



EUROPEAN SMALL AND MEDIUM-SIZED ENTERPRISES IN THE
PANDEMIC CONTEXT: NATIONAL RECOVERY AND RESILIENCE
PLANS, SME CHALLENGES, AND BANKING SYSTEM ROLE

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Abstract

Purpose: The main purpose of this paper is to highlight and analyse the measures directed to SMEs contained in the National Recovery and Resilience Plans of EU member states.

Design/methodology/approach: After a general overview of the SME sector in the EU and the impact caused by the pandemic, the work proceeds with the analysis of different factors related to the content of the texts of the recovery plans, respectively the weight of the SMEs topic, the keywords, and the collocations. The analysis also includes a picture of the resources allocated to SMEs challenges in the near future. Following the overview of the European context, the paper analyses at the micro-level how the SME scenario is changing due to the interventions of the recovery plan, taking Italy as example. Finally, it focuses on the role of the banking system in supporting the economy and SMEs during the crisis. The data for the analysis were mainly extracted from official documents of the European Commission, and regarding the textual factors, the analysis was performed through Python codes.

Findings: The main finding emerging from this work is the identification of the intervention fields for SMEs, e.g. digital transformation and green transition, and afterwards, it is also shown how the cooperation between the different components of the European production system works: enterprises, governments and banking system.

Practical and Social implications: This paper shows the lines of action that EU has decided to take on SMEs, providing a basis for discussion for further investigation and moreover enriches the literature on the pandemic and recovery plan, which is still quite limited at the moment given the recent age of these events.

Originality of the study: The paper offers a general view of a relevant topic such as the challenges of European SMEs during and after the pandemic, performing various types of analysis using different approaches.

1. Introduction

The National Recovery and Resilience Plans (NRRPs) pay special attention to small and medium-sized enterprises, which account for almost all of the production units in each EU country. The public support measures taken by the member countries' governments, during the emergency, have been useful in safeguarding the production system, mitigating the effects of the crisis, and offering economic support; however, the member countries' recovery plans will play an even more crucial role. In fact, these plans will facilitate enactment of the programme for the near future of European SMEs. Moreover, this is an opportunity to relaunch the enterprise system, because the plans aim to profoundly change the operating context of economic activity. Successfully navigating the twin transitions, digital and green, represents the main challenge facing the EU as concerns its SMEs, requiring both investments and the adoption of measures scheduled in the NRRP of each member country. To implement these changes, business model innovations will be needed. During the lockdown period, many businesses reacted to the shock by introducing forms of remote working, offering new products and services, converting production, and adopting new forms of delivering products and services directly to consumers at home. In the post-Covid period, SMEs business models will need a structural and organisational redesign that will allow them to follow the updated parameters of the digital transformation and green transition, to adapt to the new consumer needs, and to offer newer-tooled digital solutions with a focus on environmental sustainability. In Italy, for example, over half of the SMEs have already introduced at least one new technology, that has brought an innovation in products, processes, or organisations (MarketWatch PMI^a, 2021).

In this context, the banking system also played a key role, continuing to ensure economic resources for businesses and households, even in the most acute phase of the emergency. Moreover, its support function is not limited to this aspect, but also entails helping with implementation of the recovery plans, cooperating with businesses, and giving them assistance in the process of change they have to face, by providing skills and additional resources.

The present paper, both descriptive and analytical, presents the overall scenario for European SMEs during the Covid period and analyses in depth, through text analysis of the recovery plans, the policies and interventions referred to SMEs. The paper is composed of six sections: the first contains the overview and the Covid impact analysis of SMEs, with an initial focus on financing, sustainability, and digitalisation; the second section addresses the intervention fields of the measures contained in the recovery plans; the third section provides an analysis of the relevance of the topic, of the language used, and of the allocated resources, with the related find-

ings; the fourth presents a micro-level analysis of the Italian context; the fifth focuses on the role of the banking system during the emergency and finally, the sixth section offers some brief conclusions and future research perspectives.

2. Overview and Covid impact analysis of SMEs

Small and medium-sized enterprises (SMEs) are the backbone of Europe's economy. They represent over 99% of all businesses in the EU. They employ around 83 million people, representing two out of every three employees and they create 85% of all new jobs. Moreover, SMEs generate about 53% of the EU's added value, accounting for more than half of Europe's GDP, and they play a key role in adding value in every sector of the economy. They are essential to Europe's competitiveness and prosperity. The European Commission defines SMEs as companies that have fewer than 250 employees and an annual turnover not exceeding 50 million euros, or a total annual balance sheet not exceeding 43 million euros. In Europe, there are more than 22 million SMEs.

Tab.1: European SMEs and large enterprises

	Number	%	People employed	%	Value added (€ billion)	%
SMEs	22,526,457	99.8 %	83,397,841	65.2 %	3,338	53 %
Large enterprises	40,843	0.2 %	44,591,655	34.8 %	2,957	47 %

Source: Our extrapolation of 2021 data published by the European Commission

In each of the 27 member states of the European Union, SMEs make up over 99% of the total number of enterprises. Italy has the most SMEs with over three and a half million, followed by France, Spain, and Germany, each with something over two and a half million. Smaller countries like Estonia, Cyprus, Malta, and Luxembourg have, by far, the fewest.

Tab.2: European SMEs and large enterprises per country

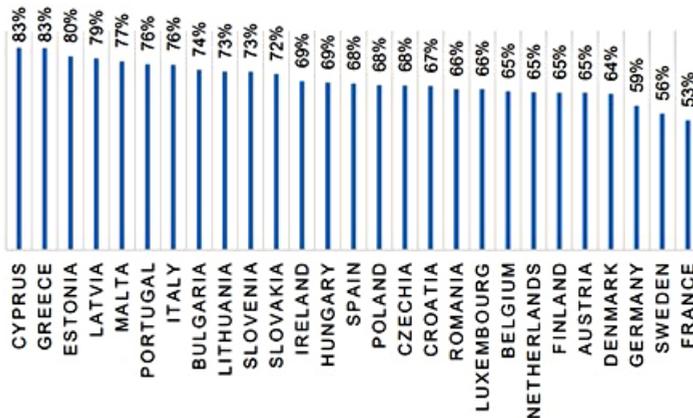
	SMEs	LARGE ENTERPRISES	% of SMEs
ITALY	3,610,877	3481	99.9%
FRANCE	2,838,671	3718	99.9%
SPAIN	2,587,121	3425	99.9%
GERMANY	2,573,946	11572	99.6%
POLAND	1,976,197	3110	99.8%
NETHERLANDS	1,241,703	1724	99.9%

CZECHIA	1,025,988	1497	99.9%
PORTUGAL	873,242	924	99.9%
GREECE	718,558	522	99.9%
BELGIUM	646,886	985	99.8%
SWEDEN	639,541	1383	99.8%
HUNGARY	602,895	883	99.9%
ROMANIA	519,203	1525	99.7%
SLOVAKIA	489,630	573	99.9%
BULGARIA	331,064	640	99.8%
AUSTRIA	312,049	1160	99.6%
IRELAND	264,215	614	99.8%
FINLAND	228,760	633	99.7%
DENMARK	225,908	744	99.7%
LITHUANIA	205,065	355	99.8%
CROATIA	153,477	457	99.7%
SLOVENIA	146,226	233	99.8%
LATVIA	108,531	198	99.8%
ESTONIA	76,768	158	99.8%
CYPRUS	57,015	78	99.9%
MALTA	36,594	79	99.8%
LUXEMBOURG	36,317	172	99.5%

Source: Our extrapolation of 2021 data published by the European Commission

In each member state, the number of people employed in SMEs accounts for at least half of the total number of people employed. In 11 of 27 countries, over 70% are employed in SMEs and in Cyprus and in Greece the figure is even higher: over 80%.

