



Collective objectives, particular objectives, and structural conditions: On Pasinetti's natural economic system and the “institutional problem”

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ABSTRACT

The paper builds on Pasinetti's separation between a dynamic path that provides a normative framework (the “natural economic system”) and the need to devise concrete institutions to approximate that path (the “institutional problem”). The paper argues that addressing the “institutional problem” requires theorising the role of actions within economic structures. By doing so, it proposes an approach to institutional analysis that shows how an economy growing with structural change offers opportunities for, and imposes constraints on, the pursuit of collective objectives as well as particular objectives by social groups variously defined. It also makes it possible to address the interplay between collective and particular objectives. A key argument is that how social groups themselves represent structures and their position therein is a non-reducible factor to explain which dynamic path an economy follows out of those which a given structure makes possible.

1. Introduction

A defining and distinctive feature of Pasinetti's theory of structural economic dynamics (Pasinetti, 1981, 1988, 1993, 2007) is the separation between a normative framework and the institutions that may or may not make it possible to approximate that framework. More specifically, the normative framework (the “natural economic system”) is a dynamic path along which an industrial economy growing with structural change can reach certain systemic objectives. The need to devise concrete institutions that would allow a given economy to approximate that path, and hence to achieve those objectives, is what Pasinetti calls the “institutional problem”. Pasinetti's theory can therefore be interpreted as defining the conditions that a growing industrial economy must meet to pursue collective objectives. Crucially, it remains open-ended as to whether and how those objectives can be achieved in concrete settings.

The paper builds on this interpretation of Pasinetti's theory. It argues that addressing the “institutional problem” requires delving deeper into the role of actions, and, on that basis, it proposes a route to develop institutional analysis. A key feature of the approach proposed in the paper is that it makes it possible to study not only the pursuit of *collective*

objectives within the structures of an economy growing with structural change, but also the pursuit of *particular* objectives by social groups variously defined, and the interplay between collective and particular objectives. In doing so, the paper aims to show how Pasinetti's work can provide crucial building blocks to interpret economic structures as offering opportunities for, and imposing constraints on, the pursuit of the objectives of a variety of collective actors and social groups. It also argues that how social groups themselves represent the system and their position therein is a non-reducible factor to explain which dynamic path the economy follows out of those which a given structure makes possible.

The paper starts by introducing Pasinetti's distinction between natural and institutional analysis (Section 2) and specifically the “institutional problem” that polities need to address in order to meet collective objectives (Section 3). Pasinetti is not committal as to which actors should pursue those objectives and, more generally, who the relevant social groups in an economy will be; Sections 4 and 5 introduce the problem and discuss the variety of social groups that could emerge within a given economic structure. To think about which groups could be relevant in a given situation out of those which are possible, it is necessary to delve deeper into how action within structures could be

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understood (Section 6). On that basis, the paper theorizes what actors might emerge (Section 7) and how they could represent economic structure, and hence what constraints and opportunities that structure entails for them (Section 8). In this light, Pasinetti's "institutional problem" can be revisited to account for a plurality of actors and objectives, both collective and particular (Section 9). Section 10 concludes the paper.

2. Pasinetti on natural and institutional analysis

Pasinetti's theory of structural economic dynamics aims to capture an essential feature of industrial economies: the continual changes in the structures of production and consumption, and the need to coordinate them. The former derive from the application of human learning to production, which results in technical change and accumulation; the latter are caused by the evolving tastes of consumers in response to changes in income. The need to coordinate production and consumption imposes requirements that must be satisfied for collective objectives to be reached. These requirements are intrinsic to the industrial form of production and must therefore be addressed by all economies that organise production in an industrial manner. These are what Pasinetti calls *capitalistic* economies, which are characterized by "a certain stock of capital goods" (Pasinetti, 1983, p. 411), and, in order to reproduce themselves and grow, they must ensure "its continual renewal, and [...] its expansion through time" (ibid.). These requirements hold irrespectively of whether a given economy also has *capitalist* institutions, i. e., who owns the means of production (Pasinetti, 1981, p. 151).¹

In Pasinetti's analysis, several layers of objectives and requirements can be detected. For example, the "general multi-sector dynamic model" (Pasinetti, 1981, pp. 80–85) describes the conditions for what Pasinetti defines as single-period equilibrium, i.e., full employment and full utilization of productive capacity in a given period. It shows that even if the system is in equilibrium in the initial period, it is not necessarily so in subsequent periods. Whilst these dynamic paths do not *prima facie* entail collective objectives, they still display (non-proportional) growth. And whilst there are no explicit requirements, there arguably are implicit ones, such as proportions between economic activities and technology that make the system viable to start with, as well as a surplus that can be invested to make possible the expansion of production capacity. These requirements in turn presuppose a degree of coordination of economic activity that can be seen as a systemic requirement for the collective objective of growth.

"Dynamic equilibrium" paths (Pasinetti, 1981, pp. 85–108) display full employment and full utilization of productive capacity at each period. These features can be seen as systemic objectives. The problem is therefore the following: in a multi-sectoral economy, full employment and full utilization of productive capacity are reached if the production and consumption of the product of each sector are equal in any given period. However, because of continual change in production techniques and consumers' tastes, that equilibrium is incessantly disrupted. Reaching the systemic objective therefore requires that sectoral employment and hence productive capacity, relative quantities and prices be constantly re-proportioned (Pasinetti, 1981, pp. 85ff.; see also Garbellini and Wirkierman, 2014, p. 253). But no mechanism in the economy guarantees that re-proportioning will happen automatically. If this does not happen, the economy will grow along a path that is not an equilibrium one, i.e., one that does not achieve full employment and full utilization of productive capacity.

The "natural economic system" (Pasinetti, 1981, pp. 127–155) not only displays full employment and full utilization of productive capacity at each period. It also has the property that a pure labour theory of value holds, so that equal rewards are offered to equal amounts of

homogenous labour (ibid., p. 132), and all surplus goes to wages because profits only serve for investments needed for expansion of productive capacity.² These can be seen as collective objectives that require a specific set of sectoral profit rates, each of which must be equal to the sum of the rate of growth of population and "the rate of increase of per capita demand for each consumption good" (Pasinetti, 1981, p. 130).

Pasinetti highlights that there are no mechanisms that guarantee that a given economy will approximate the natural system:

"The natural economic system [...] does not automatically come into being by itself. It *has* to be brought into actual existence – by us. But it is a *moving* framework (not a *stationary* one). This means that, within it, many profound tendencies are constantly at work, from its very foundations, which are making it continually evolve, i.e. *change* in its structure. Thus, even if, or when, the natural economic system were hypothetically to be brought into active existence at any specific moment in time (which will never happen, also because some extant institutions, at any specific point, may become unsuitable), it would then soon change in size and, most importantly, in its proportion (i.e. in its structure) and hence the current economic magnitudes would have to be modified accordingly, as time goes on" (Pasinetti, 2007, p. 306, emphasis original).

