

A New World Post COVID-19

Lessons for Business, the Finance Industry and Policy Makers

edited by Monica Billio and Simone Varotto

On the Impact of COVID-19-Related Uncertainty

Marta Castellini

Università degli Studi di Brescia, Italia; Fondazione Eni Enrico Mattei, Milano, Italia

Michael Donadelli

Università degli Studi di Brescia, Italia

Ivan Gufler

Università Ca' Foscari Venezia, Italia

Abstract COVID-19 has generated a substantial increase in the level of economic policy uncertainty (EPU) around the World. Recent empirical investigations suggest that the COVID-19 has played a key role in amplifying the overall level of political uncertainty. In Italy, where anti-COVID-19 measures were implemented with some delay and were badly communicated, EPU rose dramatically. We examine the implications of rising COVID-19-related uncertainty for company revenues, gross operating margin and employment in 16 different Italian sectors. Our findings indicate construction, education, manufacturing activities and hospitality as the most hit sectors, with an average short-term drop in company revenues of around 4% in annual terms and a recovery time of almost two years. Thus, COVID-19-related uncertainty is found to be a significant business cycle driver.

Keywords Political uncertainty. COVID-19. Non-macro-related uncertainty. Ambiguity. Revenues. Employment.

Summary 1 Introduction. – 2 Empirical Analysis. – 3 Concluding remarks.



Edizioni
Ca' Foscari

Innovation in Business, Economics & Finance 1

ISBN [ebook] 978-88-6969-442-4

Open access

Published 2020-07-31

© 2020 Creative Commons Attribution 4.0 International License

DOI 10.30687/978-88-6969-442-4/016

219

1 Introduction

Undeniably, the set of social-distancing measures adopted in the majority of advanced economies hit by the COVID-19 pandemic since the beginning of February 2020 led to a severe drop in the global aggregate demand. According to current knowledge, it is also very likely that the COVID-19 virus will continue to spread around the world in coming months and that the high degree of uncertainty surrounding its diffusion will certainly generate further drops in market demand, especially in some economic sectors. Not surprisingly, estimates of the International Monetary Fund (IMF) indicate a cross-country average drop in real GDP among the G7 countries of almost 9.5% for 2020.

Table 1 IMF Real GDP growth estimates for 2020 (Source: IMF)

Canada	France	Germany	Italy	Japan	UK	US
-8.40%	-12.50%	-7.80%	-12.80%	-5.80%	-10.20%	-8.00%

Notes: this table depicts the IMF Real GDP growth estimates for 2020 in the G7.
Source: IMF World Economic Outlook (June 2020)

With a total number of cases (deaths) of almost 240,000 (35,000), Italy has been one of the advanced economies most severely hit by the COVID-19 virus. This has forced the government to implement more stringent social distancing measures than in other countries. Differently from other contexts, Italy took some time to implement such measures. Indeed, the first measure was adopted 23 days after the first 100 confirmed cases of COVID-19 were reported, amplifying thus the risk of infection. France, Germany and the US reacted instead after 12, 8 and 15 days, respectively. Needless to say that, in facing a pandemic emergency, timely policies are fundamental to support the economy in case of an imminent slowdown. This initial delay in implementing the social-distancing rules and the subsequently stricter COVID-19-related measures (such as lockdown and forced stop of industrial production), together with a fragile fiscal and political structure, are responsible for the estimated 12.80% drop in the Italian real GDP [tab. 1]. More probably, this figure is also the result of the high level of uncertainty induced by both the delay and the lack of clarity in the measures adopted and implemented by the Italian government. In particular, the vagueness of policy communication had sizable adverse effects on business and consumer confidence, leading to a further drop in private consumption and investment.

Of course, some sectors have been more affected than others.¹ More importantly and, most likely for some sectors, the COVID-19-induced crisis will last longer than the virus itself. Not surprisingly - due to current and future, national and international, travel restrictions for people - the most suffering sector is (and will be) “hospitality and tourism”. For instance, Prometeia (2020) has estimated a post-COVID-19 scenario characterized by a drop in added value in “accommodation and food service activities” of around 30%, which is more than twice compared to other sectors such as “manufacturing” and “construction”. It is clear that in Italy, where the overall impact of tourism on GDP is around 13%, the return to pre-COVID-19 aggregate macroeconomic conditions is going to be quite slow. The “transportation and storage” and “art, leisure and entertainment” sectors are also expected to suffer more than others (Prometeia, 2020).

