Understanding the Transmission of COVID-19 News to French Financial Markets (Revised)

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Abstract

News of COVID-19 cases roiled the French stock market in 2020. Finance theory indicates that changes in returns across many assets are driven by economy-wide rather than firm-specific factors. To identify these factors, this paper investigates the time series exposure of 174 French assets to macroeconomic variables. It then uses these exposures to examine the cross-sectional pattern of asset price changes due to coronavirus news. The results indicate that investors responded to COVID-19 news by bidding down the prices of assets that do badly when oil prices fall and the euro appreciates and by bidding up the prices of assets that do well when the European Central Bank eases. Banking sector stocks were not harmed by COVID-19 news, indicating that fears of a sovereign-bank nexus were not driving the response.

Keywords: France, Coronavirus, European Central Bank

JEL classification: G10, I10

1. Introduction

Coronavirus news roiled financial markets in early 2020. The French stock market fell 44 percent during the first three and a half months of 2020. A year later it had yet to regain its pre-crisis value. The pandemic could flare up again. Policymakers, investors, and portfolio managers are all concerned about the link between the COVID-19 crisis and stock prices.

Ortmans and Tripier (2021) investigated how increases in the number of new COVID-19 cases in early 2020 affected 10-year sovereign yields in 15 Eurozone countries relative to 10-year German sovereign yields. Using the local projection methods of Jorda (2005), they reported that an increase of ten COVID-19 cases per million people between 2 January and 5 March 2020 raised sovereign bond spreads by 0.021 percentage points (ppt) immediately and by 0.24 ppt after five business days. When Ortmans and Tripier extended their sample period beyond 12 March, they found that increases in COVID-19 cases no longer affected spreads. Employing samples up to 9 March 2020, they also reported that 10 new cases per million people led to an 11 percent drop in Eurozone stock prices. Extending the sample period, they again found that COVID-19 cases stopped affecting returns. They concluded that interventions by the ECB on 12 March 2020 broke the link between news of COVID-19 cases and turmoil in European stock and bond markets.

On 12 March the ECB announced several steps to help the economy address the pandemic (Arnold and Stubbington, 2020). These included increasing quantitative easing (QE) purchases in 2020 by €120bn, providing subsidized loans to banks to stimulate small business lending, and offering loans to banks at rates below the yields that banks received from deposits at the ECB. These policies increased liquidity to the banking sector (Couppey-Soubeyran, Perego, and Tripier, 2020). At the same time, ECB President Christine Lagarde caused controversy by

saying that the role of the ECB was not to reduce yield spreads between the sovereign bonds of Germany and other Eurozone countries. Later in the day however she and other ECB officials downplayed her comment.

This paper investigates why COVID-19 cases roiled financial markets before the ECB's intervention on 12 March. These are several reasons why coronavirus news could affect stock returns. Investors might have expected health concerns or legal shutdown requirements to restrict spending on items requiring close contact such as hotels, transportation, and restaurant meals (Chetty et al., 2020). Concerns that international trade would be hindered and supply chains disrupted could have harmed firms dependent on global value chains (Shih, 2020). Increased government borrowing to offset the health and economic costs of the crisis could raise sovereign yields and harm banks that hold government bonds (Ortmans and Tripier, 2021). At an extreme, explosive increases in sovereign yield spreads relative to German bond yields could raise the risk of a breakup of the single currency (Jones, 2020).

The coronavirus crisis also unleashed two disinflationary shocks in Europe. First, it caused the euro to appreciate as investors withdrew funds from investments in other currencies and flocked to the safety of the euro and as they expected the Federal Reserve to lower interest rates more than the ECB would (see, e.g., Martin and Szalay, 2020). Second, it contributed to a drop in oil prices, as investors foresaw a drop in spending on transportation and as oil producing countries struggled to address the shock. Figure 1 shows the evolution of the euro and Brent crude oil prices as the crisis hit Europe. The euro appreciated by 6 percent between 21 February and 9 March 2020. Since a one-standard deviation shock to the euro equals 0.59 percent, a 6 percent change represents a large appreciation. Brent crude oil prices also fell 53 percent over

this period. News of the coronavirus crisis could have affected stock prices by impacting the euro and crude oil prices.

To investigate why news of the number of coronavirus cases affected financial markets before the ECB's intervention on 12 March 2020, this paper examines in detail the response of French stocks to news of French COVID-19 cases. It first investigates the time series exposure of 174 French assets to the euro, Brent crude oil prices, and several other macro variables over the 20 years. It then investigates the cross sectional relationship between assets' exposures to macro variables with their exposure to COVID-19 cases in 2020. The results indicate that there is a close relationship between stocks harmed by appreciations of the euro and by falls in oil prices and stocks harmed by increases in the number of coronavirus cases. Also, the results indicate that stocks that gain from expansionary ECB policy also gain from increases in the number of cases. This suggests that investors expected an increase in the number of cases to trigger expansionary policy. Finally, there is no evidence that banks in general were harmed by increases in the number of cases. Banks such as Natixis that had extended loans to firms dependent on the oil industry were harmed by increases in the number of cases, but other banks were not. This indicates that the sovereign/bank "doom loop", whereby reductions in the value of banks' holding of sovereign bonds pressure governments to borrow more to bail out banks, was not driving the response of French stock prices to coronavirus cases in early 2020.

The next section presents the theoretical framework motivating the empirical work and reviews the literature. Section 3 discusses the data and methodology. Section 4 presents the results. Section 5 concludes.

2. Theoretical Background and Literature Review

The COVID-19 crisis brought a large unexpected drop in French stock returns. Finance theory indicates that the unexpected return on an asset equals the inner product of a vector of factor loadings and a vector of innovations in macroeconomic factors plus an error term capturing idiosyncratic risk:

$$UR_{i,t} = \sum_{j=1}^{K} \beta_{ij} f_{j,t} + \varepsilon_{i,t} , \qquad\qquad\qquad (1)$$

where $UR_{i,t}$ equals the unexpected return on asset i at time t, β_{ij} is the factor loading or beta of asset i to factor j, f_j represents news about macroeconomic factor j and ε_i is a mean-zero error term. The expected return on an asset equals the risk-free rate plus the inner product of a vector of factor loadings with a vector of risk premia:

$$E_{i,t} = \lambda_{0,t} + \sum_{j=1}^{K} \beta_{ij} \lambda_{j,t} \qquad\qquad\qquad (2)$$

where E_i is the *ex-ante* required return on asset i, λ_0 is the risk-free rate, and λ_j is the risk premium associated with factor j (see Ross, 2001).

Adding equation (2) to equation (1), the actual return ($R_{i,t}$) on asset i is given by:

$$R_{i,t} = \lambda_{0,t} + \sum_{j=1}^{K} \beta_{ij} \lambda_{j,t} + \sum_{j=1}^{K} \beta_{ij} f_{j,t} + \varepsilon_{i,t} \qquad\qquad\qquad (3)$$

Ross (2001) noted that equation (3) can be viewed as a snapshot of any intertemporal model, where the factors represent innovations in the underlying state variables. Since idiosyncratic risk in this framework is specific to each asset, large changes across assets will be driven by macroeconomic rather than firm-specific factors. This paper investigates the economy-wide factors that led to a collapse in French stock prices at the outset of the COVID-19 crisis.