Hence, far from being a description of an actual dynamic path, the natural system spells out the requirements imposed by a capitalistic organization of production to a polity that aims to achieve certain collective objectives in the face of structural change.³ How to do that?

"To bring the natural economic system into existence, to close its degrees of freedom and then to keep it going through time, a set of procedures, rules, regulations, administrative bodies is required, which for short I have called *institutions*. [...] Essentially any society must face its 'institutional problem'. It must face the social responsibility of constructing its institutions, adapting and modifying them as time goes on, perfecting them and (now and then when it becomes necessary) even discarding some of them, while inventing new ones" (Pasinetti, 2007, p. 306, emphasis original).

Arguably, different institutions would be suitable for the different collective objectives discussed above.⁴ Pasinetti sees this separation between a normative framework (whether the "natural economic system" or the other paths) and the concrete institutional settings that may or may not allow an economy to meet the requirements of that framework as classically inspired, for "classical economists always underlined the necessity of penetrating below the surface of the immediately observable economic phenomena, into the more fundamental forces that move them", and in particular "the determinants of the economic magnitudes that characterize the industrial economic systems"

² Pasinetti shows that, in the natural system, "[total] profits emerge as a kind of prior claim to share in the final national income, while total wages – by being (conceptually) determined after profits have been determined already – emerge as a kind of residual, or looking at it from a different point of view, as a 'surplus' that remains over and above what has been charged for profits" (Pasinetti 1981, p. 144). Hence, "[total] consumption [...] (conceptually) emerges as a kind of residual, or 'surplus'. It must absorb all that is left over after providing for the necessary additions to productive capacity, as a requirement for full employment growth" (ibid., p. 146).

³ The same can be said of the paths, discussed above, that entail 'mere' growth or equilibrium growth, which require less demanding conditions than the natural system.

⁴ For example, Pasinetti shows that a uniform rate of profit may, under certain condition, allow full employment and utilization of productive capacity, but it would require giving up the 'natural' feature of prices that are proportional to physical quantities of labour (hence, a pure labour theory of value) and accepting instead prices that reflect labour equivalents (Pasinetti 1981, p. 153), with "quantities of labour being weighted differently according as to whether they were applied directly or indirectly" (Pasinetti, 1981, p. 132).

¹ See Garbellini and Wirkierman (2014, pp. 235ff.), where this distinction is made explicit and its implications are analysed in depth.

(Pasinetti, 1993, p. 146).⁵ And yet, in contrast to the Classics, whom he sees as attributing ‘natural’ character to the institutions of the commercial society (ibid., p. 118), Pasinetti argues that natural features are to be found at a “deeper and more fundamental level” (ibid.): that of the pre-institutional mechanisms that operate in any economy organized industrially, irrespective of its institutional arrangements.⁶

Pasinetti’s separation adds a further system-level means-ends problem to what characterizes many approaches in structural economic analysis. In fact, the latter approaches can be interpreted as studying the requirements that economic structure imposes on the pursuit of collective objectives (Cardinale, 2022a). For example, the Hawkins-Simon conditions (Hawkins and Simon, 1949) can be seen as setting an objective of viability (reintegrating the inputs and generating a non-negative surplus) and finding the requirements for the pursuit of that objective, in terms of the range of proportions between quantities of outputs of different industries. In von Neumann’s (1945–46) model, the objective is the maximum growth of the system, and the constraint derives from technology; specifically, technology determines the growth rate of the slowest-growing sector, which in the equilibrium growth path imposes the growth rate of the entire system. In Quadrio Curzio’s model (1967, 1986; Quadrio Curzio and Pellizzari, 2009, 2018), the systemic objective is the same as von Neumann’s (i.e., maximum growth), but its pursuit is subject to the scale constraints deriving from the use of non-produced resources. In Pasinetti’s approach, the first means-ends problem concerns the magnitudes that make it possible to achieve collective objectives. The second means-ends problem – the “institutional problem” – concerns how to design institutions that make it possible to achieve those magnitudes in concrete settings.

3. The “institutional problem”

Let us recall how Pasinetti introduces institutions and the “institutional problem”.

“To bring the natural economic system into existence, to close its degrees of freedom and then to keep it going through time, a set of procedures, rules, regulations, administrative bodies is required, which for short I have called *institutions*. [...] Essentially any society must face its ‘institutional problem’. It must face the social responsibility of constructing its institutions, adapting and modifying them as time goes on, perfecting them and (now and then when it becomes necessary) even discarding some of them, while inventing new ones” (Pasinetti, 2007, p. 306, emphasis original).

So, Pasinetti takes institutions to be *what closes the degrees of freedom of the system from potential paths to an actual path*. This can be the natural path (or, more realistically, an approximation thereof), or another path. Specifically, institutions define the magnitudes that bring into existence one dynamic path out of those which are possible given the coefficients.

“The same economic variables may actually come under scrutiny at both levels of investigation, but in a quite different manner: at the

natural level as ideal positions to be achieved; at the institutional level as actual positions that are in practice realizable, through particular institutional mechanisms; the latter having to be compared with the former, and to be gauged according to the speed with which they tend towards the former” (Pasinetti, 1993, p. 147).

Whilst this definition of the institutional problem leads to a ‘residual’ understanding of institutions, which may not amount to a formal definition, it is useful for the purposes of this paper as it focusses on requirements whilst preserving open-endedness as to how they are satisfied. More specifically, this paper focuses on what is arguably an important but largely neglected aspect of open-endedness: who the relevant actors are and what their actions will be. In fact, the natural system only specifies the *requirements* for a growing capitalistic economy to reach the collective objectives discussed above. That is, it specifies *what* needs to be done, but not *by whom*.

4. The systemic actor (or lack thereof)

Pasinetti’s discussion of how different institutional arrangements may be more or less likely to lead the relevant magnitudes to the natural levels does not explicitly commit to specific assumptions about actions and actors (see, for example, Pasinetti, 1993, ch. 8). However, because of the systemic character of the collective objectives and requirements imposed by the production system, it is unsurprising that Pasinetti often refers to a collective actor acting on behalf of society as a whole – what could be called a “systemic actor” (Cardinale, 2022a). A typical case is the “Agency” tasked with pursuing full employment (Pasinetti, 1981, p. 91).

