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BUSINESS CYCLE SYNCHRONIZATION OR BUSINESS CYCLE TRANSMISSION? THE EFFECT OF THE GERMAN SLOWDOWN ON THE ITALIAN ECONOMY

by Alessandro Mistretta[1]

Abstract

This work analyses the effects of the slowdown that has hit Germany since 2018 on the Italian economy using data from Banca d'Italia's Survey of Inflation and Growth Expectations. First, we briefly argue that these two economies are highly interconnected and describe the slowdown that has hampered the German economy. Using a difference-in-differences strategy, we show that since 2018, when the German economy weakened, Italian companies' sentiment and assessment whose sales were oriented towards the German market was comparatively worse than that of other companies. This finding suggests that there is a transmission link between these two economies. Finally, using a forecasting model, we provide a quantification of these effects that finds that it would have been contemporaneous and relevant for GDP, lagging for the total investment. In contrast, we do not find any significant employment effect.

JEL Classification: E2, E32, F15, F44, L6.
Keywords: business cycle, synchronization, transmission, survey.
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Contents

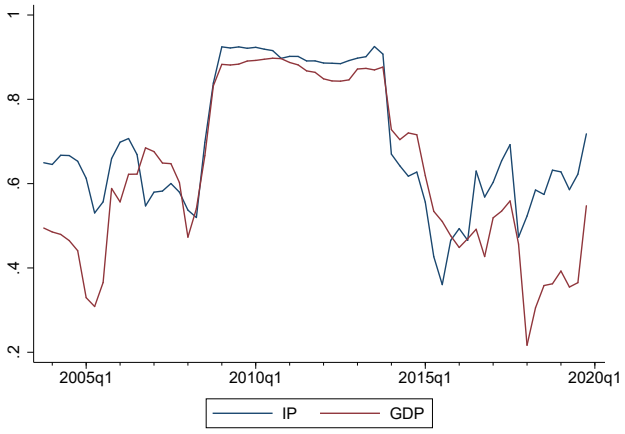
[1] Bank of Italy, Economic Research and International Relations.

1 Introduction[2]

The existence of business cycle synchronization, especially in a currency union, is extensively discussed in the economic literature. Despite the clear evidence that European business cycles (De Haan et al., 2008) have become more synchronized, there is no consensus on the determinants of business cycle co-movement that distinguish between the possibility of a common (namely determined by a common economic shock) and a transmitted business cycle (di Giovanni et al., 2018; Garnier, 2004). In this paper, given Germany's economic importance for the whole euro-area economy, we study the relationship between German and Italian business cycles.

A priori, the effect of the German business cycle on Italy's economic performance is likely to be non-trivial, as the two economies are very closely interconnected via trade relationships: according to Istat data, Germany is the top sales market for Italian firms, accounting for about 13 percent of total exports of goods in 2019; in the same year, about 17 percent of Italy's imported goods originated in Germany.[3] These close ties reflect two factors: (i) the common euro-area membership and (ii) the fact that in both economies, the manufacturing sector plays a significant role, accounting for about 23 and 17 percent of total value added in Germany and Italy respectively. The contemporaneous correlation between the key economic activity indicators (GDP and industrial production) of these economies was exceptionally high during the double dip-recession; while always remaining relatively high for industrial production (IP), it has declined for GDP since 2014 and, after reaching a historical minimum in 2018Q1, returned to growth reaching a peak during the COVID-19 recession (Figure 1). As a whole, the German and Italian business cycles appear to be closely synchronized.

Figure 1. Correlation between Italian and German economic indicators



Note: rolling correlation (5-yr) on *q-o-q* growth rates; Eurostat data.

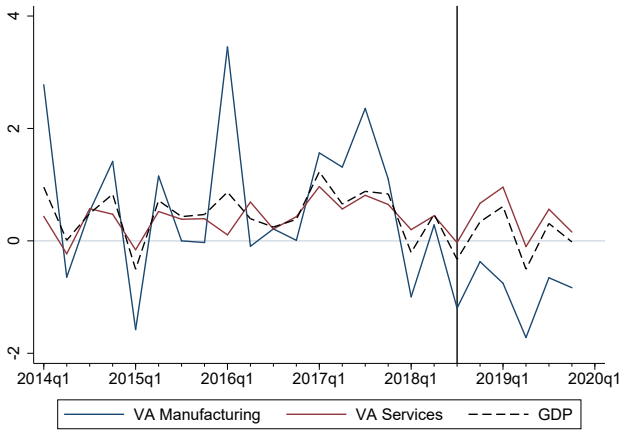
In this paper, starting from an important economic shock that hit the German economy in 2018, we analyse whether this negative shock was propagated to the Italian economy.

[2]I am indebted to Federico Cingano, Simone Emiliozzi, Marco Flaccadoro, Elisa Guglielminetti, Alberto Locarno, Concetta Rondinelli, Stefano Siviero, Alberto Tocco, Stefania Villa, Giordano Zevi, Roberta Zizza, Francesco Zollino and two anonymous referees for their valuable comments. The views expressed do not necessarily reflect those of the Bank of Italy. E-mail: `alessandro.mistretta@bancaditalia.it.`

[3]The share of goods originating in Germany is double those originating in France, which is Italy's second biggest trading partner.

Germany's economic cycle started slowing down in 2018Q1; the weakening was particularly sharp from 2018Q3 in the manufacturing sector: the growth rate of manufacturing value added has been negative since then, while services have proved to be more resilient (Figure 2).

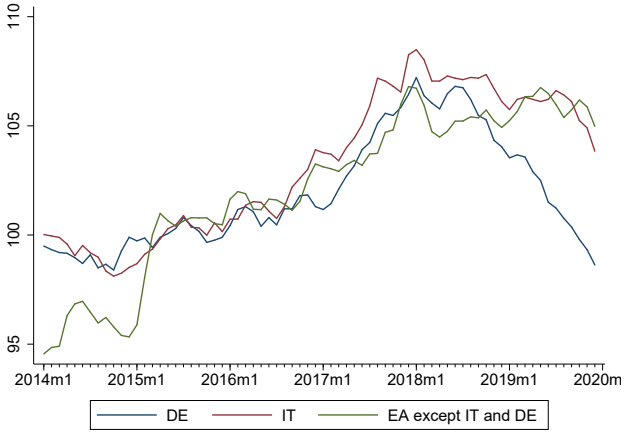
Figure 2. Germany, main economic indicators



Note: *q-o-q* growth rates on Eurostat data.

This slowdown seems to have been caused by some country-specific shocks rather than common euro-area common shocks: differently from before, the German IP dynamic has been significantly worse since 2018, with respect to those recorded in Italy and the other euro-area countries (Figure 3).

Figure 3. Industrial Production, main euro-area economies

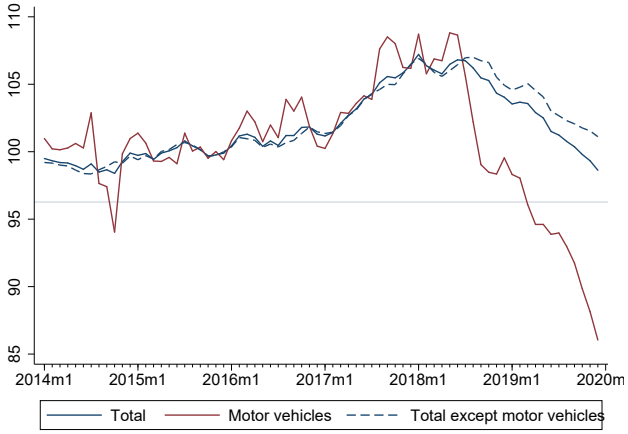


Note: MA(3), Indices 2015=100; Eurostat data.

Several temporary factors have hampered German growth since the beginning of 2018, such as the high levels of sick leave due to the unusually virulent influenza, the cold winter weather conditions, and industrial strikes; additionally, there was already growing evidence that the automotive sector may have reached its peak (Camba-Mendez and Forsells, 2018).

During 2018, German growth was curbed by bottlenecks in the automotive sector: due to difficulties in the introduction of a new emission testing procedure (WLTP), the production of motor vehicles fell sharply (see Figure 4); delays in obtaining certificates of compliance with these new standards led German manufacturers to suspend the production of many car models[4] causing severe disruption to both delivery and sales (European Commission, 2019).

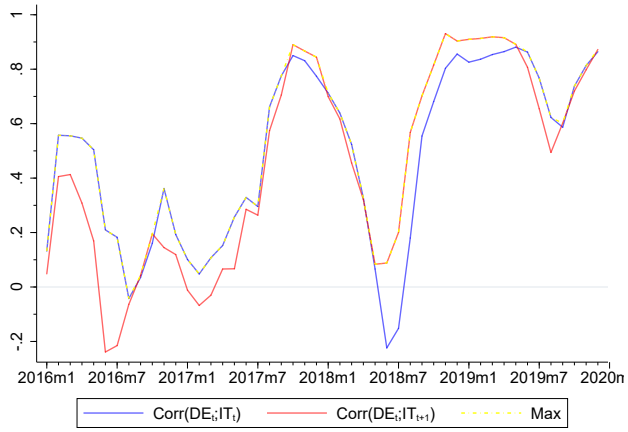
Figure 4. German Industrial Production



Note: MA(3), Indices 2015=100; Eurostat data.

The bottlenecks in the German automotive sector were significant and probably had spillover effects on the Italian[5] one: differently from before, the German automotive cycle has returned to leading the market since then (see Figure 5).

Figure 5. Correlation between automotive sectors



Note: rolling correlation (12-months) on MA(3), Indices 2015=100; Eurostat data.

[4]Some producers even decided not to request WLTP approval for selected models at the end of their life cycle, thus effectively ceasing production until new models were introduced.

[5]The automotive sector in Italy accounts for about 4.3 per cent of the IP index (of which 2.5 per cent is component production). A considerable amount of (automotive components) producers export to Germany.

As a result, the decline in industrial production was not confined to the automotive sector but widespread across manufacturing and more persistent than previously expected.[6]

Considering the nature of the German slowdown that seems to have been exogenous to the Italian economy until 2020Q1, in this paper, we analyse whether there was a transmission of the economic shock to the Italian economy.

Using a microeconometric technique, we show that the slowdown in activity suffered by Germany negatively affected the Italian economy. This work's contributions are twofold: firstly, we address the macroeconomic issue using a microeconometric approach (and in particular policy evaluation techniques) to survey micro-data; and secondly, we investigate the relationship between the German and the Italian business cycles from the standpoint of transmission rather than 'simple' synchronization.

Using a difference-in-differences (diff-in-diffs) approach applied to the Survey of Inflation and Growth Expectations (SIGE) conducted by Banca d'Italia on Italian companies, this work investigates if and how the slowdown in Germany is hitting the Italian economy. We focus on the 'direct effect' - namely, the effect on the activity of firms exporting to the German market - as this approach does not enable us to identify 'indirect effects' that may transit through other channels, such as global value chains or domestic demand. For this reason, this assessment is likely to provide a conservative estimate of the impact of the slowdown in German manufacturing on the Italian economy.

Although many works have exploited this dataset to study different issues relating to inflation expectations (see among others Bartiloro et al., 2019; Coibion et al., 2020; Conflitti and Zizza, 2020), to the best of our knowledge, only one paper uses this dataset to analyse issues relating to the business cycle (Cesaroni and Iezzi, 2017).

We find that in 2019 developments in sentiment indicators, particularly for the short term, were worse for Italian companies exposed to the German market; firms' expectations for demand and plans regarding investment and employment were significantly worse as well; the effects on investment and employment are delayed with respect to those on demand. After discussing how well the SIGE series mimics economic aggregate; we quantify the German slowdown effect on Italian GDP using a forecasting model. According to the estimates the effect on GDP was about 1 percentage point, particularly concentrated in 2019; the negative effect is equal to 2.5 percentage points on firms' investment; conversely, we do not find any effect on employment.

The rest of the paper is structured as follows. Section 2 reviews the literature and Section 3 describes the dataset used. Section 4, proposes a microeconometric exercise to estimate the effect of the German slowdown on Italian firms' economic activity, while Section 5 quantifies this effect from a macroeconomic point of view. Finally, Section 6 concludes.

2 Literature

Since Dellas (1986), the existence of a common business cycle across countries has been extensively studied from both a theoretical and an empirical point of view. Dellas (1986) proposed a model that predicts a positive and persistent co-movement in trade and GNPs across countries; he showed empirically that the primary source of this positive covariance is the existence of common shocks rather than trade interdependence. This view was confirmed by Canova and Dellas (1993), who find a positive (moderate) effect of trade interdependence on the common business cycle, though it is not statistically significant.

[6] According to the European Commission (2019), German GDP in 2018 would have been 0.6 per cent higher without such a fall in the automotive sector. According to the national accounts, between 2014-2017 Manufacturing contributed, on average, to total German growth for about 0.8 per cent per year; this contribution became modest in 2018 (0.2 per cent) and negative in 2019 (-0.8 per cent).

The determinants of business cycle co-movements between countries were investigated by Baxter and Kouparitsas (2005), who found controversial results. Using a large dataset with more than 100 countries, they showed empirically that: i) the correlation between business cycles is increasing in the trade relationship; ii) the industrial structure does not affect business cycle synchronization; and iii) the existence of a currency union does not have a significant impact on the correlated business cycle.

The importance of a currency union for business cycle synchronization has been analysed extensively since the late 1990s. Frankel and Rose (1998) studied the effects of a common currency area on the business cycle in their seminal paper. They argued that these effects are ambiguous: i) on the supply-side, by reducing trade barriers, a common currency union can lead to more industry specialization by country then more asynchronous business cycles resulting from industry-specific shocks; ii) on the other hand, increased integration may result in more highly correlated business cycles because of demand shocks or intra-industry trade. However, this ambiguity was more theoretical than empirical since they found empirically that greater integration involves a more highly integrated cycle.

Following this strand of literature, many papers analyse how business cycle synchronization was affected by the adoption of the euro. Gonçalves et al. (2009) found that the adoption of the euro has increased the correlation among euro-area (EA) members' economic cycles. Other papers classify countries according to their importance to determine the EA business cycle distinguishing between *European core business cycle* countries and *periphery* countries (see among others Ahlborn and Wortmann, 2018). Finally Campos et al. (2019), found that across European countries, the correlation coefficients between business cycles have significantly increased over time, from an average of 0.4 before the introduction of the euroin 1999 to 0.6; however, due to the existence of European national borders, this correlation is lower than the US Clark and van Wincoop (2001).

To summarize, the empirical literature explains the existence of business cycle synchronization because of: i) the presence of common shocks that hit different economies at the same time (Dellas, 1986; Canova and Dellas, 1993; Imbs, 2004); and ii) the possibility that shocks are transmitted through trade and multinational linkages (Frankel and Rose, 1998; Kleinert et al., 2015; di Giovanni et al., 2018; Burstein et al., 2008).

