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The Dynamics of Industrial and Economic Renewal in Mature Economies: Implications for Theory and Policy

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The Dynamics of Industrial and Economic Renewal in Mature Economies: Towards a Production-centred Agenda

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1. Introduction

Over the last two decades, the global industrial landscape has been dramatically reshaped by profound structural and technological transformations. Global and regional production networks have redesigned the sectoral composition of economies as well as the geography of production and international trade. Sectoral boundaries have become increasingly blurred, as a result of processes of outsourcing and industrial re-organisation along multi-tiered supply chains. The migration of production to lower-cost countries, via relocation or outsourcing, has created challenges and opportunities for continuing operations in higher-cost countries, in services as well as manufacturing (Milberg and Winkler, 2013; Gereffi and Lee, 2016; Lee et al., 2017; Merino 2017). Technological change has also played a critical role in triggering forms of ‘genetic mutation’ of traditional sectors and their boundaries. For example, in some countries, a traditional sector like agriculture has been transformed in a high-tech sector where vertical farming integrates complex automated feed systems relying on sensors and advanced biotechnologies, while self-driving tractors operate through satellite control systems. Similarly, production processes in traditional heavy industries have been augmented by digital technologies and advanced materials, allowing for virtual product and process development, scaling-up and testing (Andreoni and Chang, 2016).

Emerging technologies and their integration into complex technological systems have led to fundamental shifts in patterns of manufacturing production and consumption; and the widespread application of automation, robotics and digital technologies in advanced manufacturing systems – coupled with new developments in nanotechnologies and

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biotechnologies – have accelerated the pace of technological change, whilst increasing systemic inter-dependencies between organisations, industries and regions.

However, the impact of these transformations – both within and across countries – has been uneven. In mature industrial economies, whilst some regions have managed to capture emerging production, technological and market opportunities – and, in certain cases, develop new industrial ecosystems – others have experienced decline. In many cases, decline has been the result of a lengthy process of deterioration of the industrial base and the dismantling of both private and public entrepreneurial systems; and only partially a consequence of either the relocation of industrial production to fast catching-up economies like China or mounting oligopolistic competitive pressures in global markets.

In mature economies, new widespread forms of de-industrialisation have also been caused by a lack of private investment and targeted industrial policy; financialisation of the real economy; increasing inequalities; and the rapid contraction in domestic demand due to worsening income distribution, precipitated by the 2008 financial crisis ([Blankenburg and Palma, 2009](#)). The resulting structural unemployment, regional imbalances and uncertainty have put pressure on governments in mature industrial economies – and their public finances – exacerbating polarisation both within countries and across continental areas like Europe.

This emerging scenario poses new challenges for governments in mature industrial economies. Specifically, it challenges their capacity to halt or reverse de-industrialisation and find new pathways for sustainable socio-economic development and growth. This is particularly difficult in those peripheral regions which have been lagging behind for several decades, and whose situation has been exacerbated by increasing global competition and the political economics of austerity ([Konzelmann, 2014](#)).

The innovative industrial renewal and restructuring of these regions is indeed interlocked with broader social, organisational, institutional and political economy dynamics. Indeed increasing social unrest and political tensions in several states, countries and regions in the United States and European Union can be traced back to the erosion of their production base and its social impact. The looming threat of trade wars and related geopolitical tensions, as well as the fact that industrial policy has re-entered the government vocabulary are other manifestations of the tensions arising from structural imbalances across countries and regions.

In mature economies industrial policy has never left the political agenda, and since the global financial crisis governments have become increasingly willing to use the word ‘industrial policy’ as well as industrial policy instruments in an open way ([Andreoni, 2016](#)). Before the financial crisis, during the 2000s, mature-economy governments were guided by an innovation policy paradigm, mainly emphasising the importance of innovation and technology policies. Within this framework problems at the technology frontier are central, while those associated with industrial restructuring remain marginal. On the contrary a high ‘churning rate’ with frictional and even skill-mismatch unemployment is perceived as a good sign of industrial and innovation dynamism.