For the purposes of the collective objectives of full employment and full utilization of productive capacity, a systemic actor could indeed exist: typically, a national government. But if we consider collective objectives that should be pursued at the international level, such as international macroeconomic stability or environmental sustainability, there is typically no actor that has the mandate or power to act on behalf of an international economic system (such as the world economy). In fact, even within a given country, to the extent that reaching full employment and full utilization of productive capacity also depends on other countries through export demand, as is the case in an open economy, then the powers of a (national-level) systemic actor are not unlimited; that is, they are constrained not only by materiality and institutions, but also by the actions of other (in this case, external) actors. More generally, even when a systemic actor exists, its powers are the result of a process of centralisation that takes place over time and is never complete. The systemic actor always has, to varying extents, to interact with social groups whose worldviews and objectives may well differ from those of the systemic actor. These groups can be called “subsystemic” actors. In sum, the ability to act – whether to merely carry out “private” economic actions, or to try to influence collective decisions – belongs to a variety of potential actors, be they systemic or subsystemic. Who these actors are, and what objectives they pursue, is an institutional feature.

5. Subsystemic actors

Who are the subsystemic actors? It is typical in structural economic analysis to assume at the outset (i) what the social groups are (e.g., classes defined on the basis of the income they receive); (ii) that they behave in ways that follow straightforwardly from their position in structure, so that their actions can be assumed *ex ante* (e.g., workers will consume, capitalists will save and invest); including (iii) what their objectives are (e.g., securing a higher share of a given value added).

It will be argued in what follows that a limitation of this approach derives from the fact that structure cannot determine the relevant collective actors or their interests—much less their actions. Making sense of actions requires taking social groups’ viewpoint – something that is

⁵ An example of this separation can already be found in Pasinetti’s (1962) determination of the profit rate required to generate the investment that preserves full employment in a growing economy. Pasinetti shows that this requirement holds for ‘capitalist’ and ‘socialist’ systems alike: if full employment is to be maintained, the system must generate savings and investment at the required level, although how this will be done and by which socioeconomic group will differ across systems. See Baranzini (1991) for a study of manifold institutional arrangements, dynamics of social groups and patterns of behaviour that make it possible to satisfy Pasinetti’s condition (see also Baranzini and Mirante, 2013, 2018).

⁶ See Scazzieri (2012) on continuities and discontinuities between Pasinetti’s and the Classics’ natural analysis. See Bellino (2015) for a comparison between Pasinetti’s natural system and Garegnani’s (1984) “core” of a capitalist system in the light of classical theories and Sraffa’s reinterpretation thereof.

seldom done in structural economic analysis. For example, even when it is explicitly shown that a given class can receive a higher share of a given surplus, such as in Sraffa's (1960) standard system, it is rarely considered what its 'action problem' would look like (Cardinale, 2022a); for example, how the workers' class can obtain such higher share, i.e., through what means and with what constraints.

To establish that structure does not determine the relevant collective actors, an important negative result can be obtained through Pasinetti's (1973) logical process of vertical integration. As is well known, Pasinetti shows that any system of inter-industry interdependencies can equivalently be represented as a set of final commodities, each produced through an input of composite labour and an input of composite capital.⁷ From the viewpoint of action, the insight is that if the same structure can be represented in different ways, each of which highlights different social groups, then structure in itself cannot determine what the relevant social groups are in a given situation, and what their interests and actions will be (Cardinale, 2018b, 2022a).

Even within circular representations of the system, different aggregations are possible, and this is particularly apparent by comparing representations that differ as to the institutional assumptions they make. Take for example the difference between the price systems of the open Leontief system and the Sraffa system. The former can be seen as a relatively pre-institutional representation as value added is generated in industries but there are no assumptions as to how it will be distributed between income types within them. Hence, the aggregations that could count as actors in a given situation could be, for example, classes across industries, income types within industries, or industries themselves. The Sraffa model is less institutionally open. Here too industries are visible, but since the rates of profit and wage are assumed to be uniform, capital and labour appear as homogenous blocs across industries in that they are remunerated uniformly; hence, the interests of workers are aligned, as are those of capitalists. It is therefore likely that workers and capitalists will appear as the relevant social groups.⁸

Such a way of thinking about the aggregations that are possible within a given structure can be understood in terms of Truman's (1951) distinction between *potential* and *actual* interest groups. In the example above, if the wage rate is uniform, all workers would benefit from a higher share of surplus going to labour. Therefore, they are a potential interest group in that they would benefit from the same outcome. That they recognise themselves as such – as having an interest in common – is a precondition for becoming an actual interest group, by organising themselves to pursue that interest concretely by investing time and resources to acquire the required political influence or clout in industrial relations.

6. Two views of action

In the previous section, it was shown on the basis of representation of structure alone (i.e., Leontief vs Sraffa representations) that structure cannot determine the relevant collective actors. Hence, different *potential* interest groups are possible within the same economic structure.

How to close this open-endedness? That is, how to move from the variety of potential groups that a structure allows, to the actual groups that form in a given context? To answer this question, it is useful to

⁷ See Baranzini and Scazzieri (1990) on the horizontal and vertical patterns of interdependence underlying different economic theories, and the significance of this distinction for economic analysis; see Landesmann and Scazzieri (1990) on the implications for economic dynamics. The patterns of connectivity of a given economy can give rise to yet other representations of economic structure (see, e.g., Reggiani, 2022; Scazzieri, 2022) and a multiplicity of potential aggregations of social groups (Cardinale, 2022b).

⁸ Note that these are only examples of possible social aggregates: other possibilities exist, some of which are mentioned in what follows.

distinguish between two ways to conceptualise actions. One view emerges, for example, from Chapter 8 of Pasinetti (1993), where different institutions are evaluated in view of their ability to bring the relevant economic magnitudes close to their natural level. This approach assumes that once institutions, i.e. "procedures, rules, regulations, administrative bodies" (Pasinetti, 2007, p. 306) are set, the actions of actors in the economy will be predictable, in the sense that actors can be relied upon to behave in predictable ways given their position within structure and the institutional arrangements that the systemic actor has created. This can be seen as a "third-person" view of action (Cardinale and Scazzieri, 2023; see Martin, 2011). It is an instance of what Bourdieu (1990) calls 'social physics', which is the approach to social science that "sets out to establish objective regularities (structures, laws, systems of relationships, etc.) independent of individual consciousnesses and wills" (Bourdieu, 1990: 26–27).⁹ This is arguably the most common view in structural economic analysis, and it is shown perhaps in its clearest way in the assumptions made about workers' and capitalists' actions (for example, see Pasinetti, 1960, 1962).¹⁰ The fundamental idea is that actions are seen as being determined by something external to the actor; in this case, the position within structure (e.g., whether someone is a worker or a capitalist) and institutions (e.g., private ownership of means of production).