Some direct economic measures to stimulate these sectors have been adopted and will be soon implemented by the Italian government. However, whether or not these economic incentives will be enough to mitigate the devastating economic impact of COVID-19 still remains an open issue. In the current scenario, the effectiveness of such incentives depends on many factors. One of them is the political uncertainty that has recently rocketed in both Italy and Europe [fig. 1]. Indeed, in March 2020 the level of EPU rose by 110% in Europe (70% in Italy). As already shown in Bernanke (1985) and Baker et al. (2016), among others, political-related uncertainty could make consumers and entrepreneurs more cautious, discouraging both current and future consumption, as well as investments. In addition, the adverse effects of political uncertainty on production and labour market conditions have been shown to be more severe during bad times and when the economy is at the Zero Lower Bound (Caggiano et al., 2017a, b). Due to its recessionary effects, the rising of EPU would call for a cut in the central bank policy rate (CBPR). However, when rates are close to zero, there is no room for conventional monetary policies and the loss of their effectiveness makes EPU shocks more harmful. Of course, unconventional monetary policies might help, but (sometimes) at the cost of rising perceived policy uncertainty.

1 Further discussion could be also devoted to the relation between a company’s technological automation level and the impact of containment policies on the firm’s performance during the pandemic. The less employees of a firm are required to work within restricted physical limits, more it is likely that such firms are not subjected to mandatory cessation of production. If such perspectives had also been considered when deciding the industrial lockdown, maybe some firms could have continued production even during the pandemic. In other words, the fostering of automation in industrial production processes could be a potential solution to avoid production shut down during a potential new pandemic wave.

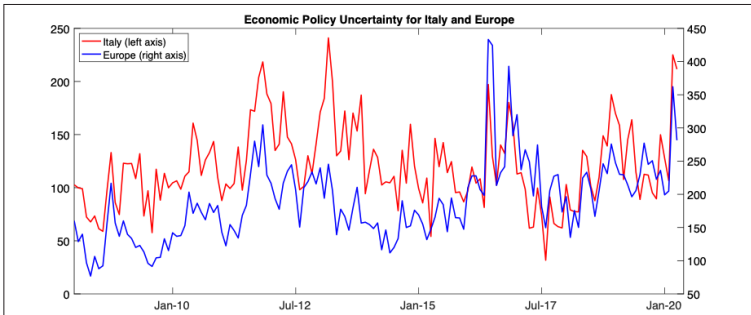


Figure 1 The Evolution of Political Uncertainty in Italy and Europe. Notes: this figure depicts the dynamics of the Economic Policy Uncertainty Index for Italy (left axis, red line) and Europe (right axis, blue line). Data at monthly frequency have been retrieved from <https://www.policyuncertainty.com/>. Sample: 2008:M1-2020:M4

The effects of political uncertainty on the real economy are well known. However, the recent and still ongoing pandemic comes with unprecedented EPU levels, in particular in the US as well as globally [fig. 2]. According to Baker, Bloom, Davis (2020) this is due to the fact that the COVID-19 has boosted several aspects of uncertainty: (i) uncertainty related to the disease (e.g. degree of infectiousness, lethality and mortality rate, capacity and efficiency of the health system, timing and development of vaccines); (ii) uncertainty induced by social distancing measures (e.g. duration and stringency of the implemented measures, probability of further lockdowns, implementation of new mitigation and containment strategies) and (iii) economic-related uncertainty (e.g. policy effectiveness, recovery timing, the number of firms at risk of default). COVID-19 induced uncertainty is not strictly related to macroeconomic policy issues, but it also includes health and science-related topics,² which have been shown to be significant business cycle drivers (Donadelli, Gerotto 2019). This is also confirmed by the rise observed in the World Pandemic-related uncertainty index over the past three months [fig. 3].

2 The efficiency of the health system and the ability of the scientific community to provide quick feedbacks to the policymakers played a key role in the evolution of the pandemics. The complex cooperation between local health systems, governments and the World Health Organization (WHO) is responsible for increasing COVID-19 related uncertainty. Furthermore, it is important to underline that further investigations must be done regarding the relationship between the past public (as well as private) funding assigned to both the health system and scientific research and the country's 'COVID-19 performance'.

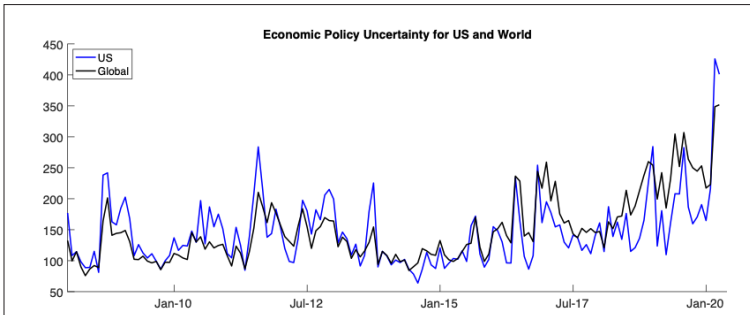


Figure 2 The Evolution of Political Uncertainty in the US and in the World. Notes: this figure depicts the dynamics of the Economic Policy Uncertainty Index for the US (blue line) and World (black line). Data at monthly frequency have been retrieved from <https://www.policyuncertainty.com/>. Sample: 2008:M1-2020:M4

