Article

Stock Indices Breakdown during the Pandemic as the Most Dynamic Bear Market in History: Consequences for Individual Investors

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Abstract: The breakdown of stock indices is an obvious part of the financial market cycle. A common question about a bear market is the time and the depth of the downtrend, as well as the speed of the following recovery. As the COVID-19 pandemic spread globally, it induced huge price drops in a very short period, and an uptrend with new historical highs afterwards. The results of this research show that the pandemic breakdown was the fastest bear market in history; however, it does not confirm that future downtrends will be at the same or even greater speed. The consequences for individual investors have forced them to prepare for possible similar market behavior in the future, and to adjust their trading techniques and strategies to these conditions.

Keywords: COVID-19; bear market; drawdown; recovery; capital markets; individual investor

1. Introduction

Individual investors form an important group of capital market participants whose activity noticeably increased during the pandemic in 2020 (Singh 2021). Other studies have already proved that, during COVID-19, trading intensity increased among individuals, many new positions on financial instruments were opened and portfolios were enlarged. Moreover, short-selling of stocks became more popular and many new investors appeared on the market (Ortmann et al. 2020).

Increased trading activity can be explained in many different ways. The most common reasons are long-term trends in the development of technologies that make market access easier and cheaper (Alshubiri et al. 2019), an increasing level of financial literacy (Liivamägi 2016) and financial inclusion (Qamruzzaman and Wei 2019). Furthermore, the pandemic lockdowns contributed to higher financial liquidity among households, as well as more free time, which, according to behavioral theories and biases, favors participation in financial markets (Bates 2020).

Other observations of financial market behavior during the COVID-19 pandemic suggest that the dynamics of price changes, volatility and the speed of recovery increased. Shorter price movements and faster trends, pullbacks and returns may be correlated with traders' overconfidence and enormous expectations (Frazer 2020). Such inclinations have been confirmed in research into the area of behavioral finance. Investors' desires for unrealistic rates of return are hard or even impossible to achieve and expose them to excessive risk (Greenwood and Shleifer 2014).

Initial insights concerning market dynamics and the speed of breakdowns and recoveries should be confirmed by proper research so that they can be used in investment activity. It is worth noticing that, at first glance, the bear market triggered by COVID-19 looks as if it is the fastest down–up cycle in the history of the financial markets. Many historical bear markets are well-known among investors, and, even today, they can be seen as a warning to current and future generations of traders. These can be compared to the COVID-19 breakdown and are listed below:

- The panic of 1907—the Bankers Panic/Knickerbocker Crisis (Tucker 2008),
- The 1929 crash followed by the Great Depression (Encyclopedia Britannica n.d.),
- The Flash Crash of 1962 (Zweig 2010) also called Kennedy Slide,
- The 1973 bear market (Duggan 2017),
- Black Monday 1987 (Semmens 1988),
- The early 1990s recession (Alcorn 2019),
- The 1998 Russian recession (Aris 2018),
- The 2000 dot-com bubble (International Banker 2021),
- The 2007/8 world financial crisis (Lazette 2017).

From the list of breakdowns mentioned above, a general rule can be formulated that indicates a "bear" on the financial markets: a bear market can be defined as such when the drawdown of prices falling from top values achieves at least 20%. Naturally, a 20% drawdown is often called a rather customary value by market analysts, journalists and traders; however, it is confirmed by price swings and movements during both historical and more recent downtrends (Schramm 2020).

Apart from abovementioned bear markets, some of the indices passed through "local" collapses. That is why the catalogue of bear markets taken into consideration in this research is extended to 28 different breakdowns. Many of them appeared on just one or two indices.

Taking into consideration the pandemic conditions of the market breakdown in comparison to previous bear markets, the aim of this article is to analyze changes in market dynamics and recovery abilities. The following research hypothesis was formulated: the COVID-19 bear market in 2020, followed by the subsequent recovery, was the fastest and the most dynamic financial market breakdown in history.

