

Scenari industriali - Centro Studi Confindustria

# MANUFACTURING IN THE PANDEMIC AGE. EUROPE AND ITALY AT CROSSROADS

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# INTRODUCTION



*Just like climate change,  
COVID-19 was a crisis waiting to happen  
(Rodrik 2020)*

## The pandemic and manufacturing

Worldwide manufacturing is still in check of the pandemic. The burst of uncertainty in the life of families and businesses that the spread of covid-19 on a global scale has determined, even beyond the actual intensity of the spreading of the disease at the local level<sup>1</sup>, immediately resulted in a postponement of the spending decisions – consumption goods and investment - which involved a partial simultaneous blocking of both supply and demand. The speed and the extent of the reaction of economic systems - thanks to substantial programs of state intervention in the economy aimed at countering the immediate effects of the lockdowns that have been gradually activated - has allowed the recovery already in the months immediately following the shock, even if with a strong heterogeneity among the different production sectors. The incompleteness of the recovery (also due to the rarefaction of the ranks of companies, many of which in the meantime have been brought to their knees by liquidity crises), highlights the true heart of the problem, which consists in the impossibility of defining the end of the emergency.

The nature of uncertainty, from this point of view, is completely represented in the persistent character of the shock, which in the first place has not yet completed its health aspects, but which in the second instance contradicts the idea that economic systems are mechanisms that automatically return to equilibrium after being disrupted by exogenous shocks. We are in a shock that is not over and this will continue to affect the behaviour of the operators along a time horizon whose extent is still indeterminate.

From this point of view, the usual metaphor of the tunnel - albeit abused - fully captures the meaning of navigation in the dark (without references), and draws attention to the existence of a path-dependence that may imply a systematic deviation of the development path of manufacturing systems from the drift that has accompanied them so far. To what extent, and in which direction?

The whirlwind sequence of more or less scientific contributions dedicated to the problem, which is invading communication at every level, is focused on a key question: in addition to its harmful consequences on many service activities, which appear immediately evident, there are direct and specific effects - beyond the general ones implied by the uncertainty - that the very nature of the pandemic exerts in particular on manufacturing activities?

The answer - as it will be better explained later in this report - is that these effects exist, but they are relatively limited and, most of all, highly selective at the sectoral level<sup>2</sup>. If the effects of the lockdown still appear minimal on the food-processing chain (in the first phase it was even put under pressure by an excess of demand), the postponement of spending is more marked on the side of durable goods (from clothing to furnishing and private means of transportation) and the side of goods of investment. Different effects concern more or less specific segments of manufacturing on the field of distribution and come from the explosion of e-commerce in the more intense phase of the lockdown, which will force producers of many consumer goods to develop new sales strategies.

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<sup>1</sup> In a UNIDO document (2020, p. 1) it was already underlined that in July “[m]any countries are experiencing a recession, even though COVID-19 has not had a serious effect on them in terms of health”.

<sup>2</sup> In addition to the analysis contained in this report, see Viesti (2020).

A potentially greater impact inevitably concerns the pharmaceutical and health supply chain, which assumes a key role starting from the need to ensure the availability - always and in any case - of the necessary measures to deal with the disease, both in the short term - or during the emergency in progress - and in the perspective that other similar events may take place in the near future, coherently with the gradual increase, over time, of widespread epidemics<sup>3</sup>. It is a need that now appears new only because this problem, which has been clear to all for a long time, has been utterly ignored<sup>4</sup>. Within this scenario, the emergency is now making the reorganization of health systems - and of the supply chains that supply these systems (services and production) - an urgent need. In too many cases health systems have shown not to be up to the problems that our interdependent world can even suddenly trigger. This reorganization requires a rethinking of the logic of supply chains which, until now, have been modelled exclusively based on the rules of global trade.

From this point of view, the “strategic” importance of a specific supply chain, therefore, allows us to draw a general lesson from this experience: commercial dependence from abroad, in a context susceptible to sudden blocks of production in one country or another, makes a production organization, that is fragmented at an international level, potentially fragile. It is important to underline that in this case, the problem is not the fragmentation of production in itself, but its displacement on a trans-national scale, calling into question the possible re-import (re-shoring) of production phases already entrusted to foreign suppliers or their redeployment on a continental scale. This change of perspective involves a remarkable change in the terms of the trade-off that has always accompanied the choice between directly producing an asset (whether intermediate or final) and purchasing it. In particular, it involves an increase in the cost that a company is willing to bear to guarantee its availability.