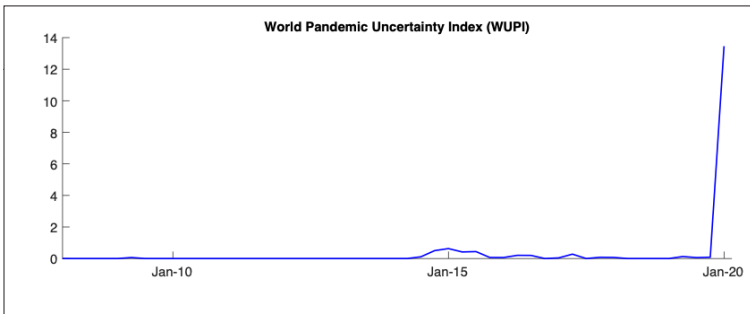


Figure 3 The Evolution of Pandemic-Related Uncertainty in the World. Notes: this figure depicts the dynamics of the World Pandemic Uncertainty Index (WUPI). Source: FRED. Sample: 2008:Q1-2020:Q1

In this respect, the implementation and the subsequent communication of efficient strategic economic-sectoral plans will help to mitigate part of this uncertainty, allowing the Italian economy, and in particular those sectors that have never recovered from past crises, to breathe again. In a country like Italy, already weakened by previous economic crises (i.e. the subprime and the sovereign debt crises) and constrained by the extremely high level of public debt, solving the COVID-19 induced uncertainty has to be considered a priority. The absence of a national industrial policy able to solve, at least partially, the uncertainty generated by this health emergency, amplified by weak and confused government economic measures, as well as by litigious EU economic policy makers, can be lethal especially for sectors such as (i) hospitality and tourism, (ii) transport and storage, and (iii) art, leisure and entertainment.

In this chapter, we assess the macroeconomic implications of COVID-19 induced uncertainty on company revenues, gross operating margin and employment in 16 different Italian sectors by means of a stand-

ard VAR analysis. Our results confirm COVID-19 induced uncertainty to be detrimental for the majority of Italian sectors, with significant drops in revenues and gross operating margin. ‘Construction’, ‘education’, ‘manufacturing activities’, ‘professional, scientific and technical activities’ and ‘hospitality’ are among the most seriously affected sectors.

2 Empirical Analysis

Data and methodology

From ISTAT we retrieve revenues, gross operating margins and employment data for Italian businesses across 16 ATECO sectors.³ Unfortunately, the aggregated company data available in the ISTAT database are recorded with annual frequency. Standard linear interpolations are performed to obtain quarterly figures with the aim to match the quarterly frequency of our uncertainty measure. As measure of political uncertainty, we employ the EPU index of Bloom, Baker and Davis.⁴ All data run from 2008:Q1 to 2017:Q1.

During the subprime crisis,⁵ EPU for Italy settled at 97.93. The average Italian EPU after the lockdown (March and April 2020) was 218.32, more than twice compared to the great financial crisis era of 2007-09. Prometeia (2020) shows that the impact of COVID-19 is not symmetric across sectors. Thus, following these estimates and, in the spirit of Baker et al. (2020) and Caggiano, Castelnuovo, Figueres (2020), we reparametrize our calculations accordingly. Specifically, we calibrate the magnitude of the uncertainty shock due to COVID-19 to be 2.3 times higher than during the subprime crisis in all sectors, except for ‘hospitality’ and ‘art, leisure and entertainment’, for which a factor of 3 and 2.8 is used, respectively. Our choice of rescaling the size of EPU shocks in all sectors is motivated by the fact that political uncertainty will last for several months. In addition, we believe that the ongoing and future social distancing measures (including several travel restrictions) in addition to the anxiety and general bad mood induced by COVID-19 will certainly have stronger recessionary effects on tourism and leisure activities. For this reason, we applied an even higher factor for the ‘hospitality’ and ‘art, leisure and entertainment’ sectors.

In the spirit of Baker et al. (2020) and Caggiano, Castelnuovo, Figueres (2020), we estimate the impact of COVID-19 by means of

3 ATECO is the coding system used by the National Institute for Statistics (ISTAT) to classify national economic activities. It complies with the European nomenclature, Nace Rev. 2.

4 See <https://www.policyuncertainty.com/>.

5 Note that this occurred from October to December 2008.

standard bivariate VAR models. We thus ask: what is the effect of an EPU shock in the 16 ATECO sectors, once the greater magnitude of EPU induced by COVID-19 is accounted for?

