Winners and Losers from the COVID-19 Pandemic: Evidence from the Stock Market

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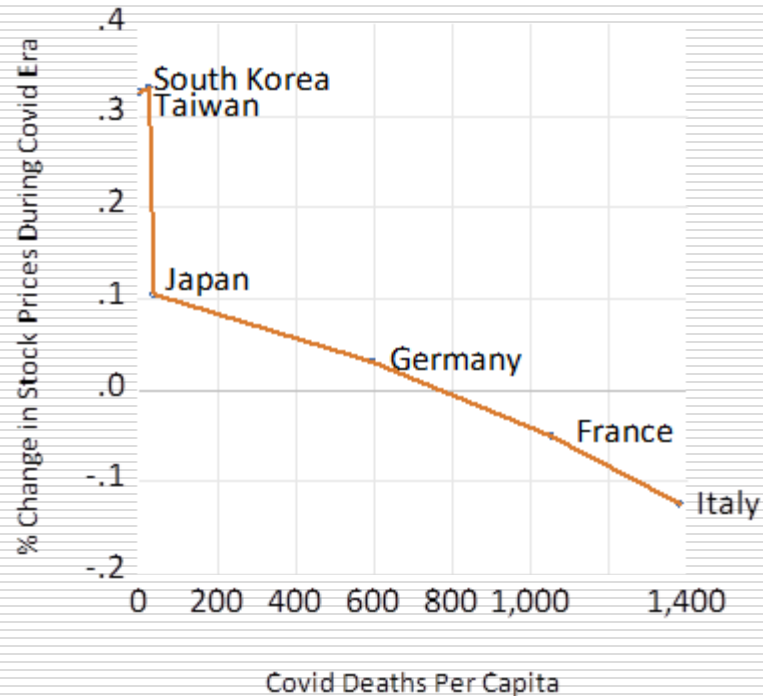
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1. Introduction

- ☐ COVID-19 walloped national health care systems and the world economy.

- ☐ East Asia has performed better than Europe at managing the health crisis.

- ☐ As of 8 July 2021, total deaths from COVID-19 per million people equaled: 2113 for Italy, 1650 for France, 1089 for Germany, 118 for Japan, 40 for Korea, and 30 for Taiwan.

- ☐ Better health outcomes are mirrored in better stock market performance.

COVID-19 Deaths Per Capita versus Stock Market Performance

Sectoral Stock Returns

- ☐ Stock prices provide information about future performance since finance theory indicates that they equal the expected present value of future cash flows.

- ☐ Black (1987, p. 113) observed that, "The sector-by-sector behavior of stocks is useful in predicting sector-by-sector changes in output, profits, or investment. When stocks in a given sector go up, more often than not that sector will show a rise in sales, earnings, and outlays for plant and equipment".

- ☐ This study uses sectoral stock returns to investigate how the pandemic affected the economies of East Asia and Europe.

Previous Research

☐ Chetty et al. (2020) examined how spending responded to the pandemic and found that 3/4 of the drop in spending came from items requiring close contact such as hotels, transportation, and restaurant meals. They also found that high-income households reduced spending at businesses producing nontradables, causing these businesses to lay off low-income employees.

☐ Eichenbaum et al. (2020) calibrated how pandemics affect aggregate demand and aggregate supply. They found that people avoiding infection risk caused labor supply and thus aggregate supply to fall and consumption and thus aggregate demand to drop. This in turn can lead to a deep, persistent recession.

Previous Research (continued)

□ Aslam et al. (2020) investigated how the coronavirus crisis affected the multifractal properties of European stock markets. They applied multifractal detrended fluctuation analysis to 5-minute index data. They reported evidence of multifractality, militating against the weak form financial market efficiency hypothesis. This evidence was strongest for Austria and the U.K. The Hurst coefficient also pointed to mean-reverting behavior during the crisis.

Previous Research and This Study's Approach

☐ Other articles include Bouri et al. (2021), Sharif et al. (2020), Gharib et al. (2021), and Okorie and Lin (2021). These investigated how the pandemic affected stock returns and other asset classes at the aggregate level.

☐ This study adds to the literature by investigating how the crisis impacts stocks at the sectoral level in France, Germany, Italy, Japan, South Korea and Taiwan. This allows us to compare in detail how the crisis is affecting sectors across Europe and Asia.

2. Data and Methodology

- ☐ Regress sectoral stock returns on macro variables (Δ exchange rate, return of country stock market, return on world stock market, Δ oil price, measure of monetary policy).

- ☐ Chen, Roll, and Ross argued that, while only supernovas are truly exogenous, one can assume that causality flows from the macro variables to the sectoral stock returns and that causality flowing in the other direction is of second order.