Lowe's instrumental analysis, which shares some features of Pasinetti's normative approach (see, e.g., Hagemann, 2022; Scazzieri, 2012; Schefold, 2022), assigns a more explicit role to actions.

"[Instrumental] analysis takes as *given* not only the initial but also the *terminal* state — the latter being "known" through explicit stipulation of a macrogoal toward which the system is to move. The *unknowns* to be determined are (a) suitable *paths* over which the system can move toward the macrogoal, (b) *behavioral and motivational patterns* that set the system on such paths and keep it to them, and, possibly, (c) public controls suitable to elicit the appropriate motivations. Finally, the link between data and unknowns is forged by our knowledge of the *pertinent laws of nature and engineering rules*, including those *psychological laws* that relate specific behavior to specific motivations, and of certain *empirical generalizations* describing the manner in which the social environment and, in particular, public controls affect motivations" (Lowe, 1976, p. 12, emphasis original).

As compared to Pasinetti, Lowe more explicitly considers actions – including the motivations of actors – as part of the systemic actor's strategy to achieve collective objectives. However, it is not fully specified whether the link between motivations and actions, especially as it can be influenced by public intervention, is a stable and predictable relationship or whether it involves an active role of actors, for example in terms of degrees of freedom in interpreting the situation, their interests, and which courses of actions would be most appropriate in the light of that interpretation.

To allow for such a role for actors, we need to also consider the "first-person" viewpoint (Cardinale and Scazzieri, 2023; see Martin, 2011). This is an expression of what Bourdieu (1990) characterizes as "social phenomenology", which is an approach to social theorizing that seeks to render reality as it appears to a given actor. In contrast

⁹ The characterization of this approach as "social physics" has no derogatory connotation. In Bourdieu's (1990) view, it expresses the necessary epistemic break that social analysis must make from how the world appears to actors in order to capture relations that are otherwise not apparent.

¹⁰ Pasinetti's (1962) approach is particularly revealing because the behaviour of social groups is not assumed *ex ante* as much as defined in terms of requirements for full employment; this leaves spaces for a variety of behavioural possibilities, such as a range of saving rates on the part of workers. Yet, the theory does not aim to reconstruct how a group's behaviour depends on its own action problem (as defined below); in this sense, it adopts a third-person view of action.

to the third-person perspective, which attempts to explain action as determined by forces external to the actor, such as position in structure and institutions, the first-person viewpoint (as instantiated in this paper) seeks to consider the viewpoint of actors within structures, in terms of the action problem on the basis of which actors act.¹¹ This can be shown to be influenced but not determined by structures (Cardinale, 2018a, 2018b, 2022a). More specifically, the first-person viewpoint will be considered in terms of how economic structure appears, to actors positioned within it, for the purpose of action.¹² In other words, the focus is on the possibilities for action that structure affords to actors within a certain position. This can be conceptualised in terms of ecological psychologist James Gibson's (1977) concept of affordances. Gibson discusses how living beings perceive objects not in terms of their material properties but for the possibilities for action they entail. In what follows, Gibson's approach is adopted to render the idea that an actor does not aim to understand structure in terms of relations for their own sake, but in terms of opportunities for action. Specifically, the focus is on how a position in structure can afford possibilities such as receiving a (higher) share of surplus. So, the problem is how actors (at different levels of aggregations) are afforded opportunities by their position within structure. This in turn requires defining who the actors are, and then reconstructing their action problem.

7. Identifying the relevant actors...

Once equipped with the distinction between third- and first-person viewpoints, we can address the problem of identifying the actors that are relevant within structures (and institutions) and how they formulate their action problems.¹³ One way to identify which subsystemic actors can be relevant out of those which are possible is to go through the (first-person) viewpoint of actors at the micro level, such as firms and workers; that is, to consider their representation of themselves and of the structures within which they act. For example, a given firm might see itself as belonging to an industry or to a vertically integrated sector, which in turn could be constructed on the basis of the final good it produces, or the inputs it uses. This approach can also be explored in the case of coalitions formed around the introduction of technological innovations, where interdependencies are between the processes that would be affected by such innovations. The same holds for workers: will they see themselves as one social group across industries, or as groups in each industry, or as groups defined by, say, mobility, or skill level?

A given structure therefore affords different possibilities for potential interest groups. Depending on how micro actors represent structures and their position therein, they will see themselves as part of a given aggregation or another, and hence will have different interests and

therefore different allies.¹⁴ In Truman's terms, they would turn from (one of the possible definitions of) potential interest group to an actual interest group. For our purposes, this is when we consider a social aggregation as a subsystemic actor. In this perspective, the analysis of coalitions of firms (and workers) is grounded in industrial interdependencies, but which coalitions come to form remains open-ended as it depends on which interdependencies are salient.¹⁵ In fact, because structure does not determine relevant social groups and their interests, self-representation of social groups is crucial to close open-endedness. Understanding salience in turn raises the question of how groups adopt a given representation instead of another. This problem is especially important in systems subject to structural change, as are those studied by Pasinetti: will the change in production structures be accompanied by a restructuring of actors' representations of that structure, and hence group affiliations and interests?

For example, structural change could lead to widening within-industry or within-sector heterogeneity, to the point that different parts of an industry could have different interests. And yet, it is unlikely that representations of structure and organisation of interests would respond immediately. In fact, representations of the economy and social groups therein might be taken for granted as a result of having been adopted for a long time, as in the case of trade unions that represent workers on the basis of their industry or type of employment, or of industry associations organised on the basis of firms' output or size, whereas structural change could make other forms of aggregation more aligned with the new structure and hence more relevant (Cardinale and Landesmann, 2022). Similarly, policymaking often takes place in a setting of 'epistemic communities' that comprise representatives of public bodies and of various economic interests (Haas, 1992). The representations of the economy that are more or less explicitly adopted in such communities are likely to have a certain persistence in representing aggregates such as social groups or sets of countries, even in the face of structural change.

Another effect of structural change could be a shift in the geographical delimitation of the relevant system of interdependencies, for example because of changes in trade patterns and production networks. In fact, some interdependencies could strengthen whilst others weaken, so that a wider or narrower system of interdependencies – say, regional, national or international – becomes relevant. There is no guarantee that the representation of relevant interdependencies on the part of actors will be updated accordingly; much less that suitable organisations can be easily set up to manage interests at shifting levels.

