concerning the interpretation of change and variability are not missing in the vast field of organization studies and would be easy to cite. In particular, we can refer the study of the variability that was first proposed by Herbert Simon (1947), then continued by his school and developed by the contribution of James Thompson (1967) and by studies that are placed in the Simonian tradition of intentional and bounded rationality<sup>9</sup>.

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<sup>9</sup> See Maggi, 2003/2016, part I, for a discussion of the different visions, of the "ways of seeing", presupposed by the field of organization studies.

We propose this opportunity for researchers to reflect. We think that scientific research feeds essentially on debate, discussion, dispute. Therefore, this suggestion of an alternative way has here the value of a working hypothesis. Like any other hypothesis, it has to be elaborated and tested. As Popper noted, the scientific path is composed of conjectures and refutations, hypotheses and critiques.

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