Due to the importance of the interconnection within the euro-area, in this paper, in line with the transmission view, we investigate how the German business cycle affects the Italian one. As stated previously, we study the effects on the Italian economy of some country-specific shocks that occurred in Germany; this is particularly suited to investigating whether a negative German economic shock is transmitted to the Italian business cycle.

3 Data

In this paper, we use the Survey of Inflation and Growth Expectations (henceforth SIGE) carried out quarterly by Banca d'Italia, on a sample of about 1,000 industrial and service firms with more than 50 employees.[7] The survey collects, among other things, data regarding firms' expectations for consumer price inflation, developments in own selling prices, views on the broad macroeconomic outlook, as well on own business. The typical question gives the possibility to choose between three options that indicate an improvement, a worsening, or a stabilization of a specific aspect of a firm's activity. To derive a macroeconomic message, these responses are ag-

[7]From 2019Q4, the sample was extended to 1,200 firms. The sample represents about 4 per cent of the entire reference population (about 5 per cent from 2019Q4); however, the results refer to the reference population thanks to sampling weights (Banca d'Italia, 2019).

gregated using the balances between the share of those companies who indicate an improvement and those that signal a worsening.

Questions regarding economic activity included in the SIGE can be broadly classified into two different groups: those aimed at assessing the firm's sentiment, both on the general economic situation and its own economic situation (henceforth *sentiment indicators*); and those that elicit firms' projections/assessments about their own decisions such as investment or employment plans or their economic total or external demand (henceforth *assessment indicators*).

In this paper, we aim to assess whether and to what extent the German economy's slowdown affected relevant economic indicators for Italy as measured by the SIGE. The following indicators are considered:

- the *sentiment indicators* include: firms' sentiment on the Italian general economic situation; opinions on the current conditions for investing; the probability of observing an improvement in the Italian economy in the following three months; sentiment indicators about companies' own expected business conditions in the following three months and three years (see Figure B4);[8]

- the *assessment indicators* include: opinions on firms' current and expected demand for their products (both total and external); investment plans at different time horizons; and the number of employees in the next three months (see Figure B7).

The information contained in the SIGE appears to be very helpful for analysing the business cycle, as it tracks the corresponding aggregates from National Accounts quite reliably (similar results hold for other business surveys; see among others Bachmann and Zorn, 2020).

Figure B2 shows how the SIGE's balances (blue lines) are very well synchronized with national account aggregates (red dots): the question about the dynamic of total demand seems to mimic GDP growth well; similarly, the question on investment plans correlated with the growth rate of Gross Fixed Investment (GFI) and the question on employment with employment growth.[9]

These graphical findings are corroborated by some simple regression models where the national account series are regressed on the corresponding SIGE balances. As shown in Table B5, the SIGE balances seem to account for more than 80 per cent of the variation in the response variable around its mean. This percentage appears to be higher when yearly data are considered (row 1) and when the last eight quarters are not considered in the regression.[10] [11]

The SIGE contains some additional structural information, such as a firm's export propensity, which is used to classify firms in four different classes.

We consider the period between 2014Q1 and 2019Q4 and exclude firms in the construction sector, whose questionnaire does not include questions relating to the German market; non-respondents to those questions belonging to the remaining sectors were dropped.

Additionally, we excluded export-oriented firms that exited the sample before 2019Q1, since we are not able to identify those selling to the German market; at the same time, we keep the firms that are no longer in the sample but declared that they only sell to the domestic market, since they can be univocally classified as part of the control group.

These criteria exclude about 5 percent of the firms from the sample in recent waves (30 percent at the beginning of the sample period; see Table B3). We end up with a sample of about

[8] In the following figures, when the questions refer to projections, the balances are plotted over the forecast period; for this reason, in some graphs there is one more observation than in the others.

[9] In this work, employment growth is based on the number of *employees (domestic concept)* released by Eurostat.

[10] According to the System of National Accounts, recent data are subjected to revisions (for 3 years) that particularly affect quarterly data.

[11] For more details on the forecasting power of these series, see Section A.

16,300 observations for the period 2014Q1-2019Q4.[12]

3.1 Firms' exposure to the German market

The SIGE questionnaire (Appendix C) occasionally includes specific questions to address issues that happen to be particularly relevant from a policy perspective when the survey is conducted. For instance, firms were recently asked to assess the impact on their activity of the 'trade war'between the US and China. In 2019Q1 and 2019Q3-2020Q1, the survey included the following questions, aimed at gauging firms' expectations on current and future external demand from Germany:

Compared with three months ago, is the foreign demand for your products…?	*Higher*	*Unchanged*	*Lower*	*I do not export in this market*
In Germany	☐	☐	☐	☐
How will the foreign demand for your products vary **in the next 3 months**?	*Increase*	*No change*	*Decrease*	*I do not export in this market*
In Germany	☐	☐	☐	☐

Using these replies, firms are partitioned into three groups: exporters to Germany,[13] exporters to other markets and non-exporters.[14] This partition is the key to implementing the empirical strategy.

Due to the dataset's lack of information, we assume that exporters to Germany both in 2019Q1 and in 2019Q3 have been exporting to that country since 2014Q1. This assumption is justified because decisions concerning destination markets are strategic, as entering a new market entails non-trivial initial costs. Indeed, according to official statistics (Istat and ICE, 2019), the number of firms exporting to Germany remained roughly stable during the period considered: there were 25,024 in 2014 and 24,408 in 2018.

In our sample, about 49 percent of firms only sell in the domestic market; about 70 percent of the remaining firms export to Germany.

Additionally, in 2019Q4, we asked for information about the propensity to export to the German market.

	Zero	*Up to 1/3 but more than zero*	*Between 1/3 and 2/3*	*Over 2/3 of export*
Considering your firm's total exports in 2019, please indicate the share of exports to the German market	☐	☐	☐	☐

This information is potentially important since it allows a proxy to be computed for the degree of the *German shock* that hits a specific firm according to their exposure to the German market.

We define the exposure as:

$$Exposure_{it} = PropensityExport_{it} * ProportionExportGermany_{i} \quad (1)$$

This represents the share of total sales from exports to the German market. Due to data limitations, we cannot obtain a continuous variable.[15] Additionally, we assume that the proportion

[12] We decided to exclude data from 2020Q1 since the common economic shock relating to COVID-19 could affect the results.

[13] Firms that declare to export in Germany in two over three of the quarters in which they were interviewed are classified as exporters to Germany; conversely, we exclude from our analysis firms that rarely declared to export to Germany.

[14] The questionnaire includes a specific question to distinguish between exporters and non-exporters (see question A.2 in Appendix C).

[15] For both export propensity and proportion of exports to the German market, firms indicate a range instead of the precise number. To compute $Exposure_{it}$, we use the median value within the provided range.

of export to the German market remains in the same range during the whole period.[16]

Using this strategy, we can define $Exposure_{it}$ for about 5,000 observations in the whole period (see Table B4). For those who export to Germany, they sell about 10 per cent of their total sales in Germany on average; less than 1 per cent of the observations are related to firms that export more than 60 per cent of their sales to Germany (see Figure B1).

3.2 Uncertainty measures

A large body of literature has investigated the effect of uncertainty on firms' activity finding that there is a negative relationship between demand uncertainty and firms' decisions (see among others Guiso and Parigi, 1999; Bloom, 2009); additionally, uncertainty itself rises sharply during recessions (Bloom et al., 2018).

To borrow from this argument, demand uncertainty could be an important channel to explain business decisions (such as investment end employments) for exporters to Germany.

Following Giordani and Soderlind (2003), let's define μ_i as the point forecast of firm i about its future economic condition, namely the firm's expected value based on three possible states. Assuming that its subjective forecast distribution is known, we define a measure of individual uncertainty, which is informative about the distribution probability attached to the different states, as the standard deviation (σ_i) of this forecast distribution.

Thanks to the SIGE information, we compute a simple version of these measures.

In particular, the SIGE questionnaire asks in each quarter t about the probability assigned by the firm i to better (p_b), worse (p_w) and unchanged (p_u) business conditions for the next three months and three years.

We assume a payoff scheme (π_j) for each of these three (j) states, in particular

$$\pi_j = \begin{cases} -1 \textit{ with probability } p_w; \\ 0 \textit{ with probability } p_u; \\ 1 \textit{ with probability } p_b; \end{cases}$$

Using this information, we define the individual point forecast as:

$$\mu_{it} = \sum_{j=w,u,b} p_{ijt}\pi_{ijt} = -1 \cdot p_{iwt} + 0 \cdot p_{iut} + 1 \cdot p_{ibt} = -p_{iwt} + p_{ibt} \tag{2}$$

and individual (forecast) uncertainty as:

$$\sigma_{it}^2 = \sum_{j=w,u,p} p_{itj}(\pi_{itj} - \mu_{it})^2 \tag{3}$$

The average of the individual uncertainty ($E(\sigma_t^2)$) across firms contributes to determining a measure of aggregate uncertainty.

According to Giordani and Soderlind (2003), an additional source of uncertainty comes from differences between firms' expectations. In particular, they define disagreement with the variance of the point estimates across firms ($V(\mu_t)$).

Finally, aggregate uncertainty ($V_A(y)$) is equal to the sum of disagreement and the average individual uncertainty:

[16] We are aware that this assumption, namely a constant share of export to Germany in a specific range during the time, is stronger than those about the decision to export in the German market. However, this is the best information that we have, and we use that only in a robust exercise.

$$V_A(y) = V(\mu_t) + E(\sigma_t^2) \tag{4}$$

According to our results, firms seem to have a more favourable expectation about their economic conditions in the medium run (three years) with respect to the short run (three months); however, a higher expectation is associated with higher uncertainty (see Figure B3). Disagreement is higher during the recession periods, and this seems to be the primary source of uncertainty at the aggregate level, confirming the main finding of Giordani and Soderlind (2003).

4 The effect of the German slowdown: a micro-econometric approach

4.1 Empirical strategy

We use a diff-in-diffs strategy to analyse the causal link between the German economic slowdown and Italian firms' sentiment and economic behaviour.

Following the literature on diff-in-diff estimators (see, among others, Imbens and Wooldridge, 2009; Angrist and Pischke, 2009), we define the German slowdown as 'Treatment', which can be interpreted as an external shock to exporters to that market. Exporters to Germany thus comprise the treated group (henceforth *'Treated'*), while the control group includes the rest of the sample (non-exporters and exporters to markets different from Germany; henceforth *'Control'*).

As already mentioned in the previous section, firms selling to Germany both in 2019Q1 and in 2019Q3 are assumed to have been exporting to that country throughout the whole sample period. Despite possible counter-arguments, this strategy remains valid in light of the remarks in Section 3.1. According to this definition, the sample is classified as shown in Table B3. The treatment period is set to begin in 2018Q3, the first quarter after the growth of German manufacturing value added turned negative.[17] We are fully aware that different economic issues may have different lags in responding to the same shock; however, to avoid an arbitrary treatment period for the different series that are evaluated, we decided to set Treatment in the first quarter in which German manufacturing had continuously negative *q-o-q* variations.

The estimated equation is the following:

$$y_{it} = \beta GER_i Treat_{t>2018Q2} + \alpha_1 GER_i + \alpha_2 Treat_{t>2018Q2} + \varphi_t + q_t + \varphi_i + \epsilon_{it} \tag{5}$$

Where y_{it} is the outcome variable potentially hit by the German slowdown, GER_i is a dummy identifying the *Treated* group (exporters to Germany), $Treat_{t>2018Q2}$ is the post-treatment dummy equal to one during the period of the German slowdown (from 2018Q3 to 2019Q4), φ_i are (vectors for) fixed effects which may vary across specifications.

Since we are using quarterly data, seasonality must be taken into account. For this reason, in each regression, we control for at least four seasonal dummies (q_t).[18] Finally, to control for different cycles at the industry/area level, we interact time dummies with the area/industry ones.

The parameter of interest is β, representing the causal effect of the "German slowdown shock" to the different outcomes considered. This parameter assumes a particular relevance for the *assessment indicators* since they can be used as proxies for the National Account aggregates.

This parameter represents the average causal effect over the period 2018Q3-2020Q1. However, depending on the length of exposure to the Treatment (i.e. the German slowdown), the causal

[17] As discussed in Section 1, since the beginning of 2018, some temporary factors have hampered the German economy; however, only after the 2018Q2 did the slowdown in manufacturing become evident and persistent.

[18] Alternatively, 24 different dummies are used (φ_t, one for each quarter), which bundle together trend and seasonal effects.

effect may change over time. For this reason, using a Dynamic Treatment Effects model (Callaway and Sant'Anna, 2018; Goodman-Bacon, 2018), we explore time-varying diff-in-diff effects for a group of variables,[19] in which we estimate the dynamic effects of Treatment for each semester (Jacobson et al., 1993). The estimated equation changes as follows:

$$y_{it} = \beta GER_i Treat_{t>2018Q2} + \sum_{h=2018H2}^{2020H1} \beta_h \mathbb{1}_h GER_i + \alpha_1 GER_i + \alpha_2 Treat_{t>2018Q2} + \mu_t + q_t + \mu_i + \epsilon_{it} \tag{6}$$

where the causal effect for a given semester h is equal to $\beta + \beta_h$.[20]

Finally, in a robustness exercise, we use the heterogeneity in treatment intensity, namely the exposure to the German market. Using the Dose-Response Function (DRF) approach proposed by Cerulli (2015) based on Hirano et al. (2003), we can check whether the firms more exposed to German demand are those that recorded the worst effect.

4.2 Results

For the sake of robustness, we estimate several specifications for each variable of interest, differing as regards time and firm fixed effects. In column (1) (Table B6), we only control for seasonal effects using quarterly dummies, while in the second specification (column (2)), we control for both quarterly seasonal effects and firm fixed effects. In the third specification (column (3)), firm fixed effects are replaced by controls for the sectors (manufacturing, other industry, trading, other services), geographical area (North-West, North-East, Centre, South), and firm size ('50-200 employees', '200-1,000 employees'and 'more than 1,000 employees'); this specification also includes a set of time dummies. In the fourth specification (column (4)), in addition to firm size and geographical area, we control for sector-specific cycles, using ad-hoc time-trend-seasonal dummies. Finally, in column (5), we control for different time effects at the geographical level. In all regressions, standard errors are clustered at the firm level, and the sample weights provided in the dataset are used to obtain results referring to the underlying population as a whole. Econometric estimates are supplemented with graphical representations, with a twofold goal: first, to give an intuitive representation of the impact; second, to show that the common trend assumption is fulfilled[21] [22]

The results show that the German slowdown adversely affected the sentiment and economic choices of Italian firms'. The worsening is remarkably for firms that export to Germany. The effects are, in most cases, statistically and economically significant. The results are shown in Table B6, where each parameter is estimated in a different diff-in-diff regression.