- ☐ Brent crude oil spot prices are used for European countries and Dubai crude oil spot prices are used for Asian countries.

- ☐ Δ 2-year and Δ10-year interest rates driven by ECB press releases, press conferences, and monetary policy events are included for France, Germany, and Italy (Altavilla et al., 2019).

- ☐ Δ Bank of Korea (BoK) base rate and ΔTaiwan Central Bank discount rate are included for Korea and Taiwan.

Estimated Equation

Datastream sectoral stock return data for France, Germany, Italy, Japan, Korea, and Taiwan are regressed on the returns on the countries' aggregate stock markets, the return on the world stock market, the changes in the spot prices of Brent or Dubai crude oil, and the changes in the measures of monetary policy. The data are daily. The sample period extends from 22 January 2001 to 18 February 2020. There are 4,911 observations. The estimated equations take the form:

$$\Delta R_{i,t} = \alpha_0 + \alpha_1 \Delta R_{m,t} + \alpha_2 \Delta R_{m,World,t}$$
$$+ \alpha_3 \Delta P_{oil,t} + \alpha_4 \Delta er_t + \alpha_5 \Delta MP_t , \quad (1)$$

where $\Delta R_{i,t}$ is the change in the log of the stock price index for firm i, $\Delta R_{m,t}$ is the change in the log of the price index for the country's aggregate stock market, $\Delta R_{m,World,t}$ 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 (for European stocks) or Dubai crude oil (for Asian stocks), Δer_t is the change in the country's nominal exchange rate against the U.S. dollar, and ΔMP_t is the change in the monetary policy measure. Since there are no cross-equation restrictions, the model is estimated equation-by-equation using least squares. Given the large number of observations and the assumption that causality flows from the macroeconomic variables on the right-hand side to the firm-specific variables on the left-hand side, this approach should provide precise parameter estimates.

Investigating the Coronavirus Period

- ☐ The crisis caused stocks to fall beginning 19 Feb 2020. Changes in returns from 19 Feb 2020 to 19 Jan 2021 are thus observed.

- ☐ Equation (1) is used to decompose returns into the portion driven by macroeconomic factors and by idiosyncratic factors.

- ☐ Equation (1) is estimated over the 22 January 2001 to 18 February 2020 period. Actual out-of-sample values of the macroeconomic variables are then used to forecast returns over the 19 February 2020 to 19 January 2021 period. These forecasted returns represent the changes in returns driven by the macroeconomic environment.

- ☐ The difference between actual returns over the crisis period and forecasted returns then measures the unexpected portion of returns.

3. Results for Italy

(1)	(2)	(3)	(4)
Sector	Δ Log of stock price between 19 Feb. 2020 and 20 Jan. 2021 driven by all factors	Δ Log of stock price between 19 Feb. 2020 and 20 Jan. 2021 driven by macro factors	Δ Log of stock price between 19 Feb. 2020 and 20 Jan. 2021 driven by other factors
Oil Refining & Marketing	-0.747	-0.173	-0.574
Restaurants & Bars	-0.609	-0.037	-0.572
Oil Equip. & Services	-0.479	-0.126	-0.354
Travel & Tourism	-0.433	-0.124	-0.309
Footwear	-0.349	-0.094	-0.254
Banks	-0.309	-0.247	-0.062
Life Insurance	-0.305	-0.152	-0.153
Apparel Retailer	-0.290	0.058	-0.348
Aerospace	-0.207	0.058	-0.264
Health Care Facilities	-0.040	0.077	-0.117
Health Care Providers	-0.040	0.077	-0.117
Auto Parts	-0.009	0.01	-0.019
Recreation Vehicles	0.069	-0.031	0.100
Electrical Components	0.097	-0.031	0.128
Medical Supplies	0.124	0.08	0.044
Technology Hardware	0.166	-0.023	0.189
Computer Hardware	0.166	-0.058	0.223
Consumer Digital Services	0.263	-0.121	0.384
Medical Equip.	0.321	0.003	0.318
Automobiles	0.38	-0.062	0.442
Computer Services	0.493	0.056	0.438

Interpreting Results for Italy

- Oil industry, restaurants & bars, travel & tourism, footwear, and life insurance lost between 30% and 75%. The losses are much worse than predicted based on macro environment.

- Computer hardware & services, consumer digital services, and medical equipment gained between 17% and 50%. The gains are much more than expected based on macro variables.