Evaluating and understanding the impact of COVID-19 pandemic on the economy is rather challenging. News-based uncertainty metrics do not capture direct effects of COVID-19 (such as lockdowns or other social distancing measures and infection dynamics or other health-related issues) and our analysis focuses on COVID-19 induced-uncertainty shock only. Actually, even though there are similarities between the subprime crisis and the COVID-19 one, especially in terms of increased economic-policy uncertainty, we have no knowledge yet about the persistence of this crisis given the risk of further waves of contagions. In addition, EPU hardly takes into account likely drops in future productivity due to social distancing measures and the reduction of investments. In other words, our approach is not capturing all the dimensions of uncertainty induced by the COVID-19. In this respect, one could expect stronger impact than those observed in our analysis.⁶

Results

Figure 4 shows the impulse response of COVID-19 induced uncertainty on company revenues [fig. 4]. The overall impact of COVID-19 on total revenues is negative in most sectors. The most affected sectors are ‘construction’, ‘education’, ‘manufacturing activities’, ‘business support services’ and ‘hospitality’, which also show the longest recovery time (i.e. almost 18 months). Note that the daily activity of these sectors has been interrupted from 21 March 2020 to mid-May 2020 by the Italian government due to social distancing measures. It is worth noting that in the majority of sectors heavily hit by the COVID-19 growth has shown a negative trend over the period 2008:Q1-2017:Q1. The COVID-19 is thus worsening a pre-existing critical economic outlook, in particular in those sectors that have never fully recovered from the 2007-09 financial crisis and the sovereign debt crisis. In general, the short-run drop vanishes within 12 quarters in most sectors. In other words, only after three years these sectors are supposed to return to their long-term equilibrium production and employment levels.

Exceptions are the ‘electricity and gas supply’ and ‘health and social care’ sectors, which show a positive response following a COVID-19 induced uncertainty shock. However, the positive effect is statistically significant only in the “electricity and gas supply” sector from two quarters after the shock.

⁶ Not surprisingly as of June (2020) the IMF revised its estimates on the real GDP growth for 2020 indicating a worsening across G7 countries.

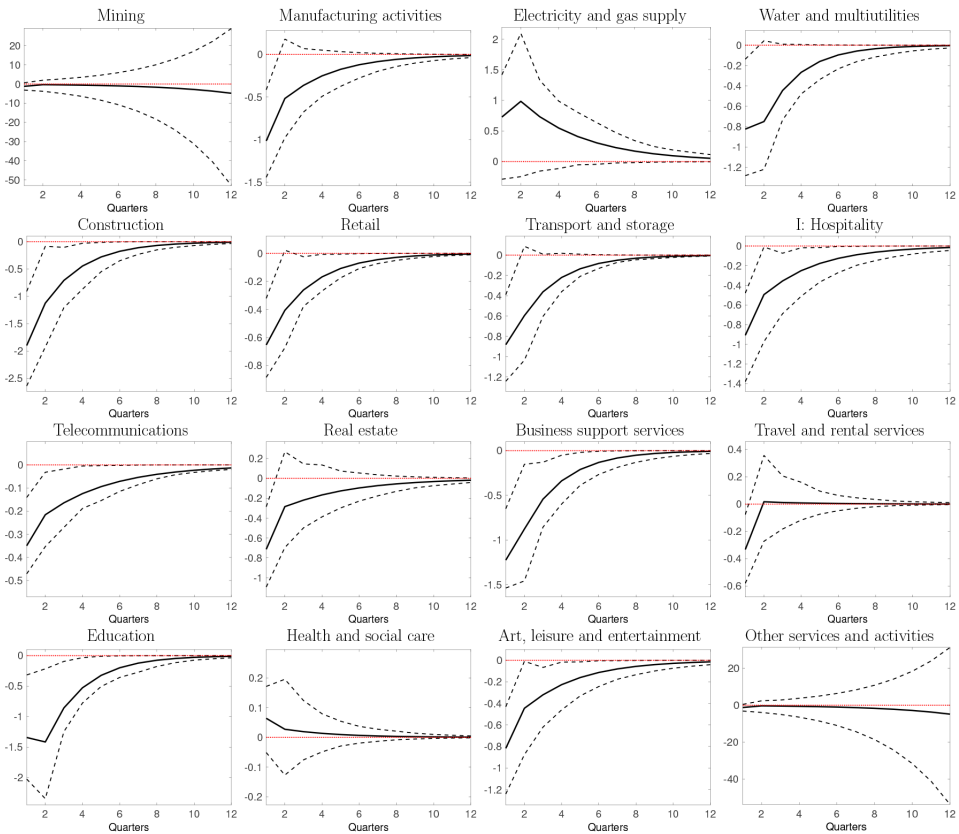


Figure 4 COVID-related uncertainty impact on company revenues (% deviations from mean).