At a company level, it is a question of redefining the perimeter of internalized activities and addressing the strategic problem of the “redundancy” of resources needed to avoid the risk of supply blocks (eliminating cases of single-source dependence as far as possible). If considered at the level of country-systems or continental areas (primarily in the European case), the problem translates into a shortening of the supply networks which passes through the reconstitution of a national (or continental) offer in defined areas and the launching of a real re-industrialization process<sup>5</sup>. This is an extremely ambitious goal (supply chains are not “moved” from one country to another by moving factories on a ship, but they are redeployed through gradual processes of differential growth), which cannot be imagined through the simple action of market forces without a market-friendly industrial policy strategy. If this is the goal to be achieved, it is necessary to create the conditions to quickly build links in the supply chain, which by their nature require care to develop, in order to re-join the technological trajectories that have been abandoned for a long time. It is necessary to activate processes capable of accelerating the formation of new productive fabrics that can replace those that have been “exported” elsewhere. In short, there is a need for a country project that designs a new path for industrial development, as part of a European strategy.

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<sup>3</sup> On this specific point, see the documentation in Arrighetti and Bottani (2020). On the wider problem of the reorganization of supply chains in the health sector - which includes the production of advanced equipment that is susceptible to major technological improvements, also thanks to the growing availability of digital technologies - see eg. Bragazzi (2020), Larrañeta et al. (2020), Ting et al. (2020).

<sup>4</sup> On this point it is worth remembering how a reference publication such as Foreign Affairs had dedicated, no later than 2005, a monographic publication to “The next pandemic”, whose contributions evoked since the title (“Getting prepared” and more) the obvious looming problem.

<sup>5</sup> Whether it takes place through processes of vertical re-integration of production or the simple redeployment of at least part of the supply chains at home, the phenomenon is nevertheless reflected in an extension of the borders of national manufacturing. A less radical version of this type of change is the one that corresponds to the re-articulation of the supply chains on geographical bases that are not necessarily national, but in any case, more restricted (regionalization); on this point see as recently argued in UNCTAD (2020).

In this sense, as is argued in the following pages, it is necessary to have a discontinuity of view that incorporates the awareness of the great changes in the context of which the pandemic constitutes only a single act: creating the transition towards a new historical phase after the end of the one that has characterized the development of world manufacturing for at least thirty years.

## How globalization is changing

As various studies carried out in recent years within the Confindustria Research Department have shown, the development model that guided the so-called "Golden Age of globalization" had already been showing deep leaks for largely endogenous reasons, so much so that this preceded its decline from the onset of the financial crisis of 2008<sup>6</sup>. The elasticity of world trade to GDP had already structurally fallen over the first ten years of the new century to values around 1, that is to levels much lower than those of the years of the most intense globalization (always higher than 2 and in some years of the 1990s higher than 3), revealing a structurally more limited role of international trade<sup>7</sup>.

To the extent that international trade had represented the fundamental lever through which the economies of the North of the world had guaranteed the coverage of their growing consumption demand (via imports from the new industrial economies of the South, thanks to the establishment of global supply chains), the blocking of world trade consequent to the series of lockdowns immediately highlighted the extent of the structural dependence of the former on the latter. The breakthrough of the pandemic into the economic sphere marked, even symbolically, the definitive decline of a historical phase during which the production problem in industrialized countries had been transformed into the problem of making available the goods requested from time to time simply buying them somewhere in the world.

In this context, the major emerging economies long ago had already started a decisive reorientation of their demand from external to internal, leaving a strictly export-led logic and accompanying this process with a parallel increase in national supply, guided by the need of not be trapped in an overly strict external constraint. This means a world that had already started to be commercially more closed, regardless of the actual exogenous increase in the degree of protectionism in trade policies and regardless of the level of confrontation of all countries with the United States can become in the future<sup>8</sup>. For every economic system, the result is a structural downsizing of the most dynamic demand component of the last twenty years.

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<sup>6</sup> The Globalisation Age was founded on unrepeatable historical circumstances, which gradually became extinct for endogenous reasons, causing a significant change in the context conditions. The change, whose start precedes the start of the 2007 crisis itself, is linked to: a) the exhaustion of the off shoring process which had launched into international markets an impressive quantity of goods (intermediate and final) that were previously produced within industrial countries; b) to the physiological slowdown of the dizzying Chinese growth, as already happened at the time - again in Asia - for Japan and Korea); c) to the emergence of a new general orientation towards bilateral exchanges (or even attempts to bring back products previously transferred abroad (backshoring); d) to the return of the growth rate of foreign direct investments (IDE) on a more contained path after the explosion of the offshoring years (which implies a lower growth of the intra-firm component of international trade); e) to the need for a reduction of the excessive trade deficits that have been accumulated to support consumption in advanced countries since before the crisis, which were not sustainable in the long term. See in particular on these points Traù (2016), Centro Studi Confindustria (2017 and 2019), Pensa Romano and Traù (2020), Manzocchi Romano and Traù (2020).

