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INDUSTRIAL POLICY IN THE CONTEXT OF GLOBALISATION, CLIMATE CHANGE, INTERNATIONAL DECOUPLING & THE NEW TECHNOLOGICAL REVOLUTION

Working Paper

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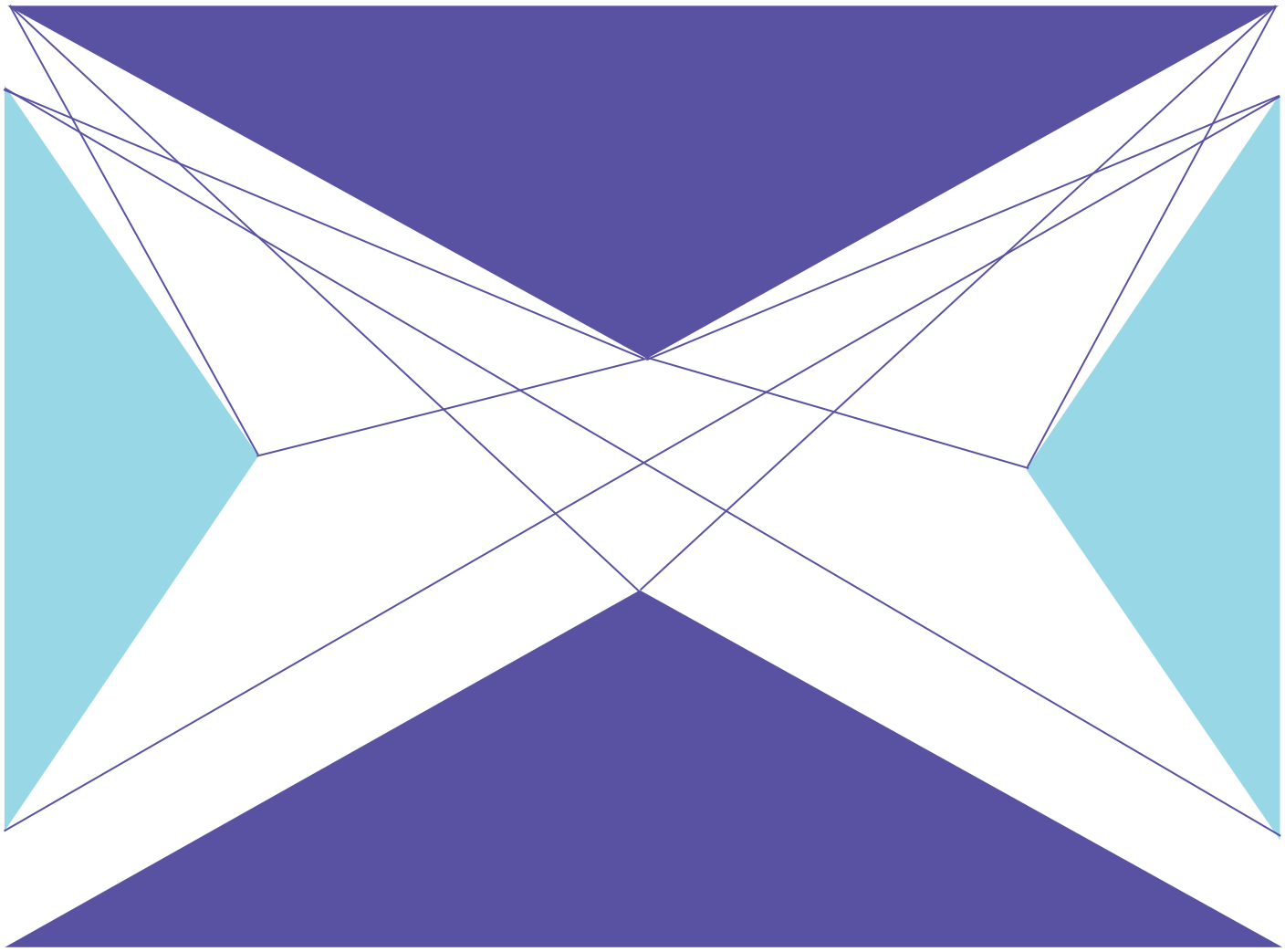

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FORCE PROJECT

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ABSTRACT

In this paper we define three essential broad 'prerequisites' for development, without which mere growth is impossible and /or undesirable and /or destabilising. These are: the 'natural prerequisite', i.e. mitigating global warming and generally environmental degradation; the 'social prerequisite', i.e. tackling oligarchic gigantism, booming inequality, increasing part time and precarious employment (sometimes connected with the new platform economy and the behemoths therein), prioritising social needs versus individual frivolous luxuries; in combination with the above two dangers, the 'international prerequisite', i.e. preventing increasing clashes between the West and especially the USA with the "Rest" (mainly China and Russia) and a possible sudden, disruptive 'decoupling' between them and generally promoting a climate of international cooperation in order to avoid upcoming global existential dangers for humanity.

Then we examine industry in the context of these prerequisites, in particular the evolving new technological revolution. Emphasis is given to industrial themes which interest the E.U., while particularly focusing on the European eastern and southern periphery where we sceptically report current and declared E.U. industrial policies.

We believe that industry per se, and considering its connections with the wider social and natural environment, features prominently in any projection of our future growth and wellbeing. Postindustrial thoughts and visions which dominated the West's recent economic and development discourse are premature if not completely implausible.

To examine all these, we adopt a new holistic approach which, in contrast to the prevailing orthodoxy of the last 30-40 years that rested heavily on the market, involves a much upgraded role for the state, civil society and, with growing importance, the interstate system.

1. INTRODUCTION

In this paper we endeavor to establish what we call the essential 'prerequisites' for development, which to a large extent define also what must be the new and appropriate meaning of it in the 21st century. Then we sketch a "portrait", a role for industry with regard to this new development context while considering in particular the evolving new technological revolution, who some call Industry 4.0, others 3rd industrial revolution, or even 6th Kondratieff wave[2] etc. Following this, we deal more specifically with industrial themes that are interesting in the E.U. context while particularly focusing on the European eastern and southern periphery.

At the beginning, and as a kind of introduction to our main theme, we establish connections between development and industry with *some major, often global issues /societal challenges, humanity is facing nowadays, which here we name 'prerequisites of 21st century development'*[3]*.* First, we focus on perhaps the utmost danger of *global warming and generally environmental degradation and the need to mitigate them, which we here call, the 'natural prerequisite'*. Second, we combine it with *oligarchic gigantism, booming inequality, increasing part time and precarious employment* sometimes connected with the new platform economy and the behemoths inhabiting it and the necessity to prioritise social needs versus individual frivolous luxuries, which we here call the "social prerequisite" and which is certainly *associated with heightened social upheavals and endangered peace.* Third, in combination with the above two 'prerequisites' or sometimes so called 'megatrends'[4], we stress the dangers of *increasing clashes between West and especially USA with the "Rest"* - mainly China and Russia - and a possible sudden, disruptive, highly conflicting and premature *'decoupling' between them,* partially based on or better to say 'legitimised' by the other two above mentioned 'prerequisites' and we label it the 'International prerequisite'.

Then, we ask if the above three megatrends *complicate or rather facilitate the handling of the other societal issues and the accompanying industrial transformations*. We are particularly interested in these broader than mere industrial issues because, firstly, we consider them to be potential disturbing (or

2 Kondratieff waves (or cycles) are successive time periods lasting 40-60 years, where each wave exhibits high and then slow growth and finally crisis, where a new wave replaces the old one. Many hypotheses have been promoted to explain this wave like economic progress, e.g. technological and other innovations, finance, war etc. Although even their mere existence remains disputed after 100 or so years from the formulation of the theory, nevertheless it can be useful for policies with strong future orientation. There is a huge bibliography on this issue. For a recent (not necessarily representative) presentation see Nefiodov (2014).

3 Here the use of the word "prerequisites" doesn't have a pure temporal meaning i.e. something to be done before something else (although to some extent this meaning is also suitable here), but mainly a 'value' meaning which refers to the primary importance to fulfill them, but not specifically at the beginning of the whole process.