¹⁴ The difference between 'micro' actors and social groups into which they might aggregate is akin to how Quadrio Curzio and Pellizzari (2018) define "macro decision-makers", where the criterion is that the latter can have an influence on collective outcomes, whereas the former are unlikely to: "the institutional [macro-decision makers] who can influence by policies all the economic system; the entrepreneurial [macro-decision makers] who earn profits and have a certain control on accumulation and choice of techniques; the labor unions [macro-decision makers] who earn wages and have a certain control on wages and employment and therefore on the choice of techniques; the [macro-decision makers] owners of [non-produced means of production] who earn rents and can exert a certain control on quantities and qualities of [non-produced means of production] put into activity and therefore on the choice of techniques" (Quadrio Curzio and Pellizzari, 2018, pp. 693-694).

¹⁵ An interesting empirical setting can be found in Ferguson et al.'s (2021) study of voting in relation to industrial structure, which discusses the need for firms to decide their political stance towards a tariff package by weighing the benefits of protection of final goods against the disadvantage of higher cost of imported intermediate inputs. Ferguson (1995) argues that firms' managerial structures are designed to make decisions in the face of such conflicting interests. From the perspective of this paper, this issue can be thought in terms of the multiple affiliations made possible by a given structure (in this case, affiliations could be based on final demand or on intermediate inputs), and how this open-endedness gets to be closed in specific situations.

¹¹ The idea that structure appears within the action problem of actors as a set of constraints and opportunities is explored in more depth in Cardinale (2022a).

¹² This is not restricted to individual actors; it can refer to agency at different levels of aggregation, as will be shown in what follows.

¹³ A different approach to the endogenous formation of social groups is developed by Baranzini (1991; see also Baranzini and Mirante, 2013, 2018), where the emergence, evolution and (potentially) disappearance of groups derive not only from structural and institutional factors, but also from behavioural ones, i.e., from groups' actions. Specifically, a key role is played by forms of bequest behaviour, which are shown to generate different dynamics of social groups. In this approach, actions are mostly understood from a third-person viewpoint, although some elements of first-person analysis are present, as in some places groups' behaviour is explicitly understood as deriving from the pursuit of objectives; however, this is rendered in a traditional microeconomic fashion. In this paper, in contrast, first-person analysis is theorised as an interaction between groups' action problems, which depend on their representation of economic structures, and the affordances and constraints shaped by those structures.

In more general terms, the argument is that whilst actors' representations cannot be fully reduced to structures, they are not completely unpredictable or subject to radical change at any moment. As was explained above, there are important elements of cognitive and organisational persistence. Hence, it is a matter of considering the interplay between changes in economic structures and changes in actors' representations, which are likely to display persistence but could also be restructured.¹⁶

8. ... and their action problems

Once groups' representations of structure are defined, what affordances will be associated with groups' positions in structure?

For example, let us assume that actors adopt a representation based on the open Leontief price system. To the systemic actor, the system would afford the generation of a surplus, but this would be constrained by the need to maintain the system within proportions that make reproduction with surplus possible (Cardinale, 2022a). In terms of the quantity system, this can be interpreted through the Hawkins-Simon conditions (Hawkins and Simon, 1949), which express the range of proportions between quantities that make it possible to produce more goods than were used as inputs in production. In terms of the price system, relative prices must remain within the range compatible with each industry being viable, which is necessary for the whole system to be viable (Steenge and van den Berg, 2001). Under each set of relative prices, a different value added would accrue to each industry.

What about the affordances for subsystemic actors? Since the Leontief representation is relatively pre-institutional, it allows different possibilities to aggregate actors and define their affordances. For example, a cleavage by class could lead to affordances that consist in a higher wage rate across the economy, which could be pursued, for example, by trade unions trying to establish institutions that set a relatively uniform wage rate and make it possible to negotiate it upwards. In contrast, if industries are the relevant actors, what the system affords to them could be a higher value added. This could be pursued, for example, by attempting to exert influence on political authorities to intervene on the price system through policies that could lead to relative prices that increase the value added accruing to the industry. This would however be subject to the systemic constraint that prices remain within the range that ensures viability. From the viewpoint of the industry, viability would be seen not as a result of the objective to preserve the system, but as a condition on the pursuit of the industry's own objectives, for outside the viability range some industries would be unable to produce and would therefore make the system unviable, so that the industry could be affected too. If, in contrast, an industry looked at the quantity system, a different affordance that could present itself would be to increase output. In this case, the constraint would be that proportions between the outputs of different industries remain within the viability boundaries expressed by the Hawkins-Simon conditions.

If the micro actors, instead, understand production structure as a Sraffa system, the assumption of uniform wage and profit rates will lead to see classes as the relevant social groups. The affordances open to them will likely be understood in terms of increasing the share of surplus that they receive. This is most clearly visible within the standard system, where distribution is independent of prices and the trade-off between profit rate and wage rate is immediately apparent. Interestingly, because in the standard system the size of the surplus is independent of distribution, a class's attempt to obtain a higher share does not affect the size of the surplus. Hence, there are no obvious constraints to the extent to which a class can try to increase its share of that surplus.

The consideration of affordances for different actors could be further extended to different aggregations of production processes, such as

vertically integrated sectors variously constructed, as well as to countries and geographically defined systems of interdependencies.

9. The “institutional problem” revisited: collective and particular objectives

The foregoing discussion of the actions of subsystemic actors leads to a more complex understanding of the institutional problem as defined by Pasinetti.

From the viewpoint of the systemic actor, the pursuit of collective objectives is first constrained by the material requirements of different paths. For example, pursuing an equilibrium path, i.e. full employment and utilization of productive capacity, requires that sectoral employment and hence productive capacity, relative quantities and prices be suitably re-proportioned over time. Making that possible in concrete settings in turn requires addressing the “institutional problem”.¹⁷ Whilst institutional design is seen by Pasinetti as instrumental to the systemic actor's objectives, at a given time existing institutions also constrain the systemic actor itself. Moreover, institutions have their own inertia; that is, they can only be changed at different time horizons (Archer, 1982; Cardinale 2019b). One must also consider political feasibility of such changes, which also depends on how actors constitute themselves and what institutional changes they pursue.¹⁸

Even once institutions are devised and (temporarily) stabilised, the systemic actor is also constrained by subsystemic actors' pursuit of their own objectives. Such objectives could be strictly economic in nature; this case is exemplified by the typical Keynesian problem of pursuing full employment under decentralised investment decisions. Subsystemic actors' objectives could also revolve around their attempts to influence collective decisions about setting institutions (e.g., Kalecki, 1943). If one takes the third-person viewpoint, these actions are assumed to be predictable within the action problem of the systemic actor. But given the open-endedness of representation of structure, the first-person view matters: even within the same structures and institutions, micro actors may coalesce into different groups, such as industries or classes, depending on their representations of structure. They would hence pursue different interests and act accordingly. We must therefore consider subsystemic actors' first-person perspectives.