Equations (1) – (3) indicate that there is both a time series and a cross-sectional dimension to asset pricing. The coefficient β_{ij} captures the time series exposure of asset i to macroeconomic factor j. At a single point in time, the cross-section of asset returns will respond

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differently to economy-wide news depending on their betas with macroeconomic variables. Suppose there is news about a decrease in a macroeconomic factor (i.e., $f_j < 0$). This will cause a predictable change in the cross-section of asset returns. Those negatively impacted (those with large positive values of β_{ij}) will see their returns fall more. Those positively impacted (those with large negative values of β_{ij}) will see their returns rise more. For instance, news about a fall in oil prices will cause a change in returns that is proportional to the assets' oil price betas. Those assets that benefit from lower oil prices such as airline stocks will see their returns rise and those that are harmed such as oil exploration company stocks will see their returns fall.

This same pattern will obtain if news causes the risk premium associated with a macroeconomic factor to change. Ferson and Harvey (1991) reported that the risk premia vary much more time than the betas. Suppose an asset is harmed by a decrease in oil prices (i.e., $\beta_{i,oil} > 0$). If investors perceive a greater risk that oil prices will fall, they will require a higher expected return to hold this asset. In terms of equation (2), $\beta_{i,oil}\lambda_{oil}$ will increase. The mechanism driving this increase in required returns is that investors in aggregate will seek to sell assets damaged by lower oil prices, driving down the prices of these assets and raising their expected returns (see, e.g., Fischer and Merton, 1984, and Thorbecke, 2000). Thus, either a decrease in oil prices (a decrease in f_{oil} in equation (3)) or an increase in the required return on assets harmed by lower oil prices (an increase in $\beta_{i,oil}\lambda_{oil}$ in equation (3)) will cause returns ($R_{i,t}$ in equation (3)) for assets harmed by lower oil prices to fall more than returns for assets that benefit from lower oil prices. Thus, when investors are reacting to news of a macroeconomic variable such as oil prices, the returns on a cross-section of assets will vary proportionally to the betas of these assets with the macroeconomic variable.

Identifying the macroeconomic factors that matter for asset returns is more of an art than a science (see, e.g., Chen, Roll, and Ross, 1986). The strategy in this paper is to choose macroeconomic variables that previous research has identified as important for stock returns. Altavilla et al. (2019) investigated how European Central Bank (ECB) policy impacted European stock prices and other variables. They used an event study methodology and constructed a database that measures how ECB press releases, press conferences, and monetary policy affect the EURO STOXX 50 index of Eurozone stocks and other Eurozone financial variables. They reported that monetary policy surprises significantly impact Eurozone stock prices.

Huang et al. (2016) examined the interdependence between crude oil prices and stock indexes for 28 countries. They employed wavelet coherence, gray correlation, and network analysis and daily data over the January 2000 to August 2015 period. Using Brent crude oil prices, they reported that at frequencies of 4, 8, 16, 32, 64, and 128 days France is always in the top five out of the 28 countries in terms of oil price-equity nexuses. Brent crude oil prices are thus tightly linked with French stock prices.

Parlapiano, Alexeev, and Dungey (2017) investigated the exposure of European firms to exchange rate fluctuations. They used the orthogonal market model to take account of common drivers of exchange rates and equity prices. Employing monthly stock return data from 1999 to 2011, they reported that many European firms are exposed to exchange rate changes.

Thorbecke (2021) found that many French firms are exposed not only to exchange rates but also to the economic state in the rest of the world (ROW). He represented exchange rates using the nominal dollar/euro exchange rate and the ROW economic state by the return on the world stock market. French companies harmed by both appreciations of the euro and drops in the world stock market include STMicroelectronics (semiconductors), Cellectis (biotechnology),

Devoteam (computer services), AB Science (biotechnology), Soitec (software), Dassault Systèmes (software), Téléperformance (industrial support services), Sopra Steria Group (com-puter services), Solutions 30 (computer services), MGI Digital Technology (electronic equipment), Esker (software), SII (computer services), Vetoquinol (pharmaceuticals), Bu-reau Veritas (industrial support services), and Sartorus Stedim Biotech (medical supplies). The exposure of these companies to both the exchange rate and the world economy indicates that they compete in world markets.

Another variable that is often employed as a state variable is the return on the national stock market. Beginning with Jorion (1990), most investigations into exchange rate exposure include the return on the country's stock market as a control variable. Researchers use the return on the national stock market to capture the effect of the overall economy on individual stock returns (see, e.g., Brown and Warner 1980, 1985).

Based on these works, this paper employs ECB monetary policy, the price of Brent crude oil, the dollar/euro exchange rate, the return on the world stock market, and the return on the French stock market as macroeconomic factors.

There has also been research on asset returns during the COVID-19 era. Aloui (2021) investigated the impact of ECB QE policies on the euro/dollar exchange rate from July 2007 to November 2020. He employed a bivariate vector autoregression model with time-varying coefficients and stochastic volatility. In October 2012 and March 2016, he reported that QE policy depreciated the euro. In April 2020, on the other hand, he reported that QE policy appreciated the euro. The euro thus behaved differently in early 2020 than it had before.

Izzeldin et al. (2021) investigated the impact of the COVID-19 crisis on G-7 stock markets. They employed the smooth transition heterogeneous autoregressive model and daily

data over the 24 April 2018 to 24 April 2020 period. They reported that international travel restrictions severely affected the consumer services sector. They found that people seeking web-based entertainment and distraction options caused the technology sector to be affected the latest and least severely. On the other hand they found that the oil and gas sector was the first to be hit by the crisis.

Gharib et al. (2021) examined how the COVID-19 pandemic affected spot gold prices and West Texas Intermediate (WTI) crude oil prices. They employed the bootstrap techniques of Phillips and Shi (2018) and daily data over the 4 January 2010 to 4 May 2020 period. They reported that during the crisis oil prices experienced a negative bubble and gold experienced a positive bubble. Granger causality tests indicate bilateral contagion between the two markets. Their findings imply that investors needed a safe haven asset to hedge against oil price falls during the crisis and found one in gold.

Bouri et al. (2021) studied how the pandemic affected the interrelationships between world equities, corporate bonds, gold, crude oil prices, and the value of the dollar. They used daily data over the 14 August 2011 to 12 May 2020 period and time-varying parameter vector autoregression techniques. They reported that the pandemic changed asset interactions and caused risk to spike. After the crisis oil prices, world stocks, and corporate bonds became the main transmitters of shocks. They also discussed how panic in the oil market made oil prices an important transmitter.

Sharif et al. (2020) investigated the relationship between the number of COVID-19 cases, WTI crude oil prices, the Dow Jones Index, the Caldara and Iacoviello (2018) geopolitical risk index, and the Baker, Bloom and Davis (2016) economic uncertainty measure. They used daily data and wavelet-based Granger causality tests and coherence wavelet methods to examine time

frequency interconnections between these variables. They found that increases in the number of COVID-19 cases lower oil prices and stock prices. They also reported that falls in oil prices lower U.S. stock prices and increase geopolitical risk and economic uncertainty.

This paper adds to this literature by investigating in detail the impact of the coronavirus crisis on the French stock market. It uses more disaggregated data than the papers cited above. This makes it possible to investigate in detail why news of COVID-19 cases roiled French financial markets in early 2020.