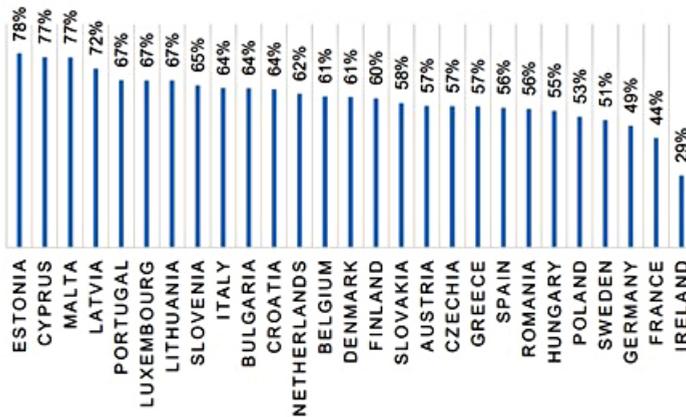
Fig.1: % of people employed in SMEs



Source: Our extrapolation of 2021 data published by the European Commission

SMEs generate the lion's share of the total added value in each member state. In 20 of the 27 countries, SME-generated value added is between the 50 and 70%, while in four countries (Estonia, Cyprus, Malta, and Latvia) it is over the 70%. Only in three countries (Germany, France, and Ireland) does it fall below 50%.

Fig.2: % of added value generated by SMEs



Source: Our extrapolation of 2021 data published by the European Commission

The global Covid-19 pandemic so significantly affected small and medium-sized enterprises in the European Union that the focus on these enterprises is meaningful for many reasons. Within the EU, SMEs are the largest source of employment and delivery of goods and services. Therefore, disruptions to this segment have relevant social and wellbeing implications for the population. In general, the pandemic has affected firms of all sizes, but SMEs are particularly vulnerable for several reasons. First, they are prevalent in countries and sectors that were more heavily affected by the crisis. Second, small and medium-sized enterprise sales fell more sharply and their liquidity ran out faster than for large firms in the same sector and country (World Bank Group, 2020). Finally, SMEs have fewer resources to help them respond to or be resilient in a crisis, and they generally reveal some managerial weaknesses, with special regard to financial management and to other support functions (the so-called “technostructure”). The turnover and profits of Euro area SMEs deteriorated, reflecting the sharp fall in economic activity. In particular, Euro area SMEs reported a dramatic drop in turnover (-46%), the lowest percentage decrease recorded since 2009. At the same time, SMEs saw reduced profits (-47%) in most countries and sectors. The decline in SMEs’ economic activity and profits was also reflected in reductions in fixed investments (-10%), in inventories and working capital (-15%) and in number of employees (-10%) (European Commission^h,

2020). For SMEs, two of the most affected sectors were hospitality (hotels and accommodations) and food services, where value added dropped by 37.8% and employment by 11.1%, as well as transportation and storage, which experienced decreases of 16.1% and 0.7%, respectively (European Commission^d, 2021). According to OECD estimates, 50 to 70% of SMEs that remained opened from May to December in 2020, have seen their sales fall and a third to half of those saw a drop of more than 40% (OECD, 2021). Waves of layoffs and closures have occurred since the beginning of the pandemic. To face this situation, many governments have introduced exceptional support measures, such as guaranteed and soft loans, grants, and subsidies (Juergensen *et al.*, 2020), which have enabled many enterprises to cover at least part of their liquidity needs and capital losses.

The Italian context is an example of a single country where a number of such measures were introduced by the government. A moratorium on loans allowed SMEs to postpone the deadlines for principal and interest payments (Brighi *et al.*, 2022); in addition, there was a state guarantee on loans, full or partial, depending on the amount and non-repayable grants provided to businesses that had reported a drop in revenues of more than one third. Despite the significant drop in GDP, the number of failed enterprises in Italy was about one third lower in 2020 than in previous years, thanks to public support measures: around 7,400 enterprises undertook liquidation procedures in 2020, compared to almost 11,000 in 2019. According to Bank of Italy estimates, without government intervention, the number of bankruptcies in 2020 could have been more than 12,000, almost 4,800 more than those actually recorded (Orlando & Rodano, 2022). Furthermore, the total number of enterprises that left the market in 2020 decreased by about 27%, dropping from a high of 70,000 in 2019 to 50,000 the next year. This evidence shows the significant mitigating effect of public measures to provide economic support to enterprises during the pandemic.

Many businesses allowed their employees to work remotely, others tried something different, like offering a new product or service that might be in demand, and a significantly greater share of them started delivering products and services directly to consumers at home. These adjustments require investments that small businesses often cannot sustain. Compared to larger firms, SMEs have less liquidity from external financing or previous years' profits, which can prove useful when facing a shutdown or demand shock. SMEs are more likely to run into financial difficulties and insolvency situations, and they must seek help from private entities and/or rely on public support for financing and other management issues. SMEs have been hit hard by the pandemic also in terms of their access to finances, because they are generally considered riskier than larger enterprises. From April to September 2020, 35% of European SMEs applied for a bank loan (up from 24% in the previous year). Opening a line of credit remains the

most popular source of financing of SMEs (32%), but grants also increased considerably (24%, up from 8%) (European Commission^h, 2020).

The European Commission has also responded in support of small and medium-sized enterprises, by financing the already existing COSME programme and advancing several measures of the new SME strategy, to moderate the impact of the crisis. COSME is the EU programme for the Competitiveness of Enterprises and SMEs, running from 2014 to 2020, with a budget of €2.3billion. The COSME programme aims to improve access to financing for SMEs through two financial instruments that have been available since August 2014: the 'Loan Guarantee Facility' (LGF) and the 'Equity Facility for Growth' (EFG). COSME supports SMEs in the following areas, by:

- facilitating access to finance;
- supporting internationalisation and access to markets;
- creating an environment favourable to competitiveness;
- encouraging an entrepreneurial culture.

In particular, the existing 'Loan Guarantee Facility' (LGF) has been boosted with additional resources from the European Fund for Strategic Investments, to enable banks to offer bridge financing for SMEs. This includes long-term working capital loans (of 12 months or more), as well as credit holidays allowing for delayed repayments of existing loans. By 31st March 2021, more than 100,000 SMEs already received €7.7 billion in financing under the COSME LGF-Covid 19 measures (COSME financial instruments (europa.eu))¹.

The new SME strategy aims to support SMEs during the recovery phase, with the main goal to increase the number of SMEs engaging in sustainable business practices and the number of SMEs employing digital technologies. The strategy is based on the following three pillars:

- capacity-building and support for the transition to sustainability and digitalisation: this is one of the main goals of the strategy. Achieving a climate-neutral, resource-efficient, and agile digital economy requires the full mobilisation of SMEs;
- reducing regulatory burden and improving market access: the SME strategy aims actions to reduce regulatory and practical obstacles to doing business or scaling up within the EU Single Market and outside the EU;
- improving access to financing: access to financial resources is one of the most urgent issues for many small and medium-sized enterprises. The European Commission works on improving the financing environment for SMEs and providing information on funding (European Commission^a, 2020).

¹https://ec.europa.eu/growth/access-finance-smes/cosme-financial-instruments_en.

Furthermore, all EU member states have adopted other targeted measures in their National Recovery and Resilience Plan that are directed to SMEs and aimed at mitigating the impacts of the Covid-19 pandemic and at helping to program the future of SMEs. More specifically, most of the measures are geared toward introducing or increasing the use of digital technologies, accelerating the green transition process, maintaining employment, and helping SMEs to address liquidity needs and get access to financing.

