CAN STRUCTURAL DYNAMICS HELP THE STUDY OF DEVELOPMENT?

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ABSTRACT

Although widely known Pasinetti's structural dynamics is largely ignored in the study of development. It might be instead of great relevance especially today that development economics has all but disappeared and that the periphery has dramatically changed. The paper first clarifies that the obstacle is the partial understanding of Pasinetti's theoretical project. In particular, it should be appreciated that structural dynamics gives clear non-mainstream foundations to the analysis of structural change and allows for the study of development as part of the second stage of the investigation. Most important, given the open-ended analytical structure and its focus on production, it can give a new perspective to the internationalization of production as the key aspect of an updated centre-periphery approach. Much research on the participation into Global Value Chains (GVCs) can become more understandable and valuable within a clear theoretical framework.

Keywords: structural dynamics, development, second stage of investigation, development economics, global value chains.
JEL Classification: B00, O10, O11.

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RESUMEN

Aunque la teoría de la dinámica estructural de Pasinetti es ampliamente conocida, se ignora en gran medida en los estudios sobre desarrollo. Podría ser de gran relevancia, sobre todo hoy en día que la economía del desarrollo ha desaparecido casi por completo y que la periferia ha experimentado una transformación radical. El artículo aclara que el obstáculo reside en una comprensión parcial del proyecto teórico de Pasinetti. La dinámica estructural proporciona fundamentos no convencionales para el análisis del cambio estructural y permite estudiar el desarrollo como parte de la segunda fase de la investigación. Gracias a su marco analítico abierto y su enfoque en la producción, ofrece una nueva perspectiva sobre la internacionalización de la producción como un aspecto clave de un enfoque actualizado de centro-periferia. Gran parte de la investigación sobre la participación en cadenas de valor globales (CVG) puede resultar más comprensible y útil dentro de un claro marco teórico.

Palabras clave: dinámica estructural, desarrollo, segunda fase de la investigación, economía del desarrollo, cadenas de valor globales.
Clasificación JEL: B00, O10, O11.

1. INTRODUCTION

The article is an attempt at bringing Luigi Pasinetti's structural dynamics into the discussion of development therefore contributing to the revitalization of development economics. Pasinetti has written on the most important topics in Political Economy, but the major constructive part, the one which had Jeff Harcourt calling him the last great model builder, is his structural dynamics. Despite the wide recognition, that has largely remained a topic within the Classical Keynesian tradition (Bellino and Nerozzi, 2021). High theory indeed. Pasinetti regards structural dynamics as the dynamic counterpart of Sraffa's static approach and an alternative to General Equilibrium. It is however conspicuously absent in any discussion of development.

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Ultimately, development studies ignored structural dynamics, while scholars of Pasinetti have hardly looked into what he says about development. At the basis of this unfortunate situation is, we contend, the partial understanding of Pasinetti's theoretical project, which blocked any consideration of its potential for the study of development. It would be misleading, however, to think that structural dynamics can be "applied" to the study of development. To show its relevance requires precisely the groundwork that the article lays out. The ultimate goal is contributing to the rethinking of development economics.

In the second section, we briefly consider this grand question. Far from any exhaustive survey, the only purpose is to highlight the direction taken by a few recent contributions. In the third section we examine the misapprehension of Pasinetti's structural dynamics and in section four, its true meaning (see Gualerzi and Mongiovi, 2025). The fifth section examines Pasinetti's appraisal of the development literature, which is, to say the least, little known. The sixth section examines the assessment of structural dynamics by a main figure in that field. Contrasting Kuznets and Pasinetti, Syrquin argues precisely the irrelevance of structural dynamics for the study of development. In section seven we argue that studying development requires a smart use of structural dynamics focusing on the stylized facts that emerge from the structure of the model. That is where to start to approach the development problem. Section eight highlights then the salient features of the problem today, with the profound changes in the periphery and the new hierarchy in the world economy. In section nine, we illustrate how a structural transformation offers a new perspective on the latest phase of internationalization of production and the participation into global value chains (GVCs). It goes without saying that a brief article cannot do more than highlight a research path emerging from an accurate reading of Pasinetti's structural dynamics. It is obvious that there is much more to be done. But this is where to start for updating and strengthening an approach that distance itself from the mainstream constellation.

