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Industrial policy for a European industrial *renaissance*. A few reflections[1]

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Abstract

This paper raises and attempts to address three questions that add to the recent debate on industrial policies to promote a European "industrial *renaissance*". We ask (i) What type of de-industrialisation represents a threat for Europe? (ii) What type of structural change can industrial policy steer in a context of increasing international fragmentation of production, both across European countries and worldwide? (iii) What type of industrial policy shall we advocate, that goes beyond the manufacturing sectors? With no pretence to provide all the answers or yet another wish list of policy tools, we argue that we are "doomed to choose" (Hausmann and Rodrik, 2006) what type of structural transformation is Europe in need of, in a context of harsher global competition from the emerging countries; of staggering income polarisation within Europe itself; of relentless international fragmentation of production processes. First, we claim that industrial policy should target sectors and segments of value chains that support the manufacturing sector and not necessarily represent a hollowing out of the industrial base. Second, industrial policy should target structural transformation alongside large "missions" and learn from classical debates on industrialisation-led development. Interventions should therefore go beyond the traditional vertical versus horizontal tools distinction and complement a "mission-oriented" plea with other tools, to avoid yet another "one size fits all" approach.

Keywords: Industrial policy; European industry; re-industrialisation; sustainable growth

JEL codes: O3; H50; H57.

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1. Introduction

There is a revamped interest in Europe (Pianta and Zanfei, 2016) and worldwide (Stiglitz et al., 2013; Stiglitz, 2016; Ciarli and Di Maio, 2014) in the role of industrial policy, and a plea for countries to 'reindustrialize' (Tregenna, 2011; Westkämper, 2014). This is reflected in the recent Juncker Plan in Europe, the Made in China 2025 programme, the Indian National Manufacturing Policy, and the new industrial strategy policies around the globe. [2]

The Juncker plan, launched at the end of 2014, has been interestingly welcome as a substantial fiscal policy intervention to get Europe out of the recession. The plan also has been considered as a concerted vision of public and public-private funding in areas that are considered strategic to ensure a European industrial *renaissance,* to achieve a sustained, inclusive and environmentally sustainable growth, prosperity and economic and social equality.

We abstain here from assessing the Juncker Plan's effectiveness as a fiscal policy intervention, and refer the reader to relevant contributions (among many others, Saraceno, 2016a and 2016b; Clayes and Leandro 2016). Rather, we look at the plan as an example of this revamped interest in industrial policy, although a consensus on its effectiveness has not been reached (yet). We will see below that some scholars have highlighted the fragmented nature of the Plan, which includes sectoral R&D subsidies, support to SME and clusters policies, and the lack of a consistent vision for a bold direction of policy (Vannuccini, 2015). Others have also criticised it as being "too little and too late" as an anti-austerity policy (Dosi et al., 2017).

Here we only take the Juncker Plan as a (rhetorical) device to offer a more general reflection on the role of industrial policy, most especially with respect to the aims of "re-industrialising" Europe, getting it out of the recessions and ensure a sustainable growth. Part of this reflection should be

[2] The UK for instance has launched in November 2017, after several months of consultation with academia and main stakeholders, the UK Industrial Strategy (https://www.gov.uk/government/topical-events/the-uks-industrial-strategy), which aims to to boost national productivity and growth in key sectors.

based on a thorough assessment of the current European industry, although this would certainly require a more extensive effort and space than those available here.[3] Once looked at the Plan and the context within which this has been launched as a starting point, we then: (1) raise a few questions on the rationale behind the Plan; (2) briefly revisit the history of industrial policy in some of the classical contributions to development to ground our discussion on industrial policy for structural transformation. In particular we ask:

(i) What type of de-industrialisation represents a threat for Europe?

(ii) What type of structural transformation can industrial policy steer in a context of increasing international fragmentation of production, both across European countries and worldwide?

(iii) What type of industrial policy shall we advocate, that goes beyond the manufacturing sectors?

In what follows we do not intend to punctually tackle all these questions. Rather, we aim to touch upon some issues that might spur some reflections and direct further efforts to face these challenges. We argue that it is important that scholars and policy makers engaging with industrial and innovation policy learn from the classical debates on industrial development policy. The current revamping of a "mission oriented" approach to industrial policy (Mazzucato, 2015)[4], albeit interesting, might be misleading if not complemented by an attentive diagnostic of what is the current European industrial structure, what type of specialisation should be retained or, alternatively, how to ensure a feasible structural transformation.