2. SMEs in National Recovery and Resiliency Plans (NRRPs)

The NRRPs outline precise guidelines concerning the interventions directed to SMEs (European Commission^f, 2021). Every Member State’s plan follows a similar structure, in line with the European indications about the general intervention areas, valid for all member states. These areas make up six “pillars” of action:

- 1) green transition;
- 2) digital transformation;
- 3) smart, sustainable and inclusive growth, including economic cohesion, jobs, productivity, competitiveness, research, development and innovation, and a well-functioning internal market with strong SMEs;
- 4) social and territorial cohesion;
- 5) health, and economic, social and institutional resilience with the aim of, inter alia, increasing crisis preparedness and crisis response capacity;
- 6) policies for the next generation, children and the youth, such as education and skills.

Then, the EU Regulation establishing the Recovery and Resilience Facility (RRF) goes into more detail to indicate the specific interventions envisaged for SMEs (European Commission^g, 2021). The field codes are shown below:

Tab.3: NRRPs’ interventions envisaged for SMEs

002	Investment in fixed assets, including research infrastructure, in small and medium-sized enterprises (including private research centres) directly linked to research and innovation activities
005	Investment in intangible assets in SMEs (including private research centres) directly linked to research and innovation activities
008	Research and innovation activities in SMEs, including networking
010	Digitising SMEs (including e-commerce, e-business and networked business processes, digital innovation hubs, living labs, web entrepreneurs and ICT start-ups, B2B)
010ter	Digitising SMEs or large enterprises (including e-commerce, e-business and networked business processes, digital innovation hubs, living labs, web entrepreneurs and ICT start-ups, B2B) compliant with GHG emissions reduction or energy efficiency criteria

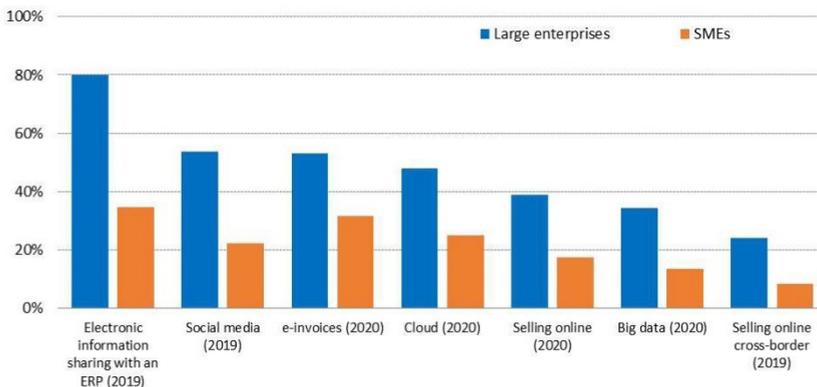
014	Business infrastructure for SMEs (including industrial parks and sites)
017	Advanced support services for SMEs and groups of SMEs (including management, marketing and design services)
019	Support for Innovation clusters including between businesses, research organisations and public authorities and business networks primarily benefiting SMEs
020	Innovation processes in SMEs (process, organisational, marketing, co-creation, user and demand driven innovation)
024	Energy efficiency and demonstration projects in SMEs and supporting measures
024ter	Energy efficiency and demonstration projects in SMEs or large enterprises and supporting measures compliant with energy efficiency criteria
047	Support to environmentally friendly production processes and resource efficiency in SMEs

Source: Regulation (EU) 2021/241 of the European Parliament and of the Council of 12 February 2021 establishing the Recovery and Resilience Facility

The main interventions most frequently sought are in the fields of digitalisation (010, 010ter, 017), innovation (002, 005, 008, 019, 020), and energy efficiency (024, 024ter, 047). Measures to promote the development of research, development and innovation competencies and to upgrade the digital skills of SMEs are among the most commonly adopted across the EU-27.

In sum, the main purpose of the investments and reforms pertaining to SMEs, contained in the recovery plans, is digitalisation (Pillar 2), followed by the green revolution (Pillar 1). Digital transformation leads the way because the digitalisation level of SMEs across European Union is still low, given that the smaller enterprises appear to be much less likely to adopt digital technologies than large enterprises are. This is quite evident from the examples, shown below, of digital technologies adopted by both SMEs and large enterprises, extracted from the 2021 Digital Economy and Society Index (DESI) report (European Commission^e, 2021).

Fig.3: digital technologies adopted by European enterprises, DESI 2021

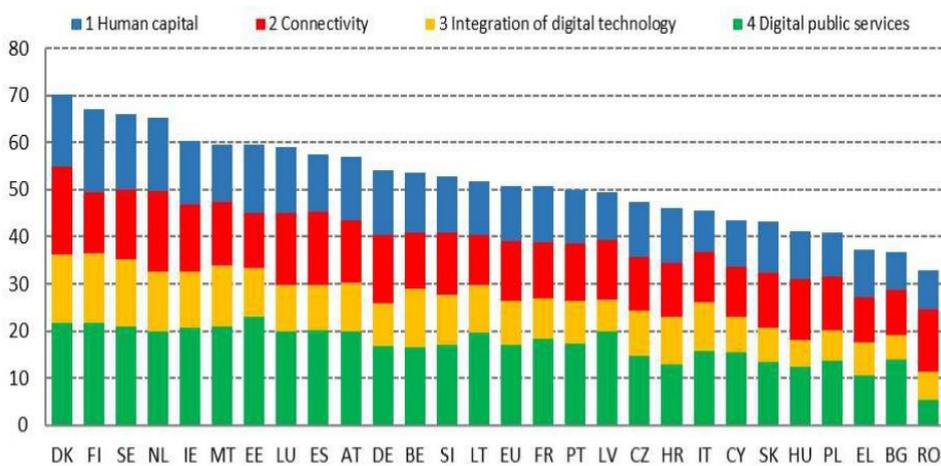


Source: European Commission, Digital Economy and Society Index (DESI) 2021 Thematic chapters

As the graph clearly illustrates, electronic information sharing through enterprise resource planning (ERP) software is much more common in large enterprises (80%) than in SMEs (35%). SMEs exploit e-commerce opportunities to a limited extent, as only 17% sell online (versus 39% of large enterprises) and only 8% sell cross-border online (24% for large enterprises). There are many other technological opportunities yet to be exploited by SMEs such as cloud services and big data.

The DESI expresses the level of digitalisation of each EU member state, categorised into four dimensions or "thematic chapters": Human capital, Connectivity, Integration of digital technology and Digital public services.

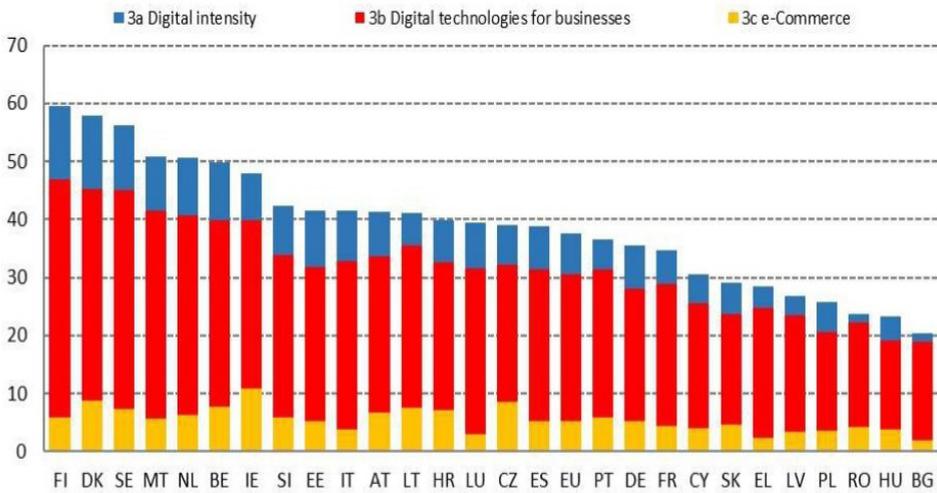
Fig.4: DESI 2021



Source: European Commission, Digital Economy and Society Index (DESI) 2021 Thematic chapters

In reference to enterprises, the third dimension “Integration of digital technology” expresses their level of digitalisation and use of technologies. As the yellow bars show above, the top performers in the integration of digital technologies are Finland, Denmark, and Sweden. While Bulgaria, Hungary, and Romania have the weakest performance in this area, the level of enterprise digitalisation is still quite low in many countries. This dimension measures the digitalisation of businesses in three areas: “Digital Intensity”, “Digital technologies for businesses”, and “e-commerce”.