From the perspective of subsystemic actors, pursuing objectives is constrained by the same structure as the systemic actor – but seen from their own position. In other words, just as a public authority to reach full employment must consider constraints imposed by production structure, so must a social group to pursue its own objectives. Hence, as for the systemic actor, economic structure shapes subsystemic actors' opportunities, e.g., for appropriating shares of surplus. Institutions constrain the ways in which this can be done in specific settings.

This in turn matters for the systemic actor's pursuit of collective objectives. Take the issue of the sectoral rates of profit that are compatible with natural dynamics (Pasinetti, 1981, pp. 151–153; see also Scazzieri, 2012). Pasinetti shows that what is taken to be a key feature of capitalist institutions – a uniform rate of profit – is incompatible with full employment and utilization of productive capacity unless the profit rate is “higher than [...] the weighted average of the sectoral “natural” rates of profit” (Pasinetti, 1981, p. 152). This is a third-person view, where it is assumed that features of a capitalist system such as the lack of barriers in the movement of capital will reliably cause actions (i.e., movements of capital across sectors) that lead to a uniform profit rate. The systemic actor's institutional design is then supposed either to devise and implement institutional arrangements that make sectoral profit rates approximate natural ones even in capitalist

¹⁶ See Cardinale (2018a, 2019a, 2019b, 2022a) for a more extended and formal treatment of this problem.

¹⁷ See Pasinetti (1993, ch. 8) for examples of institutions.

¹⁸ For a broader analysis of the ‘constitutional’ issue of the relationship between systemic actor and subsystemic actors in a polity, see Pabst and Scazzieri (2023).

systems, or to acquiesce to let the uniform profit rate rise enough.

Let us instead consider the first-person perspectives of actors. For example, if firms adopt a representation that assumes uniform rates of profit and wage, such as the Sraffa representation discussed above, they will see the profit rate as uniform but also as a variable that they can hope to change in their favour; whether the rate will rise enough to guarantee full employment will depend on factors such as distributive conflict with workers. In contrast, if firms adopt a representation where there are no assumptions about distribution, such the open Leontief representation discussed above, the profit rate might not be seen as uniform, as it will depend, for example, on the value added accruing to an industry as well as its distribution within that industry.¹⁹ It is of course unlikely that the profit rates thus reached in each industry – i.e., as the result of how firms interpret their situation and act accordingly – will lead to the profit rates in vertically integrated sectors that are required for equilibrium growth. Hence, the values of the relevant economic magnitudes, which may or may not lead to equilibrium or even natural dynamics, are influenced not only by material relationships but also by conflicts that depend on actors' representation of structure.

Another example concerns the very choice of collective objective. Take full employment. This could be an objective shared by workers if they see themselves as a 'class' across industries, but not necessarily if they see themselves as groups within industries. Firms, in contrast, may be unlikely to view full employment in a good light because of its implications for distribution and industrial relations, unless they see it as instrumentally useful within a broader social pact. But a different collective objective, such as viability in the sense of reproduction of means of production, could be seen in a different light by firms. In fact, if the system is unviable, firms may be unable to pursue their interests. Hence, viability might under certain conditions be reached even in the absence of a collective policymaker (as is the case, for example, in international settings), as a result of groups' consideration of viability as a necessary condition for the pursuit of their own interests. The requirement to keep the system viable as a constraint on the objective of each actor can be called *systemic interest* (Cardinale, 2015, 2017, 2018b, 2022b). In other words, systemic interest is the viability condition as it appears *within the action problem of a subsystemic actor*. International macroeconomic viability and environmental sustainability may be usefully interpreted in this light. Like particular interests, systemic interests depend on how actors represent structure. Of course, it cannot be taken for granted that systemic interest will be considered by actors in forming their strategies for action, and, even so, that this will preserve viability. This will depend on contexts. A relevant factor is the system that different actors consider to be the relevant one (e.g., industry, sub-national, national, international). In fact, preserving the viability of any such system could be seen as a matter of systemic interest by different actors, and there is no guarantee that actors will converge on the same definition of the system (and hence of systemic interest). Moreover, even once systemic interest is defined, acting on it also depends on whether there exist institutions that allow actors to coordinate their actions. It must also be noted that, as interdependencies change over time, so could actors' representations thereof and definitions of systemic interest, although, as discussed

¹⁹ The argument suggests that features taken as 'objective' in third-person analysis assume a different form within first-person analysis, where they matter not in themselves but for the affordances and constraints they shape, which depend on representation. In the case discussed here, whether the profit rate is uniform matters for how it influences the action problems. In a Sraffa representation, the assumption of a uniform profit rate leads to understand capitalists and workers as the relevant groups in society. Hence, for example, within the action problem of the capitalists of a firm, it might suggest a convergence of interests with other capitalists (against workers) across the economy, where (uniform) profit and wage rates are the relevant variables. The lack of such assumptions, as in the Leontief representation, might lead to different visualizations of groups in society, potential allies, and relevant variables.

above, there could also be persistence in representation in the face of structural change (Cardinale and Landesmann, 2022). Moreover, the different time horizons of different actors and the presence of fundamental uncertainty may lead to prefer established ways of coordinating interests.

In sum, the existence of, and relationship between, the systemic actor and other actors vary across contexts. All actors face constraints that are structural and institutional – each from their position. They also face each other's actions. This points to the need to understand the interaction between systemic and subsystemic actors, whose representations of structure, action problems and actions derive from their position in structure as well as from persistence of previous representations.

10. Conclusion: the institutional problem and the action problems

The paper has argued that addressing polities' "institutional problem" requires explicit analysis of action. More specifically, a third-person view of action is not sufficient: since a given structure can be represented in multiple ways, it cannot determine its representation on the part of actors, and hence their actions. We also need to address the first-person view: the *action problems* formulated by actors at the 'micro' level and at the level of social groups. Since structure doesn't determine representation, and actions close the system by setting the path of structural dynamics that takes place out of those which are possible, *actors' representation of structure emerges from the analysis as a non-reducible component of structural dynamics*.

A view of action is implied in any structural theory. Making it explicit – in its third- and first-person dimensions – allows us to develop what Pasinetti (1986) calls the "pure labour model", and indeed structural economic analysis more generally, to address new problems, such as the institutional dimension that this paper has started exploring. But this requires a view of action that is consistent with structural economic analysis. This is the purpose of the view of action within structures developed in the paper, which revolves around the affordances that structure provides to actors in different positions, depending also on the representation of structure that they adopt.