<sup>7</sup> A recent publication (IRC Trade Task Force, 2016) underlines the fact that elasticity has returned in the most recent phase to the average levels of the early 1980s.

<sup>8</sup> To be considered, however, also in relation to the change of leadership of the American Administration.

This transition also coincides, in these same countries, with the achievement of a relatively high level of development, such to imply – due to structural change – the emergence of a substantial tertiary sector, which, in turn, translates into a structural slowdown in their overall growth rate. In this case, the effect on the growth rate is direct, and comes from the supply side: the relative impact of the sector that allows the accumulation of dynamic increasing returns is decreasing, and with it the driving force that the sustained expansion of the manufacturing output guarantees to the increase in productivity of the entire economic system (in short: the growth of productivity in manufacturing is partly a significant function of the output; the growth of productivity for the entire economy is largely a function of productivity growth in manufacturing).

A third element of change, still in emerging economies, is a less stringent role of the Developmental State, which in the launching phases is mostly present to ensure the orientation of the system's resources in the direction of the accumulation process, and which gradually gives way to the market when the investment demand begins to leave more room for that of consumption. This benefits an overall transition from investment to consumption, and therefore implicitly a reduction in the multiplicative effects of spending.

All these effects, resulting in slower global growth, come not only from endogenous factors, but also from deliberate economic policy choices, and therefore come to endure, rooted into a ground of secular stagnation that the long boom in international trade and its positive effects on world growth have kept hidden for a long time, but which in fact constitutes an underlying feature of the global economic context<sup>9</sup>.

Before the outbreak of the pandemic, in the so-called "advanced" world, and especially in Europe, the problem of growth had to do instead with the lowering of potential output implied by the combination of an ineffective monetary policy (liquidity trap) and a programmatically restrictive fiscal policy<sup>10</sup>. In Europe, this has long meant for many countries, following the path of the German model, the almost exclusive tendency to seek effective demand beyond national borders. Both the "old" industrial countries and the "new" economies of the East have set their growth strategies on a substantially individual basis: since none of them have a large internal demand, the strategy was to look for demand elsewhere<sup>11</sup>.

With the outbreak of the pandemic, the need to support incomes, even before production, has radically changed the order of priorities, vertically increasing the "demand for regulation" and pushing national governments - and even the European Union – towards policies of intervention, without, however, having an adequate and complete reflection on medium and long-term industrial strategies, causing the continuing lack of vision of economic policy and its wandering according to the pressures of the moment<sup>12</sup>.

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<sup>9</sup> For everyone, cf. Teulings and Baldwin (2014).

<sup>10</sup> The stagnation of potential in the European area is also linked – unlike what happens for example in the United States - to the effects of the demographic decline, which acts as a constraint on both the demand side (consumption) and the supply side (availability of manpower). This is where the failure to manage migration flows is felt, starting with the identification of the job profiles that will be needed, and the construction of integration paths that should be embodied in a medium-term economic policy.

<sup>11</sup> To the extent that the intra-area exports represent two-thirds of the overall exports of European countries, the policies of containment of domestic demand have at the same time resulted in policies of containment of European domestic demand (i.e. of an important share of the same foreign demand of individual countries).

<sup>12</sup> The intensity of the requested state intervention is always in function of the size of the shock: the Great Depression of the 1930s called into question the public intervention in the field of economics; the Second World War led to the creation of rules to control the international financial system (Bretton Woods); the 9/11 shock resulted in massive investments in national defence systems.



For the same reasons, it is conceivable that the degree of the inaction of the new orientation could be modest and that once the emergency is over - beyond the measure and the political significance of the creation of an important tool like the Next Generation EU - the logic of economic politics can again be called upon to change, without first defining a path to follow consistently over time.

In this context, therefore, there is the need to (re) build an offer at a European level that could assure a degree of autonomy in areas that are as strategic as they are abandoned (see medical devices whose lack has characterized and, in fact, bound all the first phase of pandemic management in many countries) and at the same time to restore domestic demand that has largely disappeared. It is necessary to recover a productive orientation of "advanced" economies. Obviously, the absolute dimensions of economic systems and the policies that they are autonomously capable of formulating are very important in this perspective. This is the ground where the European institutions play their role since at the same time they are called to act on a continental scale and to design a new horizon of economic policy.