The origin of perceiving the COVID-19 bear market as the most dynamic bear market in history resulted from our own market observations during trading process and was also marked in the latest literature. The results of other researches show a high degree of integration in the extreme downside risk of stocks intensified as COVID-19 spread worldwide (Abuzayed et al. 2021), as well as a significant increase in conditional correlations between stock returns, especially for financial companies that proved their greater role in financial contagion transmission (Akhtaruzzaman et al. 2021). Moreover, a strong correlation between stock market returns and contagion frequencies was observed (Alqaralleh and Canepa 2021).

Financial markets become faster and faster at lower timeframes, due to daytrading, scalping and high-frequency trading (Hollifield et al. 2017; O'Hara 2014). The individuals operating on short-term investments are already used to increasing dynamics of the markets. However, as proved in this paper, the COVID-19 bear market signalized that mid- and long-term traders should also pay attention to the price-change acceleration in their trading intervals and that investors' strategies should be adjusted in the area of money management and order triggering to respond to latest market conditions.

2. Methodology

The research was conducted on the basis of principle tradeable stock indices in major economies represented by leading companies—the selected indices usually cover 80%+ of market capitalization (Chinese markets are intentionally omitted due to many trading restrictions for non-Chinese citizens). Complete historical data on every index were taken into account, starting with the official release date. However, it should be noted that it is possible to simulate earlier values of indices on the basis of companies' prices, but, in this research, only official values were included. The research was based on the daily closing prices of the following:

- DJIA from 1896,
- S&P 500 from 1957,
- DAX from 1987,
- Nasdaq Composite from 1971,

- CAC40 from 1987,
- FTSE100 from 1984,
- NIKKEI from 1949.

As mentioned before, a bear market is considered to be such after a price fall of 20% or more, and the total drawdown distance should then be counted from the highest price before the crash.

The measurements of downtrends include the following:

- Maximum drawdown (maxDD)—the greatest price movement from the top to the subsequent bottom of the bear market; this is presented in index points as well as in the percentage decrease referenced to the value of the top; maxDD is a kind of worst-case scenario that could be experienced by investors;
- Recovery in days—the time from the last top before the bear market began to the point where the price achieved or even exceeded the initial top (i.e., achieving a new top); the longer the recovery period, the higher the probability of investors escaping from the market;
- Number of days from top to maxDD ("top-to-bottom")—this represents the nominal speed of the bear market in days;
- Number of days from maxDD to the new top ("bottom-to-top")—this represents the speed of recovery;
- Down vs. recovery ratio in days—this represents the relation between the speed of the bear market (top-to-bottom) and the whole recovery time; the smaller the ratio, the higher the dynamics of the bear market compared to the time of recovery;
- MaxDD %/top-to-bottom ratio represented by CAGR (Compound Annual Growth Rate)—this represents the speed and the dynamics of the bear market, the higher the value, the faster and stronger the behavior of the downtrend; normalization through the use of CAGR allows for comparison with every other bear market period; the simplicity of CAGR interpretation makes it useful for individual investors and is easy to implement in their trading strategies; CAGR is presented in colors representing the 'heat' of the value—from green for low values, through yellow and orange for mid-range values, to red for the highest values;
- The charts visualizing the CAGR (%) and the time of recovery (in thousands of days) divided into top-to-bottom period and bottom-to-top (new-top) period (the same scale for *x*-axis and *y*-axis is used on every chart for better comparison purposes).

Only the DJIA, S&P500 and DAX recovered from every historical bear market before a new downtrend occurred. That is why, for these indices, it is possible to fully separate up and downtrend cycles. For the rest of the researched indices, some bear markets needed a longer time to recover (and some bear markets even never recovered), which is why a few strong up and down periods are analyzed inside others—such bear markets are called here "inner-trends".

The direct correlation among indices is intentionally omitted due to individuals trading preferences—the individual traders usually focus on one market what derives from limited ability to follow market events, some behavioral habits and cost reductions (brokerage accounts, market data and quotes, varied commissioning system, etc.).

The dataset sources for the indices were IQFeed, InFrontFinance, Yahoo.Finance and Stooq.com. The datasets were compared between the different data sources to reach the highest quality and the best validity. The calculations of all parameters, ratios and indicators are the author's own work.

The results are presented in index points, percentage values and number of days, according to the information in the tables. The dates presented in the tables are in yyyy-mm-dd format.