The paper is structured as follows. We first summarise the evidence on the initial plan of investments in Europe (Section 2). We then address the questions above by looking at approaches to industrial policies within the Balanced and Unbalanced Development theories, with a particular emphasis on

[3] For an empirically-grounded map of the variety of European industrial and innovation systems, see Wirkierman, Ciarli and Savona (2017).
[4] See Freeman and Soete (1997) for earlier discussions on mission oriented industrial policy.

the views put forward by Hirschman (Section 3). We briefly discuss what makes these theories still useful today, discounting from the structural changes that have occurred since and that should be now taken into account (Section 4). We then conclude (Section 5).

2. The evidence

The Juncker Plan in brief

The Investment Plan for Europe, known as the Juncker Plan[5], was launched in November 2014. In the words of its proponent "*This investment plan is not a one-off measure, but an investment offensive that will unfold over the next three years to come. This is a Plan that will fundamentally change public policy and the financing tools underpinning investment in Europe, to achieve the highest economical and social return for every euro spent.*" (p. 16).

The Plan has been delivered by a joint task force, involving a newly set up European Fund for Strategic Investments (EFSI), the Commission (EC) and the European Investment Bank (EIB).[6]

A substantial amount of public funds is deployed, with an expected large leverage from co-funding of private initiatives, of a total amount of up to €315bn by the end of 2017.[7] The Plan is based on a two-fold pillar: supporting Infrastructure and Innovation and Small and Medium Enterprises (SMEs), in addition to the objectives of channelling finance into the real economy, and improving the investment environment to sustain public-private initiatives.

A snapshot of the dimension and distribution of the interventions is included in a study delivered by the European Parliament (2015), usefully reported in Vannuccini (2015), and reproduced in Table 1 below. The Plan

[5] See http://eur-lex.europa.eu/legal content/EN/TXT/PDF/?uri=CELEX:52014DC0903&from=EN

[6] According to Claeys and Leandro (2016), the European Investment Bank is the most substantial contributor of the Plan. See http://bruegel.org/2016/05/assessing-the-juncker-plan-after-one-year/.

[7] At time of writing, half way through its life span, the plan has fallen short of these expectations (Clayes and Leandro, 2016).

proposes a wealth of sub-initiatives, associated to different "Themes". These include a set of "must" such as entrepreneurship, digital infrastructure, micro-finance, SMEs. As noted in Vannuccini (2015) and shown in Table 1, the portfolio of interventions is quite large and variegated, ranging from large infrastructure to initiatives for SMEs, but, most importantly, of pertinence of several Directorate Generals.

The characterising objective of the Juncker plan, in the jargon accompanying its launch, is a "European industrial *renaissance"* to achieve a sustained, inclusive, green growth of Europe. An industrial *renaissance* would eventually steer economies towards "Smart Specialisation" (as first coined by Foray, David and Hall, 2011) and address grand societal challenges, such as job-friendly competitiveness, poverty reduction, economic and social inclusiveness, which recur as a mantra in the recent policy narrative[8].

The implicit assumption behind the Plan is that financial bottlenecks hamper reigniting of private investment. It might however be the case, as it has been argued by Saraceno (2016a and 2016b), that the excess of saving characterising the recession is not consistent with a picture of financial constraints for the private sector. Another implicit assumption is that an appropriate response of the actors involved would occur and the effectiveness of the several levels of governance to make this operational is already in place. We briefly discuss this below.

[8] See for instance the Unite Nations' Sustainable Development Goals on Decent Work and Economic Growth (https://sustainabledevelopment.un.org/sdg8) and Industry, Innovation and Infrastructure (https://sustainabledevelopment.un.org/sdg9)