3. Data and Methodology

To investigate why COVID-19 news affected French financial markets the first step is to obtain time series estimates of the exposures of French stock returns to the macroeconomic variables. Data on stock returns for 311 French companies and sectors, the returns on the aggregate French and world stock markets, the spot price of Brent crude oil, and the nominal U.S. dollar/euro exchange rate are obtained from the Datastream database. To measure monetary policy, data on the change in the two-year French sovereign yield driven by ECB press conferences are obtained from the Euro Area Monetary Policy Event-Study Database of Altavilla et al. (2019). [1] To investigate whether concern about a breakup of the single currency was affecting returns, a dummy variable equaling one on 26 July 2012 and zero otherwise is employed. On this date ECD President Draghi reassured financial markets by saying that he would do whatever it takes to save the euro.

The data cover business days from 22 January 2001 to 19 January 2021. There are 5,216 observations. Augmented Dickey–Fuller tests permit rejection of the null hypothesis that the

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[1]   These data are available at: https://www.ecb.europa.eu/pub/economic-research/resbull/2020/html/ecb.rb200722~528ea64f0d.et.html#:~:text=This%20section%20briefly%20introduces%20the%20new%20resource,%20the,policy%20announcements%20for%20a%20wide%20range%20of%20assets.

variables employed have unit roots. Since the variables are stationary, least squares regressions can be employed. The following regression is employed to estimate stocks' exposures to macroeconomic variables:

$$\Delta P_{i,t} = \alpha_0 + \alpha_{1,i}\Delta P_{m,t} + \alpha_{2,i}\Delta P_{m,World,t} + \alpha_{3,i}\Delta P_{oil,t} + \alpha_{4,i}\Delta er_t +$$

$$\alpha_{5,i}\Delta MP_t + \alpha_{6,i}Draghi_{i,t}, \tag{4}$$

where $\Delta P_{i,t}$ is the change in the log of the stock price index for firm or portfolio i, $\Delta P_{m,t}$ is the change in the log of the price index for the French aggregate stock market, $\Delta P_{m,World,t}$ is the change in the log of the price index for the world stock market, $\Delta P_{oil,t}$ is the change in the log of the spot price for Brent crude oil, Δer_t is the change in the U.S. dollar/euro exchange rate, ΔMP_t represents the change in the two-year French sovereign yield driven by ECB press conferences, and $Draghi_{i,t}$ is a dummy variable that equals one on 26 July 2012 when ECB President Draghi said that he would do whatever it takes to save the euro and zero otherwise.

Following Chen, Roll, and Ross (1986), causality is assumed to flow from the macroeconomic variables on the right-hand side of equation (4) to firm and portfolio returns on the left-hand side and any causality flowing in the other direction is assumed to be second order. There are no cross-equation restrictions, so the model can be estimated equation-by-equation using ordinary least squares. Given the large sample size (5,216 observations) and the assumption that causality flows from the macroeconomic variables on the right-hand side to the firm- or sector-specific returns on the left-hand side, ordinary least squares should provide precise estimates of the time series parameters.

The second step is to examine the exposure of the assets on the left-hand side of equation (4) to the number of COVID-19 cases. This is investigated over the sample period from the beginning of January 2020 to 13 March 2020. Ortmans and Tripier (2021b) reported that news

of the number of cases had the strongest impact on Eurozone asset prices over this period. Data

on the number of cases in France are obtained from Our World in Data.[2] The following

regression is estimated:

$$\Delta P_{i,t} = \beta_{0,i} + \beta_{1,i}\Delta P_{m,t} + \beta_{2,i}\Delta P_{m,World,t} + \beta_{3,i}\Delta P_{oil,t} + \beta_{4,i}\Delta er_t +$$

$$\beta_{5,i}\Delta MP_t + \beta_{6,i}\Delta NumCases_t,$$

(5)

NumCases represents the number of COVID-19 cases and the other variables are defined after

equation (4).   The number of cases is included in first difference form since it trends upwards

over the sample period. As a robustness check it is also included in one specification in level

form. The variable *Draghi$_{i,t}$* from equation (4) is excluded from equation (5) because it only

takes on values of zero over the 1 January 2020 to 13 March 2020 sample period.

The third step is to examine the cross-sectional relationship between the fall in returns

due to news of COVID-19 cases and the macroeconomic variables. Equation (1) indicates that

news of a change in a macroeconomic variable should cause returns to change proportionally to

assets' regression coefficients to the macroeconomic variable. Even if the macroeconomic

variable did not change but if investors are reacting to possible changes in the future, the cross-

section of asset returns should react proportionally to the assets' beta coefficients.

From equation (5), $\hat{\beta}_{6,i}\sum_{t=1}^{T}\Delta NumCases$ indicates the cumulative fall in $\Delta P_{i,t}$ driven by

news of COVID-19 cases in France between 1 January 2020 and 13 March 2020. Since

$\sum_{t=1}^{T}\Delta NumCases$ is constant across all assets, the same information is contained in the

$\hat{\beta}_{6,i}$ coefficients alone. To investigate the cross-sectional relationship between the change in

asset returns driven by news of new cases in France and the macroeconomic variables, the

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[2] The website for OWID is https://ourworldindata.org/coronavirus-data .

estimated value of β_6 from equation (5) is regressed on the estimated α_i coefficients from equation (4):

$$\hat{\beta}_{6,i} = \gamma_0 + \gamma_1\hat{\alpha}_{1,i} + \gamma_2\hat{\alpha}_{2,i} + \gamma_3\hat{\alpha}_{3,i} + \gamma_4\hat{\alpha}_{4,i} + \gamma_5\hat{\alpha}_{5,i} + \gamma_6\hat{\alpha}_{6,i} + \gamma_7 Change_i, \quad (6)$$

The hats above the variables indicate that they are estimated values. $Change_i$ represents the change in the value of asset i between 1 January 2020 and 20 January 2021. This variable would be informative if investors had foresight about how assets would fare during the pandemic period. When estimating equation (6) only values of $\hat{\alpha}_i$ from regressions where the adjusted R-squareds from estimating equation (4) exceed 0.10 are used. This helps to exclude cases where the $\hat{\alpha}_i$ coefficients have little explanatory power. Out of 311 regressions run using equation (1), there are 174 that yield adjusted R-squared coefficients exceeding 0.10.[3]

4. Results

Table 1 presents the coefficients for the number of cases from estimating equation (2). Column (2) presents stocks' exposures to the first difference of the contemporaneous number of cases and column (5) presents stocks' exposure to the level of the contemporaneous number of new cases. Columns (3) and (6) present the standard errors and columns (4) and (7) the adjusted R-squareds. To make the table easier to read, the coefficients and standard errors are multiplied by 1,000. The model performs well, with the adjusted R-squareds averaging 0.71. The values of the coefficients for the first difference of cases and for the level of cases are closely related. Regressing the coefficients in column (2) on the coefficients on column (5) yields a coefficient of 1.08 and a t-statistic greater than 31.