4.2.1 The effect on *Sentiment indicators*

In the pre-treatment period, exporters to Germany had a very similar perception of Italy's current situation to that of the other firms (Figure B4). After the treatment, the former group's opinions became markedly worse, with the balance between expectations of improvement and worsening being lower by about 12 percentage points (see SITGEN in Table B6).

[19] Notably total demand, investment plans and number of employees.

[20] Data on 2020H1 are the projection collected in 2019Q4, before the COVID-19 disruption.

[21] All the graphs report seasonally adjusted data based on regression dummies.

[22] In the graph, the averages for the variables belonging to the three different groups are represented. These variables usually have a range of responses between -1 and 1, where zero represents a neutral response. For some questions, to guarantee the possibility to distinguish both the direction and the magnitude of the variation, the range is set between -2 and 2.

Concerning the question on the probability of an improvement in Italy's general economic situation in the following three months,[23] the average for the replies of firms exporting to Germany before the treatment was higher than that for of the other firms by about 3 points. This difference declined by about 2 points after the treatment (see PROMIG in Table B6 and Figure B4). Finally, focusing on the opinions about the conditions for investing, while treated firms had a better assessment than the control group before 2019, the roles were reversed after the German slowdown (see SITINV in Table B6 and Figure B4). In this case, the negative effect is highly significant from both a statistical and an economic viewpoint: the balance between expectations of an improvement and a deterioration is 14-points worse for treated firms with respect to the pre-treatment period. Focusing on firms' sentiments about their business situation, exporters to Germany are relatively more optimistic about the medium-run outlook than the short-term one historically speaking. The German slowdown had a negative impact, particularly on the short-run opinions. Among treated firms, the (weighted balance of the) sentiment regarding their expected situation in the following three months is lower by about 8 percentage points (see SITIMP5 in Table B6 and Figure B4). Instead, no effect is found for the sentiment regarding the medium run (see SITIMP36m in Table B6 and Figure B4).

4.2.2 The effect on *Uncertainty measures*

According to the measures proposed in Section 3.2, firms' points forecast (μ_{it}) are historically higher for companies that export to Germany (Figure B5). At the same time, exporters to Germany are characterized by a higher level of individual uncertainty since, on average, they have a forecast distribution with fatter tails.

According to our model, the treated group reduced their short-term point forecast by about 0.05 points (see Table B6 and Figure B5). The treatment seems to have a weakly negative effect on individual uncertainty, probably because the treated group had slightly more conservative expectations in favour of economic stability during the treatment period. We do not find any effect on disagreement or on total uncertainty.

Looking at the medium run (three years ahead), the causal effect on individual forecasts seems to be very weak; at the same time, individual uncertainty seems to be negatively affected by the German slowdown (namely, the treated group becomes less uncertain with respect to the control one). Additionally, at the aggregated level, disagreement within the treated group increased after the German slowdown. This seems to be the main contribution to the increment of total uncertainty during the treatment period for the treated group (see Table B6 and Figure B6).

4.2.3 The effect on *Assessment indicators*

The impact og the German slowdown is evident and relevant for the variables included in the *assessment indicators*, namely those that track national accounts measures well.

As regards firms' total current demand for own products, after the treatment, the opinions of treated firms worsened significantly more than those of the firms in the control group, with a negative effect amounting to about 30 points (see DOMTOT in Table 4.2 and Figure B7); weaker results hold for expected demand in the next three months (20 points on average; PRETOT).

The German slowdown seems to have hit total demand significantly since 2018H2; the effect became greater in 2019 (see Table B9 and Figure B10).

[23] For this question, firms can choose between different ranges of probability; we assign to each firm the median value of the range chosen. Unlike the other questions, in this case, the results are in terms of probability points instead of balance.

The impact is also relevant for the opinions relating to external demand: the negative effect of German slowdown on external demand is negative and significant by about 13 points (DOMEST); however, we do not find any statistically significant evidence on the expected external demand (PREEST).

The effect on firms' investment plans for the current year is also sizeable. Before 2019 the balance for exporters to Germany was higher, on average, by about 14 points; this gap turned negative after the treatment (-15 points on average) across all specifications (see INVPRE in Table 4.2 and Figure B7). Similar results are found for the capital accumulation planned for the current semester (INVSEM). In this particular case, the effect seems to be relevant from 2019H1 onwards and should be weakly significant from 2020H1 (see Table B10 and Figure B11).[24]

The intention to hire new workers in the next three months also decreased more for treated firms by about 8 points (see OCCTOT in Table 4.2 and Figure B7). The causal effect on the intention to hire seems to be negative from 2018H2; however, it became significant from 2019H2 and, according to firms' expectations, should be greater in 2020H1.

Taking into account that these variables are reliable proxies for the corresponding national account aggregates (henceforth Target variables), these results appear particularly important, suggesting that the German slowdown had a (contemporaneous) impact on total demand and (lagged) for investment plans and intention to hire.

4.3 Robustness

Since the share of sample excluded by the analysis is greater for more remote quarters (see Section 3.1 and Table B3), the results could be affected by a selection bias problem. To address this issue, we proposed two different robust regressions: i) we use a symmetric pre- and post-treatment period considering only the last 12 quarters (2017Q1-2019Q4; see col (2) of Table B7); and ii) we only consider one balance panel since 2016Q1 (see col (3) of Table B7). In both cases, the results are confirmed, suggesting that the selection process present in the data does not affect the results.[25]

This work analyses the German slowdown's direct impact on the Italian economy, namely that recorded by exporters to Germany. However, as an additional check, we exclude from the control group (and then from the entire analysis) exporters to markets different from Germany (see col (4) of Table B7). This should reduce the possibility that the 'second order effect', namely that relating to indirect global value chains, result in downward biases. The results are confirmed in this case too. Additionally, to address the same issue, we propose a falsification test excluding exporter to Germany from the analysis. In this case, we designate the exporters to a country different from Germany as a treated group, while the control group is composed of firms that do not export. In this specification, we test the presence of what we called a 'secondary effect' . Results suggest (see col (5) of Table B7, Figure B8 and B9) the irrelevance of this effect: the magnitude of the estimates is negligible compared with the reference estimation, and not all parameters are statistically significant.

To check whether the two groups are balanced for the exposure to the German market, we test the effect of the treatment by applying the same modeling strategy to the firm's 6- and 12-months ahead expectations for the year-on-year growth of the Italian harmonized index of consumer prices (HICP). In principle, these variables should not be affected by the German slowdown since there is no reason why exporters to Germany should have different expectations

[24] Also in this case, effects on 2020H1 are those related to plans declared in 2019Q4.

[25] The reference estimates are the specification proposed in col (3) of Table B6, also reported in col (1) of Table B7.

for the Italian HICP due to their nominal nature; this suggests that both groups should have similar expectations in both pre- and post-treatment periods.

The findings confirm this hypothesis: in neither case does the treatment matter (Figure B13 and Table B12); the expectations are roughly the same for both groups, both pre- and post-treatment, suggesting that the two groups are balanced except for their exposure to the German economic outlook.

Finally, the last robustness exercise tests how heterogeneity in treatment among exporters affects a firm's performance: we hypothesize that the firms that are most exposed to the German market should record a greater negative effect.

We test this hypothesis by using the dose-response function approach with a third-order polynomial approximation.[26] The results confirm the existence of a negative relationship between the level of (treatment) exposure and the deterioration of sentiment indicators during the slowdown period, meaning that firms more exposed are those that recorded a greater drop in demand with a stronger negative effect on investment decisions and future occupation (see Figure B14).[27]

In our view, this negative relationship between treatment intensity and causal effect is an additional finding that confirms our main argument, meaning that the German cycle is relevant and affects the Italian one.

5 The effect of the German slowdown: a macro-econometric quantification

The SIGE *Assessment indicators* (henceforth proxies) track some national account economic aggregates very well (GDP, GFI, and employment growth rates; henceforth target variables). Additionally, these proxies seem to have good out-of-sample forecasting accuracy for the corresponding target variables (for more details, see Appendix A; on the same argument, see among others Milani, 2017; Lahiri and Monokroussos, 2013).

Economic theory justifies these properties by using two different arguments: i) the *'animal spirits'view* posits autonomous fluctuations in beliefs that in turn have causal effects on economic activity (Blanchard, 1993; Hall, 1993); and ii) the *information view* points that confidence measures contain essential information about the current and future states of the economy (Beaudry and Portier, 2004, 2014; Barsky and Sims, 2012). Analysing the relevance of one point of view to the other is out of the paper's scope; what is essential here is these variables' capacity to mimic economic activity.

Using the results of Section 4, we can compute the unobserved counterfactual outcomes (SIGE balances) that clean up the proxies from the effect caused by the German slowdown (Angrist and Pischke, 2009).

Let us define an aggregated balances B_{Tot}, as the weighted average of the balances referring to the three different groups: treated firms (B_{tr}), those in the control group (B_{co}) and those excluded by our analysis (B_{NC}).

$$B_{Tot,t} = w_{tr,t}B_{tr,t} + w_{co,t}B_{co,t} + w_{NC,t}B_{NC,t} \tag{7}$$

Let's rewrite equation 7 as:

[26] We use the stata command *ctreatreg* proposed by Cerulli (2015) that estimates causal effect according to treatment dose, namely the presence of heterogeneity treatment among the treated.

[27] Unfortunately, in our sample, only about 2.5 per cent of firms export more than 40 per cent of their total production to Germany; for this reason, the confidence interval become larger for a high degree of treatment.

$$B_{Tot,t} = w_{tr,t} \underbrace{(B_{tr,t} - B_{co,t})}_{\alpha_1} + (w_{tr,t} + w_{co,t})B_{co,t} + w_{NC,t}B_{NC,t} \tag{8}$$

Then define the unobserved counterfactual balance $B^{UC}_{Tot,t}$ as the weighted average of balances for the three groups where, for the treated firms, we subtract to the actual balance the time-varying effects as estimated in Section 4.2.3 .[28]

$$B^{UC}_{Tot,t}(\beta) = w_{tr,t}(\alpha_1 - \overbrace{(\beta + \beta_h)}^{\text{Causal Effect}}) + (w_{tr,t} + w_{co,t})B_{co,t} + w_{NC,t}B_{NC,t} \tag{9}$$

Using this approach, we compute the unobserved counterfactual dynamics for the proxy variables ($B^{UC}_{Tot,t}$; see Figure B15), thereby getting rid of the effect of the German slowdown for the Italian economy: all counterfactual proxy variables have a more favourable dynamic with respect to the real one (B_{Tot}), suggesting that the economic shock recorded in Germany was transmitted to the Italian economy.

To quantify the loss (in terms of GDP, GFI, and employment) relating to the German slowdown, we use these counterfactual balances ($B^{UC}_{Tot,t}$) in a forecasting model.

Let's define y_t as the growth rate of the target variables and $\hat{Y}_t$ as the value predicted by the forecasting model using the corresponding SIGE balances (proxy), as regressors.

$$\hat{Y}_t = \hat{\gamma} B_{Tot,t} + \hat{\alpha}_1 y_{t-1} \tag{10}$$

where $\hat{\gamma}$ and $\hat{\alpha}_1$ are the parameters estimated according to the model selected in Appendix A that maximize the one-step-ahead out-of-sample accuracy.[29]

Using the same approach, we obtain the unobserved counterfactual figure, net of the German slowdown effect, for the target aggregates ($Y^{\hat{U}C}_t$) by applying the counterfactual value ($B^{UC}_{Tot,t}$) for SIGE series obtained using Equation (9) to the same model.

$$\hat{Y}_t^{\,UC} = \hat{\gamma} B^{UC}_{Tot,t}(\beta) + \hat{\alpha}_1 y_{t-1} \tag{11}$$

Then, we estimate the effect (E_t) of the German slowdown on the Italian economy as the difference between the growth rate predicted by the model ($\hat{Y}_t$) using the real balances and those ($\hat{Y}_t^{\,UC}$) obtained using the counterfactual proxies ($B^{UC}_{Tot,t}$) as regressor.

$$E_t = \hat{Y}_t - \hat{Y}_t^{\,UC} \tag{12}$$

Table 1. Estimated Effect

Variable	year	y_t	$\hat{Y}_t$	$\hat{Y}_t^{\,UC}$				$E_t = \hat{Y}_t - \hat{Y}_t^{\,UC}$			
				Min	*mean*	*median*	*Max*	*Min*	*mean*	*median*	*Max*
GDP	2018	0.94	0.95	0.98	1.11	1.11	1.24	-0.03	-0.16	-0.17	-0.30
	2019	0.29	0.34	0.47	1.18	1.17	1.90	-0.13	-0.84	-0.83	-1.56
Investments	2018	3.11	4.17	4.07	4.55	4.55	5.03	0.11	-0.37	-0.37	-0.86
	2019	1.14	1.79	2.57	4.31	4.31	6.1	-0.78	-2.52	-2.52	-4.31
Employment	2018	0.95	1.4	1.33	1.4	1.4	1.47	0.07	0.00	0.00	-0.07
	2019	0.45	1.04	0.74	1.09	1.09	1.45	0.30	-0.06	-0.05	-0.41

[28] The effects are estimated for each different semester h. To be conservative, we decided to correct the actual balances using the smallest causal effect estimated in the previous section; namely specification (3) of Table B9 and specification (2) for both investment (Table B10) and employment (Table B11).

[29] In equation 10, we use an ARX(1) model since the linear model is a particular case with $\alpha_1 = 0$. However, to quantify the effect, we use the best model chosen according to Appendix A.

In Table 1, for each target variable, we show the real growth rate according to the National Accounts data (y_t), the growth rate from our forecasting model ($\hat{Y}_t$) and, finally, that estimated as the counterfactual measure ($\hat{Y}_t^{UC}$).

As the latter itself depends on an estimation procedure[30] we propose a confidence interval.[31] Finally, we compute the effect E_t for the Italian economy deriving from the German slowdown based on Equation (12); in addition, in this case, we propose an average effect and the relative confidence interval.

According to our estimates, the impact of the German slowdown may have been negative on Italian GDP growth by about 0.2 and 0.8 percentage points in 2018 and 2019, respectively, signalling that the German slowdown was immediate and significant for Italian GDP.

The effect on investment decisions may have been delayed: we do not find any significant effect on investment in 2018[32], while the impact may have been about 2.5 percentage points in 2019.