More recently, since 2010, governments in mature economies have started rethinking industrial policies to take into account some of the ongoing structural and technological transformations as well as broader socio-political challenges. For example, there has been a renewed emphasis on manufacturing industries, the role of cross-cutting production technologies and the importance of rebuilding the industrial commons to address the challenges associated with innovative product scaling up – i.e. manufacturability and commercialisation. All these issues have led to the targeting of systems (instead of sectors) and greater awareness of the role of different geographies of production and spaces.

However, despite these positive developments in the industrial policy debate, and opportunities for innovative industrial renewal, there are few cases of successful industrial

restructuring among mature economies. This is not simply due to the structural constraints and challenges in the current global landscape. It is also related to the extent to which governments are able to design effective interventions based on appropriate analytical frameworks and evidence. This means selecting instruments and building institutions able to address the very place-specific organisational and technological dynamics of the new production systems.

Theoretical and empirical contributions to the industrial and innovation policy debate have largely overlooked possibilities for innovative industrial restructuring in mature industrial economies. In this context, re-industrialisation presents multiple challenges that often require the adoption of aligned policy packages – including both supply- and demand-side measures – and the coordination of different states, at different governance levels (Andreoni and Chang, 2019). In this context, new or alternative governance structures and institutions – including new forms of public-private partnerships – may be required to manage such transitions, particularly with respect to coordination and system-building.

2. Towards a Production-centred Agenda for Re-Industrialisation

Causes of economic growth stagnation and de-industrialisation have received major attention among scholars in the Cambridge and broader structuralist traditions. Since the seminal work of Nicholas Kaldor (1966), several contributions have investigated different manifestations of de-industrialisation, its causes and broader implications for mature economies (Rowthorn and Wells, 1987; Singh, 1989; Tregenna, 2014). Starting from a ‘macro-sectoral’ perspective, these analyses have pointed to the structural and macroeconomic imbalances resulting from de-industrialisation, and their impact on productivity and the balance of trade in mature economies. More recently, some debates have focused on the nexus linking structural-macro imbalances in the real economy and the global financial crisis (Blankenburg and Palma, 2009). Others have focused on how mounting structural imbalances affect the prospects of specific country blocks such as the Eurozone (Blankenburg et al., 2013) and, within these blocks, of those countries like the UK where regional imbalances have escalated dramatically since 2008 (Martin et al., 2016).

While these macro-sectoral analyses of de-industrialisation have achieved important results, a complementary ‘micro-systemic’ perspective, shedding light on the complex structural, organisational and technological transformations in the global industrial landscape is badly needed. This is particularly relevant in the design of effective industrial policy for re-industrialisation which takes into account the long term historical trajectories of places, productive organisations and the broader socio, institutional and political economy contexts. While macro-economic conditions are critical for re-industrialisation in mature economies, productive organisations and the place-specific industrial systems in which they are embedded are the ultimate triggers of change (Lazonick, 1990; Andreoni and Scazzieri, 2014; Best, 2018).

Neoclassical economics has proven unable to provide such a micro-systemic framework for a number of reasons. These include its black-box view of production and fixation with market exchanges; its limited understanding of technological and organisational learning; its assumption of production homogeneity (the idea that all production activities are basically the same); its atomistic view of society and organisations, which reduces agency to individual utility maximising behaviours (Pasinetti, 2007; Andreoni and Chang, 2017). The

neoclassical preference for analysing of firms as isolated units, assessing their interaction using game theory often with improbable knowledge assumptions, impeded the recognition of firms' embeddedness in increasingly internationalised supply chains, the analysis of power within those chains, and other insights from examining the 'ecosystems' in which firms operate (Sako 2018)

Developments in evolutionary economics have partially addressed the fallacies of conventional Neoclassical approaches. In particular, by analysing firms' organisational dynamics and Schumpeterian processes of technological change, evolutionary economics has provided a dynamic micro-behavioural perspective of innovation (Teece, 2017; Winter, 2017). Evolutionary economic geography has also emerged as a way to bridge evolutionary and regional economic insights and highlight the role of proximity and places (Boschma and Frenken, 2006). However, at the same time, developments at the interface of neoclassical and evolutionary economics – especially in terms of their modelling and empirical research strategies – have reduced the effectiveness of some of these contributions, especially when it comes to disentangling the context-specific multifaceted factors responsible for industrial decline.