The top row presents the coefficients for the aggregate French stock market. An increase in the first difference in the number of cases or in the level of the number of cases decreases

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[3] The threshold of 0.10 for the R-squared was chosen after carefully studying the data and results.

aggregate returns. For the first difference of contemporaneous cases, a one standard deviation increase in cases (equal to 206) reduces returns by 0.34 percent.[4]   Below the top row the coefficients are listed for the portfolios and firms. The rows are ordered from the asset harmed the most by increases in the first difference in the number of cases (CGG) to the asset that benefits the most by increases in the first difference in the number of cases (Eurofins Scientific). Between these two extremes there is much cross sectional variation in assets' exposure to the number of cases. Among assets harmed by increases in the number of cases are many related to the oil industry. These include CGG, Vallourec, Total, and the oil equipment and services portfolio. Among assets gaining by the number of cases are the medical equipment company Biomerieux, the testing laboratory company Eurofins Scientific, and the medical services portfolio.

By multiplying the beta coefficients in Table 1 with the number of new cases in early 2020 one can calculate the change in returns for these firms driven by COVID-19 cases in France. For the coefficients in column (2), this is given by $\hat{\beta}_{6,i} \sum_{t=1}^{T} \Delta NumCases$. For the coefficients in column (5), this is given by $\hat{\beta}_{6,i} \sum_{t=1}^{T} NumCases$. The sum of the first difference in new cases between 1 January and 13 March 2020 equals 1388 and the sum of the level of new cases equals 3091. Thus for CGG the value in column (2) implies that news of COVID-19 cases caused a drop in returns of 21.8 percent and the value in column (5) implies that the news led to a drop in returns of 48.5 percent. For Vallourec the value in column (2) implies a drop of 11.9 percent and the value on column (5) implies a drop of 22.8 percent. For Eurofins Scientific, the value in column (2) implies a rise in returns of 10.6 percent and the value in column (5) implies a

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[4] The value 0.34 percent equals the coefficient on the first difference of the number of cases (-0.0164) times a one standard deviation shock (206) divided by one thousand.

rise of 22.1 percent. For Biomerieux, the value in column (2) implies a rise in returns of 6.1 percent and the value in column (5) implies a rise in returns of 13.5 percent. Thus news of COVID-19 cases in France caused large changes in the returns on several assets in early 2020.

To investigate the cross sectional relationship between the change in returns driven by COVID-19 news and the macroeconomic variables, Table 2 presents the results from estimating equation (6). Column (2) presents the results using the coefficients on the first difference of the number of cases from column (2) of Table 1 as the left-hand side variable. Column (4) presents the results using the coefficients on the level of the number of cases from column (5) of Table 1 as the left-hand side variable. Column (2) indicates that the stocks that did better in the face of COVID-19 news were those that benefit from a decrease in oil prices, a depreciation of the euro, and a decrease in the 2-year French interest rate driven by ECB policy. Since a decrease in interest rates driven by ECB policy corresponds to expansionary monetary policy, this implies that investors responded to COVID-19 news by bidding up the prices of assets that benefit from expansionary monetary policy. The coefficient on the actual change in returns over 2020 indicate that investors responded to COVID news by bidding up the prices of assets that ended up doing well during the pandemic.

Figures 2a and 2b shed light on the results in Tables 1 and 2. The horizontal axis plots the gains or losses of the assets listed in Table 1 over the 1 January 2020 to 13 March 2020 period. This was a time when coronavirus news roiled the stock market. The vertical axis shows assets' exposures to news of the contemporaneous number of cases. As the regression line shows, assets that did worse during this period tended to be more negatively affected by increases in the number of cases. Some assets, however, are outliers.

The Southwest portions of Figures 2a and 2b show those assets that are harmed even more by increases in the number of cases than one would predict from their overall losses on the horizontal axis. These include CGG, Vallourec, and oil equipment and services stocks. These are all assets that lose significantly when oil prices fall. As investors bid down the prices of assets harmed by oil price decreases in response to news of coronavirus cases in France, these stocks were especially exposed to an increase in the number of cases. Airline stocks gain from decreases in oil prices. As investors bid up the prices of assets that gain from lower oil prices, this might help explain why airline stocks are above the regression lines in Figures 2a and 2b.

In the Northeast corner of the figures are medical services and also Biomerieux, a maker of medical equipment. News of the medical emergency benefited these stocks.

Examining banks, Natixis in the South of Figures 2a and 2b is harmed by increases in the number of cases. Morris and Smith (2020) reported that Natixis had extended many loans to companies related to the oil sector. As the pandemic caused oil prices to crash, it damaged Natixis. On the other hand, Société Générale in the North of Figure 1 benefits from an increase in cases. Thorbecke (2021) reported that Société Générale gained from euro appreciations, partly due to having borrowed from abroad. As an increase in the number of cases was associated with a euro appreciation, it benefited Société Générale.

Two electricity companies, Albioma and EDF, and also the overall electricity sector are below the regression line in Figures 2a and 2b. Equation (1) indicates that all three of these benefit from higher oil prices. Since the COVID-19 pandemic led to a fall in oil prices, increases in the number of coronavirus cases could have exerted a more negative effect than expected of these assets.

France's luxury brands in Table 1, including LVMH, Hermès, Kering, and Christian Dior, always have positive coefficients in Table 1 and in several cases the coefficients are statistically significant. Unlike many French firms, these company's stocks are either not harmed or only slightly harmed by appreciations. These firms have pricing power (see, e.g., Goldstein 2021). Thorbecke (2021) also reported that these stocks performed well during the pandemic. Investors thus discounted the impact of the health crisis on these stocks.

5. Conclusion

The coronavirus crisis caused stock prices in Europe and around the world to collapse between the middle of February and the middle of March 2020. Ortmans and Tripier (2021) found that increases in COVID-19 cases in early 2020 lowered Eurozone stock prices and raised Eurozone sovereign bond spreads over German bond yields. They reported that the ECB's intervention on 12 March 2020 broke the link between news of COVID-19 cases and turmoil in European stock and bond markets.

This paper investigates why coronavirus news roiled the French stock market before the ECB's actions on 12 March 2020. The results indicate that investors responded to increases in COVID-19 cases in France by bidding down the prices of assets that benefit from stronger oil prices, a weaker euro, and contractionary monetary policy.

Couppey-Soubeyran, Perego, and Tripier (2020) observed that the coronavirus crisis could lead to non-performing loans and threaten bank solvency, leading to sovereign debt and banking crises. There is no evidence that these fears drove the fall in French stock prices in early 2020. Banks such as Natixis that had loaned to firms exposed to oil price falls were harmed by increases in the number of cases. On the other hand, banks such as Société Générale that gain

from euro appreciations benefited from increases in the number of cases. The overall banking sector exhibited no exposure to the number of cases.

Table 2 indicates that less than 24 percent of the variance in asset prices due to French COVID-19 cases can be explained by plausible macroeconomic variables. It could be that the COVID crisis itself functioned as a systematic state variable that helped explain the cross section of asset returns in early 2020. This is difficult to investigate because France has not experienced many pandemics recently and because the sample period is short. Nevertheless future research should investigate whether assets exposed to COVID-19 had to pay increments to their required returns and whether the ECB intervention on 12 March 2020 suppressed these risk premia.