4 E.g. see https://knowledge4policy.ec.europa.eu/foresight/tool/megatrends-hub_en (where there are mentioned several more megatrends, beside the ones recorded here).

alternatively promoting-under favourable conditions) factors of major magnitude in industrial growth and secondly, because we adapt a non-deterministic approach to the new industrial revolution, that is we do not think that industry is evolving in a vacuum, disassociated from the particular societies, the international system and the biosphere, where it is embedded. Thus, we do not think that we can analyse industry as such in isolation from its surrounding society, international system and nature, when speaking about important developments as, for example, artificial intelligence, digitalisation or renewable energy per se on an ad hoc basis, but only in close/unbroken connection with them.

At all events, industry per se and considering its connections with the wider social and natural environment, features prominently in any projection of our future development and wellbeing. In parallel, there is now a greater understanding that the postindustrial thoughts and visions which dominated the economic and development discourse in the West over the last 30 years or so are probably premature if not completely implausible or even worse, colonialism's legacy and the West's arrogance[5]. As industrial evolution constitutes an integral part of any meaningful future, it will form the focus of this paper. We adopt a new approach which, in contrast to the prevailing orthodoxy of the last 30-40 years that rested heavily on the market, involves a much upgraded role for the state, civil society and, with growing importance, the interstate system, all being closely connected with industry and industrial developments.

2. THE WIDER ENVIRONMENT

Industry, as we have already mentioned, does not evolve in a blank space. The social and natural environment exercises immense pressure on it and vice versa. Although this has always been true since the years of the first industrial revolution, in the last 40-50 years the validity of it became explicit and increasingly significant especially regarding its links with the climate and environmental dimensions. Our exchanges with nature are stubbornly and permanently complicated. Formerly the issue was about practical/efficient ways to extract natural resources from a market point of view, while we remained indifferent to the consequences for the environment or the adequacy of supplies. A market system with states providing the basic framework (ownership rights, security of exchanges, a judicial system to impose them, a monetary system, basic infrastructure and education publicly provided) was regarded as satisfactory, neglecting broader environmental consequences until the 60's or 70's. Although societies already faced serious consequences at that time (e.g. industrial smog was certainly a big health issue before the 70's in the industrialised world), nevertheless, the defectiveness of this system emerged mainly during the last quarter of the 20th century.

5 E.g. see Allais's (1999) (Nobel prize in Economics, 1988) timely warning: 'it is still maintained that China, a country of low –paid workers, is going to specialise in activities with low added value, whereas developed countries, like France, are going to specialise more and more in high technology. But this means totally ignoring the work capacities and the intelligence of the Chinese people will be totally ignored. If we continue to put up these absurdities, we are heading for disaster''.

Even so, as far as the social environment was concerned, the above market system with its initial minimum public provisions was outdated even around the turn of the 20th century and certainly so, after the great depression of the 30's. We all know what happened next, especially after World War II, when the public sphere increased its role dramatically in order to provide security and guidance in the economic and social sphere. But we also know well that after the 80's, a strengthened faith in the old market system with minimum public intervention reemerged and expanded during the 90's, after the collapse of the Soviet system and Teg's reforms in China, climaxed in what was named 'globalisation'.

Based on a 40 year-time frame, we must admit that the success of this 'new' market-centered approach, is at least questionable both in social and environmental terms (Wilkinson & Pickett, 2009; Bushey, 2019). This brings us to the novel and enormous task of inventing a new system which although preserves important aspects of the old one based on private/market relations, must in parallel comply with urging societal and environmental challenges and expectations. And since the 21st century problems are international and increasingly supranational/universal, it is even more important that we invent a new role for the international community with its real meaning of *'ecumene'* as is perceived in modern times e.g. by L. Mamford (1934) and W. Mc Neil (1963), that is a united, or rather more exactly, heavily interconnected world system with its accompanying obligations[6].

Putting it more abstractly, the increased complexity of the turbulent 20th century's civilisation, demands from its 21st child, new and novel ways to handle the environmental and other societal problems which must combine, in innovative ways, aspects of the old market and state system, with a new inter/supranational one, without ignoring the role of civil and local societies. Therefore, it must move at the same time, both upwards towards the international system and downwards towards civil society, while reorganising the relations between market and state in favour of the latter, that is the creation of a new universal, sustainable and fairer path. Otherwise humanity, by moving into uncharted waters, faces existential threats which it never before had to tackle. Industry must, by necessity, be an integral part of the above process, an 'embedded' part of it.

[6] For the international dimension of our development future there is currently a huge debate going on. The Paris Agreement was a first step in this direction and the EU is one of the leading forces in achieving its goals. Today the USA is following and recently it seems that China is also trying to comply. While the E.U. was and is, to its merit, always a strong promoter of environmental issues, this can hardly be said for Trump's America (at least). For recent trends in China where some progress is observed see https://www.state.gov/u-s-china-joint-statement-addressing-the-climate-crisis/ and https://www.scmp.com/news/china/politics/article/3130132/tracing-chinas-climate-change-journey-denial-decarbonisation

3. CLIMATE CHANGE AND ITS CONNECTIONS WITH INDUSTRY

3.1 A paradigm shift

Here, focusing on the environmental issues, the first prerequisite mentioned above, we restrict our interest in climate change, considering it to be the utmost danger which the civilisation of the last 2.5 centuries has brought about, although we admit that there are several almost equally critical problems arising from the exploitation or rather expropriation[7] of nature, such as pollution and its heavy price on human health and nature's sustainability, zoonotic diseases stemming from the degradation of the natural habitat of animals, the depletion of biodiversity, natural resources hyper exploitation etc.[8] Climate change proves, admittedly with a revengeful air, that the well-known adage "there is no such thing as a free lunch'', popularised by M. Friedman in the 70's and aimed mainly against environmental protection and public spending, can also be interpreted as being against his attitude favouring individualism, the profit motive and market mechanisms against environmental and social protection.

Now, with 'utmost sorrow' we know that nature also does not provide a free lunch, and its exploitation/expropriation comes at a price, a heavy price indeed. In order "to pay the price", industry's commitment is indispensable. This requires an increased effort for green energy, aiming for zero net CO_2 emissions around 2050, or 2060 at the latest. In order to implement it, a complex highly interconnected stream of actions must be initiated and/or swiftly accelerated. A few areas of intervention of paramount importance should be highlighted: the almost complete substitution of fossil fuels for energy production with renewable energy sources and its necessary corollary, i.e. energy storage, batteries etc.; minimisation of energy consumption in industrial production and transport; restriction of energy consumption in buildings. *All in all, around the middle of the century, a new industrial paradigm must completely replace the current one. A paradigm with drastically increased energy and generally resource productivity at its core, replacing, in many aspects, the prevailing one, referring specifically to increasing labour productivity through economising on labour*.

7 The distinction is made after Frazer's (2021)

8 Many of these environmental impacts, however, are directly related to industry (e.g. industrial livestock in terms of zoonosis, heavy industry in terms of waste of raw materials, electric car batteries and new goods in general of industry 4.0 causing ecological disasters in developing countries, etc.).

3.2 Macroeconomic issues

We know from the latest exhaustive analyses[9] that the path leading to the above goals is feasible and generally in line with our current competencies (at least from an E.U. perspective) provided that we permanently continue inventing new technologies, although perhaps at a decreasing rate but not of diminishing significance and/or complexity[10]. According to A. Tooze (2021), based on footnote 8, studies: "almost three-quarters of the emission reductions we need to attain by 2030—73 per cent to be precise—can be achieved with technologies which are either mature or in the stage of early adoption, such as electric vehicles[11]. Only 5 per cent of the cuts necessary rely on technologies still on the drawing board. Even if we look as far ahead as 2050, 87 per cent of the necessary reductions can be achieved with technologies which are already in use or have, at least, been demonstrated on a small scale. That leaves 13 per cent to be covered by blue-sky innovation". Although the last and more uncertain figure, i.e. 13% is not formidable, that does not mean that there is not much work left to do. It is always the last few meters of the mountain peak, which are the most exhausting and dangerous to climb[12].