Table 1. European initiatives related to industrial policy

	EU Initiative	Budget (Euro)	Sub-initiative relevant for an EU Industrial Policy	Budget (Euro)	Theme
Competitiveness for growth and jobs (€125.6 billion, 13% of the Multiannual Financial Framework budget)	Horizon 2020	77 bln (56%)	KET (Key Enabling Technologies	6.6 bln	Innovation
			SME Instrument	2.8 bln	SMEs/ICT
			Eurostars	287 mln	SMEs Internationalization
			Fast Track to innovation	200 mln	Research and Innovation
			SILC II	20 mln	Tech/non-tech innovation
	Connecting Europe Facility	19,3 bln (15%)	Energy infrastructure	5.1 bln	Energy connections - Single market
			Broadband infrastructure	1 bln	Digital connections - Single market
			Transport infrastructure	13.2 bln	Transport connections
	COSME	2 bln (2%)	Access to finance	163 mln	Loan guarantee facility, equity financial instruments
			Access to market	57 mln	Internationalization
			Framework conditions	34 mln	simplification measures

			Entrepreneurship	9 mln	Entrepreneurship
	EaSI	815 mln (1%)	Progress	497.1 mln	Employment
			EURES	146.7 mln	Employment services
			European Progress Microfinance Facility	1711. mln	Microfinance
Economic social and territorial cohesion (€325.1 billion, 34% of the Multiannual Financial Framework budget)	Cohesion Policy	322 bln (99%)	ERDF	100 bln	Innovation, Res., Digital agenda, SME, low-carbon economy
			ESF	n.a.	Active labor market policies
			Cohesion fund	66.3 bln	Digital infrastructure, energy, transport infrastructure
Sustainable growth and Natural res. (€373.2 billion, 39% of the Multiannual Financial Framework budget)	Community Agriculture Policy (CAP) - Pillar II	84.9 bln (23%)	European Agricultural Fund for Rural Development (EAFRD)	84.9	Diversification and dev. of non-agricultural SMEs in rural area
	European Maritime Affairs and Fisheries	6.6 bln (2%)	European Maritime and Fisheries Fund (EMFF)	6.6 bln	Fishing industry - adaptation to changing conditions

Source: European Parliament (2015), p. 31

Are fiscal and industrial policies back in fashion?

The Juncker Plan has been launched after several years of staggering growth and employment decline across countries in Europe, perhaps with the only exception of Germany. Such a decline has often been attributed to the 2008 financial crisis, which has in fact just detonated a crisis of the real economy that has been going on well ahead 2008 (as argued for instance in Dosi et al., 2017).

It is interesting to note that the timing of this intervention has come in conjunction with a reversal of a dominant consensus around the role of public policy, particularly fiscal policy at the macroeconomic level and industrial policy (Lin, 2012; Stiglitz et al., 2013). It has been argued (Saraceno, 2016a and 2016b) that the financial crisis has profoundly challenged the decade-long neo-liberal dominant view that public intervention should be kept at the bare minimum, subjected to rules rather than advocating discretionary tools when needed, and preferably of monetary rather than fiscal nature. As a matter of fact, when the financial crisis and ensuing recessions hit, the US seem to have reacted much more quickly, proactively and boldly than the EU, with counter-cyclical and substantial fiscal packages. Even then, the current situation still seems to fall within the old textbooks one of "liquidity trap", with interests close to zero, excess savings, sluggish private investments and concerning unemployment rates (Saraceno, 2016a). Such has been the inability of public policy to lift economies from recession, coupled with the (historically relative) lower growth leverage of current technological paradigms, that a debate has sparked over the persistency of the current recession, leading scholars to talk about "secular stagnation" (Summers, 2014).

Somewhat similarly, the financial crisis, recession and prospective of secular stagnation have shaken the ground of the – again decade-long – narrative that considered industrial policy as a costly, distortive and at best useless type of public intervention. The recent World Bank debate raised by the contributions of Lin (2012) and Stiglitz (Stiglitz et al., 2013) shows this (partial) "consensus-reversal".

Within this context, it is interesting to look at whether the Juncker Plan can be considered as the result of a new awakening of European institutions in bringing fiscal boldness and industrial policy back to the forefront. Some scholars (Saraceno, 2016a, 2016b; see also Dosi et al., 2017) argue that the Plan has come too late and done too little to get out of the crisis, compared to the US and main competitors. In what follows we focus on the industrial policy implications and take it from there to propose a larger reflection on the role of industrial policy in Europe in this particular historical moment.

3. Industrial policy for a European industrial *renaissance*

Industrial policy in Balanced and Unbalanced Development theories

An industrial *renaissance* can in principle be ensured by industrial policy tools, which are traditionally distinguished in horizontal/general and vertical/selective (see Warwick, 2013 for a review).