Table 1. The Impact of an Increase in COVID-19 Cases on French Stock Returns between 1 January 2020 and 13 March 2020.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Datastream (DS) Portfolio or Company	Coefficient on First Difference of Contemporaneous Number of Cases	S.E.	Adjusted R-squared	Coefficient on Contemporaneous Number of Cases	S.E.	Adjusted R-squared
French Stock Market (DS Portfolio)	-0.0164**	0.00640	0.851	-0.0190***	0.00524	0.862
CGG	-0.157***	0.0229	0.76	-0.137***	0.0134	0.745
INNATE PHARMA	-0.119***	0.0131	0.689	-0.105***	0.0149	0.67
Oil Eq & Svs (DS Portfolio)	-0.0949***	0.00853	0.749	-0.0717***	0.0149	0.685
VALLOUREC	-0.086***	0.0115	0.744	-0.0736***	0.00878	0.729
MERSEN (EX LCL)	-0.08348***	0.0141	0.618	-0.083**	0.0142	0.635
Elec. Office Eq. (DS Portfolio)	-0.0769***	0.0086	0.566	-0.072***	0.0101	0.569
QUADIENT	-0.0769***	0.00806	0.566	-0.0721***	0.0101	0.569
SOLOCAL GROUP	-0.062*	0.0251	0.308	-0.066**	0.0251	0.32
ADP	-0.0565***	0.00644	0.824	-0.0558***	0.00594	0.838
Biotechnology (DS Portfolio)	-0.0531***	0.00697	0.787	-0.0490***	0.00712	0.786
ALTEN	-0.0481***	0.00561	0.83	-0.0489***	0.00393	0.854
ILIAD	-0.0451***	0.01	0.555	-0.0354***	0.0111	0.532
NATIXIS	-0.044***	0.00606	0.802	-0.0558***	0.0101	0.825
Recreation Vcles (DS Portfolio)	-0.0439***	0.0125	0.725	-0.0447***	0.0116	0.738
BENETEAU	-0.0439***	0.0125	0.725	-0.0447***	0.0116	0.738
Iron & Steel (DS Portfolio)	-0.0414***	0.00756	0.791	-0.0398***	0.00646	0.793
IPSEN	-0.0363*	0.0184	0.188	-0.0285	0.0247	0.183
DEVOTEAM	-0.0356***	0.0105	0.629	-0.0241*	0.0121	0.611
Int. Oil & Gas (DS Portfolio)	-0.0351***	0.00526	0.941	-0.0237***	0.00869	0.927
TOTAL	-0.0351***	0.00526	0.941	-0.0237***	0.00869	0.927
Recreation Prod (DS Portfolio)	-0.034***	0.00917	0.609	-0.0303***	0.00961	0.606
TRIGANO	-0.034***	0.00917	0.609	-0.0303***	0.00961	0.606
JCDECAUX	-0.0339***	0.00883	0.565	-0.0237**	0.0104	0.532
Publishing (DS Portfolio)	-0.0337***	0.0103	0.783	-0.0293***	0.00782	0.78
COVIVIO	-0.0322***	0.00636	0.835	-0.0370***	0.00675	0.853
SOPRA STERIA GROUP	-0.0322***	0.00887	0.503	-0.0317***	0.00638	0.507
CAPGEMINI	-0.0311***	0.00445	0.759	-0.0329***	0.00543	0.773
REXEL	-0.0311***	0.00954	0.73	-0.0251**	0.0112	0.725
LAGARDERE GROUPE	-0.0304***	0.00938	0.753	-0.0250***	0.00864	0.748
SODEXO	-0.0302	0.0102	0.596	-0.0148	0.0092	0.606
Transport Svs (DS Portfolio)	-0.0301***	0.00513	0.87	-0.0283***	0.0049	0.87
MAUREL ET PROM	-0.0298***	0.00722	0.776	-0.0198**	0.00852	0.762
ORPEA	-0.0295***	0.00532	0.868	-0.0306***	0.00532	0.876
LNA SANTE	-0.0285***	0.00596	0.6	-0.0259***	0.0047	0.599
General Mining (DS Portfolio)	-0.0283***	0.00512	0.711	-0.0275***	0.00516	0.713
IMERYS	-0.0283***	0.0184	0.711	-0.0275***	0.00516	0.713
KLEPIERRE REIT	-0.0280***	0.00726	0.805	-0.0330***	0.00812	0.815
NEXITY	-0.0280***	0.00452	0.828	-0.0331***	0.00394	0.85
SWORD GROUP	-0.0274**	0.0116	0.685	-0.0228**	0.00953	0.679
Water (DS Portfolio)	-0.0270***	0.00591	0.869	-0.0356***	0.00485	0.89
BOLLORE	-0.0269***	0.00844	0.773	-0.0145	0.01	0.748
NEXANS	-0.0267***	0.00723	0.833	-0.0265***	0.00708	0.835
ATOS	-0.0264***	0.00721	0.749	-0.0223***	0.00591	0.744
CELLECTIS	-0.0263**	0.00108	0.75	-0.0234**	0.00921	0.749
Computer Svs (DS Portfolio)	-0.0258***	0.00337	0.866	-0.0258***	0.00307	0.873
FAURECIA	-0.0239***	0.00641	0.67	-0.0239***	0.00741	0.671
TELEPERFORMANCE	-0.0232***	0.00413	0.85	-0.0240***	0.00536	0.855
Basic Resources (DS Portfolio)	-0.0217***	0.00447	0.821	-0.0191***	0.00437	0.819
Ind. Metal, Mine (DS Portfolio)	-0.0215***	0.00449	0.812	-0.0185***	0.00442	0.809
Ind. Transport (DS Portfolio)	-0.0202***	0.00446	0.889	-0.0203***	0.0037	0.893
IPSOS	-0.0188*	0.0100	0.427	-0.0193**	0.00906	0.43
Ind. Support Svs (DS Portfolio)	-0.0187***	0.00355	0.863	-0.0191***	0.00369	0.867
Life Insurance (DS Portfolio)	-0.0173**	0.00842	0.864	-0.0163***	0.00575	0.864
Health Care Prvd (DS Portfolio)	-0.0164***	0.00438	0.884	-0.0213***	0.00474	0.899
Real Estate (DS Portfolio)	-0.0164***	0.004	0.873	-0.0180***	0.0047	0.879