Notes: this figure depicts impulse responses (expressed as deviations from long-term mean) of company revenues (in different economic sector) to a COVID-19-related uncertainty shock. For each sector the impulse response function is estimated from a bivariate VAR where COVID-related uncertainty is ordered first.

Black solid lines and dashed black ones: point estimates and 68% percent confidence bands. Data on company revenues are from the ISTAT. Sample: 2008:Q1-2017:Q1

Estimates on gross operating margin are presented in figure 5 and show a very similar pattern compared to revenues [fig. 5]. Once again, the sectors most adversely affected by the COVID-19 are ‘construction’, ‘education’, ‘manufacturing activities’, ‘business support services’ and ‘hospitality’. Dynamics in figure 5 indicate also that in these sectors the effects of the pandemic will last for almost two years. Differently from aggregate revenues, the impact on the gross operating margin is found to be larger in magnitude. For instance, ‘construction’, ‘hospitality’ and ‘art, leisure and entertainment’ drop by more than 3%.

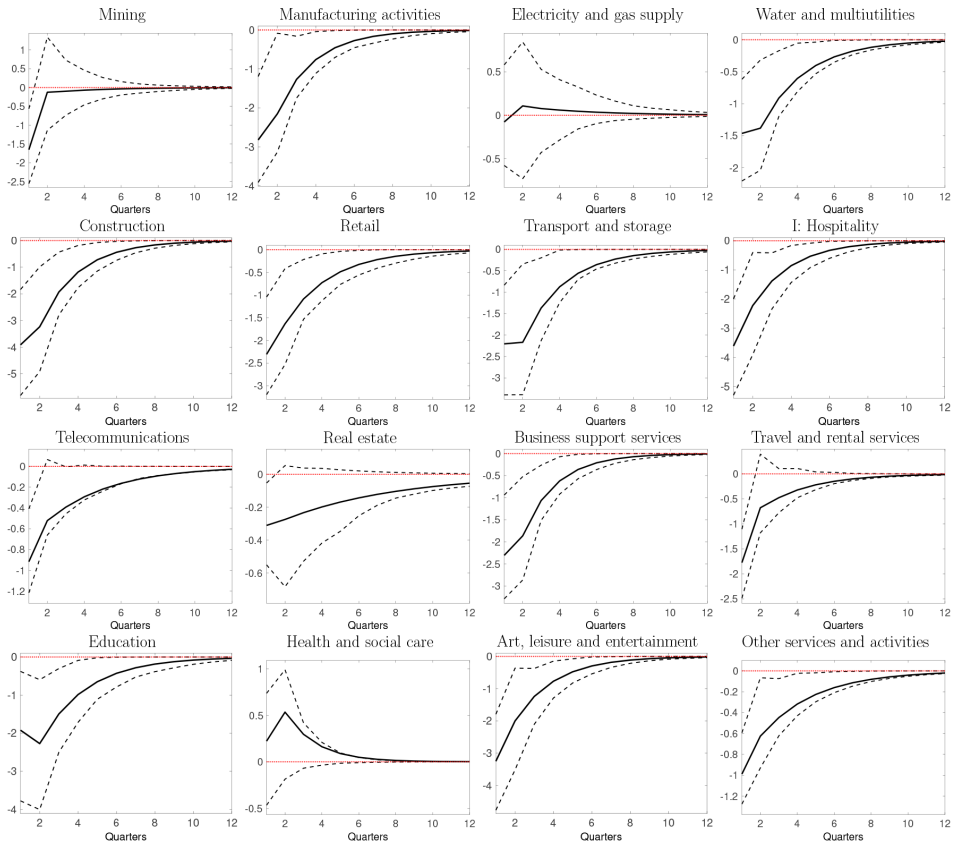


Figure 5 COVID-related uncertainty impact on employment (% deviations from mean).

Notes: this figure depicts impulse responses (expressed as deviations from long-term mean) of company *gross operating margin* (in different economic sectors) to a COVID-19-related uncertainty shock. For each sector the impulse response function is estimated from a bivariate VAR where COVID-related uncertainty is ordered first.