Finally, we do not find any statistically significant effect on employment decisions, in line with the results shown in Table B11 and Figure B12 which predict a significant effect only for 2020H1.[33]

6 Conclusions

The novelty of this work is twofold: 1) we study a macroeconomic issue using both micro and macro techniques, specifically by combining policy evaluation techniques with forecast methods; and 2) we show that there is a transmission channel from the German cycle to the Italian.

Using a diff-in-diffs strategy, based on micro-data from the Survey of Inflation and Growth Expectations, collected quarterly by Banca d'Italia, we investigate to what extent the German economic slowdown that occurred in 2018Q2-2019Q4 affected Italian firms. In particular, we study whether that external shock affected firms' opinions about the general Italian economic situation, their own business situation and their expectations for accumulation, hiring and demand, which are good predictors of the corresponding National Account aggregates. We find that since late 2018, the developments/change in the sentiment and assessment indicators, particularly for the short term, were worse for Italian companies exposed to the German market; firms' assessments for demand and plans regarding investment and employment were significantly worse as well.

Firms exposed to the German market declared the worst expectations for their activity in the short term (3 months ahead); moreover, for the medium term (3 years ahead), exporters to Germany suffered from higher uncertainty but, at the same time, disagreed less with each other; as a result, the German slowdown (only) weakly affected total uncertainty for the Italian economy.

We additionally show that the SIGE series helps to predict the corresponding National account aggregates (GDP, total investment and employment). Using the results drawn from the diff-in-diffs exercise, we recover the unobserved counterfactual SIGE series, namely those that clean up the effect caused by the German slowdown from the assessments. By using these series, in a forecasting model, we can compute the unobserved counterfactual figures for national account aggregates in a forecasting model. By comparing these counterfactual figures with those

[30] $B^{UC}_{Tot,t}$ depends on the estimation proposed in Section 4

[31] To obtain this measure, as input for our model we use the confidence interval at 5 per cent used in Figure B15.

[32] The related confidence interval includes 0.

[33] As explained before, the results for 2020 are based on assessment collected in 2019Q4. We do not quantify the effect for 2020.

recovered using the real SIGE balances, we provide a quantification for the negative effect of the German slowdown on Italian GDP, investment and employment growth.

Our findings suggest that the German slowdown may have had a negative and contemporaneous impact on Italian GDP, which can be estimated at about 1 percentage point over two years (2018-2019). The effect would have been considerable and delayed for investment but negligible for employment, whose effects are not statistically different from zero for both years (2018-2019). These results suggest that there are transmission channels in these two economies where an important role seems to be played by the commercial trade relationship.

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A A simple forecasting model

In this appendix, we test the predictive properties of SIGE balances for the corresponding variables in the National Accounts.

We implement this test using two simple models: the first one is a simple linear regression, where the SIGE series are regressors; in the second (ARX(1) model), we also consider an autoregressive component.

Linear Model	*ARX(1)*
$y_t = \gamma B_{Tot,t} + \epsilon_t$	$y_t = \gamma B_{Tot,t} + \alpha_1 y_{t-1} + \epsilon_t$

These two models are estimated using both quarterly[34] and annual data; however, since we are focusing on the effect over 2018 and 2019 when the quarterly model is used, we aggregate quarterly figures to obtain the annual frequency.

To analyse the forecasting performance, we split the sample into two sub-periods and, starting from 2016Q1, we estimate one-step-ahead (out-of-sample) forecasts. We obtain the relative forecasting performance by using both average *Bias* and the *Mean Absolute Forecast Error* (MAFE).

Let's define:

$$Bias = \sum_{t=t_0}^{T} \frac{1}{T-t_0} \hat{e}_t = \sum_{t=t_0}^{T} \frac{1}{T-t_0} (y_t - \hat{y}_{(t|t-1)}) \tag{1}$$

and

$$MAFE = \sum_{t=t_0}^{T} \frac{1}{T-t_0} \mid \hat{e}_t \mid \tag{2}$$

where y_t is the growth rate of the target variable considered in the forecast exercise, $\hat{y}_{(t|t-1)}$ is the one-step-ahead forecast for time t computed using the information at time $t-1$; finally, t_0 and T are the first and the last quarter involved in the out-of-sample prediction (2016Q1 and 2019Q4, respectively).

Due to the different data availability, the information considered in each model differs for different variables.

Table B1. Observations used in the forecast exercise

	GDP	***Employment***	***Investment***
Period	*2010Q1-2019Q4*	*2005Q1-2019Q4*	*2013H1-2019H2*
Quarterly* obs *(n)*	40	60	14
Annual obs *(n)*	10	15	7

* For investments, we consider half-annual instead of quarterly data.

Table B2 statistics on forecast performance are shown for both quarterly and annual growth rates. Since annual models are based on just a few observations, to guarantee more robust results, we also aggregate - with two different procedures - quarterly figures to obtain the annual frequency.

[34] Half-yearly data in the case of investment.

In general, there is no particular advantage to using models with an autoregressive component: the relative coefficient is statistically different from zero only when regressions consider recent quarters, probably due to the procedure used to estimate provisional data.

Table B2. Forecast Performance

Growth rate	Models		Statistics	Linear Model			ARX(1)		
				GDP	*INV**	*EMPL*	*GDP*	*INV**	*EMPL*
q-o-q	Quarterly		*MAFE*	0.231	1.421	0.338	0.219	1.421	0.344
			Bias	0.162	0.536	0.01	0.156	0.584	0.016
y-o-y	Quarterly	Simple mean	*MAFE*	0.464	4.626	0.299	0.425	4.816	0.314
			Bias	0.43	4.626	-0.14	0.407	4.816	-0.115
		Standard	*MAFE*	0.545	1.626	0.285	0.526	1.649	0.296
			Bias	0.545	0.874	-0.078	0.526	0.965	-0.056
	Annual		*MAFE*	0.299	1.24	0.322	0.375	1.502	0.335
			Bias	0.282	-0.002	-0.085	0.346	1.502	-0.131

* For investments, we use half-year instead of quarterly one data.
To obtain annual figures, we aggregate quarterly data by using two different methods: i) the standard one that uses different weight for each *q-o-q* growth rates according to their realization during the year; and ii) the simple average of the *q-o-q* growth rates, to avoid the possibility that forecast bias could be amplified by the position of the quarters in which it is verified. The red box shows the best models for each NA aggregates based on annual data; the orange one shows those based on quarterly data.

Additionally, models based on annual data seem to perform better with respect to quarterly models, probably because they are characterized by lower volatility for dependent and regressor variables.

In general, models based only on SIGE (proxy) variables perform similarly to the models usually used for the short-term forecast.

According to our results, models that minimize both *Bias* and *MAFE* criteria are linear models based on annual data; however, they only consider a few observations. For this reason, Section 5 uses linear models[35] based on quarterly data and particularly those that, to quantify the annual figure, aggregate quarterly data in the standard way.

[35] For reasons of consistency, we chose the same model for all target variables.

B Tables and Figures

Table B3. Sample composition

Quarters	Control		Treated	Not Classified	Total
	Non Exporter	*Exporter to other countries*	*Exporter to Germany*		
2014q1	363	33	193	240	829
2014q2	336	35	213	234	818
2014q3	327	43	207	226	803
2014q4	338	36	204	218	796
2015q1	349	43	215	218	825
2015q2	348	44	213	199	804
2015q3	314	44	223	205	786
2015q4	319	35	224	198	776
2016q1	331	41	227	192	791
2016q2	348	36	225	194	803
2016q3	344	43	249	191	827
2016q4	340	47	247	176	810
2017q1	328	46	252	162	788
2017q2	332	52	259	159	802
2017q3	348	62	277	134	821
2017q4	354	65	294	108	821
2018q1	375	80	320	126	901
2018q2	345	80	322	104	851
2018q3	366	78	326	89	859
2018q4	339	77	310	95	821
2019q1	365	84	351	42	842
2019q2	360	88	331	67	846
2019q3	377	92	352	45	866
2019q4	445	132	440	50	1,067
Total	8,391	1,416	6,474	3,672	19,953

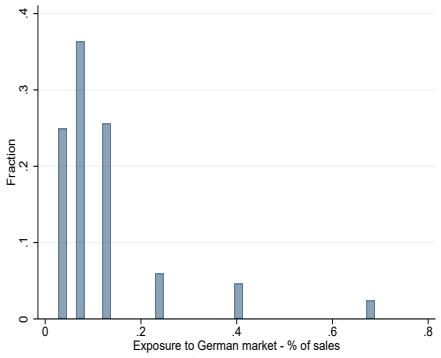
Note: In this table, the obs used are classified according to their exposure to the external market. The construction sector is excluded from this paper. Banca d'Italia SIGE.

Table B4. Classification accorndig to the exposure to the German market

Share of exports to Germany compared to total exports		**Share of sales exported**				Total
		0	0-1/3	1/3-2/3	2/3-1	
	Median	0	.165	.495	.83	
0	0	8,391	986	385	355	10,117
0-1/3	.165	0	1,222	1,692	1,271	4,185
1/3-2/3	.495	0	98	299	186	583
2/3-1	.83	0	2	47	122	171
Not classified	.	0	445	403	377	1,225
Total		8,391	2,753	2,826	2,311	16,281

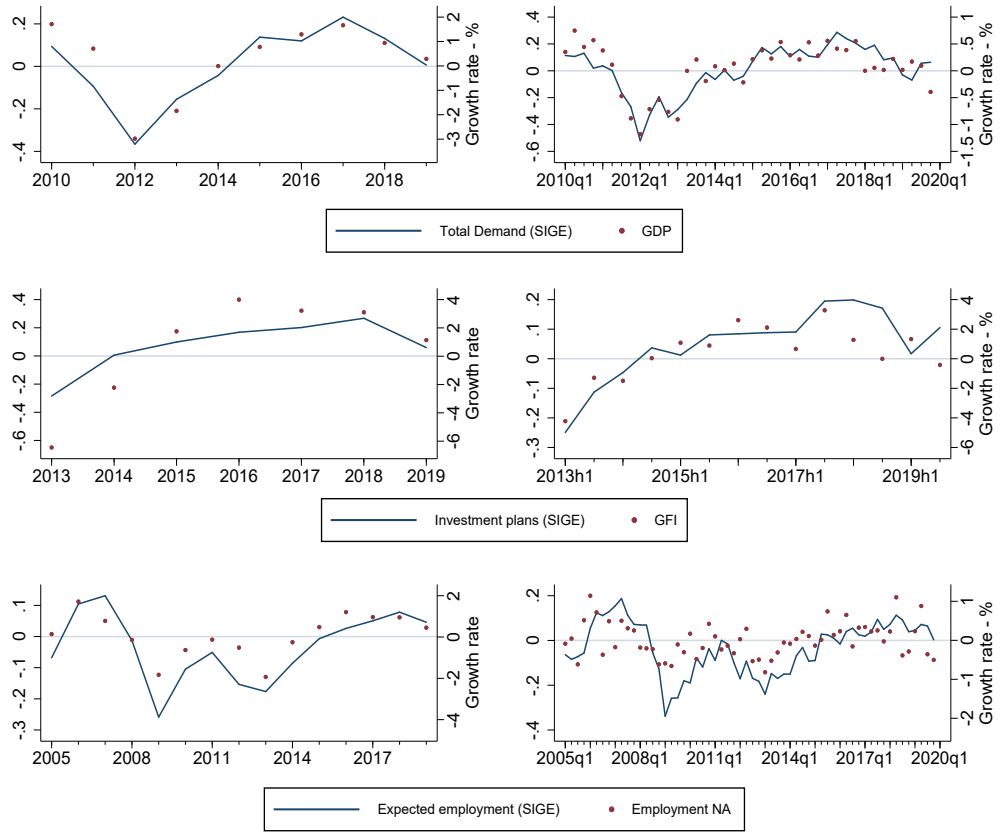
Note: Banca d'Italia SIGE.

Figure B1. Exposure to the German market



Note: In this graph, firms with zero exposure to the German market are not considered. Banca d'Italia SIGE.

Figure B2. SIGE balances and corresponding aggregates in the National Accounts



Note: Banca D'Italia SIGE and Istat National Accounts.

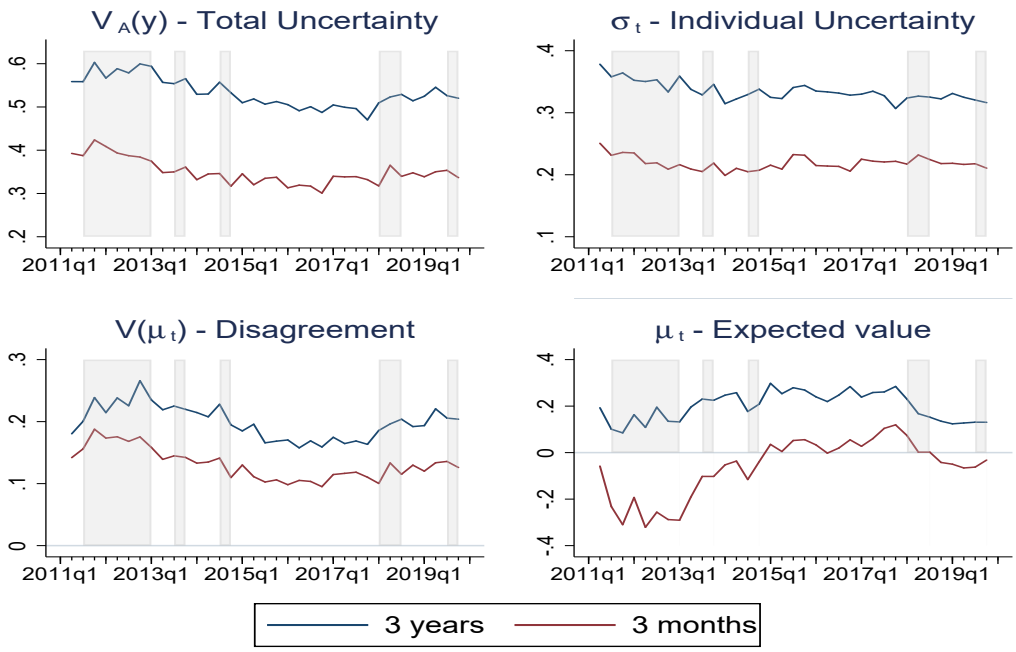
Table B5. Regressions

	(1) ΔGDP	(2) ΔIFL	(3) ΔEMPL
		y-o-y	
SIGE	7.925***	19.71***	8.591***
	(0.00)	(0.00)	(0.00)
N	10	7	15
r2	0.838	0.912	0.842
	q-o-q	*hy-o-hy*	*q-o-q*
SIGE	2.645***	12.41***	1.968***
	(0.00)	(0.00)	(0.00)
N	40	14	61
r2	0.725	0.633	0.271
		Excluding 2019	
SIGE	2.659***	13.09***	1.995***
	(0.00)	(0.00)	(0.00)
N	36	12	56
r2	0.750	0.712	0.306