Health Care Fac. (DS Portfolio)	-0.0162***	0.00447	0.882	-0.0212***	0.00486	0.898
Defense (DS Portfolio)	-0.0156***	0.0055	0.557	-0.0146***	0.00436	0.557
THALES	-0.0155***	0.00516	0.603	-0.0170***	0.00538	0.61
LEGRAND	-0.0151*	0.00826	0.779	-0.0192***	0.00561	0.788
Oil: Crude Prod. (DS Portfolio)	-0.0147**	0.00618	0.823	-0.00488	0.0074	0.814
Auto Parts (DS Portfolio)	-0.0143***	0.00515	0.756	-0.0160**	0.00613	0.759
Gen. Industrials (DS Portfolio)	-0.0135**	0.0059	0.889	-0.0162***	0.00418	0.896
BUREAU VERITAS	-0.0134**	0.00581	0.778	-0.0112*	0.00583	0.776
LISI	-0.0131	0.0129	0.284	-0.029	0.0177	0.311
SAFRAN	-0.0125***	0.00956	0.831	-0.0178***	0.00612	0.837
PLASTIC OMNIUM	-0.0119***	0.00436	0.584	-0.00849	0.00686	0.581
GECINA	-0.0114*	0.00615	0.767	-0.0168***	0.00604	0.776
EIFFAGE	-0.0104*	0.00534	0.87	-0.0187***	0.00485	0.881
Telecom.Svs Prvd (DS Portfolio)	-0.00998**	0.00443	0.822	-0.0137***	0.00415	0.83
Leisure Goods (DS Portfolio)	-0.00995*	0.00000546	0.84	-0.0110**	0.00437	0.842
VALEO	-0.00981	0.00691	0.737	-0.0199**	0.00878	0.743
Telecom. Svs (DS Portfolio)	-0.00979**	0.0044	0.822	-0.0135***	0.00414	0.83
MERCIALYS REIT	-0.0097	0.00676	0.848	-0.0095	0.0072	0.848
Cosmetics (DS Portfolio)	-0.00861	0.00472	0.772	-0.00288	0.00463	0.769
L'OREAL	-0.00842*	0.00475	0.769	-0.00276	0.00466	0.765
EUTELSAT COMMUNICATIONS	-0.00809	0.0133	0.243	-0.0133	0.0177	0.249
Telecom. Eq (DS Portfolio)	-0.00805	0.0133	0.243	-0.0133	0.0177	0.248
Tech. Hardware (DS Portfolio)	-0.00718	0.00806	0.846	-0.0069	0.00655	0.846
PERNOD-RICARD	-0.00715	0.0063	0.721	-0.00685	0.00624	0.722
Ind. Goods & Svs (DS Portfolio)	-0.0069	0.00511	0.939	-0.00937*	0.00470	0.941
ICADE REIT	-0.00563	0.0053	0.771	-0.00543	0.00618	0.771
Distill.Vintners (DS Portfolio)	-0.00517	0.00604	0.712	-0.00497	0.00634	0.712
Beverages (DS Portfolio)	-0.00478	0.006	0.713	-0.00468	0.00632	0.713
Electricity (DS Portfolio)	-0.00419	0.00857	0.676	-0.00917	0.00996	0.678
Cement (DS Portfolio)	-0.00407	0.00809	0.61	-0.00556	0.00655	0.611
VICAT	-0.00407	0.00809	0.61	-0.00556	0.00655	0.611
Pharmaceuticals (DS Portfolio)	-0.00379	0.00538	0.72	0.00245	0.00707	0.72
AIRBUS	-0.00354	0.00976	0.861	-0.00366	0.0118	0.861
STMICROELECTRONICS	-0.00309	0.0111	0.775	-0.00263	0.00948	0.775
Rest. & Bars (DS Portfolio)	-0.00301	0.0102	0.596	-0.0148***	0.0092	0.606
Medical Supplies (DS Portfolio)	-0.00294	0.00534	0.809	-0.00249	0.00387	0.809
Elec. Entertain (DS Portfolio)	-0.00291	0.0076	0.649	-0.00188	0.00663	0.648
Aerospace (DS Portfolio)	-0.00238	0.00855	0.89	-0.00892	0.0089	0.892
SANOFI	-0.0023	0.00523	0.709	0.00401	0.00673	0.71
Home Const. (DS Portfolio)	-0.00222	0.00458	0.674	-0.000487	0.00411	0.674
PUBLICIS GROUPE	-0.00153	0.00973	0.692	-0.00663	0.00976	0.693
DERICHEBOURG	-0.0015	0.00915	0.608	-0.000476	0.0101	0.608
ORANGE	-0.00121	0.00619	0.735	-0.00821	0.00578	0.74
ALSTOM	-0.00118	0.00798	0.552	-0.00514	0.00825	0.544
Semiconductors (DS Portfolio)	-0.00116	0.0108	0.799	-0.000725	0.00931	0.799
ESSILORLUXOTTICA	-0.000839	0.00592	0.797	0.0013	0.00368	0.798
Elec. Elect. Eq (DS Portfolio)	-0.000716	0.00439	0.887	-0.000288	0.00426	0.887
RENAULT	0.0000293	0.0132	0.688	0.0158	0.0209	0.692
TECHNICOLOR	0.0000318	0.0241	0.081	0.0343	0.0278	0.196
UBISOFT ENTERTAINMENT CAT A	0.000414	0.0078	0.63	-0.000874	0.0068	0.629
KORIAN	0.000631	0.00854	0.659	-0.0113	0.00967	0.666
Health Care (DS Portfolio)	0.00086	0.00397	0.861	0.00381	0.00366	0.862
EDF	0.000909	0.0101	0.637	-0.0122	0.0111	0.641
Banks (DS Portfolio)	0.00168	0.00744	0.866	0.00410	0.0127	0.866
Personal Goods (DS Portfolio)	0.00184	0.00451	0.843	0.00587*	0.0033	0.845
CHRISTIAN DIOR	0.00202	0.00508	0.872	0.00557	0.00519	0.873
Machinery: Const (DS Portfolio)	0.00251	0.0112	0.434	0.0129	0.0125	0.44
MANITOU	0.00252	0.0125	0.434	0.0129	0.0125	0.44
Software (DS Portfolio)	0.00321	0.00542	0.789	-0.000961	0.00659	0.788
CREDIT AGRICOLE	0.00374	0.00729	0.843	0.00734	0.0128	0.844
COLAS	0.00376	0.00237	0.788	0.00585*	0.00296	0.871
DASSAULT SYSTEMES	0.00462	0.00581	0.768	0.0000771	0.00699	0.766