3. Results

The results of the research are presented in the tables below.
The first analyzed index is S&P500, which results are presented in Table 1.

Table 1. Bear markets: drawdown and recovery analysis of Standard and Poors 500 (SP500/S&P500).

Index	Bear Market	MaxDD		#Days Down/Up	Recovery	CAGR
	From (Date)	(Points)	Day of MaxDD (Date)	Top-to-Bottom (#Days)	(#Days)	
	To (Date)	(%)	Lowest Index Value (Points)	Bottom-to-Top (#Days)	Down vs. Recovery Ratio (%)	(maxDD. Top-to-Bottom)
SP500	1957-07-16 1958-09-16	10.2p. 20.7%	1957-10-22 39	98 329	427 23.0%	−57.79%
	1961-12-13 1963-09-03	20.3p. 28.0%	1962-06-26 52.3	195 434	629 31.0%	−45.92%
	1966-02-10 1967-05-04	20.9p. 22.2%	1966-10-07 73.2	239 209	448 53.3%	−31.83%
	1968-12-02 1972-03-06	39.1p. 36.1%	1970-05-26 69.3	540 650	1190 45.4%	−26.10%
	1973-01-12 1980-07-17	58.0p. 48.2%	1974-10-03 62.3	629 2114	2743 22.9%	−31.75%
	1980-12-01 1982-11-03	38.1p. 27.1%	1982-08-12 102.4	619 83	702 88.2%	−17.02%
	1987-08-26 1989-07-26	112.9p. 33.5%	1987-12-04 223.9	100 600	700 14.3%	−77.48%
	2000-03-27 2007-05-30	750.7p. 49.1%	2002-10-09 776.8	926 1694	2620 35.3%	−23.41%
	2007-10-10 2013-03-28	888.6p. 56.8%	2009-03-09 676.5	516 1480	1996 25.9%	−44.77%
	2020-02-20 2020-08-18	1148.8p. 33.9%	2020-03-23 2237.4	32 148	180 17.8%	−99.12%

SP500 is an index that strongly reacts to every bear market period and fully recovers before a new downtrend begins. Since the launch of the SP500 publication, the index has passed through 10 down–up cycles with a maxDD deeper than 20%. As shown in Figure 1, the highest downtrend value measured with CAGR was in 2020, during the intensification of COVID-19. It was the fastest bear market ever, followed by an impressive recovery speed which was also faster than any other historical breakdowns.

The COVID-19 downtrend is not the deepest ever—33.9% maxDD vs. 56.8% during the world financial crisis in 2008; however, the dynamics was at an unprecedented level (99.12% CAGR) and the recovery took only 180 days.
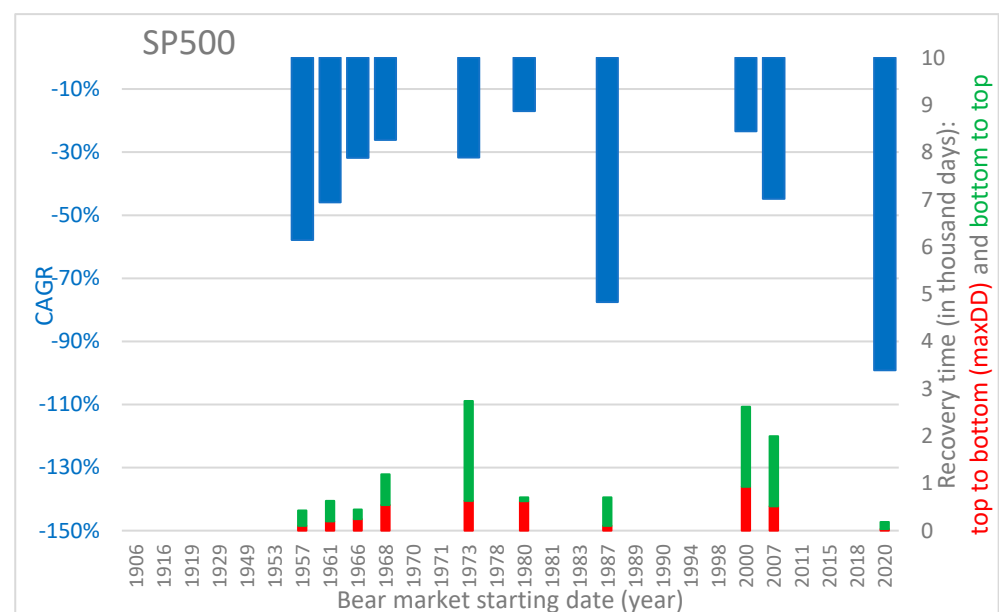
Figure 1. SP500: CAGR and recovery time of bear markets.