p-values in parentheses

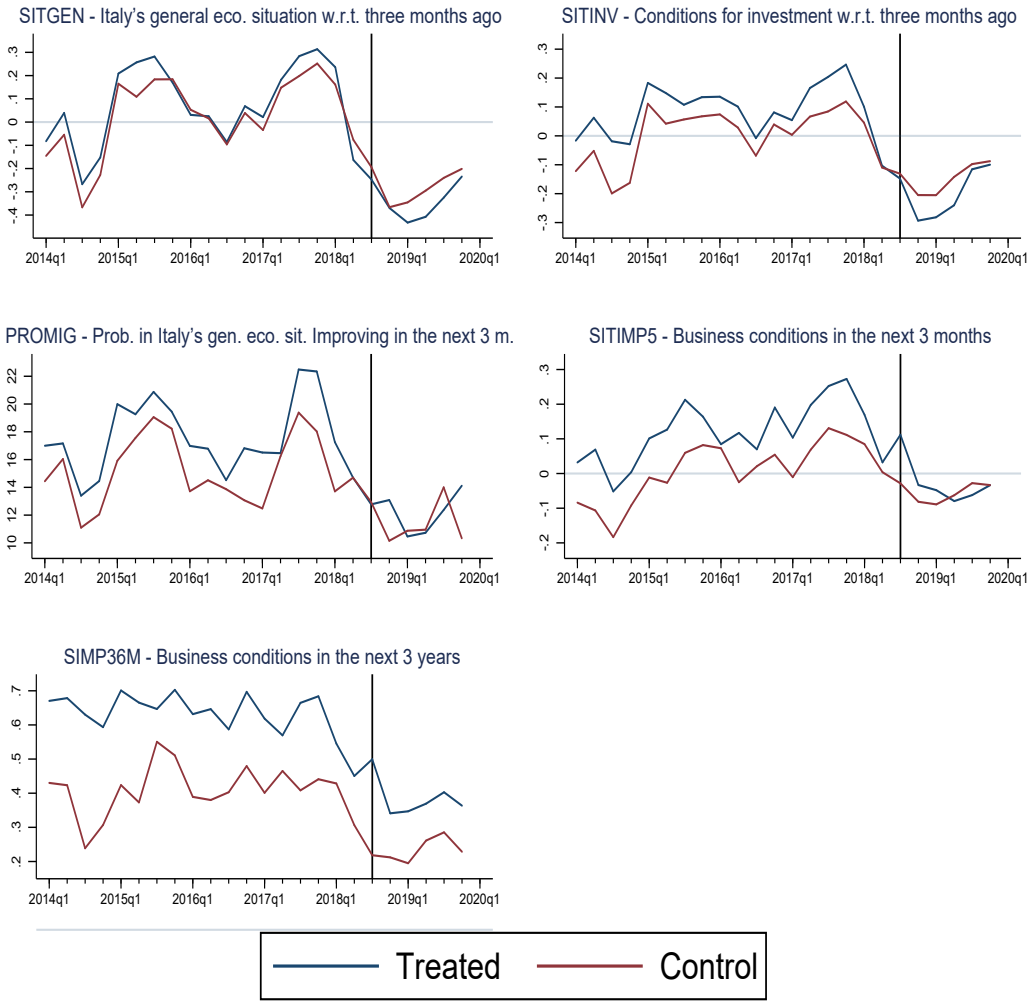
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure B3. Uncertainty measures



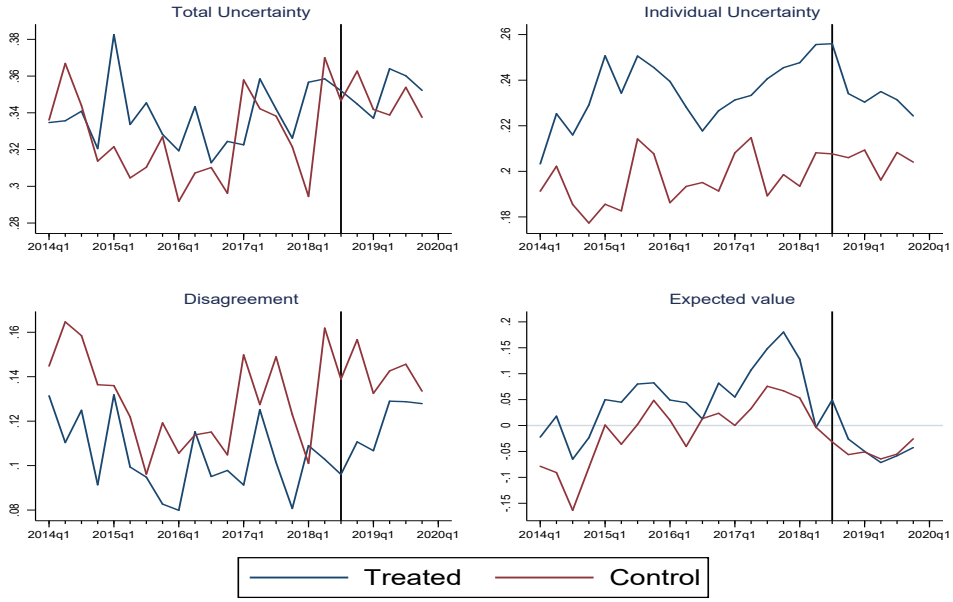
Note: Our calculation based on Banca D'Italia's SIGE survey.

Figure B4. Sentiment indicators



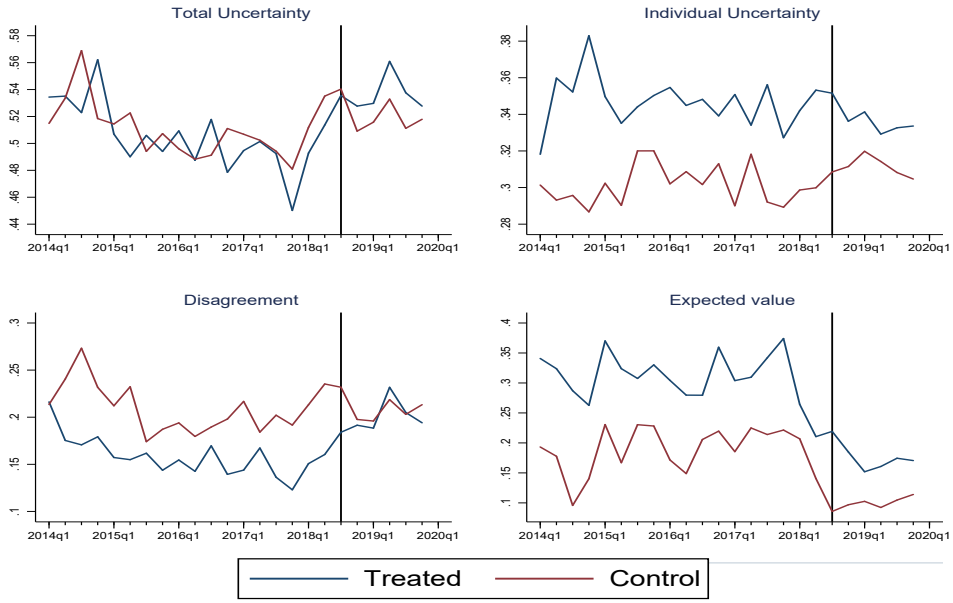
Note: Our calculation based on Banca D'Italia's SIGE survey. For more details on the variables see Table B8 and Appendix C.

Figure B5. Uncertainty measures, short term (3 months ahead)



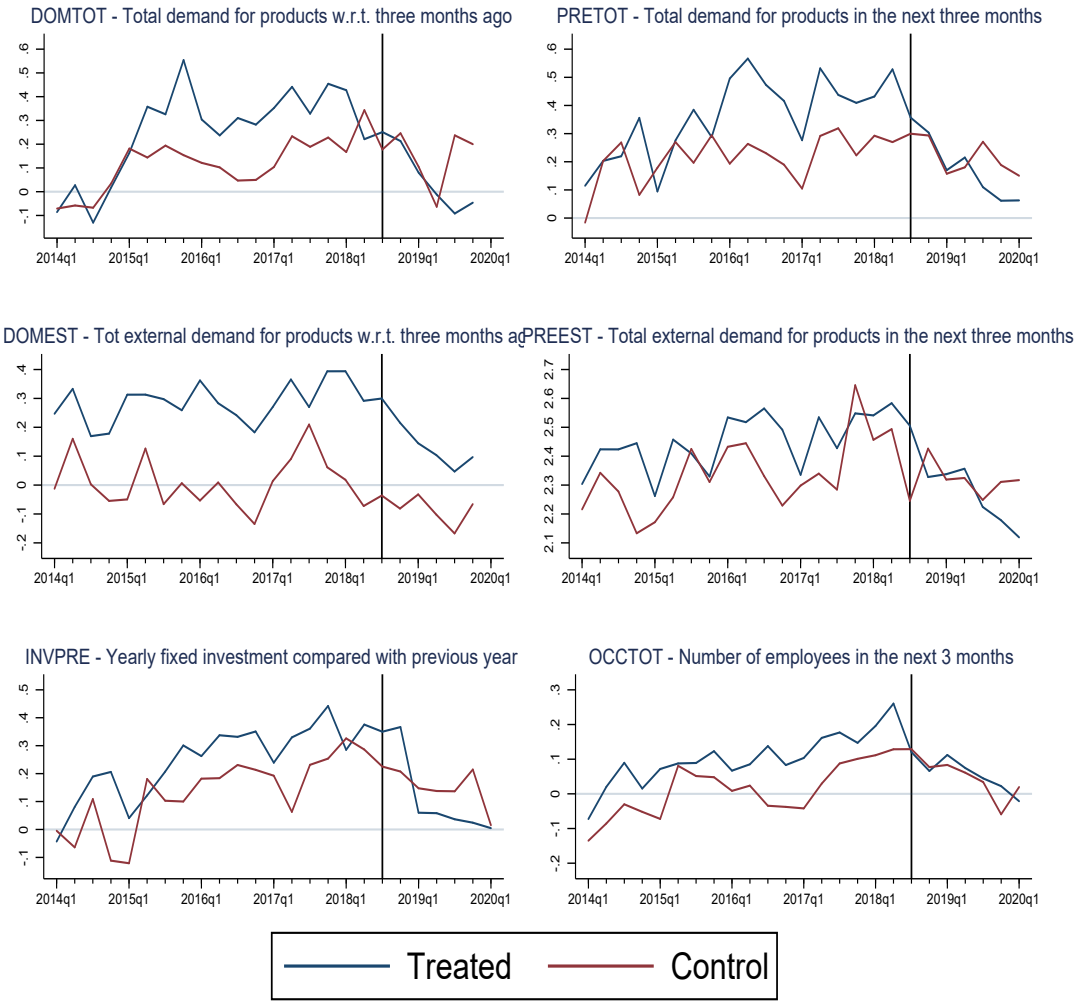
Note: Our calculation based on Banca D'Italia's SIGE survey. For more details on the variables see Table B8 and Appendix C.

Figure B6. Uncertanty measures, medium term (3 years ahead)



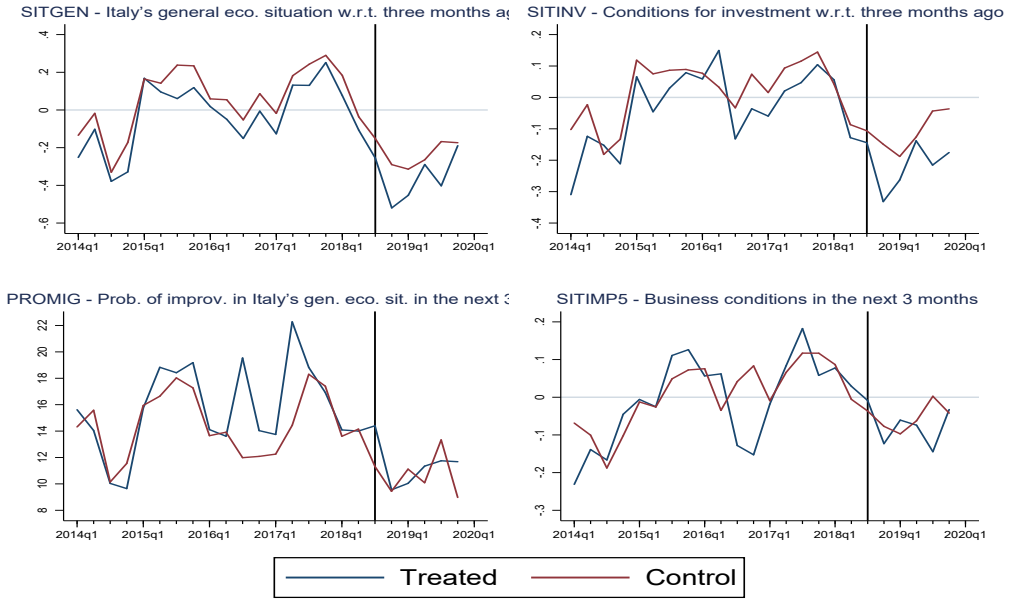
Note: Our calculation based on Banca D'Italia's SIGE survey. For more details on the variables see Table B8 and Appendix C.

Figure B7. Assessment indicators



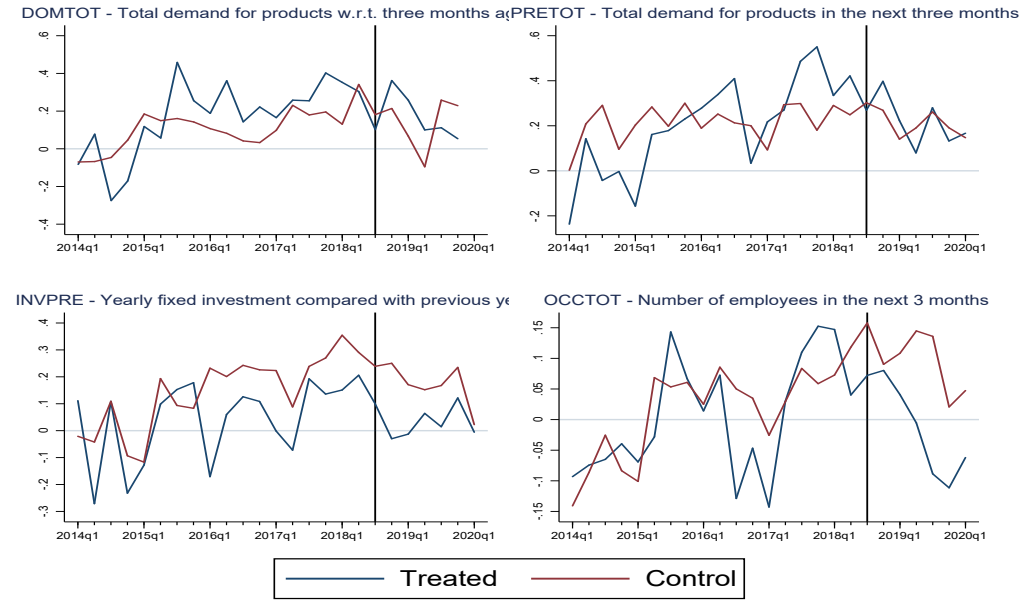
Note: Our calculation based on Banca D'Italia's SIGE survey. For more details on the variables see Table B8 and Appendix C.