HERMES INTL.	0.00592	0.00455	0.748	0.00999***	0.00427	0.755
Clothing, Access (DS Portfolio)	0.00660	0.00503	0.808	0.00982**	0.00407	0.812
ALBIOMA	0.00677	0.0151	0.5	0.0023	0.0191	0.499
M6-METROPOLE TV	0.00685	0.00446	0.594	0.00559	0.00452	0.594
SCHNEIDER ELECTRIC	0.00783*	0.00461	0.841	0.0106*	0.0063	0.843
CONS.DISCRETNRY. (DS Portfolio)	0.00881***	0.00301	0.905	0.00988***	0.0034	0.907
LVMH	0.00883	0.00584	0.763	0.0115**	0.00511	0.766
Media (DS Portfolio)	0.00916**	0.00385	0.929	0.00582**	0.00270	0.926
BNP PARIBAS	0.00975	0.00879	0.825	0.00166	0.0146	0.822
Travel & Leisure (DS Portfolio)	0.0103**	0.00406	0.853	0.00261	0.00588	0.848
EDENRED	0.0108*	0.0055	0.846	-0.000409	0.00599	0.842
Ind. Engineering (DS Portfolio)	0.0109	0.00827	0.452	0.0191*	0.00963	0.466
CONSUMER STAPLES (DS Portfolio)	0.0112***	0.00261	0.915	0.00986***	0.00246	0.913
Recreational Svs (DS Portfolio)	0.0114	0.0103	0.669	0.0116	0.011	0.669
REMY COINTREAU	0.0135	0.0841	0.33	0.0128	0.0116	0.331
NRJ GROUP	0.0149*	0.00874	0.176	0.0194**	0.00911	0.196
Entertainment (DS Portfolio)	0.0151	0.0103	0.032	0.0027	0.0129	0.022
Food Producers (DS Portfolio)	0.0152***	0.00307	0.789	0.0157***	0.00343	0.795
GETLINK	0.0161**	0.00688	0.779	0.0062	0.0064	0.77
Railroads (DS Portfolio)	0.0162**	0.00691	0.778	0.00632	0.0064	0.769
DANONE	0.0164***	0.00379	0.745	0.0171***	0.00428	0.751
Tires (DS Portfolio)	0.0168***	0.00603	0.745	0.0180**	0.00687	0.748
MICHELIN	0.0168***	0.00603	0.745	0.0180**	0.00687	0.748
TF1 (TV.FSE.1)	0.0169	0.00808	0.649	0.00746	0.00907	0.643
BIC	0.0187**	0.00714	0.432	0.0218**	0.00944	0.447
Automobiles (DS Portfolio)	0.0188***	0.00752	0.815	0.0237***	0.0088	0.821
Nonferrous Metal (DS Portfolio)	0.0201***	0.00916	0.407	0.0310***	0.0113	0.422
ERAMET	0.0201**	0.00916	0.407	0.0310***	0.0113	0.422
Retailers (DS Portfolio)	0.0228***	0.00553	0.768	0.0194**	0.00911	0.764
Basic Materials (DS Portfolio)	0.0235***	0.00216	0.955	0.0216***	0.00238	0.957
Radio TV Bcast (DS Portfolio)	0.0235***	0.00427	0.881	0.0173***	0.00379	0.871
Hotels & Motels (DS Portfolio)	0.0237***	0.00484	0.901	0.0188***	0.00537	0.896
CASINO GUICHARD-P	0.0237***	0.00728	0.447	0.0137*	0.00728	0.417
Apparel Retailer (DS Portfolio)	0.0239***	0.00578	0.759	0.0207**	0.00943	0.756
KERING	0.0239***	0.00578	0.759	0.0207**	0.00943	0.756
SOITEC	0.0244	0.0189	0.482	0.0248	0.0209	0.484
VIVENDI	0.0250***	0.00434	0.857	0.0185***	0.00418	4.50E-05
ACCOR	0.0251***	0.00489	0.904	0.0198***	0.00557	0.898
Chemicals (DS Portfolio)	0.0252***	0.00226	0.951	0.0243***	0.00251	0.953
ARKEMA	0.0252**	0.0118	0.688	0.0172**	0.00755	0.676
L AIR LQE.SC.ANYME. POUR L ETUDE ET L EPXTN.	0.0261***	0.00318	0.938	0.0261***	0.00277	0.943
SOCIETE GENERALE	0.0340***	0.00962	0.867	0.0369**	0.0147	0.873
BOUYGUES	0.0365***	0.00441	0.85	0.0277***	0.00534	0.842
Drug/Groc Stores (DS Portfolio)	0.0385***	0.00596	0.758	0.0289***	0.00799	0.729
Construction (DS Portfolio)	0.0392***	0.00341	0.95	0.0290***	0.00547	0.934
Airlines (DS Portfolio)	0.0394***	0.0118	0.534	0.0316**	0.0144	0.528
AIR FRANCE-KLM	0.0394***	0.0118	0.534	0.0317**	0.0144	0.528
RUBIS	0.0417***	0.00597	0.805	0.0259***	0.0119	0.769
Food Retail, Ws (DS Portfolio)	0.0418***	0.00658	0.745	0.0302***	0.00886	0.712
BIOMERIEUX	0.0436***	0.011	0.402	0.0429***	0.0102	0.413
RALLYE	0.0446	0.0302	0.364	0.0212	0.0293	0.341
Divers. Retail (DS Portfolio)	0.0451	0.0302	0.365	0.0000216	0.0000293	0.418
CARREFOUR	0.0474***	0.00775	0.733	0.0352***	0.00996	0.704
JACQUET METALS	0.0512***	0.0127	0.709	0.0277**	0.0116	0.676
VINCI	0.0514***	0.00412	0.947	0.0393***	0.00673	0.926
Medical Services (DS Portfolio)	0.0763***	0.00871	0.721	0.0716***	0.00889	0.724
EUROFINS SCIEN.	0.0763***	0.00871	0.721	0.0716***	0.00889	0.724

Note: The table presents results from regressions of the returns on the firms listed in column (1) on either the first difference in the contemporaneous number of new COVID-19 cases in France (column (2)) or the level of the contemporaneous number of new cases (column (5)).   The regressors also include the change in the euro/dollar nominal exchange rate, the return on the aggregate French stock market, the return on the world stock market, the change in the log of the spot price for Brent crude oil, and Altavilla et al's (2019) measures of the changes in 2-year French sovereign yields driven by European Central Bank press

conferences, The sample period extends from 1 January 2020 to 13 March 2020. There are 53 observations. S.E. in columns (3) and (6) are heteroscedasticity and autocorrelation consistent standard errors. The values in columns (2), (3), (5), and (6) are multiplied by 1,000 to improve legibility.

Source: Datastream database and calculations by the author.

*** (**)[*]denotes significance at the 1% (5%) [10%] level

Table 2. The Relationship between the Exposure of 174 French Assets to COVID-19 Cases and to Macroeconomic Variables.

	Left-Hand Side Variables:			
	Beta Coefficient on First Difference of Contemporaneous Number of COVID-19 Cases		Beta Coefficient on Contemporaneous Number of COVID-19 Cases	
(1)	(2)	(3)	(4)	(5)
Right-Hand Side Variables:	Coefficient	S.E.	Coefficient	S.E.
Coefficient on Return on French Stock Market	0.00000016	0.0000081	0.0000043	0.00000076
Coefficient on Return on World Stock Market	0.0000062	0.000013	-0.00000052	0.000013
Coefficient on Change in Log of Brent Oil Spot Price	-0.00029***	0.000067	-0.00025***	0.000057
Coefficient on Change in Log of Euro	0.000059***	0.000022	0.000052***	0.000020
Coefficient on Change in 2-year French Interest Rate Driven by ECB Press Conferences	-0.0171**	0.0075	-0.0134*	0.0070
Coefficient on Dummy Variable for Draghi's Announcement to Do Whatever It Takes	0.00017	0.00016	0.00012	0.00014
Coefficient on Change in Return between 1 January 2020 and 20 January 2021	0.000017**	0.000008	0.000015	0.000009
Number of Observations	174		174	
Adjusted R-squared	0.234		0.193	

Note: The table presents the results from using the 174 exposures to the number of cases reported in Table 1 as independent variables. Column (2) presents the results using the coefficients from the first difference of the contemporaneous number of cases as the regressand and column (4) presents the coefficients on the level of the contemporaneous number of cases as the regressand. The first six regressors listed in column (1) are the regression coefficients from regressions of the returns on the 174 assets listed in Table 1 on the return on the aggregate French stock market, the return on the world stock market, the change in

the log of the spot price for Brent crude oil, the change in the log of the euro/dollar exchange rate, Altavilla et al's (2019) measures of the changes in 2-year French sovereign yields driven by European Central Bank press conferences, and a dummy variable that equals one on 26 July 2012 when ECB President Draghi said that he would do whatever it takes to save the euro and zero otherwise. The sample period used to obtain the coefficients on the right-hand side variables that are used as regressors extends from 22 January 2001 to 19 January 2021. There are 5,216 observations. One additional regressor in column 1 is the actual change in the return on the asset between 1 January 2020 and 19 January 2021. This last regressor could be informative if investors could foresee how the pandemic would affect different firms and sectors. S.E. in columns (3) and (5) are heteroscedasticity and autocorrelation consistent standard errors

Source: Datastream database and calculations by the author.