## A broader vision

Long before the lockdown began to show its effects, and outside the production field, the emergence of a series of underlying problems that could be described as 'landmarks' was combined to the time of globalization: *i)* the governance of environmental sustainability, made even more critical precisely by the transfer of large shares of the transformation activity in underdeveloped economies (characterized by relatively more polluting technologies); *ii)* the block of social mobility within the economic systems of developed countries which the process of globalization has fuelled, and which the action of economic policy has often neglected, impoverishing investments in social capital (schools, universities, health, infrastructures) to the advantage of a short-term redistribution, with the consequence of undermining the very foundations of trust in the choices made within the systems of representative democracy; *iii)* the huge dimensions assumed by the employment problem in the developed world, resulting from a long series of "labour savings" allowed in previous decades by often modest technological innovations (especially in the services sector) and the crowding out effect due to competition from emerging economies. It is a problem that the looming of further massive transformations in the organization of production processes - announced by many as a global phenomenon - is ultimately contributing to making it increasingly threatening.

Therefore, we are in a context that is made up of urgencies (the immediate management of the effects of the various lockdowns, characterised by different timing and intensity) and of structural imbalances that have accumulated over the years, which are now asking to be eventually managed. Even if such complex issues cannot be analysed here, it is true that their very existence requires a vision that does not lose sight of their short-term implications, precisely as regards the definition of the strategies needed to identify one "high path" out of the crisis. It is not desirable to get out of the current crisis - of which the pandemic is only the end - worrying only about going back in a hurry to the "world of yesterday".

## Italian manufacturing, today

In this context, Italian manufacturing is experiencing a reduction in the number of companies (over the last twenty years over 240 thousand companies have left the market, compared to just over 94 thousand new companies

which entered the market<sup>13</sup>) and an increase of firm heterogeneity (from the point of view of the conditions for competing). The phenomenon is the effect of two subsequent shocks: globalization (that manifested its effects over a very long period of time) and the 2008 financial crisis. The pandemic, therefore, represents an additional third shock that added its effects to those already in place.

Each of these phenomena acts differently from the other, but still raising the bar each time for operators and each time causing an increase in outputs. This represents a problem because it reduces the impact of manufacturing output on GDP, limiting the sector that leads to productivity growth at the aggregate level. This trend is all the more relevant, especially since the manufacturing already tends to relatively downsize on its own, even without a shock, due to the change that - for reasons that act on both the demand and supply side - go along with the development of any economic system.

The downsizing is also expressed in a structural weakening of extended areas of the south of the country, that has involved the emerging of a new cleavage between them and the central-northern ones (with all that that implies in terms of destruction of the social cohesion and the costs of managing its consequences). The "re-industrialization" in this case would mean bringing new industrial subjects within territories that have become less and less attractive - and often also lacking adequate local demand. The logic should be that of promoting greenfield investments through conditional policies, aiming to build a setting-up path focused on the activation of structured links upstream and downstream<sup>14</sup>. Basically, it is necessary to do the opposite of what was done at the time of the so-called "Cattedrali nel deserto", i.e. vertically integrated organisms, self-contained and self-referential by their nature and unable to activate a form of endogenous development - which in fact has never been substantially realized.

The very efficiency of supply chain links is one of the main features of Italian manufacturing but it is a phenomenon whose origin was essentially spontaneous and that was realized outside of any clear view of industrial policy. This led a significant part of the national offer to find its way "by itself", simply by exploiting the increasing dynamic returns coming from the extension of the division of labour on the market, and therefore remaining close to a specialization defined by skills that were necessarily located in defined sectoral areas. This happened more or less in the same years in which in other areas of the world (especially in the Asian world, but to some extent also in the United States<sup>15</sup>) the search for increasing returns in order to build dynamic comparative advantages was instead entrusted to the action of deliberate public policies aimed at a systematic expansion of the supply matrix.

But the effects of the shocks do not concern only the downsizing of manufacturing (meaning the part of companies leaving the market) but also the companies still in the market, because these effects simultaneously increase the gap between the leading companies and the followers which may not be able to keep pace with the evolution required by the former, therefore becoming candidates to leave the market in the medium term<sup>16</sup>.

In both cases (companies leaving the market and the increase of the distance between high performers and followers) the only efficient tool to increase the security of the system is through an increase of the ability to compete of exist-

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<sup>13</sup> Data refer to the population of companies that have been surveyed by the chamber archives (Infocamere) and exclude individual companies.

<sup>14</sup> No more and no less than the backward and forward linkages described by Hirschman (1958).

<sup>15</sup> On the characteristics of the highly disguised American Developmental State, cf. in particular Wade (2014).

<sup>16</sup> This is what happens every time a supplier is unable to "follow" the downstream company that is pursuing a more sustained development path: in a de-verticalized world (in which value chains are fragmented), upgrading may involve exits from the market.

ing companies, that is their absorptive capacity. In other words, investing in all those companies that are not high performers and doing it in the places and in the factories where the companies are already located, activating - much more than before - targeted training policies in strategic areas that should be identified starting from the real needs of companies, in order to increase the company's ability to face continuous change.