Figure B8. Sentiment indicators, robustness



Note: Our calculation based on Banca D'Italia's SIGE survey. For more details on the variables see Table B8 and Appendix C.

Figure B9. Assessment indicators, robustness



Note: Our calculation based on Banca D'Italia's SIGE survey. For more details on the variables see Table B8 and Appendix C.

Table B6. Diff in Diff exercise

	(1)	(2)	(3)	(4)	(5)
			Sentiment indicators		
SITGEN	-0.123***	-0.112***	-0.131***	-0.175***	-0.118***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PROMIG	-1.842*	-1.767*	-2.270**	-3.793***	-2.017*
	(0.08)	(0.06)	(0.03)	(0.01)	(0.06)
SITINV	-0.148***	-0.146***	-0.163***	-0.198***	-0.154***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
SITIMP5	-0.0916***	-0.0659**	-0.0920***	-0.0938**	-0.0814***
	(0.00)	(0.03)	(0.00)	(0.01)	(0.01)
SIMP36M	-0.0657	-0.0445	-0.0645	-0.137**	-0.0595
	(0.14)	(0.28)	(0.15)	(0.01)	(0.19)
			Assessment indicators		
DOMTOT	-0.314***	-0.314***	-0.301***	-0.282***	-0.292***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PRETOT	-0.193**	-0.144*	-0.200***	-0.214***	-0.194***
	(0.02)	(0.05)	(0.00)	(0.00)	(0.00)
DOMEST	-0.133***	-0.135***	-0.125**	-0.110*	-0.116**
	(0.01)	(0.01)	(0.01)	(0.06)	(0.02)
PREEST	-0.126	-0.100	-0.0709	-0.0440	-0.0726
	(0.14)	(0.18)	(0.30)	(0.51)	(0.28)
INVPRE	-0.150***	-0.118**	-0.180***	-0.166**	-0.166***
	(0.00)	(0.03)	(0.00)	(0.01)	(0.00)
INVSEM	-0.194***	-0.178***	-0.217***	-0.160***	-0.204***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OCCTOT	-0.0805***	-0.0592**	-0.0899***	-0.0805**	-0.0901***
	(0.00)	(0.05)	(0.00)	(0.02)	(0.00)
			Uncertainty measures		
			3 months ahead		
V_A	-0.00489	-0.00381	-0.00649	-0.0133	-0.00951
	(0.75)	(0.81)	(0.68)	(0.49)	(0.56)
$E(\sigma_i^2)$	-0.00980	-0.00604	-0.0159	-0.0191	-0.0169
	(0.34)	(0.51)	(0.13)	(0.18)	(0.11)
$V(\mu_{it})$	0.00491	0.00224	0.00941	0.00580	0.00744
	(0.71)	(0.87)	(0.49)	(0.73)	(0.59)
μ_{it}	-0.0537***	-0.0350*	-0.0559***	-0.0677***	-0.0507**
	(0.01)	(0.08)	(0.00)	(0.00)	(0.01)
			3 years ahead		
V_A	0.0232	0.0295*	0.0265	0.0342*	0.0224
	(0.16)	(0.07)	(0.12)	(0.07)	(0.19)
$E(\sigma_i^2)$	-0.0213*	-0.0176*	-0.0269**	-0.0331**	-0.0303**
	(0.06)	(0.08)	(0.02)	(0.03)	(0.01)
$V(\mu_{it})$	0.0445***	0.0471***	0.0533***	0.0673***	0.0527***
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
μ_{it}	-0.0419	-0.0336	-0.0364	-0.0921***	-0.0332
	(0.11)	(0.18)	(0.17)	(0.00)	(0.22)
FE					
quarter	x	x			
time			x		
timeXindustry				x	
timeXarea					x
firm		x			
industry			x		x
area			x	x	
size			x	x	x
N	15891	15507	14517	14322	14517

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Our calculation based on Banca D'Italia's SIGE survey. For more details on the variables see Table B8 and Appendix C.

Table B7. Robustness exercise

	(1)	(2)	(3)	(4)	(5)
Sentiment indicators					
SITGEN	-0.131***	-0.122***	-0.149**	-0.138***	-0.0332
	(0.00)	(0.00)	(0.04)	(0.00)	(0.61)
PROMIG	-2.270**	-2.281**	-4.852**	-2.293**	-0.174
	(0.03)	(0.02)	(0.02)	(0.03)	(0.92)
SITINV	-0.163***	-0.152***	-0.162***	-0.182***	-0.0743
	(0.00)	(0.00)	(0.01)	(0.00)	(0.12)
SITIMP5	-0.0920***	-0.0935***	-0.0941*	-0.100***	-0.0458
	(0.00)	(0.00)	(0.09)	(0.00)	(0.28)
SIMP36M	-0.0645	-0.0164	-0.0251	-0.0681	-0.0610
	(0.15)	(0.71)	(0.67)	(0.15)	(0.41)
Assessment indicators					
DOMTOT	-0.301***	-0.320***	-0.300***	-0.309***	-0.0673
	(0.00)	(0.00)	(0.00)	(0.00)	(0.45)
PRETOT	-0.200***	-0.208***	-0.136***	-0.208***	-0.0555
	(0.00)	(0.00)	(0.00)	(0.00)	(0.42)
DOMEST	-0.125**	-0.164***	-0.0977		
	(0.01)	(0.00)	(0.34)		
PREEST	-0.0709	-0.0569	-0.0436		
	(0.30)	(0.41)	(0.49)		
INVPRE	-0.180***	-0.184***	-0.252**	-0.187***	-0.0650
	(0.00)	(0.00)	(0.01)	(0.00)	(0.39)
INVSEM	-0.217***	-0.236***	-0.264***	-0.229***	-0.0832
	(0.00)	(0.00)	(0.01)	(0.00)	(0.22)
OCCTOT	-0.0899***	-0.0922***	-0.0548	-0.0994***	-0.0649
	(0.00)	(0.00)	(0.26)	(0.00)	(0.13)
Uncertainty measures					
3 months ahead					
V_A	-0.00649	0.00349	-0.0450	-0.00711	-0.00647
	(0.68)	(0.84)	(0.14)	(0.68)	(0.79)
$E(\sigma_i^2)$	-0.0159	-0.0139	-0.00490	-0.0155	-0.0154
	(0.13)	(0.18)	(0.72)	(0.17)	(0.38)
$V(\mu_{it})$	0.00941	0.0174	-0.0401	0.00836	0.00890
	(0.49)	(0.25)	(0.12)	(0.56)	(0.64)
μ_{it}	-0.0559***	-0.0588***	-0.0711**	-0.0612***	-0.0244
	(0.00)	(0.00)	(0.03)	(0.00)	(0.38)
3 years ahead					
V_A	0.0265	0.0402**	0.0320	0.0329*	0.0338
	(0.12)	(0.01)	(0.23)	(0.07)	(0.17)
$E(\sigma_i^2)$	-0.0269**	-0.0221*	-0.0132	-0.0219*	0.00141
	(0.02)	(0.06)	(0.38)	(0.07)	(0.94)
$V(\mu_{it})$	0.0533***	0.0623***	0.0452	0.0548***	0.0324
	(0.00)	(0.00)	(0.11)	(0.00)	(0.17)
μ_{it}	-0.0364	-0.0222	-0.0457	-0.0350	-0.000199
	(0.17)	(0.40)	(0.23)	(0.22)	(1.00)
FE					
quarter					
time	x	x	x	x	x
timeXindustry					
timeXarea					
firm					
industry	x	x	x	x	x
area	x	x	x	x	x
size	x	x	x	x	x
N	14517	8099	3280	13222	8733

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Our calculation based on Banca D'Italia's SIGE survey. For more details on the variables see Table B8 and Appendix C.

Table B8. Variables used in the Diff in Diff exercise

Acronymus		Question
		Sentiment indicators
SITGEN	B2	Compared with 3 months ago, do you think Italy's general economic situation is ...?
PROMIG	B3	What do you think the probability is of Italy's general economic situation improving in the next 3 months?
SITINV	C7	Compared with 3 months ago, do you think conditions for investment are ... ?
SITIMP5	C1	What do you think business conditions for your company will be like in the next 3 months?
SIMP36M	C2	What do you think business conditions for your company will be like in the next 3 years?
		Assessment indicators
DOMTOT	C9	Change in demand for residential buildings compared with 3 months ago... ?
PRETOT	C10	How will the total demand for your products vary in the next 3 months?
DOMEST	C11	Compared with three months ago, is the foreign demand for your products...?
PREEST	C12	How will the foreign demand for your products vary in the next 3 months?
INVPRE	F1	What do you expect nominal expenditure will be on (tangible and intangible) fixed investment in YEAR compared with that in YEAR?
INVSEM	F2	what do you expect nominal expenditure will be in the first half of YEAR compared with that in the second half of YEAR?
OCCTOT	E1	Your firm's total number of employees in the next 3 months will be...
		Uncertainty measures
V_A		aggregate uncertanty
$V(\mu_{it})$		disagreement
$E(\sigma_i^2)$		average individual uncertainty
μ_{it}		point forecast

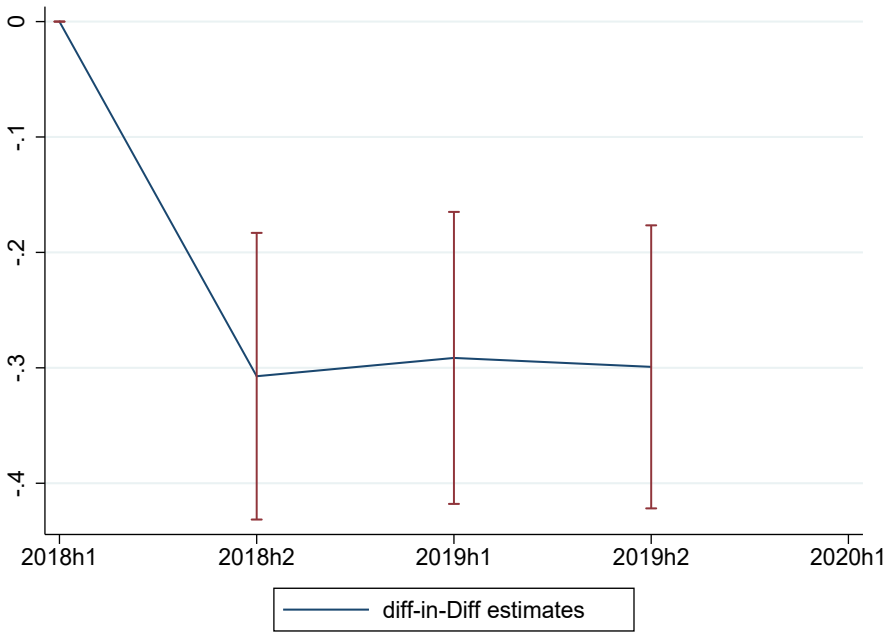
Table B9. Total demand, dynamic effects

	(1)	(2)	(3)	(4)	(5)
2018H2-2019H2	-0.314***	-0.314***	-0.301***	-0.282***	-0.292***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
2018H2	-0.2124***	-0.2154***	-0.2414***	-0.2894***	-0.2304***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
2019H1	-0.3294***	-0.3264***	-0.3424***	-0.2784***	-0.3264***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
2019H2	-0.3904***	-0.3984***	-0.3204***	-0.2864***	-0.3214 ***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
FE					
quarter	x	x			
time			x		
timeXindustry				x	
timeXarea					x
firm		x			
industry			x		x
area			x	x	
size			x	x	x
N	16053	15665	14681	14478	14681

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure B10. Total demand, dynamic effects



Note: Our calculation based on Banca D'Italia's SIGE survey. For more details on the variables see Table B8 and Appendix C.

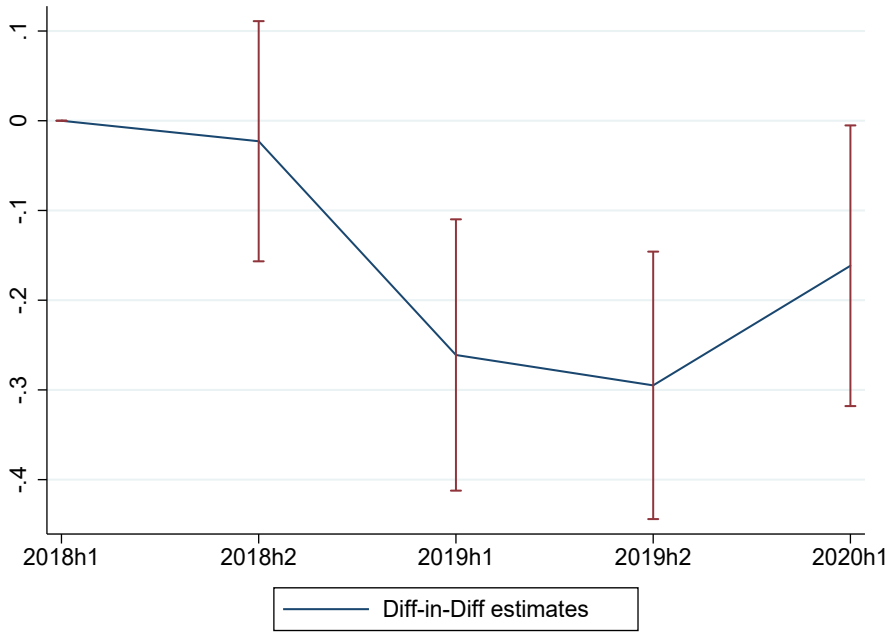
Table B10. Investment plans, dynamic effects

	(1)	(2)	(3)	(4)	(5)
2018H2-2019H2	-0.150***	-0.118**	-0.180***	-0.166**	-0.166***
	(0.00)	(0.03)	(0.00)	(0.01)	(0.00)
2018H2	0.0608	0.105	-0.0100	-0.105	0.0007
	(0.330)	(0.106)	(0.883)	(0.207)	(0.992)
2019H1	-0.200***	-0.173**	-0.250*	-0.178***	-0.243***
	(0.003)	(0.014)	(0.001)	(0.062)	(0.002)
2019H2	-0.275***	-0.256***	-0.285 **	-0.232***	-0.264***
	(0.000)	(0.000)	(0.000)	(0.017)	(0.000)
2020H1	-0.197***	-0.174**	-0.150	-0.127	-0.131
	(0.003)	(0.020)	(0.061)	(0.216)	(0.113)
FE					
quarter	x	x			
time			x		
timeXindustry				x	
timeXarea					x
firm		x			
industry			x		x
area			x	x	
size			x	x	x
N	16749	16367	15317	15108	15317

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure B11. Investment plans, dynamic effects



Note: Our calculation based on Banca D'Italia's SIGE survey. For more details on the variables see Table B8 and Appendix C.