However, leaving aside the uncertainties related to the appropriate future invention path and its difficulties, there are financial certainties and again difficulties. We Europeans need to invest €28 to 28.4 trillion (an amount double of the current E.U. GDP)[13] over the next thirty years for, among other things, solar panels, wind farms, batteries and the electricity grid and achieving substantial reductions in the energy consumption of buildings, industry, agriculture and transport in order to obtain net zero emissions around 2050. €28 to 28.4 trillion is, admittedly, a huge amount (double of the current E.U. GDP), but if we reconsider it on an annual basis, according to the E.U.'s GDP and investments, the amount which needs to be invested for this purpose is around 5.8% of GDP annually in gross terms. Although it is a considerable sum we should underline that it represents a mere 1% to 1.5% of the EU's annual GDP in net terms, if we subtract the amounts currently flowing to the fossil fuel industry (admittedly not an easy task in productive and social stability

9 See particularly https://ec.europa.eu/clima/sites/default/files/docs/pages/com_2018_733_analysis_in_support_en_0.pdf, by E.U. experts and https://www.mckinsey.com/business-functions/sustainability/our-insights/How-the-European-Union-could-achieve-net-zero-emissions-at-net-zero-cost, by McKinsey

10 There are studies that conclude that no matter how much technology we use, it is not enough to achieve the climate goals. So that the green growth paradigm is not in line with climate goals and that there is a need to decouple prosperity from the consumption of natural resources (e.g. Hickel & Kallis, 2020).

11 Nevertheless, we have to calculate and tackle the huge and increasing environmental cost of this innovative technologies. See e.g. https://get-green-now.com/environmental-impact-electric-vehicle-batteries/ and https://reporterre.net/Non-la-voiture-electrique-n-est-pas-ecologique

12 And it always remains a highly disputed issue: is the ever-growing world economy, with its constantly arising and complicated technological solutions, compatible with environmental stability and sustainability? See e.g. https://www.alternatives-economiques.fr/ecopo90

13 See above mentioned studies at footnote 8 and A. Tooze (2021)

terms). These figures are in pace with older authoritative calculations (see e.g. N. Stern, 2007) and we can cautiously rely on them.

Although such figures do not seem infeasible, there is much to be done in order to achieve them. Certainly the biggest issue is that in market economy calculations, around half of the needed investments will not be undertaken with the usual profit criteria. Making the long story short, we Europeans need to mobilise an investment surplus (in comparison with the current levels and beyond substituting fossil fuel subsidies with renewable ones) of around €4.9 trillion over the next 30 years or so providing subsidies to private investors to achieve the net zero emissions scenario by 2050. If we consider the Recovery and Resilience Facility which aims to provide in the next 6 years around € 0.6725 trillion in loans and grants, we see that roughly speaking we need to extend it for the whole period until 2050, focusing mainly on grants. This is not impossible, but equally not easy, especially if we consider the current dramatic situation of public and private debts in the majority of the E.U. countries which, for the moment are veiled under the prevailing near zero interest rates, a situation almost impossible to extend for the next thirty years[14]. If we agree on the above rough figures, we must adhere to recent J. Yellen's and Biden's intentions[15] for increased taxation of wealth (wealthiest individuals, multinationals, speculative capital, etc.) only augmenting them, in order to cope with the ambitious ecological E.U. (and global) agenda and its financial restrictions.[16]

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14 Otherwise we must deal with a new and completely different economic system, a stagnant-in current terms- system, which does not create profits to distribute to the production factors, a situation incompatible with capitalism as we know it over the last 5 or 6 centuries at least. Throughout this historical period, capital accumulation and allocation towards the more promising profits was the core of human development (with its ups and downs). Thus, based on the above thoughts, interest rates must by necessity ultimately rise and with them the problems of over-indebtedness.

15 A first, but hesitant move forward is the 15% minimum corporate tax rate, proposed by G7 recently, see https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjS28XQwYfxAhWXHewKHYmCDP0QFjAMegQIAhAE&url=https%3A%2F%2Fwww.bbc.com%2Fnews%2Fworld-57368247&usg=AOvVaw1W1lEz_hw3ADbhwisJQa9b

16 We must add here a big reservation: Trump was asking for the doubling of "defence" spending for NATO countries from around 1% currently (for the majority of them) to 2% of GDP, which is almost the amount needed for sustainable climate transition. Anyone can understand the absurdity of the proposal, given the ecological and social necessities. It is devoid of real value if we consider that the West outperforms the 'Rest', and in this case mainly Russia and China, the usual suspects as enemies, several times over in military budgets, as well as the public financial difficulties of the vast majority of the related countries. Nevertheless, we must not easily discard these proposals as "Trump nonsense". A bird's eye view reveals the opposite. In the United Kingdom Prime Minister Johnson wants to radically update the nuclear capabilities of his country, in the United States, President Biden, although announcing the biggest stimulus plan since Roosevelt's years and while strongly engaged in resolving climate issues, is augmenting the Pentagon's budget. In Ukraine the situation is warlike and the possible successor to Germany's ''Iron lady" A. Merkel, green A. Baerbock, adopts an aggressive stance against president Putin and Russia in general. E.g. she is against Nord Stream II and if she succeeds in it and Ukraine's situation worsens, the horizon of the E.U.'s relations with Russia will deteriorate critically, effectively pushing Western Europe to follow the steps of Eastern Europe after NATO enlargement to a cold war status, possibly leading to mutual increased military spending,

3.3 Even bigger than a mere paradigm shift rotating between market and the state: a civilisation shift?

And the problem is not exhausted if we can agree to relocate or find ex novo, the aggregate numbers to invest, besides its critical importance. In other words the upcoming obstacles are not only restricted in the mobilisation of the total amount of money we mentioned before and its surrounding difficulties. Behind the above macroeconomic picture, hides the real transformative agenda which aims to reform the whole European economy step by step, sector by sector, in productive and consumptive terms, in the private and the public sphere etc. and to make it sustainable ecologically and socially. In other words besides the reasonable (thought demanding) macroeconomic assumptions mentioned above, there remain abundant problems lying in the meso and microeconomic level on which we will focus later.[17]

But at the beginning, we must clearly recognise what is really happening before our eyes. We are abandoning 40 or even 50 years of prevalent economic thought and practice, which we can here summarise as the Reagan and Friedman dictum: "government is the problem and the market the solution". The market, whatever its effectiveness in capital accumulation and growth and we admit that it is crucial but not absolute, proved completely unable to tackle social and natural deterioration and to provide much needed resilience. In the case of climate change the market failed to provide, to a considerable degree, an adequate mechanism to reverse the unwelcomed consequences at the beginning of the Anthropocene epoch, which particular and predominant characteristic is its manmade character. Precisely because of its manmade nature, the exact mechanisms of our exerting influence are of particular importance. And for sure, *the market mechanism with its short-termism, its externalities indifference and its profit motive, proved completely inadequate*, at least if left by itself and unchecked, to provide the whole biosphere and as such humanity, a safe and sustainable habitat[18]. Our suspicions are even gloomier: we think that besides and beneath the market mechanism and its grim consequences for nature, lies an even stronger and older factor which dominates human history (at least) and even prehistory to some extent. We can name antagonism, competition, rivalry as this particular factor and we certainly always find

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decreasing therefore the necessary funds for climate sustainability. Even here in our small country, Greece, with its enormous debts and economic difficulties, we have to increase military spending mainly because of Turkey's aggressiveness and the E.U and U.S.A.'s refusal to guarantee our legitimate interests and especially to provide agreements for mutual support in case of external threat. Later in this paper, we concentrate on the international relations problems, because we believe that without a major forward push towards international katallage and collaboration, the possibilities of avoiding climate change are slim.

17 And we ignore for the moment the international aspects, to investigate later.

18 Let's remember that the Stern report called the climate issue, the widest ranging market failure ever seen. We would like to add reservations on or rather extensions to the above characterisation: it is not only the widest ranging market failure, but at the same time, the widest ranging government failure to fix it and the same applies to the international community, the interstate system

it in combination with its opposite,[19] i.e. cooperation in varying proportions, but unfortunately with antagonism ultimately in the driving seat.[20]

Our guess, based on antagonism's prevalence in our society, is that we need a new combination of the above two factors, that is *rivalry and cooperation, but only with cooperation now in the driving seat in order to navigate safely through the Antrhopocene*. We can no longer consider nature as a free gift, bestowed upon the winner of a competitive race to appropriate it, as we mainly did over the last 500 hundred years or so. After such a race maybe the "winner takes it all" but unfortunately for him and certainly for all of us, in a ruined s unsuitable for exploitation or even expropriation. To avoid these deadlocking races we must cooperate. Later on we specify the above abstract philosophical aphorisms, focusing on the need of international or even better ecumenical cooperation, insisting that climate change is by its nature not a problem seeking its solution between the market and the state, but firstly between states in the international arena, with markets playing an subordinating, although important role but a role in a clearly restricted area.