Results for France

(1)	(2)	(3)	(4)
Sector	Δ Log of stock price between 19 Feb. 2020 and 20 Jan. 2021 driven by all factors	Δ Log of stock price between 19 Feb. 2020 and 20 Jan. 2021 driven by macro factors	Δ Log of stock price between 19 Feb. 2020 and 20 Jan. 2021 driven by other factors
Airlines	-0.668	-0.071	-0.597
Oil Equipment & Services	-0.366	0.009	-0.376
Travel & Tourism	-0.319	-0.121	-0.198
Aerospace	-0.306	-0.007	-0.299
Banks	-0.291	-0.061	-0.230
Hotels & Motels	-0.253	-0.032	-0.220
Restaurant & Bars	-0.246	0.035	-0.281
Life Insurance	-0.227	-0.003	-0.223
Railroads	-0.205	0.058	-0.262
Oil: Crude Production	-0.119	-0.016	-0.102
Computer Services	0.029	-0.093	0.121
Recreation Vehicles	0.069	0	0.069
Electronic Entertainment	0.134	0.025	0.108
Automobiles	0.124	-0.052	0.176
Auto Parts	0.13	0.013	0.117
Technology Hardware	0.166	-0.175	0.341
Luxury	0.203	0.002	0.190
Semiconductors	0.216	-0.162	0.378
Medical Equipment	0.242	0.008	0.234
Household Furnishing	0.246	-0.193	0.439
Delivery Service	0.284	0.223	0.062
Health Care Services	0.405	0.090	0.315
Medical Services	0.493	0.116	0.378
Consumer Digital Services	1.260	0.047	1.210

Interpreting Results for France

- ☐ Industries related to travel & tourism decimated. Airlines lost 67%, hotels lost 25%, restaurants lost 25%, railroads lost 21%. Aerospace industry lost 31%. Losses almost all from idiosyncratic not macro factors.

- ☐ Oil-related sectors also suffered due to idiosyncratic factors.

- ☐ Luxury sector, semiconductors, medical equipment, household furnishings, health services, and consumer digital services gained from idiosyncratic factors.

Results for Germany

(1)	(2)	(3)	(4)
Sector	Δ Log of stock price between 19 Feb. 2020 and 20 Jan. 2021 driven by all factors	Δ Log of stock price between 19 Feb. 2020 and 20 Jan. 2021 driven by macro factors	Δ Log of stock price between 19 Feb. 2020 and 20 Jan. 2021 driven by other factors
Airlines	-0.386	0.026	-0.412
Travel & Tourism	-0.318	-0.019	-0.300
Banks	-0.275	-0.017	-0.258
Aerospace	-0.239	0.160	-0.399
Software	-0.156	0.056	-0.213
Railroads	-0.156	0.135	-0.290
Health Care	-0.020	0.065	-0.086
Machinery: Tools	-0.019	0.167	-0.186
Computer Hardware	0.033	-0.017	0.050
Consumer Digital Services	0.043	0.056	-0.014
Tires	0.075	0.161	-0.086
Auto Parts	0.115	0.097	0.018
Automobiles	0.162	0.011	0.151
Medical Equipment	0.206	0.070	0.136
Computer Services	0.223	0.024	0.198
Delivery Services	0.284	0.058	0.226
Medical Supplies	0.287	0.080	0.207
Drug Retailers	0.294	0.064	0.230
Electrical Components	0.371	0.525	-0.154
Technology Hardware	0.400	0.018	0.382
Semiconductors	0.423	0.022	0.401
Home Improvement Retail	0.764	-0.006	0.769

Interpreting Results for Germany

- [ ] Airlines, travel & tourism, aerospace, and railroads lost from 16% to 39%. The losses are driven not by the macro environment but by idiosyncratic factors.

- [ ] Banks in Germany lost due to idiosyncratic factors.

- [ ] Medical equipment & supplies, computer services, technology hardware and semiconductors, and home improvement retail gained between 14% and 77% due to idiosyncratic factors.