Investment in human resources is complementary to investments in physical capital, in particular in the case of investments in digital technologies, which require both specialized technical skills and managerial skills to manage the greater complexity of processes and create new growth opportunities<sup>17</sup>. Without putting the maximum possible number of companies in a position to benefit from the best practice technologies, favouring their introduction means to widen the gap between companies already capable of acquiring these technologies on their own and those who can not. But the education issue goes beyond the operational dimension itself: in a context dominated by the insurgency of increasingly less predictable events (non-insurable risk), the occurrence of events that cannot be foreseen calls for a strong recovery of the human factor in the evaluation of events that, by their nature, tend to appear as a series of outliers - making the use of strictly quantitative forecasting tools structurally ineffective.

## A great opportunity

The EU Next Generation Plan represents an unprecedented opportunity to implement, thanks to European financial support, a massive program of public and private investments to boost the competitiveness of the Italian production system in the recovery phase of the post-pandemic economy and to strengthen the foundations of its sustainability in the years to come, enabling the country to intercept the development trajectories around which the new European and global value chains are being shaped. In the distribution scheme of funds that was approved last July by the European Council, Italy will be granted about 200 billion euros of the 750 billion euros provided by the Plan. Two-thirds of this money will be granted through loans and the others through grants, largely to be spent within the next two years.

But the risk that Italy will not be able to fully exploit this opportunity is very high, given the chronic problems concerning the Public Administrations (central and regional) in launching and completing the projects funded by EU funds<sup>18</sup>. To minimize this risk, it would be desirable that the general goals set out in the Next Generation EU - expressed at the Italian level in the National Plan for Recovery and Resilience - were pursued by identifying a few, large supply chain projects, integrated on strategic junctions for the development of the country, coherent with other national and community development policies already defined or still being defined, and a with unitary governance and policy instrumentation at a national level. The model could be that of the Important Projects of Common European Interest (IPCEI), oriented towards the identification of chains of strategic value in the European context, which, starting from a specific policy objective, could identify all the technological junctions needed for their achievement and to build around them industrial partnerships in a logic of public-private co-financing.

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<sup>17</sup> From this point of view, the incentives dedicated to 4.0 - absolutely necessary as such - may imply, if not accompanied, to further increase a degree of heterogeneity of the system that is already very high. The "accompaniment" must be an integral part of a strategy for business development.

<sup>18</sup> Up to June 30, 2020, 62.6% of the planned European resources from the 2014-2020 programming of the Cohesion Policy were still to be used.

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# EXECUTIVE SUMMARY



## Chapter 1 - Manufacturing in the world

World manufacturing was hit by the shock produced by the pandemic after having recorded the lowest rate of expansion of industrial activity in the last decade. According to expectations, none of the main industrialized areas of the planet will be able to avoid a sharp contraction in value-added in 2020, except for China, which will record a moderate expansion.

In this scenario that is still evolving, it seems difficult to predict when the pre-crisis manufacturing production levels will return and, above all, to what extent the balance of power among the various industrial economies will change once the health emergency has ceased. The answer will crucially depend on the degree of international convergence of public policies that will be implemented for the recovery phase.

In 2019 there were no significant changes in the relative position occupied by the main manufacturers. For four years now, the rankings of the top nine world producers have been crystallized. Italy appears stably in seventh place, with a share of the world total of 2.2%, ahead of France (1.9%) and the United Kingdom (1.8%).

In 2020, world commercial exchanges collapsed as well. The impact of the shock at a geographical and sectoral level appears diversified. In general, trade in goods in advanced countries was more affected than in emerging markets. The recovery has already restarted in all economies (albeit with different "recovery speeds"), but its resilience will strictly depend on the intensity with which the pandemic continues to spread globally.

The relative positions of the main world exporters and importers of manufactured goods also appear to have stabilized, even if China (first exporter) and the United States (third exporter) lose market shares while Germany (second) consolidates its position. A complex indicator such as the Trade Performance Index shows clear supremacy in the export performance of the main European countries (Germany, Italy, and France).

The crisis has also caused a drastic fall in global foreign direct investments; however, unlike world trade, they will not return to a growth path before 2022. The impact will not be the same for all economies: developing countries are likely to experience a more pronounced contraction than developed countries due to reshaping of supply chains and the fact that some industries, such as extractive ones, will be more affected than others.

The major changes in the context that have taken place so far will strongly influence the new international architecture of production on many levels in the years to come, and will cause a reallocation of trade flows that are less and less due to a single easily identifiable model.

Regarding the logic of generalized free trade on a multilateral basis, which has generated supply chains that have exploded on a global scale, world manufacturing is entering a path in which the "solution of the production problem" is set to take on different forms at the same time. The organization of global production will consist of many different solutions, which operators will try to implement to manage the exit from a now dissipated reference paradigm.