De-industrialisation and, thus, re-industrialisation are processes centred around *production*. More specifically they are determined by the different ways in which productive enterprises in a certain historically-defined place continuously innovate their processes and products. They do so by organising complex production tasks and systems spanning across regions, countries and markets; nurturing processes of collective learning and capabilities development; managing incentives and expectations to increase workers' and organisations' responsiveness to change; and committing resources, both internally and externally, to the advantage of their ecosystems.

A production-centred agenda focusing on the micro-systemic dynamics of renewal in mature economies is well rooted in the classical work on manufacturing systems and industrial districts by Charles Babbage (1835), Alfred Marshall (1919) and, more recently, George Richardson (1972) and Giacomo Becattini (1989). Babbage and Marshall looked for solutions to the decline in industrial leadership of the UK, while Richardson and Becattini formulated a holistic perspective of industrial organisations and agglomerations understood as socio-production-institutional units.

The early works in organisational dynamics and complex systems theory by Edith Penrose (1959) and Herbert Simon (1991), respectively, complemented by the historical analyses of long term industrial dynamics of transformation (Chandler, 1990; Rosenberg, 1982), also provide foundational perspectives addressing today's challenges in mature industrial economies. In particular they point to the importance of looking inside productive organisations – down to the production floor, so to speak – to understand the causes of success and decline. Even more importantly, they offer historical-depth to the recent debates and fresh analytical lenses to understand how firms and their ecosystems undergo continuous processes of transformation and how targeted interventions can lead to their innovative renewal.

The need for a post-classical synthesis and the importance of advancing a production-centred debate in both academic and policy circles, have been stressed by a number of recent contributions (see for example the special issue by Pitelis and Runde, 2017, in particular Andreoni et al., 2017, Trau, 2017 and Teece, 2017; see also Andreoni and Chang, 2017). These contributions attempt to establish a bridge both synchronically and diachronically

linking classical and modern contributions sharing a production-centred perspective, while at the same time integrating macro-structuralist and micro-systemic perspectives. This new synthesis can lead to the formulation of alternative, more production-centred industrial policies.

The dominance (and impact) of a market-centred vis-à-vis production-centred agenda is particularly evident in the current industrial policy debate. In fact, while industrial policy is back, the risk of ‘mainstreaming industrial policy’ (Andreoni and Chang, 2019) is greater than ever. Industrial policies in mature economies are still mainly justified by a ‘market’ more than ‘production’ centred economic paradigm. When more systemic rationales are advanced – so called ‘system failures’ – they are almost exclusively raised in the context of technological innovation. Unfortunately, market and systemic failures arguments do not give governments any rationales (and guidance) when it comes to addressing the complex dynamics of de-industrialisation and innovative industrial renewal.

This special issue is an attempt to advance a production-centred agenda focusing on the real dynamics of productive organisations and ecosystems, with the emphasis on their transformation and innovative renewal in mature economies. In this respect, the contributions presented here complement macro-structuralist contributions focusing on de-industrialisation, global imbalances and financial crises, while providing new theoretical and policy perspectives as well as evidence on the dynamics of industrial and economic renewal.

3. The papers in this special issue

The special issue comprises papers covering complementary themes on and around the dynamics of industrial and economic renewal in mature economies, with a special focus on those European countries and regions affected by de- and re- industrialisation dynamics. Far from providing an exhaustive treatment of all the multifaceted dynamics and dimensions involved, the papers presented here address a number of key themes in the current theoretical and policy debates.

The first two papers set the scene by analysing the theory and practice of ‘place-based approaches’ to industrial and regional policies, in particular starting with the approach which has dominated the debate in the European Union context since 2010 – i.e. smart specialisation.

The first paper is a commentary by the main architect of this framework, Dominique Foray. In this contribution, (Foray, 2018) presents the foundational concepts and principles underpinning the Smart Specialisation Strategies (S3) approach and articulates why it is particularly suited to the problem of sectoral modernisation in the context of a mature economy. Central to this approach is the recognition of *specific* capabilities and *specific* coordination problems in mature economies and the need for regional specialisation. Therefore, standard market failures are here recognised only as a ‘starting point’, while more emphasis is given to the coordination and directionality failures which are potentially affecting regional governments in the European Union. The S3 approach also advances insights on the processes of identification of priorities and development of transformative activities to inform experimental policy design.