By a little stretch of imagination, advocates of a European industrial *renaissance* take us back to the "glory days of the High Development Policy" (Krugman, 1994, p. 40) and the debate between Balanced versus Unbalanced Growth theorists, which saw fiercely opposing views between Paul Rosenstein-Rodan (1943) and Albert Hirschman (1958), recently revisited from an historical perspective by Alacevich (2011 and 2014). Big Push types of policies, that are large, horizontal interventions, within a Balanced Growth view (Rosenstein-Rodan, 1943) have been counter posed to selective intervention to favour the emergence of "highly developmental sectors", which exploit backward and forward linkages within the economy, according to the Unbalanced Growth view (Hirschman, 1958).

Stretching the similarity a bit further, in terms of development practices Balanced and Unbalanced growth theory would counterpoise *planners* and *seekers*, i.e. those supporting large, horizontal programs and those advocating selective, vertically inter-connected interventions based on specific projects (historically Hirschman, 1958, 1962, 1967)[9].

The parallel with the High Development Theory is particularly fitting when considering the failure of the Washington Consensus and the policies of structural adjustments that have in general proved not to be effective to spur industrialisation in developing and transition countries. Since then, international development organisations have their mantra in "industrial

[9] "*Project appraisal is the art of visualising the side-effects of a public investment" (*Alacevich, 2011 and 2014)

policy is back" (see Lin, 2012 and Stiglitz et al., 2013)[10]. Leaving aside large institutional differences, one might argue that the dimension and direction of the effort required to "re-industrialising" Europe require a radically new way to think about industrial policy.

The idea of a manufacturing-led industrial renaissance is not new, and dates back to Keynesian and Kaldorian theories (as in the seminal contribution by Kaldor, 1966). Since then, though, the nature of industry has radically changed, and now incorporate far more intangible assets and other sources of value added (see for instance Jona Lasinio et al., 2017 and Di Meglio et al., 2018). Also, manufacturing production processes are now substantially more internationally fragmented, so that the very terms of international competitiveness and trade-specialisation should be revisited (Garbellini, 2014; Lopez-Gonzalez et al., 2015). With these, any strategy of (re)designing industrial policy should take into account the historical metamorphosis of the industrial bases of countries, and the nature of structural change more generally (Savona, 2015).

Reverting to the debate between balanced and unbalanced development, we briefly attempt below to articulate aspects of structural change that should be incorporated in current ways of concerting industrial policy, ways that do not seem to have been contemplated in the Juncker Plan.

De-industrialisation and international fragmentation of production

First, the idea of industrial *renaissance* should be based on a thorough reflection, in both academic and policy circle, on what is behind the loss of industrial bases, and what kind of de-industrialisation Europe is currently being threatened by.

Surely nothing of the like of the "pre-mature deindustrialisation" affecting late industrialising countries in Latin America and South Saharan Africa, mentioned by Rodrik (2015), albeit some of the implications drawn by

[10] See recent special issue and Pianta and Zanfei, 2016.

looking at pre-mature de-industrialisation of the African continent might as well be applied to Europe. Besides the usual Kaldorian argument linked to sluggish productivity growth, the implications of a loss of the manufacturing base - or, indeed, the missed opportunities to build up one - attain to the shrinking of a homogenous, cohesive working class that had emerged around (some) manufacturing sectors.

This in turn is claimed to jeopardise the opportunity to cement societies around a working class with a homogeneous identity, a sound political voice and to achieve an acceptable degree of democratisation, as argued in Rodrik (2015). As developing countries-specific as it might seem, European countries might well run this risk too, as we increasingly witness the emergence of new forms of nationalism, which, among many other complex reasons, might also be linked to the dismantling of a critical mass of manufacturing working class.

Albeit from a different perspective, this view seems to be supported, in the case of the UK, as historically documented by Todd (2014). She argues that the fracturing of collective bargaining power in favour of individual "rights", the big shifts in education being driven by the needs of employers, and the centrality of housing as an issue for working-class people all echo down the decades and have contributed to diminish class consciousness more lately. This resonates with what has been argued, for instance, by Haldane (2017), who reports how an increase in the level of precariat linked to the emergence of a variety of self-employed, linked to the so-called “platform” or “gig-economy” has been characterising the post-crisis UK.