2. DEVELOPMENT ECONOMICS TODAY

Akbulut, Adaman, and Madra (2015, p. 734) have argued that mainstream development economics is a constellation resulting from three

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historical and conceptual processes[1]. Ultimately that reduces the approach to "micro-level impact appraisals of developmental projects" while the macro-economic perspective has become "the purview of methodologically-individualist, late neoclassical analyses of institutions and growth (the so-called 'new institutionalism')." Thus, the need of a new paradigm for development economics overcoming "decimation", that is, its reduction to "micro policy evaluation" as an "instrument of governability", and "the displacement of the macrostructural concerns of the post-war development economics" (*op. cit.*, p. 754). A possible direction of research is to reconsider the development economics of the 1950s and 60s in today's context (Sunna and Gualerzi, 2016). Hirschman's subdiscipline has certainly lost today much appeal, but refreshing the basics of the approach may have a rejuvenating effect both on the research in the field and the interests of students, who are no longer exposed to an important set of ideas[2].

The background of the advocated rethinking of development economics can benefit from rather different contributions, such as the Stiglitz's criticism of globalization (2002) and the original contribution of Amsden (1989, 2001), Wade (2004), and Chang (2006), who edited a few years ago a collection of essays that had precisely this title (Chang, 2003). In 2011 Stiglitz also wrote a piece with the same title. The new structural approach to development he advocates concerns structural change that should favour knowledge and a learning society. He argues that "the long-term experiences in growth and stability of both developed and less developed countries, as well as the deeper theoretical understanding of the strengths and limitations of market economies, provide support for a new structural approach to development. At the center of creating a learning society is the identifying of sectors that are more amenable to

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1 "The transformations internal to the discipline of economics (that is, the late neo-classical turn within mainstream economic theory), transformations within the institutional-discursive matrix of development (that is, the transition from growth-centred policies to poverty alleviation —and good governance— oriented policies), and a broader transition from post-war Keynesian developmentalism (with its variants in the second and third worlds) to existing varieties of neoliberal governmentality" (p. 734).

2 This seems also the suggestion in Storm (2015) who mentions Pasinetti in connection with structural change.

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learning, with benefits not captured by firms themselves, so that there will be underinvestment in learning. Elsewhere Greenwald and I have argued that an implication of this is the encouragement of the industrial sector, which typically has large spillovers."[3]

It might be useful to mention the ambitious approach to development based on the rebalancing of the powers (Vaggi, 2018). Vaggi's book is mostly concerned with the Sustainable Development Goals (SDGs) and Agenda 2030, which in 2015 incorporated much of the 2013 UN Report where the (SDGs first appear as a guide to development. Vaggi argues that the Classical idea of reproduction should be combined with the overall objective of pursuing sustainable development. Rebalancing of powers should occur pursuing a global partnership by means of "negotiation and dialogue" (p. 142).

In sum: despite the dominating role of the constellation, there are critical perspectives. Structural dynamics may indeed be quite helpful in this discussion. We could note in this respect that Hirschman's unbalanced growth (Hirschman, 1958) makes no sense in a world in which sectors expand at the same rate. There is then an analogy with the non-proportional growth of industries that is the very foundation of structural dynamics. Note also that for Hirschman development usually means transformation rather than the creation ex-novo of the productive structure.

A quite telling remark by Celso Furtado is also of interest: "The main problem of underdeveloped economies is the selection of strategies *to alter structures* (italics added), and not the elaboration of a conventional development plan (…)" (Furtado, 1968, p. 244). This is as close as it can be to a structural change perspective on development. Furtado notes that development does occur, but it transforms the productive structure without closing the gap We can also recall Furtado's attention to the evolution of the structure of consumption, which is fully consistent with the structural dynamics approach.

[3] Stiglitz's argument of course reflects his general theoretical approach. Although there is no mention of structural dynamics, it should be noted that Pasinetti also argues that learning is the driving force of growth and structural change.

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3. THE LITERATURE ON STRUCTURAL CHANGE

An example of the limited understanding of Pasinetti's theoretical project is in an otherwise quite useful survey of the literature on structural change (Silva and Teixeira, 2008). Pasinetti's approach is discussed within the formal approaches to structural change and economic growth. "Formal theories of economic growth have been typically developed with little reference to the changing structure of the economy. Yet it is well known that growth fundamentally changes the structure of the economy and the composition of its main aggregates." (Silva and Teixeira, 2008, p. 285). This is instead precisely the starting point of Pasinetti's structural dynamics: in contrast with the mainstream, structural change is not an out-of-equilibrium phenomenon, it represents the very essence of economic growth[4].