The second paper by (Bailey, Pitelis and Tomlinson, 2018) welcomes the fact that recent industrial and regional policy like S3 have recognised ‘places’ as a key. However, they raise concerns about the fact that value creation strategies must be complemented by value

capture strategies, that is, strategies that allow places to capture a part of the value they help create and co-create with other entities, such as multinational firms and other organisations. Drawing on the business strategy literature, four value capture strategies are identified and applied for developing and renewing regional ecosystems in a sustainable way. These include: i) competitive advantage and place-renewing leadership; ii) ‘vehicles’ for regional growth; iii) place positioning/branding; and iv) bottleneck assets. In this context, policymakers play a critical role as public entrepreneurs in the development and implementation of these strategies.

The following three papers deal with the ‘organisational transformations’ that different places have experienced over the last decades. Specifically, three types of transformation are analysed: (i) processes of industrial restructuring involving different types of firms in industrial districts; (ii) global value chain reconfigurations in manufacturing and ‘home-sourcing’ dynamics; and (iii) service outsourcing by multinational enterprises and the impact of this on regional structural change.

The third paper by (Cucculelli and Storai, 2018) provides new empirical evidence on the transformations occurring in the Italian industrial districts and the impact of the so called ‘district effect’ on firm performance over recent decades. They find that ‘districts’ have a disproportional effect on their constituent firms. Medium-size firms reflecting the industrial specialization of the district are better able to leverage district assets, thanks to their ability to manage upper-level and size-related business practices. Moreover, in relatively younger districts, medium-size firms emerge as the main drivers of industrial renewal due to their capacity to respond to changes in the competitive environment. The paper concludes by providing different alternative scenarios arising from the dynamic reorganisation process occurring in Italian industrial districts, especially with respect to the potential for different players to balance market power and leverage internal and external localised assets.

The fourth paper by (Bailey, Corradini and De Propris, 2018) looks at the ‘home-sourcing’ phenomenon and the emergence of closer value chains in the Spanish manufacturing industries. The paper formulates and tests the hypothesis that in the new global competitive environment, the recoupling of innovation and production within industrial ecosystems is made possible by the altered relationship between scale economies and variety. They find that in Spain, R&D-intensive manufacturing firms with core nonstandardized products are more likely to switch sourcing of components to the home economy from abroad. This suggests an opportunity for innovative industrial renewal policies focusing on the promotion of closer value chains re-linking production and innovation towards denser and more resilient industrial ecosystems.

The fifth paper by (Iammarino and Ascani, 2018) disentangles the link between two ongoing processes in mature economies, namely the rise of foreign ownership in manufacturing activities and the pervasiveness of the service economy. Specifically, by focusing on the UK, the paper provides evidence on the service outsourcing by foreign manufacturing enterprises and the local multiplier effect of this outsourcing in UK local labour markets. The paper highlights the existence of a specific intersectoral demand-side channel for structural change triggered by foreign multinational enterprises. When the composition of this effect appears homogeneous in terms of the knowledge content of intermediate services, the evidence suggests that demand linkages will differ across subnational regions, potentially reinforcing, cumulatively, the concentration dynamics.

The next three papers focus on the relationship between organisational transformations and learning dynamics in specific historically-defined geographies. These contributions advance new theoretical perspectives on industrial ecosystems and diversification dynamics, the capability-habitat interplay and, finally, the variety of possible learning, unlearning and forgetting processes. A set of in-depth firm and regional level case studies from the UK and Italy are also presented.

The sixth paper by (Andreoni, 2018) provides a novel theoretical framework to analyse the architecture and diversification dynamics of industrial ecosystems, and to design innovative industrial renewal policies in mature economies. Industrial ecosystems are structured ‘production spaces’ involving heterogeneous agents – enterprises, institutions, intermediaries and demand-side actors – operating in and across ‘sectoral value chains’ and contributing to the ‘capability domains’ of the ecosystem with closely complementary but dissimilar sets of resources and capabilities. The paper identifies three main triggers of diversification dynamics – similarity, complementarity and recombination/integration – and shows how they can lead to innovative industrial renewal trajectories. The framework is applied and tested in the Emilia Romagna industrial ecosystem, with specific reference to different types of companies performing different innovative renewal functions in the ecosystem. A number of industrial policy implications focusing on enhancing the ‘structural readiness’ of the industrial ecosystem are also presented.