Fig.5: integration of digital technology, DESI 2021



Source: European Commission, Digital Economy and Society Index (DESI) 2021 Thematic chapters

The analysis of the “Digital Intensity” (DI) of the enterprises provides an interesting snapshot of one aspect of digital integration. The DI parameter measures the use of 12 different digital technologies at enterprise level and a DI score is given to an enterprise, based on how many out of the 12 selected technologies are used. The next figure presents the composition of the Digital Intensity, and the score differences between large enterprises and SMEs.

Fig.6: digital intensity, DESI 2021

	Large	SMEs
Have a website	94%	76%
The maximum contracted download speed of the fastest fixed line internet connection is at least 30 Mb/s	92%	76%
Website has at least one of : description of goods or services, price lists; possibility for visitors to customise or design online goods or services; tracking or status of orders placed; personalised content in the website for regular/ recurrent visitors	78%	62%
Enterprises where more than 50% of the persons employed used computers with access to the internet for business purposes	56%	46%
Provide more than 20% of the employed persons with a portable device that allows internet connection via mobile telephone networks, for business purposes	47%	39%
eInvoices sent, suitable for automated processing	53%	32%
Buy medium-high CC services	48%	25%
Employ ICT specialists	76%	18%
Enterprises with e-commerce sales of at least 1% turnover	39%	17%
Analyse big data internally from any data source or externally	34%	14%
Use industrial or service robots	28%	6%
Use 3D printing	17%	5%

Source: European Commission, Digital Economy and Society Index (DESI) 2021 Thematic chapters

The data clearly shows that large companies are more digitalised than SMEs. Therefore, the improvement of the level of digitalisation of European SMEs is a crucial goal of the recovery plans, because digital technologies enable businesses to gain competitive advantage, improve their services and products, and expand their markets. The digital transformation of businesses opens new opportunities and boosts the development of new technologies. For SMEs, digital transformation requires strong support, as they need help to develop wider and deeper managerial competences in many fields (e.g. finance, organization design, people management, technologies selection, marketing, internationalization, sustainability practices). Such strong support seems essential if SMEs are to take concrete steps in building all the pillars cited in the NRRPs.

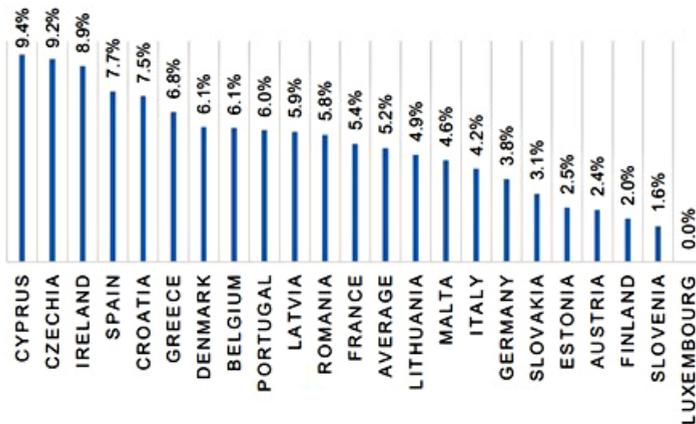
3. Analysis

For a better understanding of the interventions directed to the SME sector, and of the intentions of the EU member countries regarding the policies to adopt, it's useful to take different approaches to the analysis. Firstly, it is interesting to look at how much space is devoted to SMEs in every NRRP; it could be a significant indicator of the relevance of the topic for each country. Secondly and equally worth exploring, an analysis of keywords and collocations (multiple-word expressions that commonly occur regarding a specific topic) could prove useful in acquiring a deeper understanding, not only of this topic but of related ones, as well. Finally, it could also be important to gain a sense of how many resources European countries are going to allocate for the next challenges facing SMEs.

For the first two approaches to the analysis, i.e., weight or relevance of the topic and keywords and collocations, for each country the document of reference is the "Annex to the Proposal for a Council Implementing Decision on the approval of the assessment of the recovery and resilience plan". It is a document published by the European Commission, after the approval of the recovery plan and is specific to each Member State; it contains the list and the detailed description of every reform and investment under the plan. The plans considered for the purposes of the present paper are the 22 plans approved by 31st October, 2021. The analyses were carried out using a Python code developed on the NLTK (Natural Language Toolkit) package.

3.1 Weight of the topic

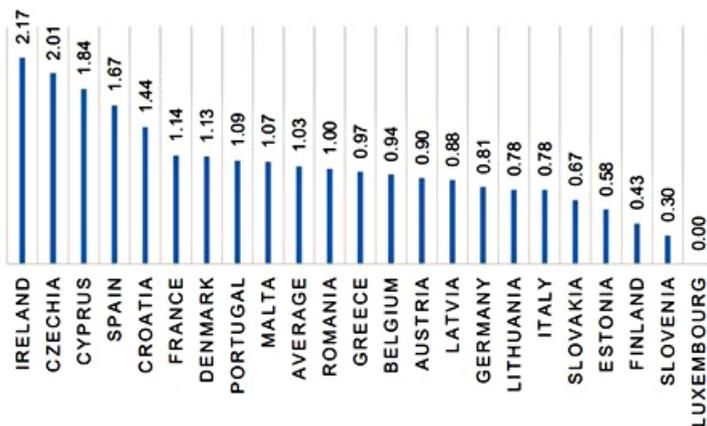
Fig.7: weight of SMEs text (%)



Source: our extrapolation

“SME/SMEs text” refers to the number of words contained in every sentence in which the expression “SME” or “SMEs” is mentioned. On average, SME text amounts to 5.2% of the document (Annex). In the top five positions the maximum weight is in Cyprus (9.4%), followed by Czechia, Ireland, Spain, and Croatia. In the broad middle band there are 12 nations and at the bottom of the list, Estonia, Austria, Finland, Slovenia, and Luxembourg. The weight is calculated by dividing the number of words of SME text into the total number of words in the entire document.

Fig.8: frequency of SME/SMEs every 1,000 words

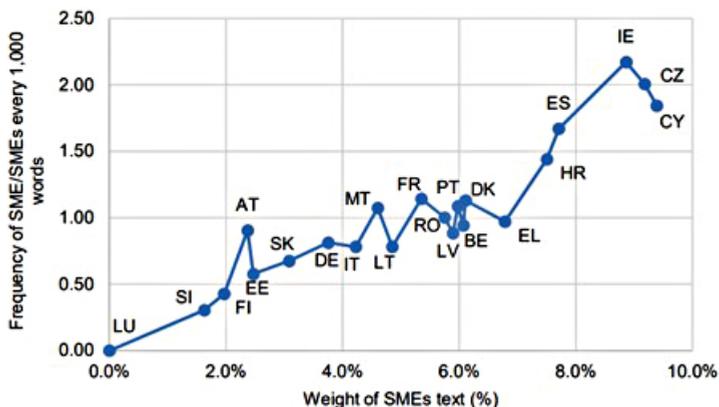


Source: our extrapolation

On average, the expression “SME” or “SMEs” appears approximately one time every 1000 words. It appears the most frequently in Ireland (2.17 times every 1000 words) and next most frequently in Czechia, Cyprus, Spain, and Croatia.