The survey observes that, although widely known and cited, structural dynamics has remained a purely theoretical question, with little or no impact on empirical analysis. In particular, it did not carry over to the study of the actual process of structural transformation. The massive empirical analysis of structural change is instead associated with the study of developing and transition economies, in which the importance of structural change could not be dodged. But without developing any theory: "(…) theoretical explanations were mainly developed along appreciative strands, with little recourse to formal reasoning, and a policy-oriented approach was generally undertaken." (Silva and Teixeira, 2008, p. 288).

Interestingly, the survey does not even mention the distinction between the natural system and institutional analysis, that is to say, the two stages approach that is so co-essential to Pasinetti's project, nor offers any clarification on the purpose of the natural system formal model. It nevertheless quite appropriately points out that the *de facto* irrelevance of structural dynamics for empirical analysis has its counterpart in the study of structural change in development with little use of theory.

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[4] There have been a few attempts to deal with structural change within the mainstream theoretical perspective. An overview and evaluation of these studies is in Arena and Porta (2012).

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4. PASINETTI'S THEORETICAL APPROACH

4.1. The natural system and the Separation Theorem

Pasinetti's natural system consists of two systems of equations, one that describes the evolution of outputs, and another that determines the movements of relative prices. Each of the two mathematical systems contains one degree of freedom. Pasinetti closes the quantities system by imposing the condition that the total amount of available labour is fully employed; the full employment requirement coincides with the condition that aggregate expenditure and the value of aggregate output coincide.

Vertical integration enables the production technology to be expressed entirely in terms of labour input requirements. The input coefficients decrease at rates which are different for each sector. In other words, the productivity of labour increases at different rates in each sector. The composition of final demand is presumed to evolve over time in accordance with a generalization of Engel's Law. Pasinetti specifies the rate of change in the per capita consumption coefficient of each final product. When the rate of population growth is specified, the model generates a trajectory for all of the outputs and prices.

This analytical structure is what Pasinetti (1981, p. xii) calls "the natural system". It corresponds to "a level of investigation which is so fundamental as to be independent of the institutional set-up of society." The natural system is *not* a model in the customary sense, *i.e.*, an abstraction capturing the essential features of the "real economy." It is the pure theory of an evolving structure. "Realism" is dealt with in the second stage of the investigation, which concerns institutions[5]. Underneath is the necessity of separating the pure theory (*i.e.*, institutions-free theory), from "the freedom of choice in the deployment of the actual institutional framework (…)". This is the separation theorem. It "suggests separating the investigation of those characteristics that lie at the foundations of

[5] Pasinetti acknowledged that the causal logic of his model may be different from the causal mechanisms found in the real economy. The notion of causality must "be understood (…) not as a deterministic description of how reality actually is, but as a formal property of the model used to understand it." (Bellino and Nerozzi, 2017, p. 1678).

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production economies (…) from the investigation of the institutions necessary to deal with (…) the specific problems which are constantly raised by the 'challenge of history.' Economic science has proceeded for too long to mix up the stages of the investigation" (Pasinetti (2007, pp. 322-323).

Critics contend that separating them is largely impossible and argue that because of that there is a similarity precisely with the pure theory of Walrasian general equilibrium. However, Pasinetti's pure theory, like that of Sraffa's, does not need perfect competition, the conventional axioms of choice, and the absence of increasing returns to scale that are an essential part of the general equilibrium model. Indeed, the general equilibrium model is incompatible with the Separation Theorem.

4.2. Institutions and actual dynamics

Pasinetti has instead repeatedly stressed the possibility of different institutional frameworks[6]. The second stage of investigation is not a detail, but an essential aspect of structural dynamics. This is most important, in general and for the purposes of the paper. Shifting the attention to the actual or hypothetical configuration of institutions implies opening the way to consider *actual dynamics*, the actual patterns of structural transformation, which includes institutional change. The second stage of investigation has however received so far scant attention. The only explicit reference to actual institutions is the distinction between market-based capitalist production (that Pasinetti distinguishes from capitalism) and socialist central planning. It brings to the fore an association with history absent in the natural system[7].

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[6] "Any given natural system is normally compatible with a variety of institutional set-ups." (Scazzieri, 2012, p. 232). Furthermore, some institutional set-up may be appropriate for certain task, but not for others. Ultimately, there are no "conclusions valid for all times and places" (Scazzieri, 2012, p. 231).

[7] Cozzi (2022) argues that the movement of an actual economic system towards the path of natural growth may require more than purely economic institutions, but include also sociological, and bureaucratic organisations.