3.4 New and green industrial policies and a novel public administration

Having said all the above and leaving the international aspects for later consideration we now search for the proper market regulations and direction in order to provide the needed means for sustainability. We have briefly covered some macroeconomic and macrosocial aspects which by necessity must prevail in this transition and we now turn to the meso and micro economic aspects. More specifically, we refer to the new green industrial policy which will guide us through all this complex 30 year-process. But how do we define it and why do we need it? First we define it "as an industrial policy in which climate change mitigation becomes a binding constraint in achieving the social welfare goal" (Tagliapietra & Veugelers, 2020). And why do we need it? The answer is straightforward: because of the market's mechanism inadequacy.[21] We must, here or there, subsidise and/or regulate markets, overall

19 Macro requirements are important but there are clearly more needs in other areas. The productive transformation must overcome the market in terms of the superiority of competition and the short-term horizon. This is an important element as both the industrial coexistence and the new forms of production and consumption of energy (see chapter in this volume by Sotiropoulos and Devve) presuppose the cooperation - trust of the actors (businesses and consumers). The same can be said for electromobility that must be included in a shared framework in order to be truly environmentally-climate beneficial.

20 We can easily trace this contrasting pairing human abstract though, i.e. primarily in theology (e.g. in the manichaeistic tradition) and philosophy: e.g. in Empedocles (around 6th BC century) perpetually contrasting two moving powers, Love and Strife and their interplay which shape nature and human history. Put it differently, the Smittian perpetual contrasting pair, friend and foe, constitutive of the political phenomenon, must at least retreat to backstage on climate issues in order to achieve constant progress towards the survival of our civilisation

21 To be sure this is not an unchallenged thesis: authoritative voices from the neoliberal past (e.g. J. Baker III, et.al. 2020) insist on what they call a market friendly and market guided solution to climate change, mainly through the carbon trading system and taxing energy-intensive imports and generally

guiding and/or creating them ex nihilo, even where needed, counselling or replacing them in favour of improved co-operative or public mechanisms.

Now returning to the new industrial policies we briefly mention some of their main aspects, which clearly differentiate them from the prevailing ones: first of all, they must move beyond the "Washington consensus" versions,[22] the dominant policies of the last 30-40 years, grounded in their absolute failure on climate issues. Thus with horizontal measures, emphasising profitability and efficiency in labour productivity terms, deregulations, liberalisations and privatisations, with incomes and wealth inequality moving upward, there is no climate future. To put it differently, we face an enormous responsibility: *to stabilise climate change, while simultaneously pursuing European competitiveness against China, USA, Japan, S. Korea etc., but in a way that would not undermine our universal goals of climate sustainability*, e.g. through excessive economic and/or arms competitive races and conflicts.[23] And adding the above complexity we have to reverse the 40 year- trend of rising inequality if we aim to achieve our climate goals peacefully and without major social upheavals (which effectively jeopardise our climate goals), while at the same time we must invent new definitions of wellbeing, taking issue with its older definitions based on GDP, which shares responsibility for our current deadlocks: economic, social or ecological. [24]

The above complex and interpenetrating targets define a somewhat new and enormous duty: at its core is a new command economy, in the footsteps of the old war economy, where markets are in a clearly inferior position and in the service of the above presented goals. Such a Copernican reversal, although not impossible, is rare and usually comes when an external danger looms. At least such were the cases of the war economies during the first and second World Wars, which resulted in upgrading government role in the economy afterwards. And such a reversal is obviously needed today, but even more dramatically, since beyond **an updated government role in the transition to our ecological future**, we must **invent a completely novel way for the international community** *to co-operate*, because without it we must not expect to achieve our goals.[25]

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carbon pricing, assigning a secondary role to government intervention through regulations and subsidies.

22 Although "Washington consensus" policies were not generally considered industrial policies, but in fact their exact opposite, this is a false understanding based on language misuse. They are certainly a type of industrial policy, albeit with inverted signs from the previous prevailing, which, incidentally, doesn't obliterate the innermost meaning of all (until recently where we endeavour to give a broader meaning) industrial policies as public policies designed for competitive reasons.

23 Europe's share of greenhouse gas emissions however is limited compared to China and the US. https://ourworldindata.org/co2-emissions

As Hickel & Kallis (2019: 15) point out "The objective could be to find ways to decouple prosperity and development from growth … rather than to continue to chase the phantom of green growth".

25 See e.g. the now evolving international debate about vaccines, patents and global public goods

We now focus on the new aspects of the green industrial policies we propose. To begin with, we insist on its harmonious character, integrating economy, society and nature, simply put, its *holistic approach*. In other words it is not exclusively concentrated in the usual competitive aims to foster industry or manufacturing per se and especially through enhancing labour productivity (Aiginger & Rodrik, 2020). That means focusing on central societal challenges and within them on missions (Mazzucato, 2017), in order to accomplish their important obligations. Such societal challenges are primarily: achieving environmental sustainability; tackling unemployment, underemployment and generally precarious and insecure jobs; reducing inequality/poverty; reversing demographic decline and brain drain; modernising and strengthening SMEs; enabling technological innovations so as to build an advanced knowledge economy especially in the digital economy and artificial intelligence, while tackling and avoiding its accompanying dangers[26] etc. All in all, industrial policies support for structural change, investments and productivity growth, must no longer be evaluated only in in mere financial and economic terms. It is no longer only a matter of increasing the rate of growth, but, more importantly, it is about the direction of growth, e.g. in an age of artificial intelligence and robots, *labour productivity must stop being the outmost aim and perhaps be (partially) replaced with resource/ecological productivit*y that economise precious raw materials, earth's biodiversity, the health of living organisms, forests, oceans etc.[27] Without increased regulations combined with international cooperation in order to avoid catastrophic competition to undercut cost and prices and to invest according to ecological principles, because of the rising costs for climate and generally environment protection, this so welcomed transition to resource and environment productivity will not materialise. For this to happen we need to move beyond the market mechanisms through state regulations and international cooperation.

Most, if not all of the above societal challenges (and specific missions adapted for them) interact, usually in new and poorly traced ways. *Public administrations in general and especially in the less or moderately developed nations, are not in a position to provide this kind of holistic planning.* New and old industrial policies may collide not only with each other but also with other policies such as regional and competition policies. What is more, less developed public administrations might observe and handle recent and accelerating changes in European policies with rising difficulty. Their structures are outdated, purely hierarchical, horizontally and vertically separated, with little communication between them and even less with

26 Such as increased universal surveillance and almost complete loss of personal space (Zuboff, 2019), and the always increasing issues regarding AI and its dangers: see e.g.(https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwi2--i5zofxAhUO26QKHTOgCxgQFjAAegQIBBAD&url=https%3A%2F%2Fwww.researchgate.net%2Fpublication%2F328625147_Facing_disaster_the_great_challenges_framework&usg=AOvVaw1sSV07uDbEULVZtRnSK6TN)

27 The premium of other forms of productivity. While we know that technology can make a significant contribution to resource and energy productivity, it is uncertain whether companies will invest in it because it entails increased investment costs as well as operating costs (which creates a competitive disadvantage). Strong regulatory intervention is therefore necessary.

society and its institutional players overall. To achieve the new green industrial policies combined with digitalisation and transition to knowledge economy generally, we must transcend and improve the above public structures in many ways. For example, we must abandon the typical top-down public programming 'principal agent' model (Rodrik 2004) and adopt a new one where information flows circulate between the public, social and private sector (not to mention the international level), as well as, at least up to a point, decisions planned ahead are combined.