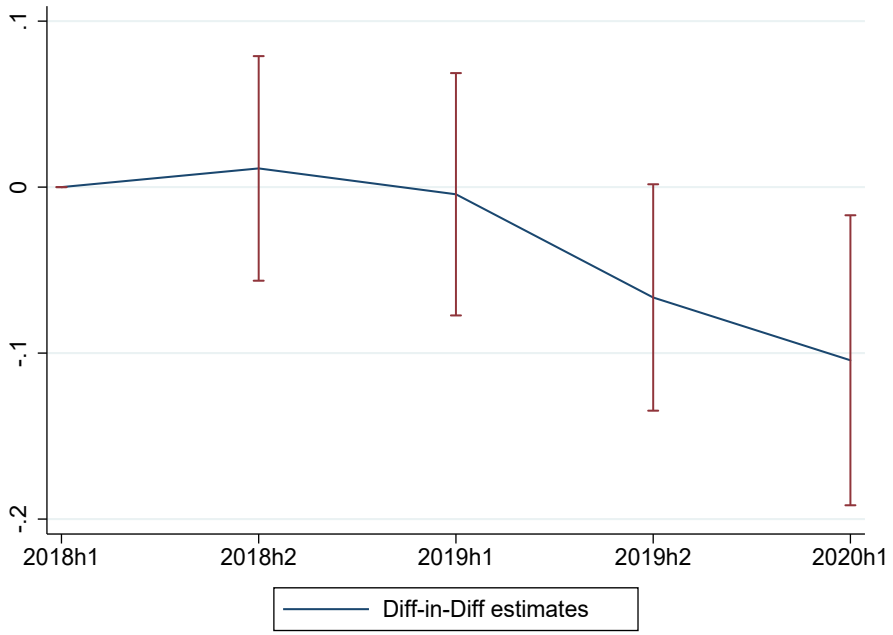
Table B11. Intention to hire, dynamic effects

	(1)	(2)	(3)	(4)	(5)
2018H2-2019H2	-0.0808***	-0.0596**	-0.0899***	-0.0805**	-0.0901***
	(0.00)	(0.04)	(0.00)	(0.02)	(0.00)
2018H2	-0.0458	-0.0142	-0.0580	-0.0911	-0.0514
	(0.167)	(0.668)	(0.118)	(0.0558)	(0.172)
2019H1	-0.0482	-0.0320	-0.0648	-0.0496	-0.0730
	(0.178)	(0.381)	(0.106)	(0.299)	(0.0706)
2019H2	-0.116***	-0.0978***	-0.110***	-0.0829***	-0.114***
	(0.000)	(0.004)	(0.004)	(0.105)	(0.004)
2020H1	-0.137***	-0.138***	-0.153***	-0.114***	-0.144***
	(0.000)	(0.002)	(0.001)	(0.071)	(0.003)
FE					
quarter	x	x			
time			x		
timeXindustry				x	
timeXarea					x
firm		x			
industry			x		x
area			x	x	
size			x	x	x
N	16749	16367	15317	15108	15317

p-values in parentheses

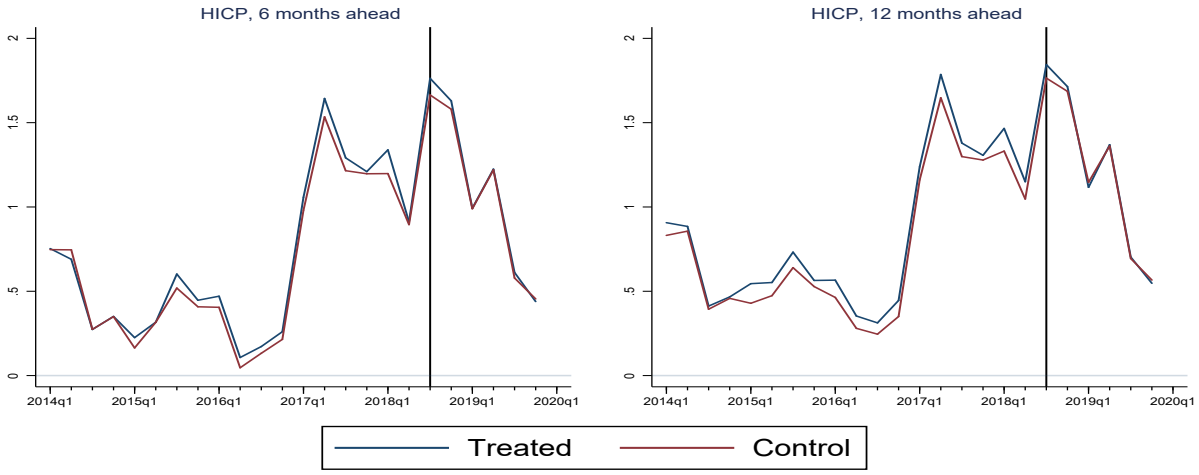
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure B12. Intention to hire, dynamic effects



Note: O Our calculation based on Banca D'Italia's SIGE survey. For more details on the variables see Table B8 and Appendix C.

Figure B13. HICP



Note: Our calculation based on Banca D'Italia's SIGE survey. For more details on the variables see Table B8 and Appendix C.

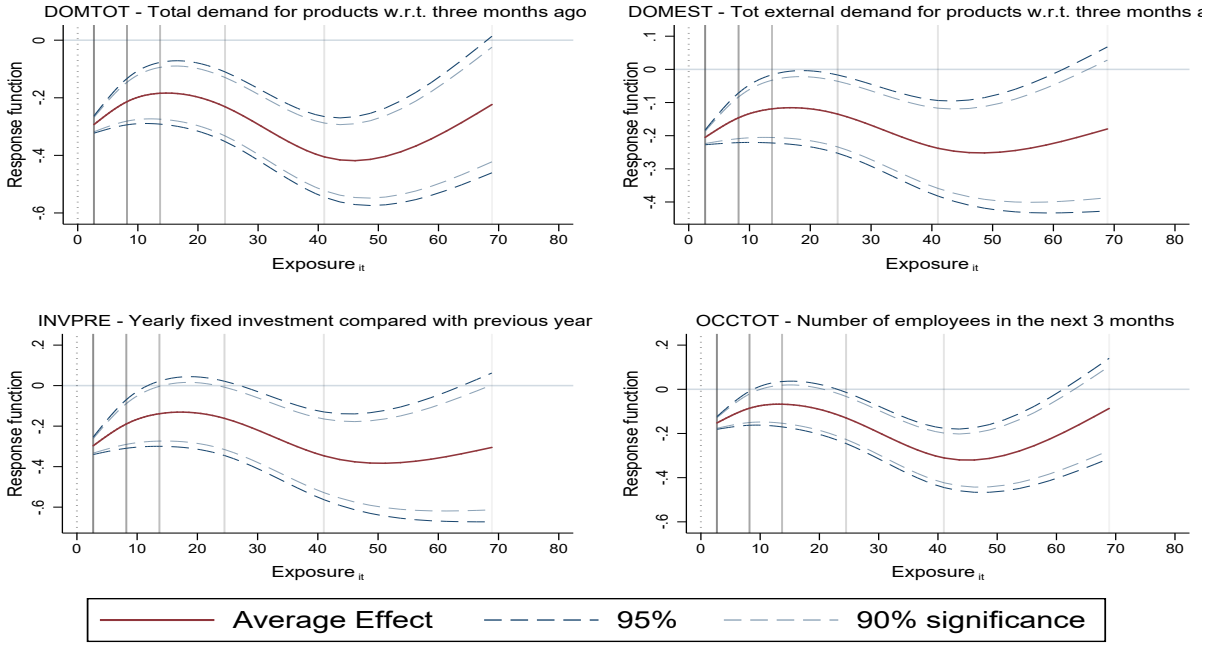
Table B12. Effects on HICP

	(1)	(2)	(3)	(4)	(5)
hicp 6-months	0.0173	-0.0361	-0.0215	-0.0286	-0.0216
	(0.81)	(0.65)	(0.66)	(0.47)	(0.65)
hicp 12-months	-0.0301	-0.0191	-0.0392	-0.0782	-0.0250
	(0.72)	(0.82)	(0.50)	(0.11)	(0.66)
FE					
quarter	x	x			
time			x		
timeXindustry				x	
timeXarea					x
firm		x			
industry			x		x
area			x	x	
size			x	x	x
N	10184	9852	9262	9000	9262

p-values in parentheses

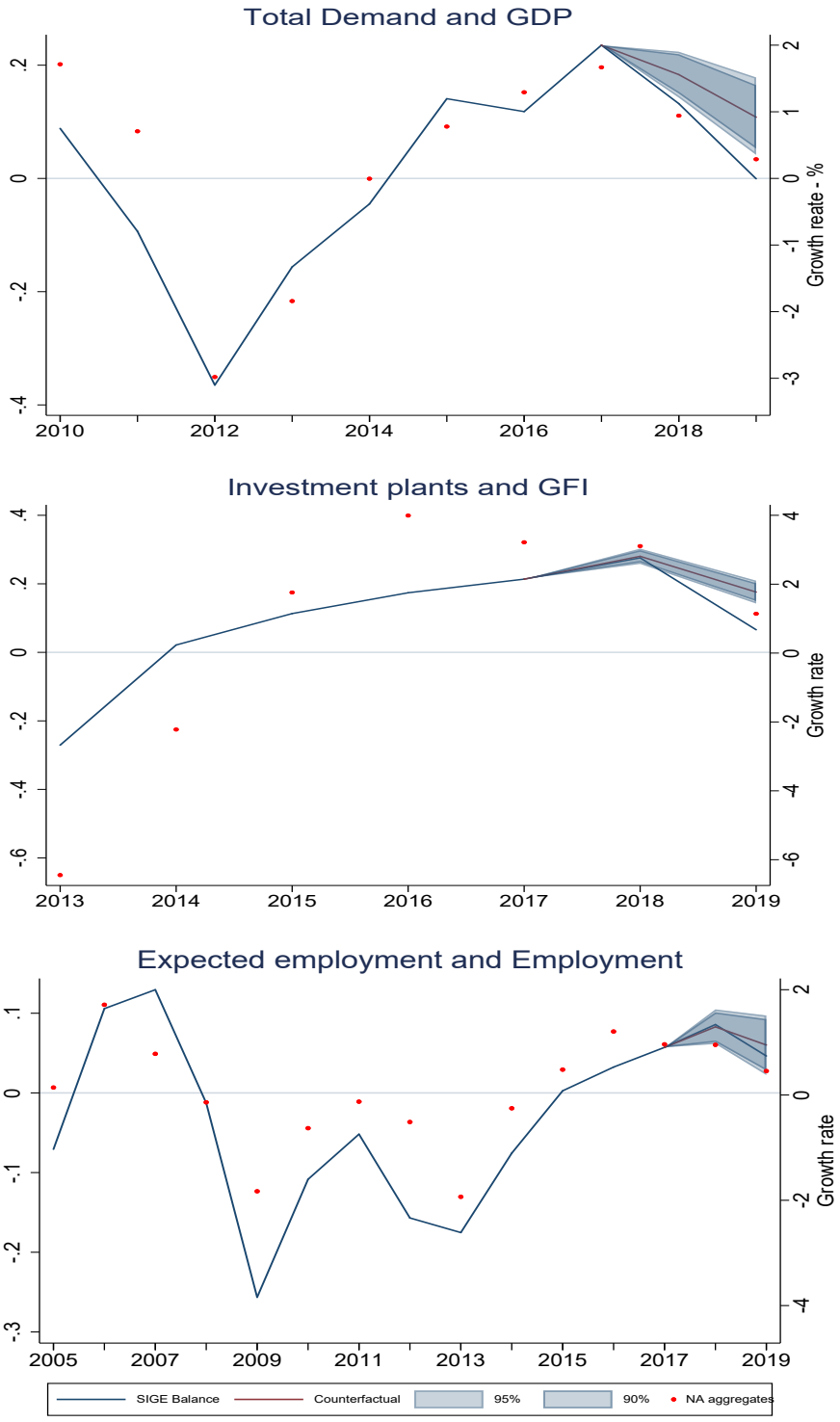
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure B14. Dose response function approach



Note: Our calculation based on Banca D'Italia's SIGE survey. For more details on the variables see Table B8 and Appendix C.

Figure B15. Actual vs Counterfactual Balances and National Account aggregates



Note: Our calculation based on Banca D'Italia's SIGE survey.

C Questionnaire

SURVEY ON INFLATION AND GROWTH EXPECTATIONS
BANCA D'ITALIA

December 2019

Company Name _____

A0. Which is your firm's main sector? |__| SETTON5

(1) Manufacturing

(2) Other Industry
- Mineral extraction from mines
- Elettrical. gas. vapour. air conditioning supply
- Water supply
- Sewerage, waste management, and redevelopment

(3) Trading

(4) Other Servicies

→ Fill in GREEN questionnaire

(5) Construction
- Buildings
- Engineering
- Special construction works

(demolition and preparation of building sites, plant installation, completion and finishing. etc.)

→ Fill in LIGHT BLUE questionnaire

INDUSTRY EXCLUDING CONSTRUCTION AND SERVICES

Firm
Instructions: For percentage changes, indicate the sign in the first box on the left (+ :for increases; —: for decreases).