The two graphs (Fig. 7-8) are quite similar and by observing their overlap it emerges that the countries where the weight of the topic is higher are Ireland, Czechia, Cyprus, Spain, Croatia, Denmark, and Portugal. These are also the countries that are above the average in both graphs, for weight and frequency. The following graph shows this evidence relating the weight of SMEs text with the frequency of SME/SMEs every 1,000 words.

Fig.9: weight of the topic

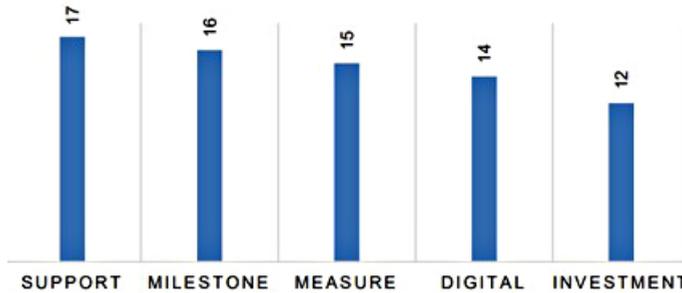


Source: our extrapolation

3.2 Keywords and collocations

Keywords and collocations analyses aim to identify the words and the multi-word expressions that most often appear close to the expression “SME” or “SMEs”. This is important to understand several aspects of the topic, like trends, policies and connected topics. The documents considered are the same as for the previous analysis, i.e., the 22 approved plans.

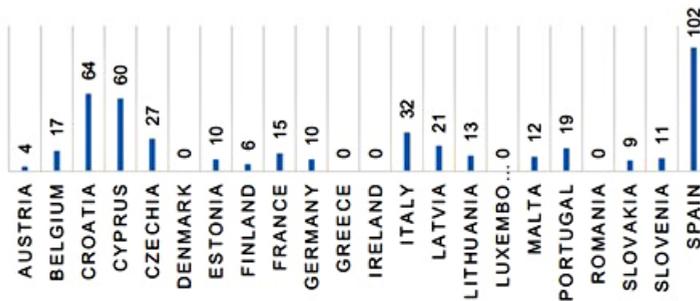
Fig.10: top 5 keywords about SMEs



Source: our extrapolation

Talking about SMEs, also means to talk about: support/ supporting/ supported: the word “support” appears in 17 of 22 documents. The SME sector was hit very hard by the pandemic and the European governments have shown their support to them through many interventions;

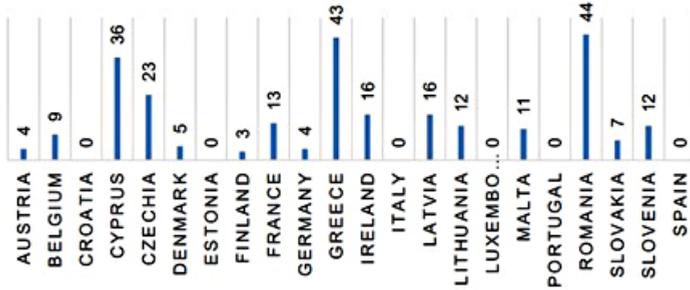
Fig.11: support/supporting/supported



Source: our extrapolation

- milestone/milestones: the word “milestone” appears in 16 of 22 documents. Support to SMEs is a milestone of recovery plans. They are mentioned in the third pillar: smart, sustainable, and inclusive growth, including economic cohesion, jobs, productivity, competitiveness, research, development and innovation, and a well-functioning internal market with strong SMEs;

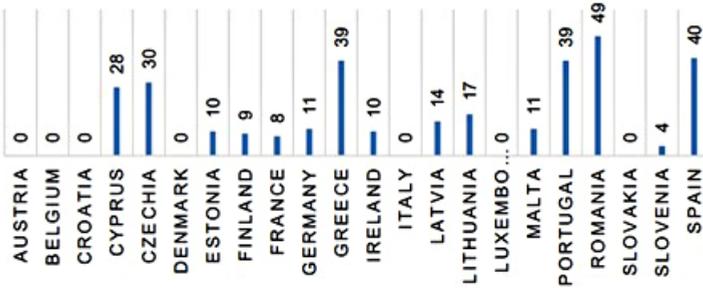
Fig.12: milestone/milestones



Source: our extrapolation

- measure/measures: the word “measure” appears in 15 of 22 documents. Recovery plans contain many measures directed to SMEs;

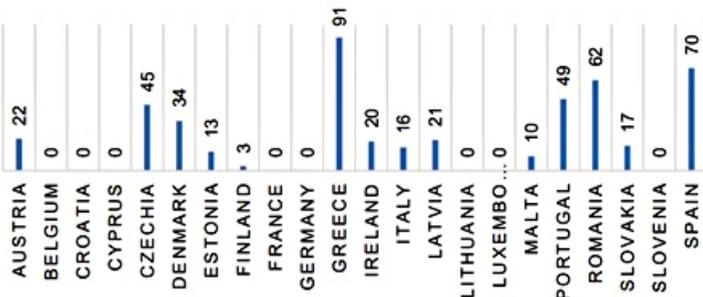
Fig.13: measure/measures



Source: our extrapolation

- digital / digitalisation/ digitalising/ digitalised: Digitalisation is the main intervention area for SMEs. The word “digital” appears in 14 of 22 documents, but overall, it’s the word that appears most often close to the word SME/SMEs;

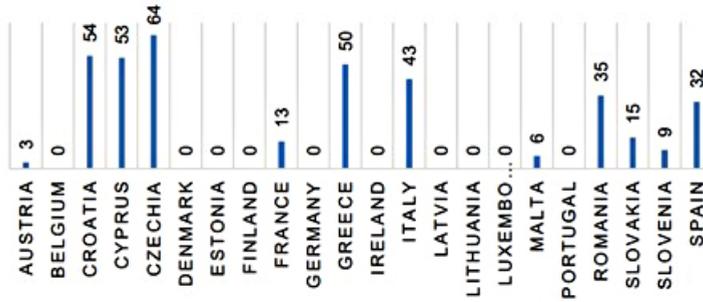
Fig.14: digital /digitalisation/ digitalising/ digitalised



Source: our extrapolation

- investment/ investments: “Investment” appears in 12 of 22 documents. A great number of investments in the recovery plans are directed to SMEs operating in a variety of sectors;

Fig.15: investment/ investments



Source: our extrapolation

In Tab.4, the top 10 collocations collected from the 22 plans examined are listed for each country.

Tab.4: top 10 collocations in the 22 plans

AUSTRIA	BELGIUM	CROATIA	CYPRUS
relevant guidelines	cyber resilience	environmentally friendly	energy efficiency
milestone approval	quickly identify	action plan	wider public
certified consultants	identify areas	public procurement	public sector
cyber security	cybersecurity awareness	production processes	agricultural products
digital administration	targeted towards	medium-sized enterprises	promoting energy
digitalised market	public tenders	strategic planning	efficiency investments
external providers	campaign targeted	resource efficiency	consulting services
four topics	living labs	innovative companies	innovative companies
future digitalised	regulatory texts	funding programmes	funding programmes
help get	risks delivered	exclusion list	exclusion list
CZECHIA	DENMARK	ESTONIA	FINLAND
district heating	data-driven society	digital transformation	job search
digital transformation	received funding	ict specialists	least eur
creative vouchers	digital projects	financial support	low-carbon solutions
environmental impact	digital-ready regulatory	measure consists	built environment
directive 2000/60/ec	critical drugs	training activities	covid-19 crisis
pilot phase	health systems	different stages	government decision
river basin	promoting better	following strands	innovations often