The other "famous" American index—the DJIA presented in Table 2 and Figure 2—behaves similarly to the SP500.

Table 2. Bear markets: drawdown and recovery analysis of Dow Jones Industrial Average (DJIA).

| Index	Bear Market From (Date)	MaxDD (Points)	Day of MaxDD (Date)	#Days Down/Up Top-to-Bottom (#days)	Recovery (#days)	CAGR
	To (Date)	(%)	Lowest Index Value (Points)	Bottom-to-Top (#Days)	Down vs. Recovery Ratio (%)	(MaxDD. Top-to-Bottom)
DJIA	1906-01-22	36.2p.	1907-11-15	662	3472	−30.69%
	1915-07-26	48.50%	38.4	2810	19.10%	
	1916-11-22	44.2p.	1917-12-19	392	959	−37.99%
	1919-07-09	40.10%	66	567	40.90%	
	1919-11-05	55.7p.	1921-08-24	658	1883	−29.39%
	1924-12-31	46.60%	63.9	1225	34.90%	
	1929-09-04	340.0p.	1932-07-08	1038	9211	−54.29%
	1954-11-23	89.20%	41.2	8173	11.30%	
	1961-12-14	199.1p.	1962-06-26	194	630	−44.84%
	1963-09-05	27.10%	535.8	436	30.80%	
	1966-02-10	364.0p.	1970-05-26	1566	2465	−10.08%
	1972-11-10	36.60%	631.2	899	63.50%	
	1973-01-12	474.1p.	1974-12-06	693	3582	−27.08%
	1982-11-03	45.10%	577.6	2889	19.30%	
	1987-08-26	983.7p.	1987-10-19	54	729	−95.18%
	1989-08-24	36.10%	1738.7	675	7.40%	
	1990-07-18	634.7p.	1990-10-11	85	273	−64.00%
	1991-04-17	21.20%	2365.1	188	31.10%	
	2000-01-18	4436.7p.	2002-10-09	995	2450	−16.02%
	2006-10-03	37.80%	7286.3	1455	40.60%	
	2007-10-10	7617.5p.	2009-03-09	516	1973	−42.09%
	2013-03-05	53.80%	6547.1	1457	26.20%	
	2020-02-13	10959.5p.	2020-03-23	39	277	−98.70%
	2020-11-16	37.10%	18591.9	238	14.10%	
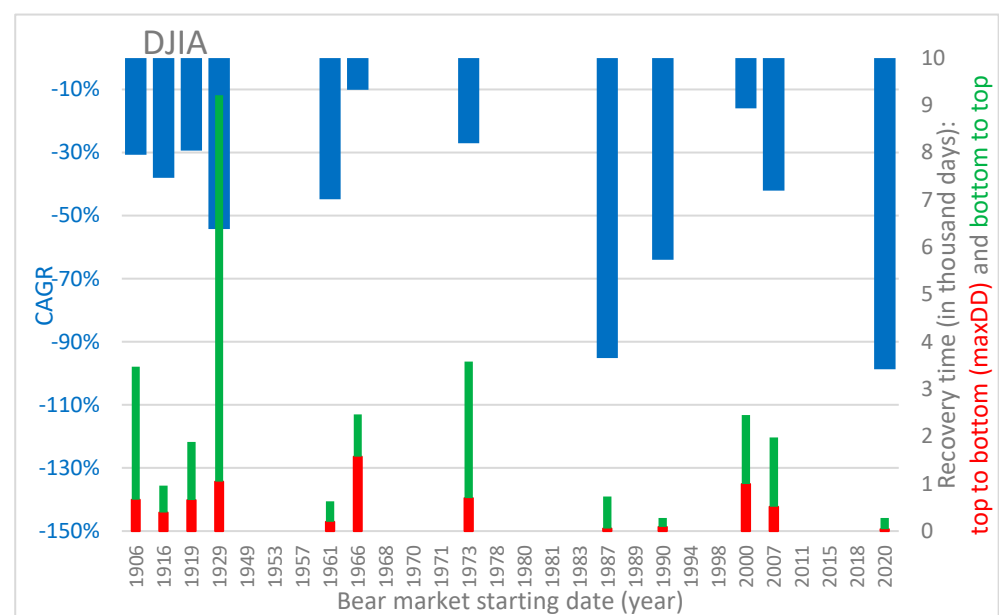
Figure 2. DJIA: CAGR and recovery time of bear markets.