Black solid lines and dashed black ones: Point estimates and 68% percent confidence bands.
Data on company revenues are from the ISTAT. Sample: 2008:Q1-2017:Q1

Lastly, we present and discuss the estimated COVID-19 impact on the number of employed workers in each sector [fig. 6]. Estimates are generally less significant with respect to the previous cases. Nevertheless, similar conclusions can be drawn. ‘Business support services’ show the highest (negative) impact on employment, with a drop of -0.5% after one quarter and a full recovery not earlier than three years, followed by ‘education’ with almost -0.5% after six months. A key difference with respect to responses on revenues and gross operating margin regards the recovery time. Due to certain rigidities in the labour market, the effects of COVID-19 induced uncertainty

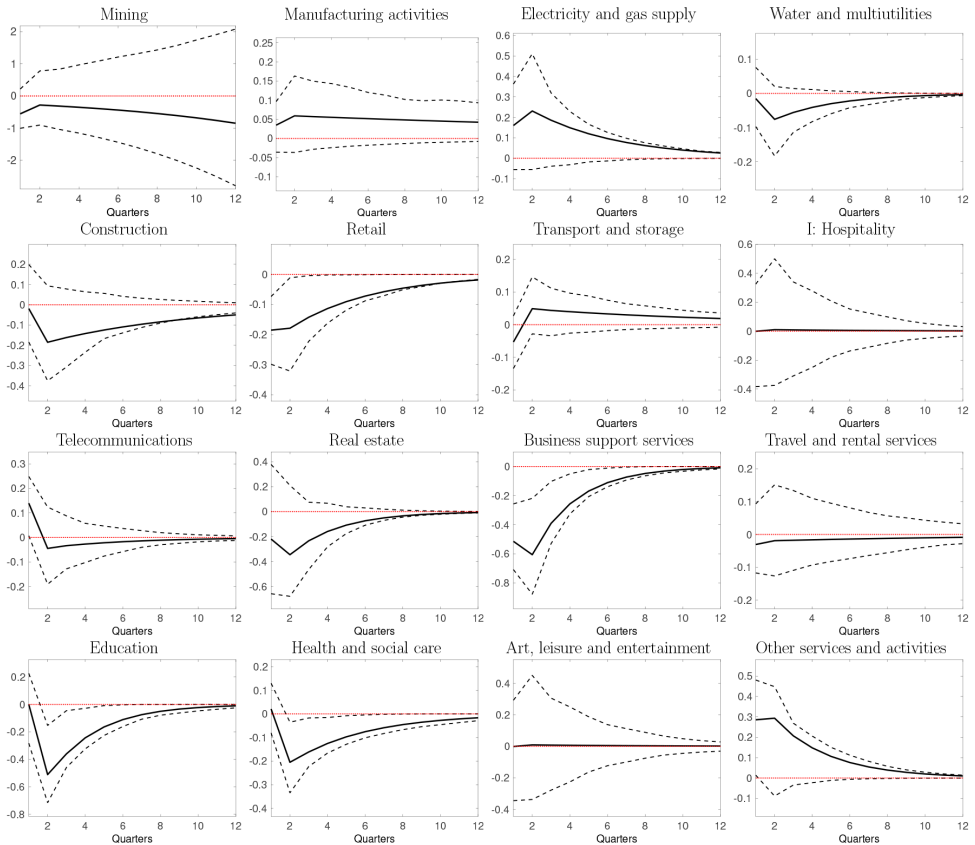


Figure 6 COVID-related uncertainty impact on employment (% deviations from mean). Notes: this figure depicts impulse responses (expressed as deviations from long-term mean) of company employment (in different economic sectors) to a COVID-19-related uncertainty shock. For each sector the impulse response function is estimated from a bivariate-VAR where COVID-related uncertainty is ordered first. Black solid lines and dashed black ones: point estimates and 68% percent confidence bands. Data on company employment level are from the ISTAT. Sample: 2008:Q1-2017:Q1

shocks on employment are more persistent. It is important to underline that - at the end of 2019, before the virus spread - Italy was one of the EU countries with the highest unemployment rate (9.9% compared to an EU average of 6.7%).⁷ The slowdown of the economy induced by COVID-19 is undoubtedly worsening a pre-existing Italian economic scenario. With regard to 'hospitality', it is noteworthy that employment levels follow a seasonal trend and most of the workers in

⁷ Source: World Bank data, Total Unemployment (% of total labor force).

this sector are hired during the tourist season (i.e. from May to October). The consequences on employment are thus likely to be worse than those estimated in figure 6.

Finally, table 2 shows the cumulative impact of COVID-19 at 6, 12 and 18 months after the EPU shock. On average, the impact on revenues after 18 months is -2.1%. Estimates on GOM depicts a more dramatic framework among Italian sectors. The average cumulative impact equals -3.4% after 6 months, -4.5% after 12 and -5% after 18. Clearly, many Italian sectors are not going to recover quickly from this pandemic.