Furthermore, this new public administration must in parallel with its above mentioned radical transformation, tackle the usual market failures which lay behind the justification of industrial policies. Those failures are mainly information and co-ordination externalities, the usual suspects of market failures (Rodrik, 2004; Tagliapietra & Veugelers 2020; Aiginger & Rodrik, 2020), such as the discovery or even application of new products and technologies and the simultaneous provision of accompanying products and infrastructures in order to boost these new provisions.[28] Discovery and its accompanied uncertainty is always present and a main characteristic of industrial production, especially when innovations and technological and production change are on the agenda. Therefore industrial policies must reduce it, taking measures such as public procurement, guarantees, subsidies and other forms of incentives (e.g. tax reduction for R&D expenditures), along with more straightforward protection,[29] all of which are obviously more important for weaker and smaller enterprises, which constitute the vast majority of entrepreneurship in the less developed nations generally and particularly on the E.U. level. New public bodies (and in our case, new European ones) must be constructed accordingly to tackle the above externalities and the required knowledge cannot easily be obtained 'in abstracto' by these public programming bodies but in close co-ordination and co-operation with the private sector and representatives of civil society.

28 Information externalities are prevailing especially when and where we introduce innovations and generally new technologies, processes and products, because of inherent uncertainties about cost, sales promotions etc., which are mainly problems for the initiator, the innovator. Conversely for the imitators, things are pretty clear and free riding is easy. Therefore if there is no state help, through protection, subsidies etc. for the initiators, there will be under provision and lower growth. Now for co-ordination externalities to emerge, of critical importance is the absence of supporting structures and preconditions as for example roads, electricity, irrigation, specialised labour, which generally must be provided by the state and/or under its co-ordination and help, and which typically are absent or in limited supply in the less developed nations.

29 European IPCEIs are clear examples of this more straightforward protection where subsidies structure clearly supersedes the older ones drastically.

3.5 Specifically on green industrial policies and their civil society and international requisites

When speaking about green industrial policies we are faced with a more demanding job to do. This is so, as we have already mentioned above, because we do not have to deal with the usual agents, i.e. public administration, private enterprises, and labour representative organisations. Here we must also add civil society's schemes with particular interest in ecological issues and social innovation, the real initiators of climate policies, as well as a broad number of others such as regional organisations which are influenced in one or another way by the green transition (e.g. regions dependent on fossil fuel production, areas where the new renewable infrastructure is located etc.). And this is not the end of the story: we must add here their more demanding, novel and uncertain aspect, which are their generally speaking higher complexity (Tagliapietra & Veugelers, 2020) and the required international co-ordination already mentioned above. Here is not the place to analyse the problem, but we must understand its prevailing nature. And this is mainly because if we do not construct a suitable international scheme to regulate climate transition, there is plenty of room for free riding among nations as well as within nations, which will dissolve any inappropriately constructed scheme (e.g. the Kyoto protocol and the Paris agreement are probable examples, albeit their evident usefulness to initiate the whole process). And the suitable international scheme for climate change mitigation is apparently not just a technical issue (albeit certainly such), that is, well constructed incentives, carrots and sticks, but also agreements for providing innovative products and their financial aspects (who pays who benefits etc.) and ways of inspecting them as well is a very crucial aspect, since we usually deal with powerful states (China, Russia, USA etc.) unfamiliar with international checks and penalties. A probable example is USA under Trump: the international community failed to even slightly penalise it, even though with its stance it jeopardised humanity's future.

This is completely unacceptable and an all-powerful demonstration of the present inadequate status of the international agreements and of the problems lying ahead. To avoid such trends, fairness issues, as well as a clear interest to avoid drastically changing the balance of power (except in a unanimously accepted way e.g. to help poor nations through the whole process), that is to equally co-operate in the pros and cons of the climate agreements, is of paramount importance. Unfortunately this is not the way current green policies are usually constructed: they explicitly have an eye on gaining new dynamic comparative advantages from the new technologies by the inventing companies and countries, but that could easily result in a competitive race where the losers, may be tempted to change the rules of the game, i.e. by not conforming with the international agreements. Certainly, it is impossible to deduct the competitive motive from climate change innovations. But equally certain is the need for international co-operation, firstly in the invention process and secondly in promoting ways f or all users to have a say in the design and production of the new products in order to internalise adequate value added, thus effectively minimising international and internal conflicts. All these can be facilitated e.g. by lowering patent cost and duration, perhaps compensating the inventors through international

schemes/funds under U.N. aegis, where rich and medium income countries contribute proportionally (while simultaneously excluding poor nations from payments), or under international agreements that evenly and fairly create enough internal value added for all participant nations and not only for the inventors.[30] We fear that if we do not avoid excessive international competitive races, the whole process of climate mitigation is endangered, not to mention the benefits of co-operation which were clearly demonstrated in the evolving pandemic crisis, or rather, negatively demonstrated through the absence of international co-operation and the prevalence of competition between nations and firms. The above long parenthesis aims to show that *the green industrial policies must by necessity be of another more encompassing and co-operative character*, in other words they cannot be a race which benefits the winner and that is all. Appropriate schemes of international compensations for the losers must prevail and the competitive races must be downgraded (or better eliminated).

4. GROWING INEQUALITIES AND THEIR INDUSTRIAL IMPLICATIONS

4.1 Growing Inequalities, international rivalries and redistribution

In this section we explicitly deal with the second "prerequisite" mentioned above for industrial and general growth that is the drastic reduction of inequality both between and within nations. The reason for this is clearly straightforward. In all cases, class, social and international upheavals will tear down the new and ecologically sustainable universal road for growth and with it, possibly, the future of humanity[31]. There is a well-established fact that after the 80s a worldwide trend of growing inequalities engulfed the international community, between as well as within nations. It is equally well known that until the great recession there was not even the slightest interest in tackling them. Afterwards, a rather rhetorical interest was expressed, accompanied practically by inaction. Thus inequalities grew faster and this tendency remained unchecked and deteriorated after the pandemic crisis, effectively endangering coherence at the national level and peace at the international one. It is very promising that president Biden declared his intentions to increase the tax burden for the rich in the U.S.A. as well as a wish to find imitators internationally. But the whole process lies ahead and faces paramount challenges, mainly because of the acquired power of the millionaire and billionaire class and the globalised structure of world production. In contrast with Roosevelt's New Deal and the first 30 years after World War II, it is impossible for a country, albeit the strongest one, to impose such a redistribution without the acquiescence of the rich which is at least questionable, or alternatively without international agreements

30 And certainly this global process of equal participation for invention and production of new green technologies and products is more important inside E.U.

31 A clear demonstration of such dangers is Trump's USA, Bolsonaro' s Brazil. Modi's India, Johnson's UK etc.

(e.g. for tax havens, for equalising somehow tax rates etc.), aiming not to mutually undermine these efforts.

Here we face the same uncertainties we encompassed before dealing with the climate change issues. Without agreements, that is without preserving the balance of power (economic, military or political primarily) between the major powers at least, there is no solution because every state will succumb to the temptation to free ride, that is to invite the capital to boost its investments, growth and relative international position, effectively undermining any important endeavour towards redistribution. But without redistribution world affairs will permanently deteriorate regressing between major social and international upheavals, usually leading to far right political positions which tend to aggravate the whole situation (e.g. the years after 2010, or the interwar period), and stagnation (economic but mainly social and cultural) as well as global subjection stemming from the imposition of international oligarchy's new world order (e.g. the years between 1990-2010, with the declarations of the new world order, which proved catastrophic for many people around the globe -e.g. in the Middle East and stagnating at best for the majority in the West).