water bodies	regulatory framework	four following	often requires
baseline goal	medium-sized enterprises	freight transport	peer countries
goal quarter	data infrastructures	growing importance	requires extra
FRANCE	GERMANY	GREECE	IRELAND
energy efficiency	evaluation report	digital transformation	reducing regulatory
wider public	educational institutions	significant harm	regulatory barriers
public sector	cet networks	cash registers	government departments
agricultural products	federal armed	name qualitative	anti-money laundering
promoting energy	training facilities	quarter year	innovation hubs
efficiency investments	climate protection	environmental impact	feasibility studies
consulting services	education platform	directive 2011/92/eu	company service
innovative companies	project contract	baseline goal	service providers
funding programmes	2050 targets	goal quarter	reform consists
exclusion list	additional apprenticeships	indicative timeline	digital transformation
ITALY	LATVIA	LITHUANIA	LUXEMBOURG
fund 394/81	innovation clusters	horizon europe	terrorist financing
december 2019	shadow economy	higher education	money laundering
official gazette	capacity building	insurance contributions	financing milestone
industrial property	local government	social insurance	grand-ducal decree
exclusion list	socially responsible	advisory services	service providers
gender equality	digital skills	encouraging science	regime applicable
italian republic	energy efficiency	income inequality	company service
received support	cabinet regulations	offshore wind	income tax
guarantee fund	support measures	potential applicants	legal persons
environmental impact	strengthening analytics	innovation programme	amended act
MALTA	PORTUGAL	ROMANIA	SLOVAKIA
national risk	environmental impact	goal quarter	country-specific recommendation
unemployment benefits	fully incorporating	indicative timeline	high-quality long-term
digital solutions	updated design	name qualitative	long-term socio-health
energy performance	directive 2000/60/ec	quarter year	care needs
money laundering	directive 2011/92/eu	completion description	regulatory burden
post-intervention compared	digital commerce	target unit	innovation hubs
council directive	commerce accelerators	energy efficiency	digital technologies
directive 92/43/eec	technical guidance	qualitative indicators	public administration
comparing wellbeing	potentially likely	quantitative indicators	business environment
online publications	roads built	related measure	local level
SLOVENIA	SPAIN		
one-stop shop	value chain		
circular economy	exclusion list		

particular small	environmental legislation
medium-sized enterprises	national environmental
support businesses	public procurement
research organisations	milestones quantitative
baseline goal	name qualitative
creating systemic	time description
goal quarter	digital skills
indicative timeline	qualitative indicator

Source: our extrapolation

The topics that emerge from the results of the collocations analysis are very similar to the results of the keywords analysis. The five most frequent collocations related to SMEs are:

- digital transformation (4);
- environmental impact (4);
- energy efficiency (4);
- baseline goal (3);
- medium-sized enterprises (3).

These findings indicate that support to SMEs is a baseline goal for the recovery plans. Moreover, digital transformation stands out as the main goal of the intervention directed to SMEs, with particular attention to environmental impact and energy efficiency. Thus, the two leading goals in the recovery effort are digital transformation and green transition.

3.3 Resources

To complete this three-pronged analysis, it's interesting to have an idea of which countries have allocated the most resources in digital and green measures, specifically referred to SMEs and contained in the National Recovery and Resilience Plans. This data was extracted from the "Analysis of the recovery and resilience plan" document and related annexes published by the European Commission, after the approval of each plan (European Commission^{b,c}, 2021). These measures are listed in each document, in the "Climate and digital tracking table". Each measure contained in these tables where the expressions "SME", "SMEs", and/or "small and medium-sized companies/businesses/enterprises" were used, has been considered, and the amount of each measure has been aggregated. The plans consid-

ered are those approved by 31st October, 2021.

Tab.5: resources in digital and green measures taken from the "Climate and digital tracking tables"

	SME (€ million)	Tot (€ million)	%
Spain	11,297	53,128	21%
France	2,991	30,463	10%
Greece	1,890	20,290	9%
Italy	1,457	138,014	1%
Germany	807	25,048	3%
Romania	586	19,897	3%
Portugal	497	12,588	4%
Slovakia	409	4,407	9%
Croatia	225	4,226	5%
Slovenia	142	1,856	8%
Ireland	140	809	17%
Lithuania	106	1,555	7%
Belgium	95	5,184	2%
Denmark	76	1,305	6%
Czechia	74	5,504	1%
Estonia	68	621	11%
Latvia	59	1,084	5%
Austria	32	4,055	1%
Finland	30	4,024	1%
Cyprus	29	812	4%
Malta	15	269	6%
Luxembourg	0.9	91	1%

Source: our extrapolation of 2021 data published by the European Commission

In several cases, the amount of allocated resources reflects the weight that the topic of SMEs holds in that nation's plan. Comparing the data from the above table with the "Weight of SMEs text" graph (Fig.7), it emerges that Spain, France, Greece, Romania, and Portugal, which are in the top-ranking positions for allocated resources, are also positioned above the average in the "Weight of SMEs text" graph. Of these five, Spain, Greece, Romania, and Portugal are also the countries where the word "digital" in proximity to "SMEs" is most frequent.

In looking at these findings in the context of the number of SMEs in each country, it's possible to deduce that the countries with a comparatively larger number of SMEs (Italy, France, Spain, and Germany) are also the countries that have allocated most resources; Greece can also be considered part of that group. However, it's also possible to observe that several countries

(Italy, Greece, Romania, Portugal, and Slovakia), which are lower-ranking on the DESI, and in the “Integration of digital technology” area, have nevertheless mobilised a sizeable amount of resources for digital and green investments in SMEs. This means that for many countries there is the intention to strongly push forward to undertake and complete the digitalisation process.

Finally, comparing the amount of allocated resources in digital and green measures directed to SMEs with the total amount of the allocated resources in digital and green measures of the entire plans (3rd column), it emerges that a high amount of resources allocated to SMEs is not always matched with a high percentage of resources allocated to SMEs, probably due to the high cost of the plans for example for countries such as Italy, Germany, Romania, and Portugal.

4. Micro-level analysis of the challenges facing Italian SMEs

In order to have a more specific idea of what is happening at the micro level, the Italian context can be shown as an example of a single country in which the twin impacts of the pandemic-induced crisis and of development opportunities consequent to the NRRP can be observed. Italy has obviously not been immune to the consequences of the health and economic emergency linked to the forced closures of business activities, the reduction of people’s mobility, and the implementation of social distancing rules. For SMEs, the impact of the lockdown has provoked a precipitous fall in revenues, a serious deterioration of payment deadlines, and a sharp drop in business births: in the first eight months of 2020, there were 20% fewer businesses born compared to the same period in 2019. Asymmetric in its impact on different sectors of the economy, the crisis has more heavily affected those activities most sensitive to lockdowns and restrictions. The sectors most affected in terms of turnover contraction are travel agencies (-51.3%), air transport (-50.8%), hotels (-47.1%), and restaurants (-33.8%) (CERVED, 2020).

It was in this scenario that the NRRP has intervened. It represents a ground-breaking opportunity to relaunch the enterprise system, because it aims to profoundly change the operating context of economic activity, orienting it towards digital and green transition while building resilience. The Italian plan provides resources amounting to €191 billion, of which 40 billion are earmarked for digitalisation and innovation and 60 billion for green transition. Moreover, 68% of the resources allocated to digital transformation and 55% of those allocated to green transition are targeted toward the enterprise system (Ricerca Avanzata - Italia Domani)².