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5. PASINETTI ON DEVELOPMENT

Although absent in his theory of the evolving structure, Pasinetti is nevertheless keenly aware of the development problem. Especially in the non-analytical parts of his 1981 and 1993 books he discusses themes and issues, but also the nature and scientific profile of the study of development. Furthermore, he presents a criticism of trade theory based on concepts that are derived from the model of structural dynamics.

5.1. Structural change: theory and empirical analysis

Pasinetti acknowledges that, in spite of the general theoretical neglect, precisely the authors who have paid attention to empirical or institutional aspects of economic systems have raised the problem of structural change. Perroux "explicitly used the term 'structural change' by defining the economic structure as made up of 'proportions and relationships that characterize (…) an economic set-in space and time' (Perroux, 1939, I, p. 194). This was the definition taken up and afterwards used by many other non-mathematical writers" (Pasinetti, 1993, p. 8). Perroux´s early definition "became particularly widespread in the economic literature of Latin America, where a certain number of economists called themselves 'structuralists' and directed their research towards an institutional-historical-descriptive approach."[8]

Referring primarily to Kuznets and Chenery, but also to Rostow's attempt at a historical generalization, Pasinetti observes that this economic literature sharply highlights the contrast between theory and observed facts. Kuznets meticulous work led to empirical generalizations and facts gathering about changes in the structure of many countries worldwide, without pretending either to use or to develop any theory. Similarly, the massive econometric work carried out by Chenery and his group at the UN (testing simple hypotheses on the evolution of the economic structure) did not rely, nor proposed, any particular theory. The inspi-

[8] Pasinetti also mentions some of the seminal concepts in the development literature such as Rosenstein-Rodan's 'big push', Streeten's 'unbalanced growth', Lewis's and Nurske's 'dual economies'. None of them is considered in the natural system.

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ration, notes Pasinetti, goes back to Colin Clark's book (1940), which set the basis for a rudimentary, but much used analysis of structural change based on the changes in employment in the primary, secondary and tertiary sectors, as a condition and a result of economic progress. Here it's better to quote Pasinetti at length:

> It seems to me very significant that these scholars, on any synthetic presentation of their works, have always very sharply distinguished two separate fields of analysis and research, which they call 'complementary', but which rather uneasily, they keep separate, namely: the field of research concerning changes in the economic structure —which they connect with long-term development, and which they do not integrate into any theory and the field of research concerning prices and markets, which they do explicitly connect with a specific theory— the Walrasian general equilibrium theory —but which they openly acknowledge as being unhelpful to the investigation of structural change. Still these scholars claimed there should be a use for general equilibrium theory, although never found a way to use it in their studies of structural change.

Thus, the conclusion: "One can indeed see very clearly the embarrassment and endless difficulties which have arisen when one has tried to relate received theoretic lines of thought —analytically so elegant, but inimical to the investigation of structural dynamics— with the more practical facts of structural change, that do not lend themselves to be set easily in elegant terms, and yet are so much closer to the observable events of the real world." In fact, development economics was concerned in some way or another with problems of structural change. These problems "have all indeed proved to be very hard to formalize". That difficulty, argues Pasinetti, may explain "the poor reputational standing that development economics has at present among theoretical economists."[9]

[9] Development economics lacked formalization and that according to Krugman (2005) determined its fall. Interestingly, Stiglitz (1992) argues that the cause was rather a change of economic and political conditions. Hirschman (1981) explained along similar lines its demise. For an analysis of high development theory see Gualerzi and Cibils (2014).

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5.2. The criticism of international trade theory

Pasinetti (1981, chapter xi) develops also a criticism of standard trade theory, where he discusses international economic relations. The analysis is carried out considering an advanced country and an underdeveloped country. It begins exposing "The fallacy arising from the Heckscher-Ohlin model". Pasinetti then argues that the primary source of international gains for the underdeveloped country is "international learning" (p. 250). Absorbing that knowledge is not a simple matter because "the technical knowledge which an underdeveloped country can draw from (…) is only a small percentage of the total." (*ibid.*). However, international trade is only a secondary source of international gains. The focus is on the "comparative productivity-change advantage", that is, the differential rates of productivity growth and their impact on the structure of production. That depends on whether we consider industries exporting or producing for the domestic market. In this framework Pasinetti explains the deterioration of the terms of trade in a way he regards as deeper and simpler than that of Prebisch (p. 267, footnote 11).