These views seem to be challenged by the argument that drawing a neat boundary between manufacturing and services does not seem to make sense any longer (Fontagné, Mohnen and Wolff, 2014). Some segments of services, business services in particular, are so closely linked to manufacturing sectors that they emerge and locate spatially close to their manufacturing destination markets (Meliciani and Savona, 2014). As argued in several occasions, forms of structural change towards services are mainly led by an increase in dimension and complexity of the amount of knowledge to be managed in production

processes (Ciarli et al., 2012). If on the one hand this would keep Kaldorian appeased (Di Meglio et al., 2015; 2018), it might still be a source of concern for other scholars in terms of the argument mentioned earlier (Todd, 2014; Rodrik, 2015).

The relevant question is therefore what kind of de-industrialisation we are seeking to avoid, and what type of tertiarisation we are willing to bargain against (some) loss of industrial core, where our criteria of assessment should be increase in employment and knowledge-related competitiveness. As Lundvall (2016) puts forward too, we should consider industrial policy as directed to a larger range of sectors than manufacturing ones only.

In this context, in line with the Hirschman notion of "high developmental sector", industrial policy should first and foremost go beyond the idea of manufacturing at all costs but at the same time be able to steer structural transformation by leveraging on "highly developmental linkages" [11]. This cannot disregard processes of increasing servitisation of manufacturing (Kommerskollegium, 2012). This process entails the emergence of new, highly knowledge intensive tasks that would be Hirschman backward linked to traditional, or mature, industries. Part of this debate is being revamped now in Latin America on the role of highly intensive services serving Natural Resource Industries (NRI) (Katz 2016).

Second, the Juncker Plan's seems to overlook that domestic and trade specialisation are no longer bounded to the classical "wine for cloth" (Grossman and Rossi-Hansberg, 2008). The emergence of Global Value Chains (GVCs) puts

[11] In a seminal text on economic development, Hirschman (1958) identified the structure of sectoral intermediate linkages within regional economies as the main determinant of specialisation and growth polarisation. According to Hirschman, there are different types of externalities, depending on whether activities are related to one another by backward or forward inducement mechanisms, i.e. whether certain sectors, by demanding inputs, induce the growth of supplier industries (input-provision or backward linkage effect) or, rather, by supplying output induce the growth of client industries (output-provision or forward linkage effect). Hirschman took a remarkably original stand with respect to the mainstream growth theory based on factor endowments. Sectoral specialisation and structural change had hitherto rarely been considered of much relevance in explaining growth polarisation across local and national economies. The role of linkages in Hirschman's work serves the purpose of *creating new sectors* by way of scalable intermediate demand, and therefore represents a useful device to explain structural change of the sectoral composition of economies.

in perspective earlier preoccupations around de-localisation of low value-added segments of manufacturing to Eastern Europe or China that dates back to the early 1990s. These processes had already eroded the European traditional manufacturing base but also depressed wages due to cheap labour competition.[12]

Current concerns are linked to the hollowing out of the industrial (more often high value-added manufacturing) base, due to new modes of international fragmentation of production worldwide and GVCs. For instance, Italy is increasingly losing high value-added intermediates to Germany, which is able to increase its high value-added exports. This phenomenon is different from earlier waves of offshoring of low value-added intermediates adding to low value-added segments of semi-final products that we would re-import, say, from China. This trend is well illustrated in Gaddi and Gabellini (2016), who identify new tendencies in terms of international fragmentation of production and de-localisation in the case of Italy and Germany and, more generally, between Germany and the Southern European countries. It is shown that Germany is acquiring the ownership of some of the best and highest tech Italian champions such as metal mechanics, electrical equipment, car industry, energy, chemicals through what has been defined as "strategic shopping" (Gaddi and Garbellini, 2016). These strategic FDI exploit a "reverse technology transfer" from Italy to Germany, and explain at least part of the diverging labour productivity dynamics in the two countries (booming in Germany, stagnating or decreasing in Italy), which are being misleadingly imputed to de-industrialisation.