It also fluctuates dynamically, with new historical tops during every bull market and full recovery after all breakdowns. Again, similar to the SP500, the DJIA responded violently to turbulence related to COVID-19 in 2020: the downtrend achieved an impressive

−98.7% dynamics measured with CAGR, and the recovery took only 277 days (in 1991, the recovery took 273 days, but, at the time, the maxDD was only 21.2%, while, in 2020, it was 37.1%).

The German index DAX30 was launched in 1987, so it does not cover earlier bear markets. However, during the last 30 years, it has passed through strong breakdowns seven times, as seen in the Table 3 and Figure 3.

Table 3. Bear markets: drawdown and recovery analysis of DAX30.

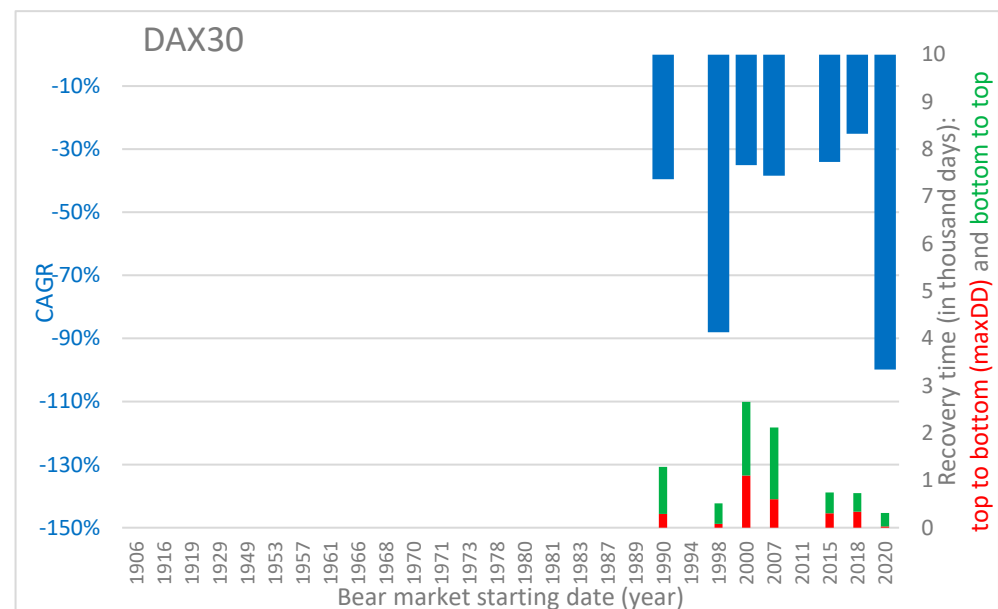| Index	Bear Market	MaxDD		#Days Down/Up	Recovery	CAGR
	From (Date)	(Points)	Day of MaxDD (Date)	Top-to-Bottom (#Days)	(#Days)	(maxDD. Top-to-Bottom)
	To (Date)	(%)	Lowest Index Value (Points)	Bottom-to-Top (#Days)	Down vs. Recovery Ratio (%)	
DAX30	1990-04-02 1993-10-05	645.9p. 32.8%	1991-01-16 1322.7	289 993	1282 22.5%	−39.50%
	1998-07-21 1999-12-14	2275.4p. 36.9%	1998-10-08 3896.1	79 432	511 15.5%	−88.08%
	2000-03-08 2007-06-20	5862.0p. 72.7%	2003-03-12 2203	1099 1561	2660 41.3%	−35.03%
	2007-07-17 2013-05-03	4439.3p. 54.8%	2009-03-06 3666.4	598 1519	2117 28.2%	−38.40%
	2015-04-13 2017-04-24	3621.9p. 29.3%	2016-02-11 8752.9	304 438	742 41.0%	−34.03%
	2018-01-24 2020-01-24	3178.1p. 23.4%	2018-12-27 10381.5	337 393	730 46.2%	−25.13%
	2020-02-20 2020-12-28	5347.3p. 38.8%	2020-03-18 8441.7	27 285	312 8.7%	−99.87%