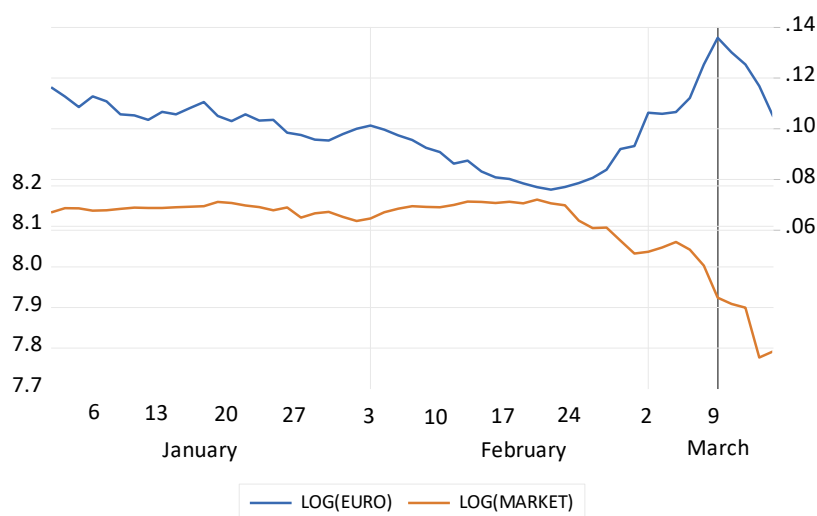*** (**)[*]denotes significance at the 1% (5%) [10%] level

Figure 1. The Value of the Euro and Brent crude Oil Prices, January – March 2020.
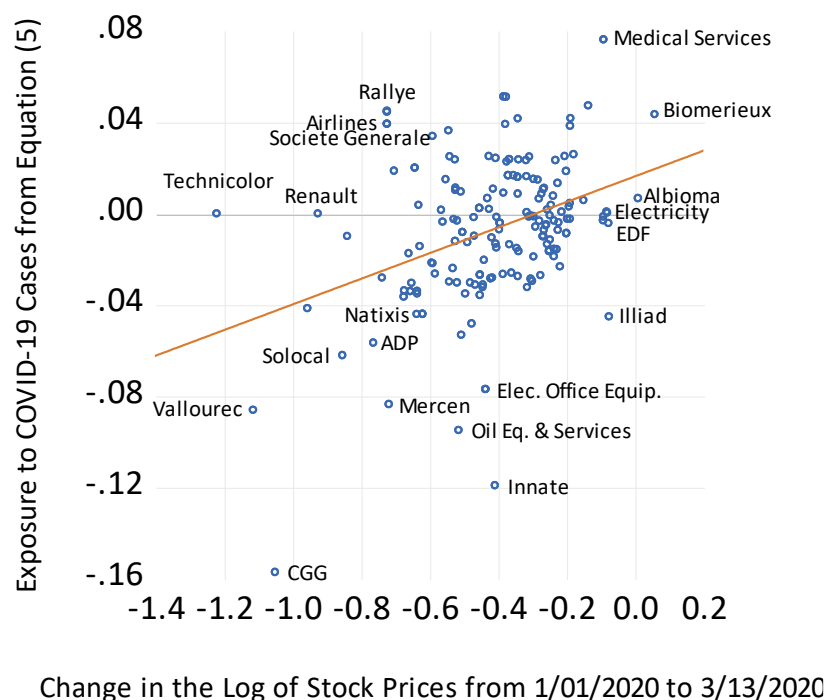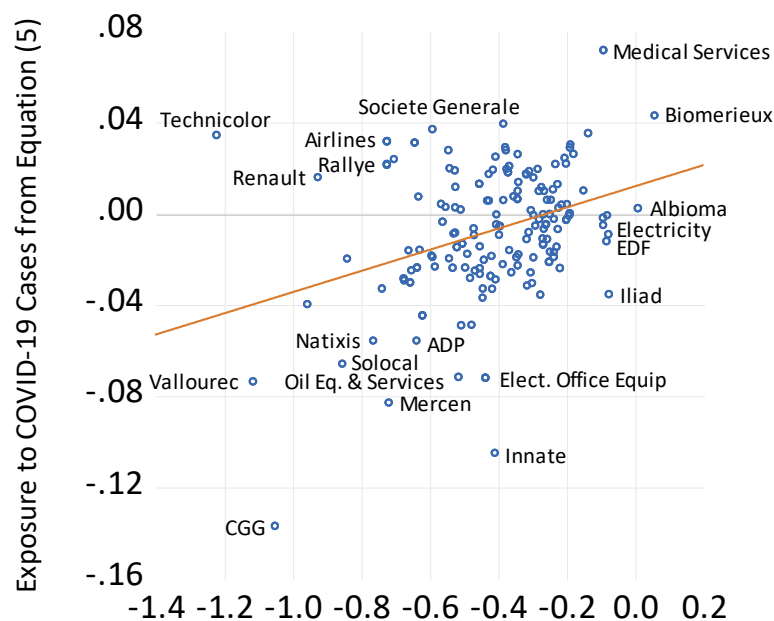*Source:* Datastream database.

Figure 2a. The Relationship between Asset's Exposure to the First Difference of COVID-19 Cases and their Performance between 1 January 2020 and 13 March 2020.

Note: The figure presents the scatter plot and the regression line from a regression of 174 firms and portfolios' exposures to news of contemporaneous COVID-19 cases on their actual returns over the 1 January 2020 to 13 March 2020 period. Assets' exposures to news of the first difference of contemporaneous cases on the vertical axis come from a regression of daily returns on the 174 firms on the first difference of the contemporaneous number of new cases, the change in the euro/dollar nominal exchange rate, the return on the aggregate French stock market, the return on the world stock market, the change in the log of the spot price for Brent crude oil, and Altavilla et al's (2019) measures of the changes in 2-year French sovereign yields driven by European Central Bank press conferences. The sample period for the regression using asset returns as the regressand extends from 1 January 2020 to 13 March 2020.

Figure 2b. The Relationship between Asset's Exposure to COVID-19 Cases and their Performance between 1 January 2020 and 13 March 2020.

Note: The figure presents the scatter plot and the regression line from a regression of 174 firms and portfolios' exposures to news of contemporaneous COVID-19 cases on their actual returns over the 1 January 2020 to 13 March 2020 period. Assets' exposures to news of contemporaneous cases on the vertical axis come from a regression of daily returns on the 174 firms on the contemporaneous number of new cases, the change in the euro/dollar nominal exchange rate, the return on the aggregate French stock market, the return on the world stock market, the change in the log of the spot price for Brent crude oil, and Altavilla et al's (2019) measures of the changes in 2-year French sovereign yields driven by European Central Bank press conferences. The sample period for the regression using asset returns as the regressand extends from 1 January 2020 to 13 March 2020.

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