In another occasion (Lopez-Gonzalez, Meliciani and Savona, 2015) we have empirically identified the determinants of the emergence of GVCs in business services, and the new global division of labour between "headquarters" and "factory" economies (see also Baldwin and Lopez Gonzalez, 2014). Related to the argument above on the nature of industry and the quality of de-industrialisation, we claim that the industrial domestic structure and

[12] There is a very large literature on these topics. The interest reader might resort to the work of Milberg and Winkler (2011, among others).

particularly the presence of high value added intermediate demand from the manufacturing sectors affects trade specialisation in backward linked sectors, such as business services. Joining Global Value Chains (GVCs) in business services - particularly for late developing countries - should strategically maintain opportunities of related industrialisation, precisely to avoid the risk of specialisation traps in low value-added segments and "premature" de-industrialisation. Despite this phenomenon seems to apply to a lesser extent to the European countries, it suggests that new forms of trade such as GVCs are possibly even more tightly linked to domestic specialisation and accumulation of technological capabilities. With trade competition increasingly linked to specific tasks within the global production process, the ability to change domestic industrial structures and technologically upgrade, eminent objective of industrial policy, is all the more crucial.

In summary, the battery of tools advocated in the Juncker Plan seems to have overlooked – or at least not fully acknowledged – the heterogeneous nature of de-industrialisation and new international fragmentation of production.

4. Industrial policy for structural transformation

We have argued so far that industrial policy tools should not be limited to remove financial barriers to private investments and that this might not suffice to lift European countries from the crisis or decisively reignite the post-crisis, which seems so far to be languishing. We have also highlighted that overlooking evidence on the type of de-industrialisation, and the metamorphosis of trade in GVCs might frustrate the main rationale of stimulating private investment and achieving an industrial *renaissance*. In this context, we have suggested that one of the eminent objectives of industrial policy should be identify the (technological and economic) opportunities for structural transformation of the economies and the challenges associated.

Following from the issues above, industrial policy should support processes of structural transformation while having a clear idea of what

direction of de-industrialisation shall be avoided and how GVCs affect these processes.

First, one of the most crucial and underexplored question is how to best identify technological opportunities and directions for potential upgrading. Decisions on where to invest and where to support private investment are crucial decision to steer the direction to private and public investment and structural transformation to address societal challenges.

Second, the literature and, indeed, the practice of industrial policy are often silent or at best vague on the question of who is "doomed to choose": the coordination of several levels and several "themes" of intervention – as argued earlier - is difficult, and likely to fail. Opportunities for economic and technological upgrading might be specific to local context, while at the same time affected by international fragmentation of production, which require different levels of intervention and regulation. How to make these consistent? The political economy of public intervention should envisage integration of industrial, innovation and trade policy.

Here we revert to a debate within development theories and practices that might be a relevant source of inspiration on how to tackle structural transformation in Europe. It goes back to the discussions on the opportunity of moving away from natural resources and start off processing industries (*beneficiation*)[13].

In a relatively recent contribution, Hausmann, Klinger and Lawrence (2008) reflect on the nature of *beneficiation* and the strategy of selecting appropriate policies to identify what has to be produced and, all the more so, what has to be exported. Hausmann and co-authors have in several occasions argued that selective interventions of industrial policies, that aim to the creation of highly developmental backward and forward linkages à la

[13] Strictly speaking, beneficiation refers to the process of moving downstream from natural resource based sectors and starting off processing industries (Hausmann et al., 2008). As argued in what follows, we take it from here and extend it to refer in general the emergence of sectors that are (forward) linked to an existing one, in line with what Hirschman had put forward when defining backward and forward linked industries (Hirschman, 1958). We reprise this below.

Hirschman, are simply wrong as they are not supported by the empirical evidence. [14]

The implicit assumption seems to be that development is quasi automatically ensured by a virtuous circle that can be simplified as a first phase of export (based on relative factor endowments), which somewhat leads to related capabilities accumulation, then further trade diversification in export that sustains economic growth. Within this context, and more generally within the product space framework (Hidalgo et al., 2007), industrial policy is horizontal in nature, is supposed to facilitate existing comparative advantage, with countries managing at some point to "self-discover" the direction of structural transformation (Hausmann and Rodrik, 2003). This is based on an "(…) alternative hypothesis to linkages is that factor intensities and technology, the workhorses of traditional trade theory, are the real determinants of structural transformation" (Hausmann et al., 2008, p. 11).