² <https://italiadomani.gov.it/Interventi/investimenti/ricerca-avanzata.html?beneficiaries=Imprese&orderby=%40jcr%3Acontent%2Fjcr%3Atitle&sort=a%20sc>

One of the main goals of the NRRP is to accelerate the modernisation processes of the production system in order to help businesses face the challenges of the future. The health emergency has highlighted the need for a greater use of digital tools. Since 2020 there has been a strong increase in the demand for digital services and, given the country's current technological infrastructure, it has underscored its limitations but, at the same time, this demand has provided a strong impetus to the digital transition process in all sectors of the economy. Italian enterprises' poor degree of digitalisation is one of the reasons underlying their low productivity and growth over the last decade. Moreover, as a result of the pandemic, the behaviour of consumers and investors has changed, and they are now more aware of and sensitive to the topic of sustainability. Therefore, SMEs need a structural and organisational adjustment that will allow them to pivot towards the new parameters of the digital transformation and green transition: business models need to be redesigned and innovated in order to adapt to consumer needs, offering new digital solutions with a focus on environmental sustainability. However, the question arises: how are these changes applied in practice?

On the digital front, innovations can be structural, affecting products, services and especially, processes. Examples include the creation of a website, an application, or a social profile; innovations in the production process; the introduction of remote working; or new ways of selling and delivering goods and services to customers, through the application of the various innovative tools of the fourth industrial revolution (the cloud, Internet of things (IoT), big data analytics, additive manufacturing, artificial intelligence, collaborative robotics, etc.) (Cesaroni *et al.*, 2020).

On the environmental front, for the green transition to be successful, the main challenge for enterprises to overcome is to remain competitive while maintaining a positive, or at least a neutral, environmental impact. To achieve this goal, it is necessary for enterprises to:

- increase efficiency in the use of resources;
- reduce (and eventually eliminate) greenhouse gases produced by energy consumption;
- move from a linear model of using resources to a circular model (Confindustria, 2020).

In this area, Italy can be seen in a position of advantage, considering that responsible approaches to the production and consumption of resources have been the norm for some time.

In terms of innovation, it is interesting to see how the adoption of digital technologies and interventions in the field of sustainability, after the global health emergency, has brought about innovations in the business models of SMEs. According to data taken from surveys conducted by MarketWatch PMI, the *Osservatorio* of *Il Sole 24 Ore*, and Banca Ifis, which analyse the

ecosystem of Italian SMEs by interviewing over 500 companies from different sectors every month, new strategic and organisational drivers are being used in the wake of the impact that the health and economic crisis had on the market to help generate new business models. The surveys show how Italian enterprises have tended to react to the shock, innovating production processes and making progress on the sustainability front. In the two-year period of 2020-21, 52% of the SMEs interviewed introduced at least one new technology, which brought an innovation in products, processes, or organisations. The most active sectors on this front were the chemical-pharmaceutical (76%), the home system (63%), and the technology (60%) sectors. Enterprises' investments in digital technologies were focused on different tools: digital signature (48%), SPID- service profile identification (41%), PEC- certified email (32%), digitalisation of payments (17%), use of the cloud (16%), acquisition of software for finance and accounting (16%), digitalisation of forms (11%), and use of big data and machine learning (8%). An important factor contributing to increased investments in digital technologies by SMEs has been the process of digitalisation of public administrations; in fact, half of all enterprises recognise it as a facilitating influence in their business relationships.

Another factor that has led to an increase in the use of digital technologies is the adoption of smart working. Before the lockdown it was practised by only 4.6% of Italian SMEs, while after the emergency the percentage increased to 37% (MarketWatch PMI^a, 2021). Smart working does not only mean the use of videoconference and communication platforms, but also using file and document sharing services, as well as supplying employees with individual productivity tools, such as laptops, tablets, and smartphones. The enterprises interviewed are confident that the increasing use of new technologies and digital tools will bring great benefits: not only an improvement in the quality of products, for 59% of the enterprises, but also increased productivity, minimisation of process mistakes, greater safety in the workplace, the ability to enter new markets, and the possibility to personalize their offer.

As regards sustainability, for many Italian SMEs it is not only perceived as a duty, but also as a competitive positioning strategy and a reputational factor. Overall, 38% of Italian SMEs have invested in sustainability over the last two years. More specifically, these investments concern different facets: 82% have invested in energy saving, 78% in waste cycle management, 68% in reducing the use of polluting chemicals, 24% in the use of innovative materials with low environmental impact, 20% in the use of renewable resources, and 18% in packaging reduction.

Finally, future forecasts confirm the rising trend of the last two years; the *Osservatorio* estimates that over the next two years, 6% more SMEs will invest in digitalisation of processes (34%), sustainability (32%), customer

relationship management (21%), research and development (21%), and re-shoring of supply chains (12%) (MarketWatch PMI^{a,c}, 2021).

5. The role of the banking system during the emergency

In this context of crisis, the role of the European banking system has been crucial. It has acted as a cushion and has been essential in ensuring economic resources for businesses and households. It bears underscoring that it was thanks to the regulatory reforms passed after the great financial crisis of the last decade that banks were able to face this recent crisis from a position of greater stability and with a higher level of reserves. As the world faced the Covid-19 pandemic emergency, banks in the Euro area could rely on relatively strong capital ratios, which were further supported by extraordinary policy measures enacted throughout the pandemic. Thus, the banking system was able to offer support to the real economy, even during the most critical phases of the crisis.

As an initial support intervention, in March of 2020, the ECB launched the Pandemic Emergency Purchase Programme (PEPP), a temporary tool consisting of both public and private bonds purchases that aimed to mitigate the economic collapse of the Eurozone, with an initial value of €750 billion, an amount that has now grown to € 1,800 billion (Pandemic emergency purchase programme (PEPP) (europa.eu)³.

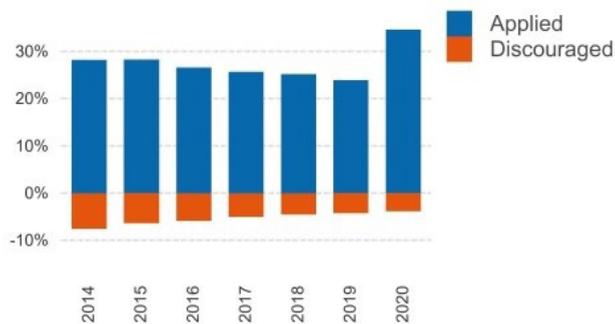
The local banks acted according to the instructions of governments and central banks. They were the vehicle through which public funds available from the extraordinary financial support measures were transmitted to individuals and businesses. One of the keywords associated with the banking activity at that time was “flexibility”. In order to give a strong impulse to the economic recovery, banks were urged to act with flexibility in the credit granting and recovery phase. This was made possible thanks to the measures of public guarantees that cover, in whole or in part, new loans granted and those already granted before the beginning of the emergency. Interest rates were maintained at historic minimum levels to ensure that the cost of money remained low. Flexibility is also a guideline followed by supervisory authorities, which for the moment, are less strict about the amount of capital reserves that banks must hold to cope with these difficult times. The ECB has also asked banks to suspend, or at least limit, the payment of dividends for the time being, in order to concentrate resources and give priority to financing households and businesses in difficulty.

The combination of these measures and recommendations issued allowed Eurozone banks to concentrate on their essential function, i.e., lend-

³<https://www.ecb.europa.eu/mopo/implement/pepp/html/index.en.html>

ing, in this extraordinary time period. The banking system has remained stable and has kept credit channels open to the real economy. Bank products have been the most important financing source for SMEs. Credit volumes increased by 3.1% after the regulatory capital relief measures, while interest rates on loans to firms eased by 7 basis points (European Central Bank, 2021). SMEs benefited the most from these measures. According to the European Commission’s Annual Survey on the Access to Finance of Enterprises (SAFE), between April and September of 2020, in the most critical phase of the pandemic, 35% of SMEs in the European Union applied for a bank loan (a considerable increase from 24% in the previous year) with a success rate of 71%. Fear of rejection prevented 4% from applying.