Actors' representations of structure are in turn neither exogenous nor completely unpredictable. They emerge over time as actors act within structures. They can therefore be seen as an interaction over time between positions in structure and representation thereof. They tend to be relatively persistent but there is also a possibility for actors to restructure them, notably as a result of changes in economic structures. It thus becomes possible to address the relationship between the many possibilities for dynamics that a given structure affords, and the way in which the history of actors can close that open-endedness.²⁰

Once action is duly considered, Pasinetti's approach can lead to an interpretation of structural economic analysis where the purpose is neither to provide a model of an actual economy by closing *ex ante* the open-endedness of dynamics, nor to fit stylised facts. Rather, the purpose is to discover the requirements imposed by the materiality and organisation of a capitalistic economy (as defined by Pasinetti) on the pursuit of objectives. More specifically, it becomes possible to conceive the pursuit of a variety of possible objectives – collective and particular – on the part of several potential actors – systemic and subsystemic – who may form a variety of possible action problems.

This interpretation can pave the way to overcome the reduction of

²⁰ This approach can be seen as bringing together the relative structural invariance that characterizes economic structures (Landesmann and Scazzieri, 1996) and the interplay between invariance and restructuring that characterizes structures of cognition and action (Bourdieu, 1990; Cardinale, 2018a).

structural economic analysis to mechanistic interpretations where action follows from external circumstances alone, such as positioning in structure and institutional settings.²¹ Rather, this approach lays out what economic requirements need to be satisfied to achieve collective objectives; and in so doing, it leaves open the relevant actors, their action problems, and their actions. This makes it possible to reconnect structural economic analysis to the preoccupation with statecraft that characterized the origins of political economy (Serra, 2011 [1613]; Montchr stien, 1999 [1615]; see Cardinale and Scazzieri, 2018), but with full consideration of the structural requirements of a capitalistic economy, the relevant institutional constraints (such as those of a capitalist economy, and with the specific features of each context) and a complex set of actors exercising agency at different levels and in different ways.

Recognising the extent to which representations, actions, institutions, and structural dynamics are open-ended in different contexts, and how they relate to each other, allows systemic actors to abstract from the status quo without falling into utopian thinking. It also offers a framework for the political action of subsystemic actors, highlighting the central role of their representation of structures and of themselves, and how different structures and institutions afford opportunities and impose constraints on their action.

CRedit authorship contribution statement

Ivano Cardinale: Conceptualization, Writing – original draft, Writing – review & editing.

Data availability

No data was used for the research described in the article.