The seventh paper by (Froud et al., 2018) develops an ecological approach to investigate the different possible relations between firm capability and local habitat and, thus, the different conditions for industrial renewal and the role of policies in mature economies. The authors focus on economies (and sectors) affected by dramatic de-industrialisation processes. These have left a material legacy conditioning opportunities for survivor firms and have created specific, subsectoral, industrial ecologies. Within this framework, and with a focus on carpets and apparel sub-sectors in the UK, the paper identifies a number of distinctive opportunities for renewal which have been captured by different players, such as co-evolving partnerships between larger firms and big retailers in carpets. In apparel, the evidence suggests that predatory behaviour by much larger retailers has negatively impacted small and micro-firms. The paper concludes that supporting firm capabilities and modifying supply chain behaviours are key policy areas for industrial renewal.

The eight paper by (Bellandi et al., 2018) provides a conceptual framework focusing on knowledge accumulation and depletion in industrial districts. Specifically, the paper focuses on the cognitive structure of industrial districts and three different types of endogenous cognitive processes, namely learning, forgetting and unlearning. These processes are affected by internal dynamics within the districts (and its institutional structure) as well as external dynamics, including internationalisation strategies, technological change and political processes. The paper finds that both internal and external processes determine the reconfiguration of the cognitive structure of the industrial district. The framework is applied to the cases of the Stoke-on-Trent ceramic district, the Prato textile district, and the Macerata-Fermo footwear district. The cases demonstrate how the contraction of some productive specializations through forgetting may be a condition fostering manufacturing recovery trajectories.

The special issue concludes with a paper by (Pyke, 2018) engaging with a cross-cutting challenge for mature economies, that is, the management of technological change for inclusive growth. Ground breaking technologies such as robotics, automation, 3D printing, nanotechnology and new materials pose both opportunities and challenges for mature economies. The extent to which they will set mature economies along socially sustainable paths depends upon the effective management of change across a broad range of policy areas,

including active labour market policies and a regulatory framework encouraging enterprises to take a high productivity path of development; social protection inhibiting downward pressure on incomes while reducing inequality; and policies promoting good working conditions, and effective industrial relations, including collective bargaining.

4. Conclusion

Over and above the wide range of issues raised in this special issue, three core themes run through most of the contributions.

The first is the importance of ‘places’ – understood as *historically-defined geographies of production* in which a plurality of organisations and institutions interact in complex ways. Indeed, this ‘thick’ conceptualisation of places is classical – à la Marshall and Becattini – as it takes into account the multiple structural, evolutionary, institutional and social processes stemming from production activities in places. While regional lenses are often used to identify these places, there is increasing awareness of the fact that spatial boundaries are constantly redefined by both internal and external processes of value creation involving different players in the industrial ecosystem.

Second, all of the contributions assign a key role to *industry organisations and production structures*, as their transformations are both a driver and outcome of ongoing changes in the global industrial and technological landscape. By developing different types of local supply chain relationships, including home-sourcing and outsourcing across sectoral value chains, productive organisations develop an intricate web of production relationships in the production space of ecosystems. These relationships determine and distribute opportunities for co-creation of value as well as value capture, ultimately affecting power relationships among firms.

Third, although with differing emphasis, all of the special issue contributions are grounded in a resource capability framework emphasising the role of *cognitive and structural learning dynamics in production*. These dynamics not only determine the capability of productive organisations in different industrial ecosystems; they also result in processes of diversification, niche and relatedness discovery, recombination and innovative industrial renewal as well as transitions to completely new pathways via forgetting.

Taken together, the three themes running through the contributions of this special issue – *historically-defined geographies of production; industry organisations and production structures; and cognitive and structural learning dynamics in production* – provide building blocks for advancing a production-centred industrial policy agenda. This agenda has the potential to invigorate contemporary industrial policy debates in mature economies, particularly with respect to the formulation of policies for the innovative renewal of industrial ecosystems in mature economies, involving the development of new analytical and empirical lenses, as well as policy tools. This special issue thus offers contributions in this direction, while stressing the importance of developing a fertile dialogue between rigorous research engaging with the real dynamics of production and industrial policy practice in mature economies.

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