4.2 The contrasting views of the previous and still dominant economic paradigm and the emerging one, and its growth and industrial implications

Besides the above mentioned causes, which mainly focus on political and civilisational issues, albeit of primary importance, in order to remain faithful to our subject, i.e. industry, we must show why inequality and its exacerbation has important repercussions for it. For that we have to go back in theory.[32] At least since A. Okun's (Okun, 1975) mid -70's influential thesis about *inequality* and *efficiency*'s mutually exclusive roads resulting in a trade-off between them (Boushey, 2019*)* a near unanimous consensus between mainstream economists and policy makers was established: we cannot have both simultaneously. If we want more from the one, the other subsides. The above view combined with the income and wealth 'trickle down' dogma prevailing after 1980, a dogma based in reality until the 70's, but not after, guided policy makers to focus on GDP growth, without concerns about distributional items. Furthermore, neoliberal advance reinstated neoclassical theories of income distribution according to one's marginal contribution to production, or more explicitly in the words of its pioneer Clark (Clark, 1908): "[W]hat a social class gets is, under natural law, what it contributes to the general output of industry". Additionally, supply side economics of the 80's and in particular the well-known Laffer's curve suggestions, further boosted not only indifference to inequality issues, but a positive role of regressive taxation on growth. Last but not least, beginning from an early 90's paper (Giavazzi & Pagano, 1990*)* and gaining international fame after the Great Recession (Alesina & Ardagna, 2009) the expansionary fiscal contraction (or austerity) hypothesis, the so called 'German view', albeit with strong Italian roots in Bocconi Milan's private University (Blyth,

32 This section rests heavily on Labrianidis (2021).

2013), gave a strong boost to decreased fiscal spending and/ or decreased tax for the rich, therefore heavily deteriorating inequality, especially in Europe, between and within nations. Overall, beginning from the 80's, a climate of indifference and/or positive views on the role of inequality on growth prevailed.

It was not until the 2010's that the above status quo was challenged in theory, although in praxis it remains dominant. The theoretical challenge emerged because gradually a great wave of (mainly) empirical scientific studies demonstrated that, in contrast with the orthodoxy mentioned above, *inequality, at least at the prevailing levels nowadays, hinders development in multiple ways.* There are many reasons for this: economic, social, political etc. Below we briefly mention, some of them which we consider vital and we admit that our list is only partial.[33]

Inequalities of income, wealth, inferior social (e.g. women, coloured minorities etc.) and educational status and opportunity, are major impediments to personal and economic/social achievement. Less educated, underpaid and discriminated labour, with minimal social provisions (e.g. preschool child care and elementary education) slow down growth significantly by reducing productive factor's supply, quantitatively and qualitatively. Furthermore, it is increasingly obvious that lagging individuals, firms and regions have been a major source of slower productivity growth and therefore GDP growth for the last 3-4 decades.

Another major growth obstacle in the last two decades especially, is the stagnating effect of savings increase and concentration in the hands of the few, with parallel debt bondage of the poorer people, regions and nations. The above combined resulted in unproductive financiation, lower popular consumption, lower system stability, increased volatility, bubbles and crises. A progressive redistribution will benefit economy, increasing consumption because of the higher marginal propensity to consume of the poorer classes and therefore increase demand overall and investments and stabilising them through lower levels of debt and savings in the hands of the few.

Lower tax revenues stemming from tax reductions and tax-evasion exhaust public finance and therefore public goods provision (infrastructure, education, incentives etc.) and development. Recent macroscopic studies e.g. one using data from 18 OECD countries, including the UK and the US, over the last five decades, show that major reforms reducing taxes on the rich lead to higher income inequality, but do not have any significant effect on economic growth or unemployment (Hope & Limberg, 2020*).*

However, we should not restrict our attention to the effects of inequality on strictly economic issues. A great number of problems such as poor physical or mental health, violence and crime, obesity, drugs, high imprisonment, low social mobility etc. (Wilkinson & Pickett*, 2009)* are also outcomes of inequality. Generally, societal wellbeing is strongly correlated with more equal societies (Helliwell *et al., 2019*).

33 We heavily base this section on Bushey (2019) and OECD (2019). There is a plethora of bibliographical notes, counted in the hundreds and obviously we cannot cite them here.

Thus reducing inequality on the one hand boosts growth and on the other has an important impact on both social and individual wellbeing. We have come full circle and we face again the opening question of this section (why inequality is an important obstacle for growth) hoping that we have answered it: we need the reduction of inequality for a new growth period and certainly we need a green growth, thus we need new industrial strategies,[34] which tackle these two preconditions for sustainable growth. If we do not secure their provision, we may speak of growth and industry's role in vein, because of its unsustainable character, socially and environmentally.

5. THE NECESSITY OF A NEW INTERNATIONAL CO-OPERATION ETHOS

Due to limited space as well as frequent references above, here we restrict our presentation clearly, but briefly, listing the dangers of international rivalry as well as the benefits of co-operation, mentioned above. We are particularly afraid of the now reemerging "cold war" with its potentialities of hot bursts, which could easily evolve, at the minimum, in new arms races absorbing public budgets, thus undermining their ecological aspects. We are also afraid of a hurried, without prior agreements international decoupling of the global economy which will exert strong downsizing pressure on world growth. We certainly think that the integration of the world's economy, i.e. globalisation, prevailing over the last 30-40, or even 50 years is unsustainable. Thus, ultimately a new economic and therefore world order must substitute the current one and we also believe that the new one must retreat somehow from the previous global context, effectively permitting space for more internal sufficiency/, for nations and regional alliances. This is inevitable because of the unevenness and unfairness of globalisation effectively revolving around the international and global value chains in their current form of costs/benefits distribution and because, for the moment, of a low real possibility of frank, cordial global co-operation at least for the basics.

Having said that, we hurry on to mention, that it is of paramount interest for humanity to orderly and only partially decouple, if we want to preserve peace, while increasing sustainability and growth. There is a great temptation to use climate issues to launch trade wars, e.g. with arbitrary carbon pricing on imports, allegedly for environmental reasons, but with a clear, although hidden, agenda of trade and

34 Sometimes the phrase "industrial strategy" is misleading, because it refers mainly to a former historic period, where its main purpose was to build strong competitive advantages through it, firstly around industry, especially manufacturing and certainly by means of a highly intervening state. We here use it in a much more expanded form, usually encompassing broader sectors such as the service sector and especially digitalisation and Artificial intelligence and ideally the whole economy. But even this broader use does not cover other societal aims, e.g. the greening of the economy, reduction of inequalities etc. a new view of what is a god job and generally wellbeing etc. And even more we do not perceive industrial policies in the old frame i.e. as state constructed and implemented in isolation, but in a broader sense where the private sector, the civil society and the international community are also engaged. Thus the term 'industrial policy 'is rather inappropriate but in absence of an internationally acceptable one, we insist on using the traditional terminology, despite its obvious inadequacy or even misleading nature.

general domination. The way to avoid such upsetting developments is through pre-agreed terms securing mutual and sustainable growth, with perhaps the only losers being the clear winners of the previous period, the billionaire/millionaire class of 1% or rather 0.1%. This is not an easy task because the West and the US especially must abandon its previous ambitions for global domination and adopt a new balance of power, somehow in line with the late Brzezinski (2016), Kissinger (2021) and the sitting president and member (respectively) of the Council of Foreign Relations, Haas & Kupchan (2021) and Sanders (2021), with important mutual mechanisms of co-operation and/or co-ordination in global issues as the world peace and climate mitigations and its prerequisite a win-win world development. In the course of events not only the USA must divest its global ambitions.

In other important aspects of international life e.g. the systematic trade surpluses of the "mercantilist" world powers (especially Germany and generally northern Western Europe, Japan, China and East Asian countries) must also gradually move towards balanced trade, or otherwise face trade wars etc. In this particular context Keynes' ideas presented in the Breton Woods Conference (1944) but refuted by the triumphing American delegation, for mutual responsibility of surplus and deficit countries to correct the imbalances, must be reintroduced. This time with no obvious triumphal power and with tremendous global dangers looming, there are promising possibilities for a new start.