Table 2 Cumulative impact of COVID-19 (% deviations from the mean)

Moths after the shock		Mining	Manu- facturing activities	Electricity and gas supply	Water and multi- utilities	Construc- tion	Retail	Transport and storage	Hospitality
		6	Rev	-1.549	-1.532	1.713	-1.574	-3.024	-1.059
	GOM	-1.777	-4.973	0.030	-2.847	-7.148	-3.943	-4.374	-5.832
	E	-0.836	0.094	0.391	-0.091	-0.204	-0.364	-0.004	0.009
12	Rev	-2.569	-2.147	2.994	-2.286	-4.177	-1.488	-2.059	-2.010
	GOM	-1.945	-7.000	0.167	-4.365	-10.260	-5.759	-6.614	-8.065
	E	-1.501	0.206	0.727	-0.187	-0.508	-0.620	0.079	0.025
18	Rev	-4.303	-2.441	3.710	-2.541	-4.633	-1.665	-2.274	-2.313
	GOM	-2.031	-7.729	0.248	-5.036	-11.423	-6.572	-7.527	-8.924
	E	-2.331	0.311	0.943	-0.239	-0.741	-0.783	0.149	0.036
Moths after the shock		Telecom- munications	Real estate	Business support services	Travel and rental services	Education	Health and social care	Art, leisure and enter- tainment	Other services and activities
		6	Rev	-0.566	-0.998	-2.103	-0.315	-2.758	0.091
	GOM	-1.438	-0.585	-4.169	-2.454	-4.194	0.756	-5.249	-1.614
	E	0.095	-0.565	-1.120	-0.050	-0.511	-0.184	0.008	0.579
12	Rev	-0.854	-1.383	-2.983	-0.295	-4.140	0.124	-1.809	-2.569
	GOM	-2.124	-1.018	-5.853	-3.253	-6.673	1.214	-7.259	-2.379
	E	0.035	-0.957	-1.768	-0.084	-1.114	-0.471	0.022	0.934
18	Rev	-1.019	-1.605	-3.325	-0.284	-4.662	0.140	-2.081	-4.303
	GOM	-2.505	-1.330	-6.423	-3.621	-7.751	1.351	-8.032	-2.765
	Emp	-0.005	-1.138	-2.047	-0.113	-1.388	-0.643	0.033	1.116

Notes: this table depicts the cumulative impulse responses of company revenues (Rev), gross operating margin (GOM), and employment (E) in different economic sectors to a COVID-19-related uncertainty shock after 6, 12 and 18 months. For each sector the impulse response function is estimated on the basis of a bivariate VAR where COVID-related uncertainty (i.e., EPU) is ordered first. Data on company revenues, gross operating margins and employment level are from the ISTAT. Sample: 2008:Q1-2017:Q1

3 Concluding Remarks

Since March 2020, the rising number of confirmed COVID-19 cases around the World has made it necessary to implement a series of social distancing measures (including lockdowns) aimed at slowing down the rate of infection. Naturally, these measures have generated a direct effect on the real economic activity. In particular, a rapid drop in production and subsequently in employment levels. Even before the virus was detected in Italy, the country was in a thorny economic situation. In fact, it was one of the last EU countries in terms of economic growth performance and among the first for level of unemployment and public debt. Certainly, for Italy the economic effects related to COVID-19 could be more harmful than for other countries.

Measuring the true impact of COVID-19 may be challenging. What is sure is that this newly declared pandemic has generated an unprecedented level of uncertainty. Even if not strictly related to economics or politics, such uncertainty seems to be induced by topics associated (on average) with bad news that are well known to be detrimental for production.

The lack of clarity in managing the pandemic and the absence of immediate, efficient and concrete government actions⁸ failed in restoring market confidence and resolving uncertainty. This will lead to more severe adverse effects on the real economy. Intuitively, unclear policies and measures make consumers and businesses more averse to ambiguity. Consequently, investments and hiring are postponed to obtain additional information on future outcomes (Baker, Bloom, Davis 2016). More importantly, COVID-19 induced uncertainty seems to be responsible for a delay in economic recovery. More severe and long-lasting negative effects have been found in particular in the ‘construction’, ‘education’, ‘manufacturing activities’, ‘business support services’ and ‘hospitality’ sectors.

COVID-19 hit 208 countries worldwide representing thus a global shock. In order to mitigate its adverse effects, any government should implement policies aimed at reducing the overall level of domestic political uncertainty and slowing down contagions while boosting the economy. This with the ultimate goals of recovering more quickly.

8 In the case of Italy, it is also important to underline the significant delay of national government in establishing a scientific-economic committee. The scientific health committee was formally set up in early February 2020, whereas the economic one was established only in April 2020. First lockdown measures started in early March 2020 whereas industrial shutdown was declared from mid-March 2020. Since containment policies aimed to protect population health also affect economy, the government should have defined earlier and more concisely the economic compensation policies. By immediately identifying the optimal mix between containment policies and economic compensation this would have reduced the overall uncertainty induced by the COVID-19 pandemic as well as its negative impact on economy.