The criticism of the principles of trade theory develops into an alternative perspective. Solidly rooted in production (and productivity) the approach to international relations highlights the effects on the domestic structure of production. The explicit reference to the unequal international development is compatible with the hierarchical view of development of the centre-periphery framework: "Luigi Pasinetti's treatment of international economic relations is compelling, and it is powerful also at the didactic level due to the pristine clarity of the author's exposition" (Halevi and Kriesler, 2016, p.13). Halevi shows the empirical relevance of the approach examining China, but also in other economies like Mexico, Brazil, and India.

6. SYRQUIN'S ASSESSMENT OF STRUCTURAL DYNAMICS

6.1. Pasinetti vs Kuznets

Syrquin (2012) compares Kuznets and Pasinetti, and argues that, although both focus on structural change, the first does contribute to the study of development, the second neglects the fundamental issues. He

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therefore sees no use for structural dynamics. For Syrquin structural transformation includes, together with the relative importance of sectors in the economy, also changes in the location of economic activities and urbanization, and other concomitant aspects of industrialization. Interestingly, he adds also "changes in institutions by which structural change is achieved" (p .70). He recalls that for Douglass North, change in history is institutional change. Furthermore, "Models are abstractions; it is not immediately obvious that any change is model-essential." (p. 72).

It is then not surprising that Syrquin finds "puzzling" the 'natural economy' at the pre-institutional level (p. 73). "It is ironic that one of the strong criticisms levelled against mainstream economics by radical economists in the 1960s was precisely that it ignored institutions." But Pasinetti does not do that, the second stage of the investigation focuses on institutions. Ultimately, disagreement seems to concern what Syrquin calls "the concerted attempt to demolish the edifice of neoclassical economics and establish a revitalized classical/Sraffian alternative in its stead" (p. 78). He concedes that structural dynamics can be defended on the ground of its avowed purpose, but are the main questions of development present in Pasinetti as they are in Kuznets?

The argument boils down to the absence of any treatment of economies of scale or of the division of labour; learning and knowledge are invoked but left unexplained; "no agents with volition (…) no price-responsiveness and no incentives." Thus, the "excessive reliance on theoretical constructs with no life of their own" (p. 80)[10]. Finally, although both Kuznets and Pasinetti regard learning (technical change) as the engine of growth, Kuznets stresses that it requires institutional and ideological adjustment. Pasinetti instead dwells "on the lack of diffusion and possible downside of what he takes to be the pattern of productivity growth across countries" (Syrquin, 2012, p. 81). In that connection, Syrquin mentions Prebisch's thesis on the deterioration of the terms of trade and argues that there is "a great affinity between the structural dynamics approach and the structuralist approach to development of the 1950s" (p. 82).

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[10] On vertically integrated sectors Syrquin quotes Steedman: such sectors are hypothetical constructions leading to what are just calculated accounting magnitudes. He also mentions Malinvaud (1995) who criticized Pasinetti's "reductionist view of theory which would exclude Kuznets and Leontief, among others" (p. 81).

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6.2. The main questions of development

Syrquin seems rightly concerned about formal theory that may do away with the essential aspects of development. He, however, ignores Pasinetti's point: the development literature was unable to develop a theoretical view of structural change because it was unwilling to abandon neoclassical premises. Kuznets, argues Syrquin, wanted to endogenize "what economics mostly regards as givens: technology, population, tastes, and institutions (…)" One can understand the difficulty of developing a theory of such a complex web of phenomena. The two-stages approach solves the problem separating a pure theory of the moving structure alternative to general equilibrium from actual dynamics, which must be studied with respect to the institutional set up and in specific historical circumstances. Precisely the institutional and historical analysis of the second stage of investigation calls for a way of theorizing quite distinct from formal modelling.

Lastly, note that Kuznets "documented and analysed the processes of structural change over time in the *advanced countries*" (italics added) [Syrquin, 2012, p. 73] Ultimately the very question of developing economies, investigated by structuralism and dependency theory, disappears. Structural dynamics is instead open to that distinction in the examination of the actual dynamics of developing economies. In sum: Syrquin's assessment seems to misunderstand Pasinetti's theoretical project. Or simply indicates a disagreement with that project, (and its classical theory underpinnings). Granted, the study of actual dynamics, and therefore of the actual features of development, is largely unaccomplished. For that we need to depart from the natural dynamics and focus on the stylised facts of structural transformation. We can then incorporate the peculiarities of development in the periphery.