However, Hausmann's framework, at least from the perspective of industrial policy, overlooks several important aspects, in line with what argued in the previous section. First, technology might indeed have a centripetal rather than flattening effect in terms of countries' convergence in the accumulation of technological capabilities through trade specialisation. Second, relying on gross export baskets as a measure of capabilities might be largely misleading in a context of increasing fragmentation of production, where segments of value added rather than final products are traded.

[14] "The quantitative analysis finds that broad factor intensities do a much better job of identifying patterns of production and structural transformation than forward linkages, which have an insignificant impact despite the fact that our data is biased against finding significant effects of factor intensities and towards finding significant effects of forward linkages. Moreover, the explanatory power of forward linkages is even smaller in sectors with high transport costs, and in sectors classified as primary products or raw materials, which are the most common targets of such policies. Finally, the results are the same even when only considering developed countries, meaning that colonial legacy inhibiting transitions to natural resource processing are not to blame. These results suggest that policies to promote greater downstream processing as an export promotion policy are misguided. Structural transformation favors sectors with similar technological requirements, factor intensities, and other requisite capabilities, not products connected in production chains. There is no reason for countries like South Africa to focus attention on beneficiation at the expense of policies that would allow other export sectors to emerge. This makes no sense conceptually, and is completely inconsistent with international experience. Quite simply, beneficiation is a bad policy paradigm." (Hausmann et al., 2008, p. 22.)

In contrast, industrial policy strategies based on *beneficiation* are based on the implicit idea that some form of initial protection of the industry are needed, and are very cautious on relying on the idea that countries might be all equally able to self-discover. The idea behind *beneficiation* is one of a trial and error process, where the identification of high development-inducement activities, given the initial specialisation, is an objective of policy per se. Investing in highly linked industries would stimulate upstream supply via backward linked industries, where investing in processing industries stimulates the demand of raw materials, and investing in high tech manufacturing allows demand coming from more mature manufacturing to be rejuvenated.

Rethinking industrial policy for structural transformation would benefit from revisiting the classical views around Hirschman's high development inducing linkages; from embedding rationales of innovation policy, that steers a direction behind promoting "self-discovery".

An interesting hint to reflect on how to enhance structural transformation to address societal challenges is suggested in the brief essay by Frenken (2016) on innovation policy from the perspective of complexity theory and related variety (Frenken et al., 2007). It is argued that the additionality of public spending in closely related sectors à la Hausmann, that favour processes of "related diversification", might be lower than the policy additionality of "unrelated diversification" which however is more costly, risky and uncertain (Frenken, 2016). For instance, in the case of traditional industrial policy tools such as R&D tax incentives, a meta study (Gaillard-Ladinska et al., 2015) found that across countries, the elasticity of R&D investments to R&D tax incentives is 0.21 and even lower for large firms. Public spending that supports diversification in closely related activities might run the risk of saturation of opportunities. In considering this trade-off, what is advocated is rather an **ambidexterity** of innovation policy, which coordinates interventions in both related and unrelated areas.

In this context, albeit acknowledging that they might well respond to pressing societal challenges, interventions with a mission-oriented logic might overlook the importance of structural transformation of countries' existing specialisation and capabilities. Mission-oriented advocacy might raise a few issues when attempting to operationalize this (Frenken, 2016).

1. If there is a trade-off in public spending, favouring structural transformation might leave little space for large programme and mission oriented policies, most especially in a context of austerity that does not seem to be reversed.
2. When favouring large mission oriented investments, issues of operationalization and design of the relevant governance structure that maximise mission-oriented benefits might arise. These have been left relatively unaddressed in the literature and policy debates, most especially when it comes to the redistribution of these benefits to society at large. There is therefore a European institutional vacuum for mission oriented investments, that must be addressed.

The European Council (Better Regulation to Strengthen competitiveness, 2016) advocates the creation of institutional spaces and introduce the "right to challenge" existing rules by actors who meet public interests by alternative means. For instance, the rise of solar energy technology in Germany was a case of bottom-up processes of users and housing corporations pressuring local governments for new policies and regulations that were later embedded in national policies. This is a typical case of societal challenge that is not met by a mission-oriented logic, which might run the risk of a complete institutional vacuum, if not sustained by a balanced, inclusive and clever institutional governance of the process. This in turn needs a clear articulation of a technology projects which is delineated by those parts of society that mostly feel the challenge so to build consensus around a clear project that the state intervenes into (Frenken, 2016).