Results for Japan

(1)	(2)	(3)	(4)
Sector	Δ Log of stock price between 19 Feb. 2020 and 20 Jan. 2021 driven by all factors	Δ Log of stock price between 19 Feb. 2020 and 20 Jan. 2021 driven by macro factors	Δ Log of stock price between 19 Feb. 2020 and 20 Jan. 2021 driven by other factors
Oil: Crude Production	-0.460	0.103	-0.563
Airlines	-0.430	0.024	-0.454
Luxury Items	-0.411	0.061	-0.470
Railroads	-0.233	0.096	-0.329
Travel & Tourism	-0.125	0.095	-0.219
Banks	-0.115	0.083	-0.197
Tobacco	-0.109	0.110	-0.219
Hotels & Motels	-0.106	0.072	-0.178
Household Furnishing	-0.103	0.071	-0.174
Oil Refining Marketing	-0.06	0.110	-0.170
Restaurants & Bars	-0.020	0.063	-0.083
Auto	-0.010	0.108	-0.118
Cosmetics	0.001	0.150	-0.150
Auto Parts	0.140	0.129	0.011
Medical Equipment	0.162	0.143	0.019
Computer Hardware	0.176	0.062	0.115
Medical Supplies	0.215	0.074	0.141
Home Improvement Retail	0.231	0.150	0.083
Computer Services	0.233	0.093	0.140
Consumer Digital Services	0.303	0.169	0.135
Technology Hardware	0.342	0.070	0.272
Semiconductors	0.438	0.079	0.360
Electronics Entertainment	0.469	0.097	0.372
Delivery Services	0.566	0.082	0.483
Health Care Services	1.130	0.222	0.907

Interpreting Results for Japan

- Sectors related to travel & tourism, including airlines, railroads, and hotels & motels lost between 10% and 43%. The losses are driven by idiosyncratic factors.

- Sectors catering to those working and hunkered at home did well, including computer hardware, home improvement retail, computer services, consumer digital services, technology hardware, electronics entertainment, and delivery services. The gains are driven by idiosyncratic factors.

- Medical equipment, medical supplies, and health care services gains between 16% and 116%.

Results for Korea

(1)	(2)	(3)	(4)
Sector	Δ Log of stock price between 19 Feb. 2020 and 20 Jan. 2021 driven by all factors	Δ Log of stock price between 19 Feb. 2020 and 20 Jan. 2021 driven by macro factors	Δ Log of stock price between 19 Feb. 2020 and 20 Jan. 2021 driven by other factors
Tobacco	-0.083	0.184	-0.267
Travel & Leisure	-0.021	0.244	-0.266
Banks	0.001	0.322	-0.321
Drug/Grocery Stores	0.040	0.307	-0.267
Consumer Staples	0.042	0.350	-0.307
Cosmetics	0.073	0.357	-0.284
Computer Services	0.179	0.368	-0.189
Life Insurance	0.187	0.142	0.045
Semiconductors	0.232	0.320	-0.088
Electronic Entertainment	0.300	0.340	-0.039
Technology Hardware	0.372	0.351	0.021
Computer Hardware	0.373	0.276	0.096
Tires	0.384	0.331	0.053
Auto Parts	0.402	0.382	0.020
Airlines	0.432	0.381	0.051
Oil Refining & Marketing	0.453	0.349	0.104
Health Care	0.489	0.328	0.161
Electronic Components	0.579	0.390	0.189
Consumer Digital Services	0.624	0.407	0.218
Automobiles	0.688	0.320	0.368
Consumer Electronics	0.766	0.352	0.414
Chemicals	0.826	0.451	0.375

Interpreting Results for Korea

☐ While most sectors in Korea posted gains, idiosyncratic factors reduced returns by between 27% and 31% in tobacco, travel & leisure, banks, drug/grocery stores, consumer staples, & cosmetics.

☐ Idiosyncratic factors contributed to gains of between 10% and 41% in oil, health care, electronic components, consumer digital services, automobiles, consumer electronics, & chemicals.

Results for Taiwan

	(1)	(2)	(3)	(4)
Sector		Δ Log of stock price between 19 Feb. 2020 and 20 Jan. 2021 driven by all factors	Δ Log of stock price between 19 Feb. 2020 and 20 Jan. 2021 driven by macro factors	Δ Log of stock price between 19 Feb. 2020 and 20 Jan. 2021 driven by other factors
Leisure Goods		-0.398	0.466	-0.864
Consumer Discretionary		-0.187	0.351	-0.538
Banks		-0.169	0.341	-0.509
Food Producers		-0.154	0.373	-0.528
Drug/Grocery Stores		-0.147	0.272	-0.419
Telecommunications Services		-0.053	0.107	-0.16
General Industrials		-0.049	0.297	-0.346
Chemicals		-0.036	0.318	-0.354
Life Insurance		-0.032	0.325	-0.358
Industrial Materials		-0.025	0.418	-0.443
Textile Products		-0.025	0.418	-0.443
Iron & Steel		-0.002	0.242	-0.244
Tires		0.053	0.357	-0.304
Oil Refining & Marketing		0.059	0.278	-0.218
Autos & Parts		0.105	0.308	-0.202
Footwear		0.119	0.342	-0.223
Computer Hardware		0.188	0.313	-0.125
Electronic Components		0.314	0.367	-0.053
Telecommunications Equipment		0.434	0.357	0.077
Industrial Engineering		0.534	0.539	-0.004
Machinery: Industrial		0.534	0.539	-0.004
Technology Hardware		0.579	0.383	0.196
Semiconductors		0.660	0.401	0.259

Interpreting Results for Taiwan

- ☐ Idiosyncratic factors contributed to losses of between 53% and 86% for leisure goods, food producers, and consumer discretionary goods. For example, the catering sector collapsed.