7. STRUCTURAL DYNAMICS AND DEVELOPMENT

7.1. Stylised facts

Natural dynamics and actual dynamics are driven by the same forces. Actual dynamics however concerns their actualization. To see the use of structural dynamics we must focus on the stylised facts rooted pri-

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marily in the dynamics of technical progress and consumption patterns. To clarify this crucial step let's consider the question of unemployment. Shapiro (1984-85, pp. 244-245) has argued: "For the employment effects of technical change to be specified, the pattern of technological change has to be determined. And this can only be done by 'denaturalizing' the innovation process (…)" But this is precisely what the analysis of actual dynamics does. Although based on the logic of the underlying natural system, the focus is on the actual effects of technical change and the ensuing effect of employment. Whereas in the natural system full employment is a normative condition, in actual dynamics employment and unemployment depend on the actual course of technical change and innovation.

Second, the analysis concerns the whole of structural transformation that comprehends the evolution of the productive structure and the institutional framework. Institutions, their actual configuration and development, is part of actual dynamics shaped in the real time of history. We can then briefly outline the most important stylised facts that become the object of the investigation. 1) The changing of industries proportions becomes the question of expanding and declining industries, quite essential in both industrialized and industrializing economy. Technical change is intrinsically linked to this phenomenon and must then be addressed in that framework. 2) The transfer of employments necessary to maintain full employment become the problem of the disrupting effects of structural change on the sectoral distribution of employment. Whereas the model does not deal with out-of-equilibrium employment effects, the study of actual dynamics does. 3) Similarly, the changes of the composition of demand required by the learning of consumers become the much more concrete question of the forces governing the composition of consumption spending and point at the question of the rise of new markets (Gualerzi, 2010).

From these stylised facts we can conceive of three kinds of institutions: the institutions for full employment and the institutions appropriate to an economy based on knowledge and learning. Furthermore, the importance of the evolution of consumption and of new markets suggests a third category of institutional arrangements concerned with consumptions patterns. These three categories of institutions are already a formidable theme for empirical and historical analysis. The stylised

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facts outlined above, and their institutional implications, have a general relevance, although as we have argued all along, their manifestation differs in developed and developing (late comers) economies.

7.2. The development problem

For developing economies, we need indeed to incorporate into structural transformation the development problem, primarily the effects of the centre-periphery hierarchy and dependent accumulation. There is an external constraint imposed on the pattern of development of the periphery. Typically, it operated via international trade. Centuries of dependent accumulation have however shaped what we can call a dependent structural transformation.

It can be argued that at the origin is the penetration of capitalist production, established in the centre, into the socio-economic formations of the periphery. Therefore, the development problem is not backwardness as such, but the dynamic interaction between centre and periphery. In developing economies, the evolution of the structure of production is conditioned historically. Consequently, dealing with latecomers requires a specific approach. That is the dividing line with respect to the mainstream that does not recognize the development problem and the existence of a centre-periphery hierarchy.

8. DEVELOPMENT TODAY

8.1. Reconsidering centre and periphery

The question is addressed by structuralism and dependency theory, responding to the inability of mainstream economic theory and modernization theory to address the underdevelopment of Latin America[11].

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[11] It is well known that Prebisch was the founder of structuralism and most known scholars are Celso Furtado, Juan F. Noyola, Anibal Pinto, Osvaldo Sunkel, Maria Conceição Tavares (For an overview of dependency theory see Kay, 1991; Palma, 2008). Structuralists and dependency theorists have remarkable similarities. "Both are holistic and historical: holistic because their analysis encompasses the interaction between social class, political and economic structures in the periphery and between the periphery and the centre.

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The point is the symbiotic relationship with the centre. Most known consequences are the industrial dualism and structural heterogeneity. At the core of the problem is the question of technical change. Technical progress that originates in the centre affects the industrial sector in peripheral countries unevenly, so that a modern sector coexists with a larger traditional sector. Although remarkably resilient especially at CEPAL [Comisión Económica para América Latina y el Caribe] (see Cimoli, Porcile, and Rovira, 2008; CEPAL, 2012) it is open to question how influential that set of ideas is today. But the development problem still exists, and the centre-periphery model has not lost its relevance.