On the one hand, there will be back-shoring phenomena, consequent to the choice of re-importing previously "exported" phases and processes at home. Over the last 20 years, around 1,430 cases of reshoring have been recorded worldwide, i.e. the return of manufacturing and supplying activities to their homeland by companies that - in whole or in part - had located them elsewhere. The phenomenon mainly concerned European and American companies. The most affected macro-area - the one that has suffered the most "departures"

- is Asia and especially China. But re-shoring will only partially translate into actual physical re-transfers of productions and will be expressed above all in the launching of new growth processes in the "starting" areas (both through an increase in the degree of vertical integration of the productions recalled at home and through the replacement of "distant" suppliers with national ones).

A second perspective concerns a greater degree of "regionalization" of supply chains (so-called near-shoring), as a response to the problems posed by a context in which distance, also in terms of security of supplies, counts again. Three different trade regionalization indicators (a regional trade specialization index, concerning six major macro-areas; an average trade distance index; an elasticity index which measures the decrease in trade between two countries in relation to the increase of their distance) draw a coherent picture, according to which signs of regionalization emerged between 2016 and 2018, just as previously (between 2004 and 2016) there was an increase in globalization.

In any case, the complexity (and the cost) of the divestment processes acts as a strong disincentive to the international redeployment of productions. As a result, in most cases, the structure of supply chains will continue to remain what it is. This is bound to happen whenever the costs of re-appropriation of the skills transferred to emerging economies in distant years - and now dissipated in the countries that have relocated them - will be greater than those of the goods the former are now able to supply.

This range of solutions must go hand in hand with another solution consisting in the redeployment of supply chains not in closer areas, but in equally distant areas, which however must prove to be able to guarantee lower production costs than those where they had already been located. In this case, it is a question of further diversification of the areas targeted by phenomena of international decentralization of the offer, and therefore of an increase in the degree of diffusion of industrialization.

## Chapter 2 - Manufacturing in Italy

The impact of the pandemic on manufacturing activity levels was immediate and violent. In the two months of lockdown (March and April), production fell by over 40%. The recovery of production levels from May was almost instantaneous, so that within four months the production level returned to around January values. But the prospects for the autumn months have turned negative, in line with the increase in infections globally and with the introduction of new measures aimed at limiting the spread of the virus.

The impact of the health crisis on industrial sectors was not homogeneous. At a sectoral level, the variance was very large, going from -92.8% of the production of leather products to -5.5% of the pharmaceutical sector. The least affected sectors were those belonging to strategic supply chains, whose activity was also allowed during the lockdown to guarantee consumers the supply of primary goods.

The manufacturing system entered the lockdown with two years of recession already behind it. The expansion phase of the 2015-2017 three-year period had already begun to run out in the summer of 2017 and in the two-year period 2018-2019 the dynamics of industrial production recorded a gradual reversal of the trend. An important determinant of the growth deficit is the gradual erosion of domestic demand, which has severely limited the possibility for domestic producers to find space in the domestic market. In this context, the real collapse of the public component of investments, which has been in constant decline since 2011, is noticeable while the component of private investments has recovered, also thanks to the climate of greater confidence and reduction



of technological uncertainty that the "Industry 4.0" strategy has helped to generate.

The decrease in activity levels could not be without consequences on the very dimensions of the production apparatus. Starting from 2017, the balance of registrations and cancellations to the Chamber Archives, already in negative territory since the early 2000s, has significantly worsened, as a result of the combined increase in exits and a new decline in new firm formation. A prudential assessment of the cumulative change in the balance for the years 2017-2020 alone indicates a decrease in the number of companies exceeding 32 thousand units. The number of entries is far less than that of exits, meaning that the formation processes of new businesses are no longer able - unlike in the past - to guarantee the expansion of the production base.

The selection process did not correspond to a reallocation of resources towards the companies still in the market: the companies that left the market took away the resources and skills they had from the economy, reducing the level of production potential and opening gaps within territories in which they operated. At the same time, the massive skimming imposed by the crisis on the number of companies operating on the market did not generate a greater "degree of compactness" of the production apparatus, but on the contrary, was accompanied by a further increase in the distance between companies in terms of efficiency.

Overall, we are witnessing a return, albeit still limited, towards larger average dimensions, which follows a stop in the process of fragmentation of production structures along vertical lines - which has been going on for decades - and the emergence of signs of re-verticalization, albeit selective. On average, the value of production achieved within the boundaries of companies has increased, and the share of that originated through outsourcing processes has decreased. This is linked not only to the processes of re-integration of previously outsourced activities but also to an increase in the ability of companies to "recover value" through an increase in their production efficiency.