SECTION A – General Information

A1. Number of employees : |__|__|__|__| **ADD**

A2. Share of sales revenues coming from exports: |__|
(1= more than 2/3; 2= Between 1/3 and 2/3; 3= Up to 1/3 and more than zero; 4=Zero) **EXPORT4**

SECTION B – General economic situation of the country

	…in June 2020? **IT6**	…in December 2020? **IT12**	…in December 2021? **IT24**	… on average between December 2022 and December 2024? **IT48**
B1a. (about 3/5 of the sample) In October consumer price inflation, measured by the 12-month change in the harmonized index of consumer prices was +0.2 per cent in Italy and +0.7 per cent in the euro area. What do you think it will be in Italy...	|__| |__|__|,|__|%	|__| |__|__|,|__|%	|__| |__|__|,|__|%	|__| |__|__|,|__|%
B1b. (about 1/5 of the sample) What do you think consumer price inflation in Italy, measured by the 12-month change in the harmonized index of consumer prices, will be…	|__| |__|__|,|__|%	|__| |__|__|,|__|%	|__| |__|__|,|__|%	|__| |__|__|,|__|%
B1c. (about 1/5 of the sample) The European Central Bank has as an objective the maintenance of the 12-month change in the harmonized index of consumer prices in the euro area close but below 2 per cent in the medium term. What do you think consumer price inflation in Italy, measured by the 12-month change in the harmonized index of consumer prices, will be…	|__| |__|__|,|__|%	|__| |__|__|,|__|%	|__| |__|__|,|__|%	|__| |__|__|,|__|%

B2. Compared with 3 months ago, do you consider Italy's general economic situation is …? **SITGEN** ☐ Better ☐ The same ☐ Worse

B3. What do you think is the probability of an improvement in Italy's general economic situation **in the next 3 months**? **PROMIG**
☐ Zero ☐ 1-25 per cent ☐ 26-50 per cent ☐ 51-75 per cent ☐ 76-99 per cent ☐ 100 per cent

SECTION C – Your firm's business conditions

How do you think business conditions for your company will be:

C1. in the **next 3 months**? ☐ Much better ☐ Better ☐ The same ☐ Worse ☐ Much worse **SITIMP5**

C2. in the **next 3 years**? ☐ Much better ☐ Better ☐ The same ☐ Worse ☐ Much worse **SIMP36C5**

For each of the above forecasts imagine there are 100 points available; distribute them among the possible forecasts according to the probability assigned to each one. How do you think business conditions for your company will be:

	Better **SITM3M SITM3A**			The same **SITU3M SITU3A**			Worse **SITP3M SITP3A**			Total		
C3. In the next **3 months**										**1**	**0**	**0**
C4. In the next **3 years**										**1**	**0**	**0**

Please indicate whether and with what intensity the following FACTORS will affect your firm's business **in the next 3 months**.

Factors affecting your firm's business In the **next 3 months**	***Effect on business***			***Intensity*** *(if not nil)*		
	Negative	*Nil*	*Negative*	*Nil*	*Negative*	*Nil*
C5. Changes in demand **DISIT**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
C6. Changes in your prices **PRSIT**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
C7. Availability and the cost of credit **CRSIT**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
C7.1 Uncertainty due to econ. and political factors **POLIT**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
C7.2 Exchange rate dynamics **TACAM**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
C7.3 Oil price dynamics **PRPET**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
C7.4 Tensions on liberalization policies of international trade **POLIB**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|

C8. Compared with 3 month ago, do you think conditions for investment are ... ? **SITINV** ☐ Better ☐ The same ☐ Worse

C9. What do you think your liquidity situation will be in the next 3 months. given the expected change in the conditions of access to credit?
☐ Insufficient ☐ Sufficient ☐ More than sufficient **LIQUID**

C10. Compared with three months ago, is the total demand for your products ... ? **DOMTOT** ☐ Higher ☐ Unchanged ☐ Lower

C11. How will the total demand for your products vary in the next 3 months? **PRETOT** ☐ Increase ☐ No change ☐ Decrease

(Answer to questions C12-C14.1 only if the share of sales revenues coming from exports is positive. otherwise go to C15)

Compared with three months ago, is the foreign demand for your products…?	*Higher*	*Unchanged*	*Lower*	*I do not sell in this market*
C.12 Total **DOMEST**	|__|	|__|	|__|	
C.12.1 In Germany **RTEU_GE**	|__|	|__|	|__|	|__|

(Please answer question C13 only if your answer to question C.12.1 was not 'I do not sell in this market')
C.13 Considering your firm's total exports in 2019, please indicate the share of exports to the German market. \|__\|
(1= Over 2/3 of turnover; 2= Between 1/3 and 2/3; 3= Up to 1/3 but more than zero; 4=Zero) **EXPGE**

How will the foreign demand for your products vary **in the next 3 months**?	*Increase*	*No change*	*Decrease*	*I do not sell in this market*
C.14 Total **PREEST**	|__|	|__|	|__|	
C.14.1 In Germany **ETEU_GE**	|__|	|__|	|__|	|__|

C15. Compared with three months ago, are credit conditions for your company ...? **SITCRE** ☐ Better ☐ Unchanged ☐ Worse

SECTION D – Changes in your firm's selling prices

D1. In the last 12 months, what has been the average change in your firm's prices? **DPRE** \|__\| \|__\|__\|.\|__\|%

D2. For the next 12 months, what do you expect will be the average change in your firm's prices? **DPREZ** \|__\| \|__\|__\|.\|__\|%

Please indicate direction and intensity of the following factors as they will affect your firm's selling prices **in the next 12 months**:

Factors affecting your firm's prices in the next 12 months	***Effect on firm's selling prices***			***Intensity*** *(if not nil)*		
	Downward	*Neutral*	*Upward*	*Low*	*Average*	*High*
D2.1. Total demand **DPR**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
D2.2. Raw materials prices **MPPR**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
D2.3. Intermediate Input **IICT**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
D2.4. Labour costs **CLPR**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
D2.5. Pricing policies of your firm's main competitors **PRPR**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
D2.6 Exchange rate dynamics **TCPR**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
D2.7 Inflation expectations dynamics **AINF**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
D2.8 Financial conditions **CFIN**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|

D3. In the last 12 months, what has been the average change in your firm's prices of goods and services bought in Italy and abroad ?
\|__\| \|__\|__\|.\|__\|% **DPRE_INT**

D4. In the next 12 months, what has been the average change in your firm's prices of goods and services bought in Italy and abroad?
\|__\|\|__\|__\|.\|__\|% **DPREZ_INT**

SECTION E – Workforce

E1. Your firm's total number of employees in the next 3 months will be: **OCCTOT**	*Lower*	*Unchanged*	*Higher*
	1|__|	2|__|	3|__|

SEZIONE F – Investment

F1. What do you expect will be the nominal expenditure on (tangible and intangible) fixed investment in 2020 compared with that in 2019?
☐ Much higher ☐ A little higher ☐ About the same ☐ A little lower ☐ Much lower **INVPRE**

F2. And what do you expect will be the nominal expenditure in the first half of 2020 compared with that in the second half of 2019:
☐ Much higher ☐ A little higher ☐ About the same ☐ A little lower ☐ Much lower **INVSEM**

NOTE: The responses "much higher" and "much lower" also apply when. in the two periods compared. investments are zero.

F3. Please rank in order of importance the following SOURCES OF INFORMATION choosing from those that you use the most to obtain financial information to support your business decisions (e.g. production, investments or entry into new markets).

(*Please indicate no more than 3*)

1. Newspapers (paper or online). 2. TV news. 3. Publications by public institutions (e.g. Bank of Italy, Istat or Ministry of the Economy and Finance) and business associations (e.g. Confindustria or Confartigianato). 4. Market consultancy and analysis services provided by private firms. 5. Direct contact with clients and/or suppliers. 6. Social media (e.g. Twitter or Facebook) ☐ **FON1** ☐ **FON2** ☐ **FON3**

CONSTRUCTION

Firm
Instructions: For percentage changes, indicate the sign in the first box on the left (+ :for increases; —: for decreases).

SECTION A – General Information

A1. Number of employees : |__|__|__|__| **ADD**

A2. Share of sales revenues coming from exports: |__|
(1= more than 2/3; 2= Between 1/3 and 2/3; 3= Up to 1/3 and more than zero; 4=Zero) **EXPORT4**

A3. Share of revenue from residential building: |__|
(1= more than 2/3; 2= Between 1/3 and 2/3; 3= Up to 1/3 and more than zero; 4=Zero) **COMPRES4**

SECTION B – General economic situation of the country

	…in June 2020? **IT6**	…in December 2020? **IT12**	…in December 2021? **IT24**	… on average between December 2022 and December 2024? **IT48**
B1a. (about 3/5 of the sample) In October consumer price inflation, measured by the 12-month change in the harmonized index of consumer prices was +0.2 per cent in Italy and +0.7 per cent in the euro area. What do you think it will be in Italy...	|__| |__|__|,|__|%	|__| |__|__|,|__|%	|__| |__|__|,|__|%	|__| |__|__|,|__|%
B1b. (about 1/5 of the sample) What do you think consumer price inflation in Italy, measured by the 12-month change in the harmonized index of consumer prices, will be…	|__| |__|__|,|__|%	|__| |__|__|,|__|%	|__| |__|__|,|__|%	|__| |__|__|,|__|%
B1c. (about 1/5 of the sample) The European Central Bank has as an objective the maintenance of the 12-month change in the harmonized index of consumer prices in the euro area close but below 2 per cent in the medium term. What do you think consumer price inflation in Italy, measured by the 12-month change in the harmonized index of consumer prices, will be…	|__| |__|__|,|__|%	|__| |__|__|,|__|%	|__| |__|__|,|__|%	|__| |__|__|,|__|%

B2. Compared with 3 months ago, do you consider Italy's general economic situation is …? **SITGEN** ☐ Better ☐ The same ☐ Worse

B3. What do you think is the probability of an improvement in Italy's general economic situation **in the next 3 months**? **PROMIG**
☐ Zero ☐ 1-25 per cent ☐ 26-50 per cent ☐ 51-75 per cent ☐ 76-99 per cent ☐ 100 per cent

SECTION C – Your firm's business conditions

How do you think business conditions for your company will be:

C1. in the **next 3 months**? ☐ Much better ☐ Better ☐ The same ☐ Worse ☐ Much worse **SITIMP5**

C2. in the **next 3 years**? ☐ Much better ☐ Better ☐ The same ☐ Worse ☐ Much worse **SIMP36C5**

For each of the above forecasts imagine there are 100 points available; distribute them among the possible forecasts according to the probability assigned to each one. How do you think business conditions for your company will be:

	Better **SITM3M SITM3A**			The same **SITU3M SITU3A**			Worse **SITP3M SITP3A**			Total		
C3. in the next **3 months**										**1**	**0**	**0**
C4. in the next **3 years**										**1**	**0**	**0**

Please indicate whether and with what intensity the following FACTORS will affect your firm's business **in the next 3 months**.

Factors affecting your firm's business In the **next 3 months**	***Effect on business***			***Intensity*** *(if not nil)*		
	Negative	*Nil*	*Positive*	*Low*	*Average*	*High*
C5a. Trend in new sites **CNSIT**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
C5b. Trend in existing sites **CASIT**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
C6. Changes in your prices **PRSIT**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
C7. Availability and the cost of credit **CRSIT**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
C7.1 Uncertainty due to economic and political factors **POLIT**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
C7.2 Exchange rate dynamics **TACAM**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
C7.3 Oil prices dynamics **PRPET**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
C7.4 Tensions on liberalization policies of international trade **POLIB**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|

C8. Compared with 3 month ago, do you think conditions for investment are ... ? **SITINV** ☐ Better ☐ The same ☐ Worse

C9. What do you think your liquidity situation will be in the next 3 months. given the expected change in the conditions of access to credit?
☐ Insufficient ☐ Sufficient ☐ More than sufficient **LIQUID**

C10. Change in demand for residential building compared with 3 months ago... ? **DOMTOT** ☐ Higher ☐ Unchanged ☐ Lower

C11. How will the total demand for your products vary in the next 3 months? **PRETOT** ☐ Increase ☐ No change ☐ Decrease

(Answer to questions C12-C13 only if the share of sales revenues coming from residential building is positive. otherwise go to C14)

C12. Compared with three months ago, is the demand for residential building... ? **DOMRES** ☐ Higher ☐ Unchanged ☐ Lower

C13. How will the demand for residential building vary **in the next 3 months**? **PRERES** ☐ Increase ☐ No change ☐ Decrease

C14. Compared with three months ago, are credit conditions for your company ...? **SITCRE** ☐ Better ☐ Unchanged ☐ Worse

SECTION D – Changes in your firm's selling prices

D1. In the last 12 months, what has been the average change in your firm's prices? **DPRE** |__| |__|__|.|__|%

D2. For the next 12 months, what do you expect will be the average change in your firm's prices? **DPREZ** |__| |__|__|.|__|%

Please indicate direction and intensity of the following factors as they will affect your firm's selling prices **in the next 12 months**:

Factors affecting your firm's prices in the next 12 months	***Effect on firm's selling prices***			***Intensity*** *(if not nil)*		
	Downward	*Neutral*	Upward	*Low*	*Average*	High
D3. Total demand **DPR**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
D4. Raw materials prices **MPPR**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
D5. Intermediate input **IITC**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
D6. Labour costs **CLPR**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
D7. Pricing policies of your firm's main competitors **PRPR**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
D8. Inflation expectations dynamics **AINF**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|
D9. Financial conditions **CFIN**	1|__|	2|__|	3|__|	1|__|	2|__|	3|__|

D10. In the last 12 months, what has been the average change in your firm's prices of goods and services bought in Italy and abroad? |_|_|_|,|_|%
DPRE_INT

D11. In the last 12 months, what has been the average change in your firm's prices of goods and services bought in Italy and abroad? |_|_|_|,|_|%
DPREZ_INT

SECTION E – Workforce

E1. Your firm's total number of employees in the next 3 months will be: **OCCTOT**	*Lower*	*Unchanged*	*Higher*
	1|__|	2|__|	3|__|

SEZIONE F – Investment

F1. What do you expect will be the nominal expenditure on (tangible and intangible) fixed investment in 2019 compared with that in 2018?
☐ Much higher ☐ A little higher ☐ About the same ☐ A little lower ☐ Much lower **INVPRE**

F2. And what do you expect will be the nominal expenditure in the second half of 2019 compared with that in the first half of 2019:
☐ Much higher ☐ A little higher ☐ About the same ☐ A little lower ☐ Much lower **INVSEM**

NOTE: The responses "much higher" and "much lower" also apply when in the two periods compared investments are zero.

F3. Please rank in order of importance the following SOURCES OF INFORMATION choosing from those that you use the most to obtain financial information to support your business decisions (e.g. production, investments or entry into new markets).

(*Please indicate no more than 3*)

1. Newspapers (paper or online). 2. TV news. 3. Publications by public institutions (e.g. Bank of Italy, Istat or Ministry of the Economy and Finance) and business associations (e.g. Confindustria or Confartigianato). 4. Market consultancy and analysis services provided by private firms. 5. Direct contact with clients and/or suppliers. 6. Social media (e.g. Twitter or Facebook) ☐ **FON1** ☐ **FON2** ☐ **FON3**

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