Fig.16: bank loans’ application in EU27, 2020



Source: European Commission, SAFE: Annual Survey on the Access to Finance of Enterprises, 2020

Similarly, 48% of large firms applied for a bank loan, with a comparable success rate (73%) to that of SMEs. European SMEs reported an improvement in the willingness of banks to provide credit. Within the EU27, 67% of all SMEs and 80% of all large enterprises felt confident about talking to banks for financing and obtaining the desired results. The countries in which SMEs reported the strongest improvement in the availability of bank loans were Spain, Italy, and France. Finally, for the first time since 2009, Euro area SMEs reported an improvement in access to public financial support, an indication of the willingness of governments to provide public guarantees for bank loans during the Covid-19 pandemic (European Commission^h, 2020). In sum, the Euro area banking system as a whole has been able to meet credit demand and withstand stress.

A banking system conversation is not only about traditional finance; this discussion also includes the fintech industry, which has helped broaden the financing opportunities for households and enterprises. Fintech has helped the traditional system to satisfy the growing credit demand, through deals and partnerships, and offering time, cost, and efficiency

advantages. In Italy for example, in 2020, the amount of fintech-provided credit to SMEs soared 450%, to reach the amount of €1.65 billion, compared to the €372 million in 2019. Related to this growth is the increase in the number of fintech customers that enterprises typically have; they rose from 1,092 in 2019 to 5,464 in 2020. (Ecco perché il credito alle Pmi delle fintech italiane è aumentato del 450% - Il Sole 24 ORE).⁴

Banks themselves are accelerating their digital transformation process, especially because of changes in customer relations; the pandemic has shown how important is to be able to use banking and financial services from remote locations. For example, 64% of Italian SMEs prefer a digital relationship with their bank, preferring to use online banking services, and 35% use digital platforms even for the most complex operations related to credit (Market Watch PMI^b, 2021).

The role of the banks, however, does not end only with a rescue role in emergency situations. The banking system will have to also play a supporting role in the implementation of the NRRPs and cooperate with businesses to achieve the goals of the twin transitions, both digital and green; they will need to support the strong increase in investments expected in the coming years, by providing additional resources. In 2021, 65% of EU27 SMEs indicated that they prefer bank loans to finance their future growth (European Commissionⁱ, 2021). However, banks will also need to be selective; according to the new guidelines, projects that are coherent with the guidelines of the NRRPs (innovation, digitalisation, sustainability) should have priority for financing. A careful selection of borrowers becomes paramount, therefore, to ensure an efficient allocation of resources.

An example of an intervention of support to the investments planned by the NRRP is provided by the Intesa Sanpaolo group, which has granted €400 billion in medium-long term loans to businesses and individuals in support of the Italian NRRP. The interventions supported by Intesa Sanpaolo aim to implement innovative projects, mainly in areas closely related to the recovery plan such as green, circular economy, ecological transition, digitalisation, infrastructure, transport, and urban regeneration projects, through the offer of dedicated services with specific know-how in the field of digital technologies and sustainability (Messina, 2021).

UniCredit bank also has created a task force to pursue the objectives of the NRRP: digitalisation, innovation, competitiveness, culture and tourism, green revolution and ecological transition, infrastructure for sustainable mobility, education and research, inclusion and cohesion, and healthcare. The task force aims to provide the best possible support to customers and guides businesses seeking to access European funds, through a dedicated

⁴ <https://www.il-sole24ore.com/art/ecco-perche-credito-pmi-fintech-italiane-e-aumentato-450percento-Adf2TiLB>

consulting service. UniCredit has also recently issued bonds for €1 billion, aimed at financing innovative and sustainable projects, (Piano Nazionale di Ripresa e Resilienza (PNRR) ([unicredit.it](https://www.unicredit.it))⁵ and introduced a new range of soft financing directed to enterprises which show their commitment to improving their ESG (Environmental, Social, Governance) profile.

In addition to its crucial contribution to supporting the real economy, the banking system is also called to play this second role, as a driving force for the changes and future challenges of the production system guided by the NRRP, by providing skills and additional resources. It is not unthinkable to assume that when the extraordinary measures of public guarantees come to an end, the quality of bank assets may deteriorate. However, one can also see how the growth impulse provided by the NRRP is expected to limit this effect in light of the overall improvement of the macroeconomic conditions. It is precisely at that moment in time when banks must not fail in their support to businesses on this path of modernisation and development, just as they have been committed to working alongside households and businesses in facing the economic crisis.

6. Conclusions and research perspectives

The pandemic-induced damage has been significant to SMEs in the European Union. Closures, layoffs, sales falls, and the difficulties accessing financial resources are ongoing hurdles that Europe must overcome. In this scenario support to SMEs has been crucial, as they represent over 99% of European enterprises and, percentage-wise, employ the most people and generate the most added value.

Overall, from the analysis, a substantial cooperation and coordination emerges between and among the various components of the European productive system: the enterprises, the governments, and the financial system. European countries have taken emergency measures, which enabled SMEs to postpone payments and obtain guaranteed loans, soft loans, grants, and subsidies - designed to protect the liquidity of SMEs. In addition to the emergency measures, an even more important role will be played by the NRRPs in programming the future of SMEs in Europe.

The analysis of the measures geared toward SMEs shows the direction that the European Union has decided to undertake. Digitalisation, innovation, energy efficiency, and green transition are the main trajectories that EU countries have decided to follow. The determination to pursue these objectives is also demonstrated in the language adopted and in the associ-

⁵ <https://www.unicredit.it/it/contatti-e-agenzie/supporto-covid-19/UniCredit-per-l-Italia-PNRR.html>

ated keywords and collocations. For example, “Support”, “Digital”, “Investments”, and “Environmental impact” are some of the most common words and expressions used in relation to SMEs and as they pertain to the achievement of these ambitious goals, which represent the main challenges European SMEs will be facing in the near future. The expressly formulated objectives underscore the existence of a positive macroeconomic policy context within the EU27. SMEs’ corporate governance actors must take advantage of the many opportunities, developing more mature competences in numerous managerial fields to achieve positive results in digitalisation, innovation, energy efficiency, and green transition efforts. The micro-level analysis of the Italian context shows how enterprises are taking these directions: after the emergency, a significant percentage of SMEs has innovated its business model, making progress on both the digital and the sustainability fronts. The banking system also, after providing essential to the economy, is playing its part in bringing to fruition the NRRP objectives. Banks and the fintech industry are cooperating with businesses to achieve their digital transformation and green transition, and they are supporting and fostering increased investments in the coming years by providing additional resources.

These challenges also open further research opportunities for SME management scholars. Research pathways relating to corporate finance, accounting and organizational studies would merit exploring, as well as some across-the-disciplines topics that have already emerged but could be developed more deeply (e.g. stakeholder management, sustainability in its different meanings, employability, and flexibility). Future research could delve into the role of entrepreneurial and financial education in preparing entrepreneurs to manage situations of uncertainty. In order to prevent the difficulties resulting from crisis situations, the entrepreneur must be able to promptly recognise the crisis status, to set up appropriate managerial and financial structures, and, in general, to take appropriate impact-mitigating initiatives.

Discussing about the contribution to practice and some limitations of this work, the paper is a basic analysis that provides insights for further investigation. There is no analysis of cause-effect relationships among the factors considered. The topic of pandemic and recovery and resilience plans are quite recent, and this paper has this aspect of novelty, helping to enrich the literature in these fields. Once the picture of SMEs in Europe is represented and the way the topic is treated in the recovery plan texts, afterwards it might be interesting to study in more detail the relationships between the different factors analysed, and to compare the actual implementation of the recovery plan measures with the relevance of the SMEs topic that emerges from the texts.

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