From the point of view of employment, the dramatic fall in manufacturing output was almost entirely absorbed by the reduction in the number of hours worked (-23%), against the substantial stability of the total number of employees (-0.6%). A wide range of forms of working time reduction has been a buffer to the loss of jobs, with limited additional burdens for businesses. In addition to the disposal of holidays and the use of leave, the rapid and massive use of tools for supplementing income from work, primarily the layoffs (CIG), which the government has made available in derogation, was crucial. But, of course, the blocking of dismissals also counted, even in international comparison.

The employment dynamics appear highly heterogeneous at the territorial level. During the entire post-crisis period, the country appears literally divided in two: on the one hand the North (western and eastern), always above the national average, and on the other the Centre-South, always below. While in the first two areas - and in particular in the Northwest - employment levels at the end of the last decade recovered almost all that had been lost in the first years, in the other two the recovery is almost absent, and the gap with respect in the North remains noticeable.

The structure of employment also changes. In industry, the number of employed women is still decreasing (already in 2008 women represented only 27.6% of the workforce and in 2019 this percentage dropped to 25.5%); younger workers (under the age of 35); the autonomous component of employment (the share of self-employed people continuously decreases from 13.9 to 10.1%). On the other hand, workers of foreign origin continue to grow, reaching 9.9% of employment in the sector in 2019 (about 466 thousand employed) and - in the context of dependent employment - the incidence of fixed-term con-

tracts increases (from 9.5% in 2008 to 12.7% in 2019), as well as the spread of reduced hourly regimes (part-time work goes from 6.6 to 8.4%), often used to make the need to reduce worked hours compatible with the maintenance of employment levels.

As happened to industrial production, during the first pandemic wave, Italian exports of goods recorded a V-shape: they almost halved from February to April 2020 and returned to close to pre-crisis levels in September. The trend was substantially equivalent in intra-European and extra-European destinations and for the main groupings of goods. In this case, too, the crisis does not seem to represent a structural break up to now, but rather fits within medium-long term trends already underway.

Italian manufacturing exports had already slowed down in the two-year period 2018-2019, in line with European and world trade, as a result of protectionist tensions and uncertainty. In the whole period following the global crisis of 2009, however, the Italian performance was positive and on average better than that of its European partners. Non-cost factors such as the quality of exported goods and participation in global value chains (GVC) played an important role.

Almost half of the sales of Italian products abroad depend on participation in the GVC; a slightly lowering share, in line with the contraction trend of the international production chains. Germany and France are still the two main destinations for Italian products. The weight of the US market, which absorbs the one-tenth of sales abroad, has increased. On the other hand, the Italian presence in China remains heavily in deficit, especially when compared with the German one. Finally, the weight of the United Kingdom is decreasing, in connection with the increase in the risk of a hard Brexit.

The balance sheet data, available up to 2018, show an overall positive pre-pandemic financial situation of the companies. Despite a difficult year for the economy, the operating profitability of manufacturing companies remained in 2018 at the levels of the previous year (7.9% of revenue), and the results of financial management were even better (by half a percentage point) thanks to higher income and lower charges, in the wake of low-interest rates. However, since at the same time the weight of inventories increased (as a result of the decrease in orders and deliveries) and productive investments absorbed resources for 4.0% with a slight increase, the net financial balance was in line with 2017, i.e. negative for about one point of revenues.

This requirement was covered by greater use of new equity (1.2%), which led to the strengthening of the capital structure. In the face of lower bond funding (due to the turbulence in the Italian sovereign bond market), more resources flowed through an increase in bank debt and, above all, towards third parties. In this context, the liquidity reserves of companies have grown markedly (1.4%), even more than in 2017. This figure may have been affected by the sudden worsening of expectations, which increased prudence, without however implying a lower investment orientation. In 2020, these liquidity reserves constituted an important shock absorber for part of the industrial system.

CERVED estimates relating to companies that currently have a negative liquidity balance due to the pandemic indicate a liquidity crisis in manufacturing amounting to 20.2 billion euros by the end of 2020, following the collapse in revenues implied by the lockdown. This measure defines the minimum size of public intervention needed to provide liquidity to the industry and prevent the temporary cash-flow problem from turning into a dangerous solvency issue.

During the year, the variability of situations between the various companies in deficit has increased more and more: in particular, the heterogeneity between the various manufacturing sectors is very wide, as a result of the strong sectoral variability in revenue trends.

## Chapter 3 - Manufacturing and the environmental issue

The keyword for addressing the environmental challenge is *decoupling*, that is, making economic and social progress as neutral as possible from the point of environmental impact. To achieve this final goal it is necessary: i) to increase efficiency in the use of resources; ii) to reduce and – in the future – eliminate the greenhouse gases produced by energy consumption; iii) transition from a linear model of resource use to a circular model.