In summary, the complexity and diversity of the European landscape requires a carefully crafted mix of different types of interventions: while a mission-oriented logic, entailing public procurement and large interventions of state development banks, are a necessary condition to "invest out of the crisis" (Dosi et al., 2017), they might not necessarily steer structural transformation and ensure its persistence, and must therefore be coupled with a battery of instruments that effectively support upgrading and structural change, in line with the argument posed above.

5. Concluding remarks

This work has put forward some reflections that might spark a larger debate on what direction industrial policy should take, that ensures a sustainable industrial *renaissance* of Europe, and lifts countries out of the recession. We have focused on the extent to which the Juncker Plan, launched in 2014, goes in this direction.

We started by sketching the content of the Juncker plan. We noted that the timing and nature of the interventions have been welcome as a return of the fiscal and industrial policies to the forefront of the academic and policy debate. However, a few scholars have lamented too much of a timid presence of a mission-oriented vision behind the Juncker plan (Dosi et al., 2017); a "too little, too late" character of the plan as a fiscal policy instrument (Saraceno, 2016a); a rather fragmented nature of the interventions included (Vannuccini, 2015). Some scholars have also advocated a bolder use of more public funds for scientific research and innovation (Archibugi and Filippetti, 2016).

While we share to some extent some of these concerns, we have out forward further reflections that might be relevant to direct and assess the effectiveness of the industrial policy instruments contemplated in the plan. We have done so by going back to the classical debate between Balanced and Unbalanced Development theorists, who had different stands on the main aim and means of industrial policy.

In particular, we have raised and tackled three questions.

First, we have asked what type of de-industrialisation does Europe fear the most. Re-industrialising Europe might not simply mean funding large infrastructures, or maintaining core manufacturing activities, such as aircraft or automobile. Rather, a substantial role in the European competitiveness of industry is played by backward linked knowledge intensive business services, such as engineering, technical consultancy of excellence, and high-tech intermediates more at large. Centring industrial policy on manufacturing might be misleading or at best insufficient. What Europe should fear the most is the loss of high-skilled, high-value added knowledge base, which might well be an integral part of mature, traditional manufacturing, but also high value-added business services. So, the question might be reformulated in terms of what type of tertiarisation we are willing to bargain against (some) loss of industrial core, where our criteria of assessment should be based on reducing unemployment and ensure knowledge-related competitiveness (Lundvall 2016).

Second, we have asked what type of structural transformation should industrial policy steer in a context of increasing international fragmentation of production, both across European countries and worldwide. Indeed, current concerns on the effects of offshoring are linked to the hollowing out of the industrial (more often high value-added manufacturing) base, due to new modes of international fragmentation of production worldwide and GVCs. Related to the point above on the quality of de-industrialisation, we have argued that the industrial domestic structure and particularly the presence of high value added intermediate demand from the manufacturing sectors affects trade specialisation in backward linked sectors, such as business services. New forms of trade such as GVCs make domestic specialisation and accumulation of technological capabilities possibly even more important, so to avoid countries getting stuck in a low value-added trade-specialisation "trap", as argued in a different occasion (Lopez-Gonzalez et al., 2015).

Third, we have asked what type of industrial policy shall we advocate, that goes beyond the manufacturing sectors and acknowledges the points above. We have argued that a strategy of industrial *renaissance* should borrow from the classical contributions to the unbalanced development theory and

redefine the nature and direction of backward and forward linkages across sectors. We have also argued that this task is tightly linked to the task of *identifying nature and direction of new technological opportunities*, which should be an eminent objective of industrial policy (see also Archibugi and Filippetti, 2016). In this context, we have acknowledged the importance of public procurement and large public investments in radically new, risky and costly areas, all requiring a substantial role for the European Investment Bank and the EFSI mentioned early, in conjunction with national promotional banks. However, consistently with what argued above, we have aligned with scholars who have advocated an *ambidexterity* of industrial policy, that is the ability of intervening in both radically unrelated areas – via substantial public investment and public procurement - and in related areas, building upon accumulated technological capabilities (Frenken, 2016; Frenken et al., 2007). Mission oriented policies should be complemented with more targeted instruments that ensure structural transformation of economies that are based on extant specialisations and related technological capabilities.

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