Figure 3. DAX30: CAGR and recovery time of bear markets.

Compared to the DJIA and SP500, which, in the same period, had only four and three breakdowns respectively, it must be admitted that the DAX30 serves up investors with a large dose of negative emotions during bear markets and euphoria during recoveries. Similar to US indices, the German blue-chip index confirmed the highest dynamics of the down and up trends during COVID-19 in 2020. CAGR at the level of −99.87% (a decrease by 38.8% in 27 days), followed by a 312-day recovery, is historically the most volatile period for the DAX30.

The forth analyzed index and the third of American indices is NASDAQ Composite which behaves a little different than DJIA and S&P500. The NASDAQ had to wait more than 15 years to recover from the dot-com bubble. Naturally, this results from its component parts—a significant share of IT industry companies. As shown in Table 4 and Figure 4, the nature of the NASDAQ is very sensitive to market turbulences, to which it responds dramatically.

Table 4. Bear markets: drawdown and recovery analysis of Nasdaq Composite.

| Index	Bear Market	MaxDD		#Days Down/Up	Recovery	CAGR
	From (Date)	(points)	Day of MaxDD (Date)	Top-to-Bottom (#Days)	(#Days)	
	To (Date)	(%)	Lowest Index Value (Points)	Bottom-to-Top (#Days)	Down vs. Recovery Ratio (%)	(maxDD. Top-to-Bottom)
NASDAQ Composite	1973-01-12	81.9p.	1974-10-03	629	2064	−41.15%
	1978-09-07	59.9%	54.9	1435	30.5%	
	1978-09-14	28.4p.	1978-11-14	61	315	−74.47%
	1979-07-26	20.4%	110.9	254	19.4%	
	1980-02-11	41.2p.	1980-03-27	45	154	−90.24%
	1980-07-14	24.9%	124.1	109	29.2%	
	1981-06-01	63.8p.	1982-08-13	438	521	−24.44%
	1982-11-04	28.5%	159.7	83	84.1%	
	1983-06-27	103.6p.	1984-07-25	394	925	−29.58%
	1986-01-07	31.5%	225.3	531	42.6%	
	1987-08-28	163.9p.	1987-10-28	61	706	−93.06%
	1989-08-03	36.0%	291.9	645	8.6%	
	1989-10-10	160.3p.	1990-10-16	371	539	−32.59%
	1991-04-02	33.0%	325.4	168	68.8%	
	1998-07-21	595.1p.	1998-10-08	79	129	−80.19%
	1998-11-27	29.5%	1419.1	50	61.2%	
	2000-03-13	3934.5p.	2002-10-09	940	5519	−44.41%
	2015-04-23	77.9%	1114.1	4579	17.0%	
"inner-trend"	2007-11-01	1590.5p.	2009-03-09	494	1273	−45.16%
	2011-04-27	55.6%	1268.6	779	38.8%	
NASDAQ Composite	2018-08-30	1916.8p.	2018-12-24	116	236	−57.22%
	2019-04-23	23.6%	6192.9	120	49.2%	
	2020-02-20	2956.5p.	2020-03-23	32	109	−98.33%
	2020-06-08	30.1%	6860.7	77	29.4%	
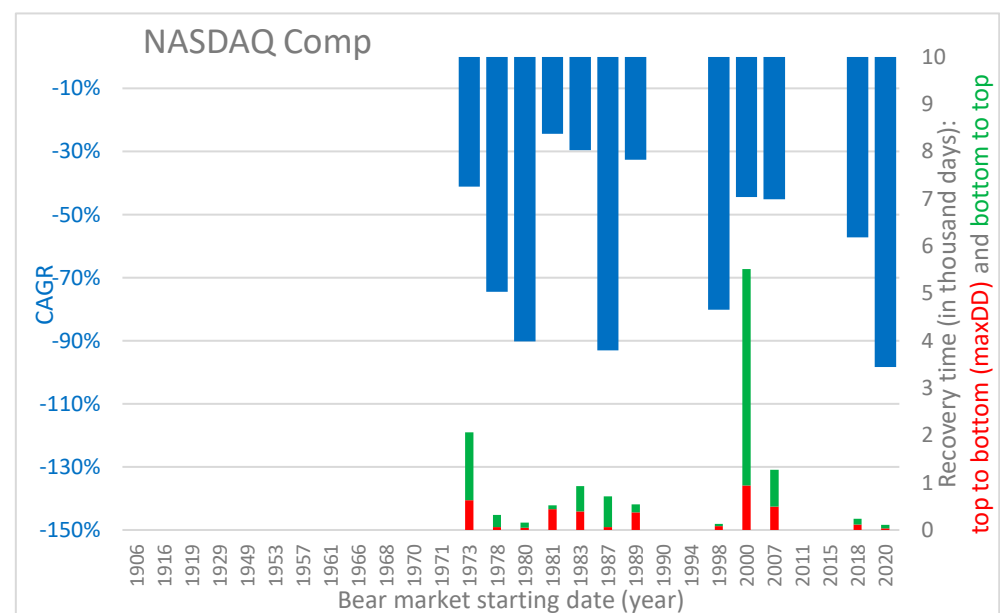
Figure 4. NASDAQ Composite: CAGR and recovery time of bear markets.