References

- Archer, M.S., 1982. Morphogenesis versus structuration: on combining structure and action. *Br. J. Sociol.* 33, 455–483.
- Baranzini, M., 1991. *A Theory of Wealth, Distribution and Accumulation*. Clarendon Press, Oxford.
- Baranzini, M., Mirante, A., 2013. The Cambridge Post-Keynesian school of income and wealth distribution. In: Harcourt, G.C., Kriesler, P. (Eds.), *The Oxford Handbook of Post-Keynesian Economics*. Oxford University Press, Oxford and New York, pp. 288–361. I.
- Baranzini, M., Mirante, A., 2018. Luigi L. Pasinetti: An Intellectual Biography, Leading Scholar and System Builder of the Cambridge School of Economics. Palgrave Macmillan, London and New York.
- Baranzini, M., Scazzieri, R., 1990. Economic structure: analytical perspectives. In: Baranzini, M., Scazzieri, R. (Eds.), *The Economic Theory of Structure and Change*. Cambridge University Press, Cambridge, pp. 227–333.
- Bellino, E., 2015. Sraffa's price equations in light of Garegnani and Pasinetti: the "core" of surplus theories and the "natural" relations of an economic system. *Cah. d' conomie Politiq.* 69, 15–44. <https://doi.org/10.3917/cep.069.0015>.
- Bourdieu, P., 1990. *The Logic of Practice*. Polity Press, Cambridge.
- Cardinale, I., 2015. Towards a structural political economy of resources. In: Baranzini, M., Rotondi, C., Scazzieri, R. (Eds.), *Resources, Production and Structural Dynamics*. Cambridge University Press, Cambridge, pp. 198–210.
- Cardinale, I., 2017. Sectoral interests and 'systemic' interest: towards a Structural Political Economy of the Eurozone. In: Cardinale, I., Coffman, D., Scazzieri, R. (Eds.), *The Political Economy of the Eurozone*. Cambridge University Press, Cambridge, pp. 216–237.
- Cardinale, I., 2018a. Beyond constraining and enabling: toward new microfoundations for institutional theory. *Acad. Manage. Rev.* 43, 132–155.
- Cardinale, I., 2018b. A bridge over troubled water: a Structural Political Economy of vertical integration. *Struct. Change Econ. Dyn.* 46, 172–179.
- Cardinale, I., 2019a. Microfoundations of institutions and the theory of action. *Acad. Manage. Rev.* 44, 467–470.
- Cardinale, I., 2019b. On action, embeddedness, and institutional change. *Acad. Manage. Rev.* 44, 673–700.
- Cardinale, I., 2022a. On means and ends in structural economic analysis: broadening the field of enquiry. *Struct. Change Econ. Dyn.* 61, 450–457. <https://doi.org/10.1016/j.strueco.2021.09.007>.
- Cardinale, I., 2022b. Vulnerability, resilience and 'systemic interest': a connectivity approach. *Netw. Spat. Econ.* 22, 691–707. <https://doi.org/10.1007/s11067-019-09462-9>.
- Cardinale, I., Landesmann, M.A., 2022. Generalising the political economy of structural change: a Structural Political Economy approach. *Struct. Change Econ. Dyn.* 61, 546–558. <https://doi.org/10.1016/j.strueco.2020.07.001>.
- Cardinale, I., Scazzieri, R., 2018. Political economy as theory of society. In: Cardinale, I., Scazzieri, R. (Eds.), *The Palgrave Handbook of Political Economy*. Palgrave Macmillan, London, pp. 787–815.
- Cardinale, I., Scazzieri, R., 2019. Explaining structural change: actions and transformations. *Struct. Change Econ. Dyn.* 51, 393–404.
- Cardinale, I., Scazzieri, R., 2023. *Positional Political Economy manuscript*.
- Ferguson, T., Jorgensen, P., Chen, J., 2021. The Knife Edge Election of 2020: American Politics Between Washington, Kabul, and Weimar, Institute for New Economic Thinking Working Paper No. 169. Retrieved from. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3980948.
- Ferguson, T., 1995. *Golden Rule: The Investment Theory of Party Competition and the Logic of Money-Driven Political Systems*. University of Chicago Press, Chicago.
- Garbellini, N., Wirkierman, A.L., 2014. Pasinetti's 'Structural Change and Economic Growth': a conceptual excursus. *Rev. Pol. Econ.* 26, 234–257. <https://doi.org/10.1080/09538259.2014.881671>.
- Garegnani, P., 1984. Value and distribution in the Classical Economists and Marx. *Oxf. Econ. Pap.* 36 (2), 291–325.
- Gibson, J.J., 1977. *The Ecological Approach to Visual Perception*. Houghton Mifflin, Boston.
- Haas, P.M., 1992. Introduction: epistemic communities and international policy coordination. *Int. Org.* 46, 1–35.
- Hagemann, H., 2022. Necessity of finding an appropriate analytical framework for dealing with technical change and economic growth: technical change, structural dynamics and employment. In: Bellino, E., Nerozzi, S. (Eds.), *Pasinetti's 'Structural Change and Economic Growth': Nine Methodological Issues*. Cambridge University Press, Cambridge, pp. 214–232.
- Hawkins, D., Simon, H.A., 1949. Note: some conditions of macroeconomic stability. *Econometrica* 17 (3/4), 245–248.
- Kalecki, M., 1943. Political aspects of full employment. *Polit. Q.* 14, 322–330.
- Landesmann, M., Scazzieri, R., 1990. Specification of structure and economic dynamics. In: Baranzini, M., Scazzieri, R. (Eds.), *The Economic Theory of Structure and Change*. Cambridge University Press, Cambridge, pp. 95–121.
- Landesmann, M., Scazzieri, R., 1996. Introduction: production and economic dynamics. In: Landesmann, M., Scazzieri, R. (Eds.), *Production and Economic Dynamics*. Cambridge University Press, Cambridge, pp. 1–30.
- Lowe, A., 1976. *The Path of Economic Growth*. Cambridge University Press, Cambridge, New York.
- Martin, J.L., 2011. *The Explanation of Social Action*. Oxford University Press, New York, Oxford.
- Montchr stien, A. de, 1999 [1615]. *Traict  de l'oeconomie politique*, critical ed., ed. F. Billacois. Librairie Droz, Geneva.
- Neumann, J. von, 1945–46. A model of general economic equilibrium. *Rev. Econ. Stud.* 13 (1), 1–9.
- Pabst, A., Scazzieri, R., 2023. *The Constitution of Political Economy*. Cambridge University Press, Cambridge.
- Pasinetti, L.L., 1960. A mathematical formulation of the Ricardian system. *Rev. Econ. Stud.* 27, 78–98.
- Pasinetti, L.L., 1962. Rate of profit and income distribution in relation to the rate of economic growth. *Rev. Econ. Stud.* 29, 267–279.
- Pasinetti, L.L., 1973. The notion of vertical integration in economic analysis. *Metroeconomica* 25, 1–29.
- Pasinetti, L.L., 1981. *Structural Change and Economic Growth: a Theoretical Essay on the Dynamics of the Wealth of Nations*. Cambridge University Press, Cambridge, New York.
- Pasinetti, L.L., 1983. The accumulation of capital. *Cambrid. J. Econ.* 3–4, 405–411.
- Pasinetti, L.L., 1986. Theory of value – a source of alternative paradigms in economic analysis. In: Baranzini, M., Scazzieri, R. (Eds.), *Foundations of Economics. Structures of Inquiry and Economic Theory*. Basil Blackwell, Oxford, New York, pp. 409–431.
- Pasinetti, L.L., 1988. Growing subsystems, vertically hyper-integrated sectors and the labour theory of value. *Cambrid. J. Econ.* 12 (1), 125–134.
- Pasinetti, L.L., 1993. *Structural Economic Dynamics. A Theory of the Economic Consequences of Human Learning*. Cambridge University Press, Cambridge.
- Pasinetti, L.L., 2007. *Keynes and the Cambridge Keynesians. A 'Revolution in Economics' to be Accomplished*. Cambridge University Press, Cambridge.
- Quadrio Curzio, A., 1967. *Rendita e distribuzione in un modello economico plurisettoriale*. Giuffr , Milan.
- Quadrio Curzio, A., 1986. Technological scarcity: an essay on production and structural change. In: Baranzini, M., Scazzieri, R. (Eds.), *Foundations of Economics. Structures of Inquiry and Economic Theory*. Basil Blackwell, Oxford, New York, pp. 311–338.
- Quadrio Curzio, A., Pellizzari, F., 2009. *Rent, Resources, Technologies*. Springer, Berlin.
- Quadrio Curzio, A., Pellizzari, F., 2018. Political economy of resources, technologies and rent. In: Cardinale, I., Scazzieri, R. (Eds.), *The Palgrave Handbook of Political Economy*. Palgrave Macmillan, London, pp. 657–704.
- Reggiani, A., 2022. The architecture of connectivity: a key to network vulnerability, complexity and resilience. *Netw. Spat. Econ.* 22, 415–437. <https://doi.org/10.1007/s11067-022-09563-y>.

²¹ See Scheffold (2022) for a different but compatible explanation of how Pasinetti's "normative turn" eschews mechanistic explanations, and Cardinale and Scazzieri (2019) for a discussion of the open-endedness of structural dynamics.

- Scazzieri, R., 2012. The concept of ‘natural economic system’: a tool for structural analysis and an instrument for policy design. In: Arena, R., Porta, P. (Eds.), *Structural Dynamics and Economic Growth*. Cambridge University Press, Cambridge, pp. 218–240.
- Scazzieri, R., 2022. Decomposability and relative invariance: the structural approach to network complexity and resilience. *Netw. Spat. Econ.* 22, 635–657. <https://doi.org/10.1007/s11067-021-09519-8>.
- Schefold, B., 2022. Pasinetti’s Separation Theorem. In: Bellino, E., Nerozzi, S. (Eds.), *Pasinetti and the Classical Keynesians: Nine Methodological Issues*. Cambridge University Press, Cambridge, pp. 290–316.
- Serra, A., 2011 [1613]. *A Short Treatise on the Wealth and Poverty of Nations*, edited and with an introduction by Sophus A. Reinert, translated by Jonathan Hunt. (Original edition: *Breve trattato delle cause che possono far abbondare li regni d’oro e argento dove non sono miniere, con applicazione al Regno di Napoli*. Scorriggio, Naples.) Anthem Press, London, New York.
- Sraffa, P., 1960. *Production of Commodities by Means of Commodities: Prelude to a Critique of Economic Theory*. University Press, Cambridge.
- Steenge, A.E., Van den Berg, R., 2001. Generalising the Tableau économique: Isnard’s *Système des richesses*. *Int. J. Appl. Econ. Econ.* 9 (2), 121–146.
- Truman, D.B., 1951. *The Governmental Process*. Knopf, New York.