6. WHY INDUSTRY? WHAT INDUSTRY?

6.1 Manufacturing and industry generally, must be at the epicenter of any new development perspective

After paying *particular attention to the above mentioned new prerequisites for development (greening, equalising and co-operating),* we explicitly turn our focus to industry and particularly to manufacturing. To fulfill our aims, it is of paramount importance to *have manufacturing at the epicenter*. First, *in order to reintegrate manufacturing production and its necessary protection (especially for infant and innovative firms) into our toolkits since manufacturing is a vital engine of development*. It is time to reintegrate Kaldor's growth laws (Kaldor, 1967*)* into our economic thinking, where manufacturing is an important engine. Oversimplifying we can seek the underlying reasons in path dependency, where *innovation and technology/product/process adaptation is not only the outcome of formal R&D procedures but, equally important, is the outcome of the 'learning in' process that takes place within production*. Thus, when manufacturing is limited, one can only obtain inferior products, processes and organisational innovations and consequently lower productivity and output growth. Putting it differently and more precisely, economic growth through innovation and technology adaptation is not only the outcome of formal R&D procedures, happening in public or entrepreneurial specific laboratories but, equally important, with 'learning in' ones (Chang & Andreoni 2020), which by definition are the outcomes of real production. As a rule, you cannot easily have the one (R&D, patents etc.) without the other (production and learning in procedures). Therefore when real manufacturing is absent or restricted, naturally we

obtain an inferior wave of product, process and organisational innovations, as well as technological adaptations and consequently a lower productivity and output growth.

For all the above reasons, we depend critically on manufacturing and therefore any postindustrial strategies which have been advocated widely over the past 30 or so years are baseless. And this is not the only reason: those postindustrial strategies, proved inextricably related with a view of the world which we name here as meta-colonial, a view prevailing for the last 40-50 years. This is a world where the West preserves its intellectual superiority while the Rest is limited to a rather 'robotic' role, unintelligently manufacturing the West's ideas and desires. Life proved this inherently "superiority complex" expectations, the outcome of the West' imposing its will on the Rest, albeit in an 'enlightened' mode, a fairy tale. Fortunately, the Rest, firstly Japan, then the Asian tigers and lastly and decisively China (and perhaps the remaining BRICS) were not satisfied with such a role consequently obliging the West to reintroduce industry and manufacturing to its toolkit if nothing else but to sustain its international position as far as it could.[35]

All in all, the final outcome may be a rather more equal future for humanity, which is good for almost all (except the 1%), but only if we manage the transition period peacefully. And that is not all. With the 'Rest' rediscovering its lost strength and pride as well as from the pandemic lessons (mask shortages, low productive capabilities for vaccines etc.), it is obvious that some more self-sufficiency for the basics (food, energy, drags etc.) and a minimum of manufacturing capability in the event of emergencies is inevitable, with possible outcomes such as the shortening of some international value chains.

6.2 Industry 4.0 and the new technological revolution

To save space we do not need to analyse in depth the well-known new industrial priorities for every country striving to sustain its position in the emerging "brave new world'. Thus, for Europe and whoever endeavours to sustain a relative position in the world, it is necessary to engage with the new technologies of digitalisation (5G, 6G and counting), internet of things, robotics, artificial intelligence, quantum computers, new materials, nanotechnology and biotechnology etc., which promise a new enlightened future for humanity, finally, once and for all discharged from Adam's curse : "i*n the sweat of thy face shalt thou eat bread*".

Now, partially blurring the above triumphalist picture and before we focus on the new industrial policies enabling the above developments, we must mention some major dangers lying ahead in the not so distant future[36] and/or already present, clearly/closely related with the upcoming technologies: *first the clear and paramount*

35 And certainly, as we mentioned before, in order to sustain a strong path towards innovations inventions etc. which was jeopardised by the strong decoupling with actual manufacturing.

36 We omit where, due to space limitations references on futuristic developments and/or legitimate dangers about the future of humanity and meta-humanity: AI including artificial neural networks, machine and deep learning, especially in its unsupervised form etc., not because they do not have a sound basis, not at all, but in order not to stray from our main subject.

danger of falling behind (nations and supranational entities, regions, classes, groups and individuals), leading to their potentially irreversible future subjugation. This is an evident danger for the E.U. and an obvious, almost certain one for the E.U.'s southern and eastern periphery, with which we must engage later. *Secondly, we must tackle the very real dangers from the ever growing oligopolistic tendencies stemming mainly from the technological multinationals, especially those around the Internet digital platforms, where the unchecked network effects clearly support oligopolies or even monopolies, with obvious dangers for national coherence, peace etc.*

We need to take immediate measures to crack these new mighty structures owned by the Robber Barons of our age, who, incidentally are even more powerful and perhaps more dangerous than their late 19th century precedents, not to mention the powerful German cartels and their role in Hitler's ascent, or Japan's zaibatsus in its semi-fascist and imperialistic interwar regime[37]. Their monopoly power and wealth deteriorates equality internationally, nationally and regionally and weakens the bargaining power of labour unions and workers generally, as well as middle class status and strength[38]. Potentially, they might endanger civilization's evolution and particularly its direction, either slowing the rate of innovation, through acquiring potential competitors (atypical strategy) or through competing in a marketplace they own, or by choosing innovations which serve their special interests[39].

Moreover, the dominant digital platforms in their current oligopolistic structure owned by the 1% and mainly regulated informally but solidly by the USA's deep state, exert powerful influence on our everyday life, gathering personal information which allows them not only to predict our behaviour but also to influence and modify it for economic as well as political reasons. This has had disastrous consequences, lying beyond oligarchs' economic domination, for democracy and freedom since we end up living in what Zuboff (2019) names a "surveillance capitalism".

Additionally, digital and mainly international platforms acting at the international level as co-ordinators between customs and employees, offering new ways of dividing the work, as well as workers representations (e.g. labour unions)· or we might say for the moment, 'not representations' because the actual status of

37 It is a big temptation to imagine USA between the end of 19th century and 1940's if the partially (at least) successful endeavor to dismantle or/and heavily regulate trusts, in the progressive and new deal era failed· perhaps one more interwar totalitarian version or a hybrid partially totalitarian, partially autocratic with democratic remnants?

38 There are some measures in E.U. and in other countries around the world to regulate digital oligopolies (https://www.channele2e.com/business/compliance/big-tech-antitrust-regulatory-breakup-updates/ KAI https://www.reuters.com/article/us-eu-antitrust-tech-idUSKBN27E1JU). It is not our purpose to evaluate their outcomes although we must acknowledge that we don't consider them very successfully. And the same applies for labor provided through digital platforms (https://ec.europa.eu/commission/presscorner/detail/en/IP_21_686)

39 Innovations with low social value and added value are promoted while the technological possibilities that serve fundamental social needs (individual and collective) are underused.

workers in digital platforms is debated, regressing between employees and self - employed. Certainly, platforms bring jobs to poor nations, thus workers there have a geographically expanded pool of jobs to bid for, which has many especially short term advantages. However, by connecting rich and poor into a global labour market it leads workers to desperately try to underbid each other to attract short-term contracts, *creating a race to the bottom for wages and working conditions at a global scale* in a medium and long term perspective. The technical infrastructure of the platforms amplifies an information asymmetry between buyers and sellers of labour that favours buyers.

Thus, for this new digital industry to thrive and share its benefits widely, we must heavily regulate and even nationalise parts of the enterprises doing business there, due to their public good characteristics. Here we face new important dilemmas which need to be debated: which are the proper forms to regulate these international digital platforms? Beginning with the softer regulatory forms and moving on upwardly, we can mention: suitably taxing them (e.g. Australia), while recognising for the moment their almost tax –free situation which contributed heavily to their gigantism; regulating them lightly[40] (here we must point out that auto-regulation, in the form of e.g. Greek Hoaxes for Facebook in our country is almost nothing towards this development); or in a heavier manner usually connected with more authoritative regimes (e.g. Turkey, Russia, China) or even nationalising them (a rather rare phenomenon for the moment, especially because of the international dimensions of platforms, although there is an obvious connection with their respective mother-deep states). **Perhaps it is time for the international community to search for new international forms of regulation, especially for some major digital platforms, exactly because of their international and somewhat global public good character.**

40 see e.g. for E.U. "EU leaders agreed in principle to introduce a digital levy, with details to be put forward in mid-2021."
https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiqt8yn_YfxAhXQO-wKHTKqDhwQFjAEegQIBhAE&url=https%3A%2F%2Fwww.imf.org%2Fexternal%2Fpubs%2Fft%2Ffandd%2F2021%2F03%2Ftaxing-big-tech-and-the-future-of-digital-services-tax-christie.htm&usg=AOvVaw21zuxBWk6kAHduGSdXSlMj

7. EUROPE'S INDUSTRIAL FUTURE WITH PARTICULAR FOCUS ON ITS PERIPHERY

7.1 E.U. structural disadvantages and the new industrial policies

E.U. authorities as well as the governments of the major member –states have finally and belatedly recognised that Europe is falling behind in the international race to catch up with the ongoing new technological revolution.[41] Here is not the place to analytically delve into why this has happened: briefly we can mention a number of hopefully significant reasons : a) an overconfidence in its structure inherited mainly from the Maastricht and Lisbon treaties and the clear hegemony of Germany's ordoliberalism as well as UK's neoliberalism, which were not inclined to provide a clear and powerful industrial strategy for themselves and even more for the whole E.U. b) the catastrophic mishandling of the euro area crisis (2009-2015) which resulted (among other things) in an extravagant and needless waste of mutual trust and of leadership's recourses to endless meetings, c) problems lying within the whole E.U. and Euro projects with their permanently interim structure which hesitantly share leadership between E.U. headquarters (the Commission, Council and the parliament), the major states (Germany, France, U.K. and Italy), and the all-powerful and independent Central Bank, thus effectively undermining a clear responsibility for the E.U.'s actual status.