Indeed, uncertainty related to this pandemic may represent the trigger of a deep change in the current paradigm of economic development. The need of a different approach to the economic growth has been widely recognised over the last 10 years. The tackling of climate change, inequality and hunger are at the centre of the world debate from many years and still local governments lack of concrete actions in their policy strategies. This 'new world' re-designed by the pandemic represents the perfect field to put finally such strategies into actions.

Close cooperation between EU members represents a fundamental element for the success of any economic, as well as health, policy identified by each country. In the last years, European Union played a central role in boosting innovation in green technologies sector for instance, but such specific interventions are not enough now to address the economic challenge drawn by the COVID-19 virus. The institutional role of EU and its economic policy in response to ongoing COVID-19 induced crises are crucial for the economic recovery of the continent.

Italy has been in need of a consistent industrial policy for many years. The labour market was subject to different reforms but all of them were constrained by the high level of political uncertainty. Digitalisation and sustainability topics were key elements of several electoral programmes but they remained so even after the elected government settled. The current pandemic has emphasised the effect of policymakers' behaviour to postpone such interventions, which instead firms necessitated even before the COVID-19 diffusion. Italian policymakers identified short-term solutions to support the economy during the pandemics, and contain the virus diffusion at the same time, by selecting specific industrial sectors to exclude from the mandatory cessation of production and providing economic compensation measures to the others. In a medium term perspective, it is very unlikely that this solution to be optimal for the national economy. In addition to the traditional economic policies aimed at fostering the growth of an economy after a shock like this one, policymakers are called to identify specific interventions aimed at supporting firms' innovation so that production to continue even during a second potential wave of pandemic (i.e. supporting automation of industrial process, home automation, digitalisation, implementation of smart working system...).⁹ The success of such instruments is conditioned by the presence of a high level of efficiency in public insti-

⁹ With reference to the Italian case and the economic measures to be adopted for those sectors affected the most by this pandemic, the different entrepreneurial perspectives at regional level must be taken into account. As also during the pandemic, the governors of the regions will play a central role on this aspect. Since the Italian firms' environment is characterised by a significant level of family-owned SME, a specific dialogue with each trade association must be open to understand the different entrepreneurs' perspectives.

tutions, infrastructures and national health care system. Thus, economic reforms must focus also on these aspects.

With reference to the health system in particular, we underline the importance of a close cooperation and coordination between private and public health institutions, as well as of the role played by academic research. Regulations regarding the former must be re-defined learning from the experience of the last months of pandemics (by increasing the employees in the sector, the compliance of the health structures to operational and safety standards in line with the pandemic critical issues and the level of technological endowment...), so that the uncertainty related to the pandemic is reduced. In addition to that, public funding strategies for these sectors must be re-organised with a specific attention to their contribution in responding to the emergency. Reducing the uncertainty in public funding in these two sectors could increase their qualitative performance and outputs, which in turn can be considered as a key element to prevent or manage the next pandemic wave.

Bibliography

- Baker, S.R.; Bloom, N.; Davis, S.J. (2016). "Measuring Economic Policy Uncertainty". *The Quarterly Journal of Economics*, 131(4), 1593-636. <https://doi.org/10.1093/qje/qjw024>.
- Baker, S.R.; Bloom, N.; Davis, S.J.; Terry, S. (2020). "Covid-Induced Economic Uncertainty". NBER Working Paper no. 26983. <https://www.nber.org/papers/w26983>.
- Bernanke, B.S. (1983). "Irreversibility, Uncertainty, and Cyclical Investment". *The Quarterly Journal of Economics*, 98(1), 85-106. <https://doi.org/10.2307/1885568>.
- Caggiano, G.; Castelnovo, E.; Figueres, J.M. (2017). "Economic Policy Uncertainty and Unemployment in the United States: A Nonlinear Approach". *Economics Letters*, 151, 31-4. <https://doi.org/10.1016/j.econlet.2016.12.002>.
- Caggiano, G.; Castelnovo, E.; Kima, R. (2020). "The Global Effects of Covid-19-Induced Uncertainty". Bank of Finland Research Discussion Paper No. 11/2020. <https://ssrn.com/abstract=3623226>.
- Caggiano, G.; Castelnovo, E.; Pellegrino, G. (2017). "Estimating the Real Effects of Uncertainty Shocks at the Zero Lower Bound". *European Economics Review*, 100, 257-72. <https://doi.org/10.1016/j.euroecorev.2017.08.008>.
- Donadelli, M.; Gerotto, L. (2019). "Non-Macro-Based Google Searches, Uncertainty, and Real Economic Activity". *Research in International Business and Finance*, 48, 111-42. <https://doi.org/10.1016/j.ribaf.2018.12.007>.
- Prometeia (2020). *Italy in the Global Economy*. Prometeia Brief, April 2020 - no. 20/3. <https://rb.gy/lqasfw>.