The COVID-19 breakdown of NASDAQ in 2020 was the most dynamic down–up cycle, with CAGR at the level of −98.33% and a full recovery in only 109 days, although similar panics and euphoria occurred in 1980, 1987 and 1998. This proves that, for short-term

investors using long and short positions, the NASDAQ is one of the best instruments for trading, while building a long-term stable portfolio on the basis of the NASDAQ is not the best idea.

Due to close European economic ties, the CAC40 would be expected to behave similarly to the DAX and FTSE. However, the results presented in Table 5 and Figure 5 show the opposite.

Table 5. Bear markets: drawdown and recovery analysis of CAC40.

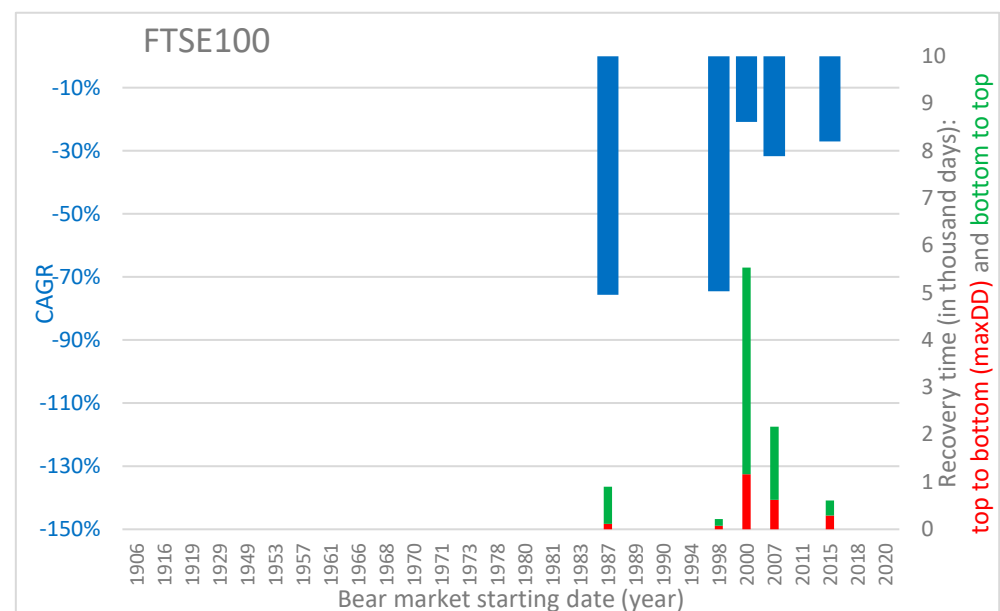| Index	Bear Market	MaxDD		#Days Down/Up	Recovery	CAGR
	From (Date)	(Points)	Day of MaxDD (Date)	Top-to-Bottom (#Days)	(#days)	(maxDD. Top-to-Bottom)
	To (Date)	(%)	Lowest Index Value (Points)	Bottom-to-Top (#Days)	Down vs. Recovery Ratio (%)	
CAC40	1990-04-23	688.0p.	1991-01-14	266	1197	−41.49%