8.2. The new world economy hierarchy

Discussing the returning interest for structuralism and dependency theories in the age of globalization and financialization, Kay and Gwyenne (2000) highlight the major phenomena of differentiation within the periphery. Indeed, the development problem has dramatically changed. The facts are well known. In the 1980s we saw the rise of the NICs (the Asian Tigers) and later of the BRICS countries (now including also Egypt, Argentina, Saudi Arabia, United Arab Emirates, Iran, and Ethiopia). The most stunning development is the establishment of China as the second largest world economy. Consequently: "New discussions have arisen about the possibilities and paths to development in the periphery. Along these lines, Samir Amin has distinguished between dominant countries, first class peripheries and marginalized peripheries." (Cibils, 2016, p. 112).

The emergence of these economic and political actors has made the hierarchy of power in the world economy more complex, clearly redefining the very notion of the periphery. Furthermore, the increased dominance of finance led to a new form of dependency. According to Vernengo, although dependency theorists all "agree that at the core of the dependency relation is the inability of the periphery to develop an autonomous and dynamic process of technological innovation" (Vernengo, 2006, p. 561), the domination of the periphery by international capital

Historic because underdevelopment is the outcome of a specific historical process in which colonialism and Northern empires played a key role." (Gualerzi and Cibils, 2014, p. 145).

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depends on financial factors, and more precisely on the impossibility of countries in the periphery to borrow in their domestic currency in international markets.

The redesigned world economy hierarchy is today best described as a system of contending centres of economic and political power (Gereffi, 2014), and a competition among poles of development with a geopolitical dimension. Note that the new phase exacerbated the serious problem of inequality that was soon associated with the globalization press[12].

8.3. The internationalization of production

At times interpreted as the end of the centre-periphery distinction, globalization, rather than obliterating hierarchy, has in all evidence reshaped it. At the same time, the often-heard notion that globalization is over obscures a crucial point: the importance achieved by the globalization of production. That was strikingly shown by two very recent phenomena: the COVID-19 crisis and the tariffs war waged by the current US administration. They made clear that blocking the world-wide supply chains is lethal to the world economy.

As early as 1971 Vernon had noted that multinationals were learning to use their subsidiaries in the developing countries as points in an international network. The building up of these networks and the long supply chains overlap with the phenomena of de-localization of production from the centre towards some periphery, and outsourcing, which mostly concerns the imports to a market in the centre of final goods or intermediate inputs produced in the periphery[13]. As a result, the development problem today has a lot to do with the fragmentation

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[12] Pasinetti has offered a stinging appraisal of the problem. "Economists should ask many questions in relation to the distorted phenomena that globalisation has created and exacerbated, such as the unequal distribution of wealth and income and the related inequalities between and within countries, poverty, illiteracy and environmental deterioration (Pasinetti, 2019). The globalised economy shows contradictions that capitalism, in its various forms, cannot alleviate." (Quoted in Rotondi, 2021, p. 252).

[13] Outsourcing and global value chains are examined in Millberg and Winkler (2013). Notice also that the international reorganization of production is such that the expansion of manufacturing, in the sense of fabrication of products and components, typically may occur outside industrialized economies (Van Neuss, 2018).

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and coordination of production at the world scale, with an increased interdependence at the international scale. In particular, development today depends very much on the position occupied by the national economies in the productive networks.

9. GLOBAL VALUE CHAINS AND STRUCTURAL TRANSFORMATION

9.1. Value Chains: subordination and opportunities

Some hints on the development of these networks can be based on the empirical evidence from the much in vogue Global Value Chains (GVCs) approach. Analysing the contracts between two Indonesian companies and Western multinational corporations Suwandi (2019) highlights that Value Chains are both linkages and instruments of bondage. This is what Suwandi calls the imperialist chain. As it could be expected wage differentials have great importance: "Countries with the highest participation in labour value chains —the top three being China, India and Indonesia— also have very low labour unit costs." (p. 18).

Further details emerge when the integration into value chains concerns small enterprises. Case studies refer to *maquila* in Mexico (Gereffi, 2001; Carrillo and Hualde, 2002), footwear production clusters in Brazil (Schmitz, 1999; Humphrey and Schmitz, 2002; Navas-Alemán, 2011) or even networks of rural suppliers as the case of the coffee value chain in countries such as Ethiopia, Nicaragua or Colombia (Fitter and Kaplinksy, 2001; Petit, 2007). The general problem is the degree of subordination the participation in the network entails *vis-à-vis* the opportunities it offers.