Unfortunately, quite a few of the above dysfunctions remain and cloud the E.U.'s future. Nevertheless, as the Franco-German and E.U. declarations mentioned above prove, there is now a new spirit which intends to provide much needed industrial leadership for a green, digital and fair future. We must remain hesitant for the final outcome and simultaneously we must push towards these new goals. But some observations and reservations are clear already.

7.2 Eastern and southern periphery and their importance for the E.U.'s future

We believe that beyond its new industrial strategies revolving mainly around green and 'industry 4.0' developments, it is time for the E.U., to revisit its regional, coherence and competition policies. To begin with, it must admit the partial (at least) failure to secure a coherent future for its member states (South + Balkans vs North). In short, the actual picture of numerous member-states is highly problematic.

41 https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjT2v7-47DwAhUEQEEAHRaMA2gQFjAAegQIBBAD&url=https%3A%2F%2Fwww.bmwi.de%2FRedaktion%2FDE%2FDownloads%2FF%2Ffranco-german-manifesto-for-a-european-industrial-policy.pdf%253F__blob%253DpublicationFile%2526v%253D2&usg=AOvVaw2-pMpPnYv8Gi8IKPmYgqkA and https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwi9tqHT5bDwAhVTVBUIHcACAj8QFjACegQIAhAD&url=https%3A%2F%2Fec.europa.eu%2Fgrowth%2Findustry%2Fpolicy_en&usg=AOvVaw2ZoL7hH0m6zL81zJuhIPtm

For Italy, Spain, Portugal and especially Greece, the last 10 or so years regressed decisively catching –up endeavours of a generation. For many eastern states, of which Bulgaria looms prominently but not exclusively, a stagnant economy and even worse a great demographic depletion is not an optimistic sign for their future. Tricks like renaming brain drain to brain circulation, currently in use, will not help. Even France one of the two leading European powers, barely retains its status inside the E.U. structure and globally (Buiques & Cohen, 2020).

Equally, although perhaps prematurely, we must recognise that besides the older failures, the newer and more promising European policies for the last 10 years, e.g. Smart Specialisation Strategy (S3) did not "make the difference". A part of the explanation hides in the kernel of S3: "*Smart specialisation is a place-based approach*, meaning that it builds on the assets and resources *available* to regions and Member States and on their specific socio-economic challenges in order to identify unique opportunities for development and growth".[42] That is, this strategy is heavily based on current competitive advantages, albeit for upgrading them in innovative, 'smart' ways.

But that is not enough. There is a clear possibility that the European periphery needs to *move beyond its current static comparative advantages and perhaps more boldly to "leapfrog' in order to catch up with the core.* Although there is no scientific consensus on this topic, there is growing evidence (Lin & Chang, 2009; OECD 2019) that we must move beyond current comparative advantages in order to grow and especially, as it is necessary for poorer nations/regions, to 'leapfrog' (Cherif & Hasanow, 2019) so as to catch up with developed ones, something fundamental for a more equal future. To be sure this leapfrogging must be neither too small to produce noticed outcomes, nor too big to fail (and this can only be achieved by close co-operation of planning authorities with the private sector, continuously setting a higher, riskier but attainable target -OECD, 2019).

Interestingly, these new dynamic comparative advantages are mainly not the outcome of concentration on specific products or sectors (perhaps in contrast with S3 strategy), but rather in capability domains (Chang & Andreoni, 2020), i.e. domains of techniques, productive knowledge and production technologies/equipment that show a high degree of similarity and complementarity. Naturally, these new acquired capabilities could apply by definition not only to a certain product but to categories of them. And this is perhaps the explanation for the stylised facts (Hausmann et al, 2007) that countries which manage to grow, tend to multiply their product bases, something which fits uncomfortably with the theory of static comparative advantage, but fits in easily with the acquisition of capability domains and therefore proves that, by its nature, production is a learning process. And a learning process demands protection: as Chang (2003) says, you don't engage a 6-year-old child in a competitive race with an adult PhD holder. Thus protection must

42 https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiXh8WY_LDwAhUH2BQKHaUuD4IQFjABegQIBRAD&url=https%3A%2F%2Fs3platform.jrc.ec.europa.eu%2Fwhat-is-smart-specialisation-&usg=AOvVaw1SHF-5BN7NygAPTXD3jV96

be reintegrated to some degree for catch-up purposes albeit with an eye on avoiding usual past mistakes (i.e. permanently provided protection, something by definition impossible and/or inefficient, captured by rent seekers etc.), especially considering the limited outcomes of current policies aiming towards cohesion.

Concluding, as Cherif and Hasanov (2019) show, for a middle income country to escape the 'middle income trap', it is critical not only to increase investment and faster adoption of already existing technologies, which are important at early stages of development, but also to innovate (Aghion & Howitt, 1992). In other words for a country to create sustainable growth, it constantly needs to produce new goods and adapt and create new technologies/capability domains. Extending this logic for countries and regions not formally numbered among the middle income ones, but equally not at a far distance and not in good economic condition, **we must invent new much more ambitious strategies for the European periphery**. Here the Commission's support would be critical, because of attested inadequacy of the peripheral states and it must be multidimensional (financial, monitoring, providing strategic guidance etc.). Of crucial importance is the need to upgrade the innovative capacity of peripheral states, but not only in the way S3 does, rather within the new technological frontiers. That means (amongst others) the peripheral states and regions must increasingly participate in the new European alliances, IPSEIs (Important Projects of Common European Interest) e.g. batteries for energy storage, clean hydrogen already established or in process of being established and mainly Franco-German projects as e.g. a new war aeroplane, Airbus etc. Otherwise their future is undermined, Europe's coherence would be challenged and we dare to insist that even the E.U.'s relative position in world affairs would be jeopardised.

Let us give brief explanations:

- Firstly we recall Brexit, Grexit, Italexit etc. Although for the moment this danger seems to be in retreat, every new crisis will by necessity reintroduce it if the current dichotomy between rich and poor European nations remains or even increases, **a not so remote possibility if the periphery does not participate in the new technological and green revolution**[43].
- Secondly, we also recall that the E.U. is constantly underperforming in crucial aspects of the new industrial era that is in R&D spending, patents creation, Startups etc., in comparison with the US, Japan, S. Korea, China etc. To explain this, we must consider that half or even more of the E.U.'s population inhabits countries which clearly and substantially underperform in all the above mentioned domains. The E.U. currently is devoting around 2% of its GDP for R&D. In comparison China already surpasses this and is speeding ahead, USA, Switzerland, S. Korea and Japan outperform us by a great margin. Consequently, we must move on, but how? The European core already allots comparable and even higher amounts for R&D than its main competitors. But the periphery (actually more than half of the European

43 Not to mention pandemic's outcomes, which obviously tend to aggravate the situation of E.U. poorer member states, especially because of the productive specialisation

population) lags behind dramatically. If Europe's periphery fails to adjust its R&D expenditures (as well as other innovation indices), there will be no acceptable future for the whole of Europe, especially regarding the core's great repulsion, or we could say terror of redistribution and a bigger E.U. budget. We believe that unfortunately this is not a widely shared opinion within the E.U. leadership and in the major countries.

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