Strong involvement of industry is needed, both on the supply side (development of green technological capacities, eco-design) and the demand side (use of green products and technologies, implementation of circular models of resource management within the productive process). In this context, a fundamental contribution comes from the contextual development and large-scale adoption of advanced digital technologies (the so-called 4.0 technologies).

In the short term, the green transition imposes strict constraints on industrial activity as compared to a usual business scenario and is also expected to have a direct impact on the shape of global value chains (GVC). However, it also provides a great opportunity for industrial renewal, whose implementation depends on: i) international convergence on the rules and environmental standards that must be respected; ii) the existence of industrial policies to support existing and emerging supply chains; iii) the existence of an industrial base that could face the technological transition with the speed required by the environmental challenge.

Italy can count on a strategic advantage as a first mover over many of its international partners, having long since come to terms with a “responsible” approach to the production and consumption of resources. However, until now it has shown an objective difficulty in intercepting the environmental challenge from the side of the endogenous development of green technologies. In this regard, it is essential to bridge the enormous distance that today still divides the ecosystem of public research from that of industrial innovation, with policies for the co-generation of knowledge between the world of universities and companies that have clear and measurable objectives and that are characterised by integrated governance among all the parties involved.

The Green Deal represents the institutional framework within which, already this year, the European and national policies aiming to stimulate public and private investments are implemented. These policies, including those that were launched last summer by the European Commission with the Next Generation Europe Plan in response to the economic crisis caused by the pandemic, will complement the measures already envisaged in the EU's ordinary budget, thus representing the most important driver of industrial development and transformation of the near future for European companies. The implementation of the Green Deal will require the allocation of huge resources that can only be ensured through the combination of all the available policy tools at the European and national level, in a close synergy between public and private funds.

There is a huge gap in the intensity of CO<sub>2</sub> emissions between national manufacturing systems, starting with those directly caused by industrial processes. According to the estimates of the Confindustria Research Department, nine of the top ten manufacturing systems with the lowest environmental impact are European, and among these, the performances of Italy and Germany stand out. All emerging manufacturing powers, on which a significant share of global industrial production depends today, have extremely higher emission intensities (up to eight times higher than those of Italy and Germany).

The low carbon footprint of Italian manufacturing in international comparison is explained above all by a better environmental efficiency of industrial pro-

cesses, and only marginally by a specialization that is less oriented towards productions that, by their nature, have a greater environmental impact.

The ISTAT data of the permanent census on businesses confirm the high propensity of the Italian industry to invest in environmental sustainability. Virtuous behaviours could be especially found in the context of circularity in the use of resources, which appears to be the constant of all environmental strategies that are voluntarily implemented by Italian manufacturing companies. These strategies are followed by strategies aimed at improving energy efficiency and, lastly, by those aimed at greater use of energy sources with low environmental impact.

The tendency to consciously invest in environmental sustainability is a common factor of Italian manufacturing companies of every size, although the frequency of cases and the degree of complexity of the adopted strategies increase with the size of the organization. There are no particularly marked differences between the Italian regions as regards the sustainability strategies that are consciously put in place in different areas. At the sectoral level, five manufacturing sectors are mostly involved in the strategic reorientation process in favour of environmental sustainability: chemicals, the beverage industry, pharmaceuticals, rubber-plastics, and iron and steel.

The data from the Census also indicate that the choice to consciously embrace the ecological transition is generally part of a broader process of “virtuous” change that affects the company organization.

Research and development in the environmental field (measured by the number of patents) flared up at the beginning of the 2000s, mainly driven by technological applications in the field of energy and transport, followed at a distance by those in the field of energy efficiency of buildings and, to a yet limited extent, by those related to capturing of polluting emissions and smart grids. The relative specialization of patents referable to Italy is strongly focused on the energy efficiency of buildings and much less on technologies for CO<sub>2</sub> capture and sustainable mobility.

The processes of creation and commercial exploitation of new scientific discoveries in the green field, like what happens with other technological drivers, have a strong national connotation, also in Italy. The inventors of the same patent tend in the vast majority of cases to live in the same country, which is most of the time the same as the applicant (i.e. whoever commercially exploits the patent).

Analyzing the Italian case at a sub-national level, it is clear that there is a deep territorial heterogeneity in the geographical distribution of the inventors of eco-patents. They tend to be located in a small number of provinces - mainly in the North-West and North-East - which also act as eco-innovative hubs for other areas. The low number of patents registered in the South is significantly affected by the low impact of the industrial component in this area, which creates a limited demand for scientific knowledge.

**The full version in Italian is available at**

<https://www.confindustria.it/home/centro-studi/temi-di-ricerca/tendenze-delle-impres-e-dei-sistemi-industriali/tutti/dettaglio/scenari-industriali-Italia-2020>