Overall, there is a rather clear asymmetry between the firms that command the chain and the (small) enterprises in developing countries, which are as a rule inserted in the less remunerative sections (Kaplinsky, 1998; Humphrey and Schmitz, 2000). However: "A combination of geographic consolidation and value chain concentration in the global supply base (…) in some cases is shifting bargaining power from lead firms in GVCs to large suppliers in developing economies" (Gereffi, 2014, p. 9). However, upgrading is nowhere ensured or easy. Case studies from Korea and Brazil suggest that it may be necessary to leave the chain and then re-enter it in a more advantageous position (Lee, Szapiro, and Mao, 2017). The position in the value chain depends on the tacit

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knowledge accumulated in the local companies, on the learning developed in the customer-supplier relationships, on the control over strategic assets. Local production systems can affect the accumulation of the above-mentioned assets.

The modalities of insertion into the GVCs can vary considerably even within the same sector. That is confirmed by the analysis in an emerging cluster in the city of Buenos Aires, exporting software and IT solutions to global markets (Obaya *et al.*, 2020). Further complexities emerge from the most recent engagement in value chains. According to the compressed development thesis (Whittaker *et al.*, 2010) the options for firms in the developing economies may be further restricted.

Industrial transformation in Japan, or later in East Asia, was compressed in a short period of time, compared to the time it took in early comers like the UK. It involved the presence of a development state, "Recent developers (…) confront a world in which production system have become *dis*-integrated and geographically dispersed (…) This creates opportunities, but also serious constraints (…) Because production systems, especially in leading sectors such electronics and automobiles, are globally distributed, (…) recent developers cannot recreate an industrial model from the past. Instead, they are more likely to emulate and engage with the 'global value chains' that now span *developed and developing countries* in a range of key industries" (Whittaker *et al.*, 2010, pp. 440-441; italics added). The late development model of the East Asia economies may no longer be feasible.

The global value chain approach has evolved into a framework for analysis and intervention in the developing economies. So much that it has been adopted by multilateral agencies (Werner, Bair, and Fernández, 2014). That supposedly signals a new generation of policies going beyond the market fundamentalism of the Washington Consensus. It is not immediately clear the extent in which this change of policy can affect the problems highlighted by the literature examined above[14].

[14] This large use, oriented to firm and non-firm actors, appears to have taken over other approaches to global value chains, focusing, for instance, on industrial clusters (Rabellotti, 2007).

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9.2. Structural change in the periphery: dependent structural transformation

The leap forward of the internationalization of production of the last decades is a promising starting point for the revitalization of development economics. It refocuses the attention on production; trade relations are reshaped precisely by supply chains. This is also the one aspect where a structural dynamics approach can be most useful.

In the literature examined above it is frequent the attempt to draw conclusions on the subordination/opportunity that the participation to the GVCs entails. However, lacking some general perspective it is difficult to go beyond a case-by-case conclusion. A useful change of perspective would be treating them as dependent processes of structural transformation affecting the domestic structure of production. In other words, a structural dynamics framework could help reconnecting the focus on firms, industry or regional context to the stylized facts of structural change and the specificities of domestic institutions. A single focus on structural transformation, both industrial and institutional, could shed new light on the internationalization of production.

10. CONCLUDING REMARKS

The purpose of structural dynamics is not "demolishing" neoclassical theory for its own sake but removing the obstacle to a theoretical analysis of structural transformation. Notoriously the theory of development has been (neoclassical) growth theory. But development cannot ignore structural change. Structural dynamics lays out the non-neoclassical foundations for the analysis of the changing structure leaving open the discussion of actual patterns of transformation in historical time. That concerns also developing economies. Pasinetti, who passed away in January 2023, has left his project at the point in which the second stage of investigation is de facto much less developed than the natural system.

One may disagree with the approach, but ought to recognize its clear logic. Its consequence is the focus on actual dynamics of existing economic systems. We have argued that the peculiarities of development can be dealt with in that framework. The last section of the paper shows that participation in GVCs is a helpful vector to highlight the problem of

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dependent production structures. At the same time, it shows the limitation of fragmented evidence for constructing a general interpretation. Precisely supply chains and international networks reassert the centrality of production. That is a promising venue for the study of the new forms of the development problem, contributing to the revitalization of development economics. An approach centered on structural transformation seems well equipped to the task. Pasinetti's structural dynamics is rooted in the production paradigm, which he argues distinguishes Classical Theory and Keynes from general equilibrium, rooted in the exchange paradigm. Other research questions, such as the variety of the development paths, the role of the state, beyond the at times idealized views, and the national question (Moyo and Yeros, 2011) can complement this focus on production, completing a research program alternative to the dominant approach. ◄

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