- ☐ For technology hardware & semiconductors, idiosyncratic factors contributed to gains of between 20% and 26%.

4. Comparing Findings Across Countries

- ☐ Tourism stock in Italy, France, Germany, Japan, and Korea fell by between 20% and 31% due to idiosyncratic factors.

- ☐ Airline stocks in France, Germany, and Japan fell by between 41% and 60% due to idiosyncratic factors.

- ☐ Contributed to a fall of between 26% and 41% in aerospace stocks in France , Germany, and Italy due to idiosyncratic shocks.

Technology

- As people worked from home, spending on technology increased. Technology hardware stocks rose 19% more than expected in Italy, 20% more in Taiwan, 27% more in Japan, 34% more in France, and 38% more in Germany.

- Increased demand for technology and recovered demand for automobiles and other items led to a semiconductor shortage. Semiconductor stocks rose 26% more than expected in Taiwan, 36% more in Japan, 38% more in France, and 40% more in Germany.

French versus Japanese Luxury Brands

- ❑ Idiosyncratic factors caused Japanese luxury stocks to fall by 47% and French luxury stocks to rise by 19%.

- ❑ They also caused Japanese household furnishing (HF) stocks to fall by 17% and French HF stocks to rise by 44%.

- ❑ If we include the return on the Chinese stock market in equation (1) when explaining French luxury returns, the coefficient is positive and highly significant. French luxury companies have benefited from the recovery in China.

Banks

- Bank stocks fell 6% more than expected in Italy, 20% more in Japan, 23% more in France, 26% more in Germany, and 32% more in Korea.

- The threat of nonperforming loans from the pandemic has harmed banks.

- Nontraditional monetary policy that lowers the spread between long and short-term interest rates and short-term interest rates can also decrease bank profitability.

- Given the importance of banks in the economies of Asia and Europe, authorities should monitor the health of banks and how their policies affect this.

Medical Equipment & Supplies

- Idiosyncratic factors caused medical equipment stocks to rise 14% more than expected in Germany, 23% more in France, and 32% more in Italy. They also caused medical supply stocks to rise 4% more than expected in Italy, 14% more in Japan, and 21% more in Germany.

- Increased demand due to the pandemic and supply chain glitches have raised prices for these goods.

5. Conclusion

☐ The Covid-19 shock caused large losses in hotels, restaurants, airlines and in industries such as aerospace that supply these sectors.

☐ The pandemic also produced large gains for technology companies that equip employees to work from home and in industries such as semiconductors that supply these sectors.

Supply Chain Disruptions

- ☐ Supply chain disruptions and quick changes in demand led to windfall gains for producers of semiconductors and medical equipment.

- ☐ These also led to disruptions for firms using semiconductors and dangers for those needing medical equipment.

- ☐ Firms and governments need to think out supply chain links more carefully and prepare for disruptions.

Inequalities

☐ Industries such as hotels, restaurants, and airlines that employ lower paid service workers performed badly.

☐ Industries such as computer services, technology hardware, and semiconductor manufacturing that employ high skilled workers did well.

☐ This trend exacerbated inequalities that existed before the crisis.

☐ Policymakers in each country should focus on reforms (e.g., easing product market regulations) that could reduce longer-term structural inequities.

Producing Luxury Brands in France

- Luxury brands help to stabilize the French economy in the face of exchange rate shocks and the pandemic.

- Many outsource production, risking a loss of knowledge in France.

- Luxury brands can learn from Asian industrial clusters. This agglomeration helps young people and experienced workers to acquire knowhow and gain human capital.

- Keeping production in France also helps to preserve quality and maintain strong brands.

Diversifying the Economy

☐ The COVID-19 pandemic was unforeseen.

☐ Some sectors lost big and others won big.

☐ Economies should not rely on one or a few growth engines, but should diversify so that they can better weather unforeseen shocks such as the pandemic.

Learning from Each Other

- ☐ The results in this paper indicate that the way countries managed the health crisis influenced the performance of their economies.

- ☐ European countries should glean lessons from Asia's success at keeping the death toll low.

- ☐ As the crisis moves to a new stage and vaccines are available, countries in Asia that have managed the crisis well should not become complacent but learn lessons from Europe into how their populations can get vaccinated quickly and efficiently.

□ Thank You