	1993-08-02	32.3%	1441	931	22.2%	
	1994-02-03	634.8p.	1995-10-23	627	1075	−16.71%
	1997-01-13	26.9%	1721.1	448	58.3%	
	1998-07-20	1428.5p.	1998-10-08	80	281	−83.44%
	1999-04-27	32.6%	2960	201	28.5%	
CAC40 dot-com bubble			not recovered			
CAC40 "inner-trend"	2007-06-04	3648.9p.	2009-03-09	644	5058	−39.82%
	2021-04-09	59.2%	2519.3	4414	12.7%	
CAC40 "inner-trend after 2009"	2011-02-21	1375.5p.	2011-09-22	213	940	−49.79%
	2013-09-18	33.1%	2781.7	727	22.7%	
	2015-04-28	1372.2p.	2016-02-11	289	728	−31.70%
	2017-04-25	26.0%	3896.7	439	39.7%	
	2020-02-20	2356.4p.	2020-03-18	27	411	−99.86%
	2021-04-06	38.6%	3754.8	384	6.6%	
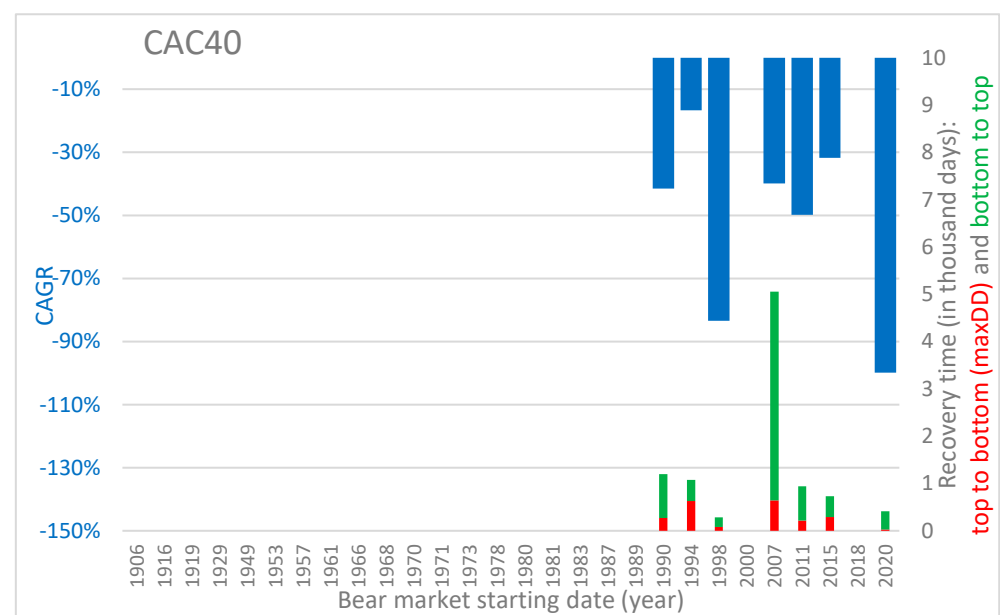
Figure 5. CAC40: CAGR and recovery time of bear markets.

The CAC40 has severe difficulties recovering after breakdowns: the dot-com bubble was never recovered from; the drawdown after the escalation of the world financial crisis in 2008 (2007) was only overcome after almost 14 years; and even after the most dynamic bear market in CAC40 history, i.e., the COVID-19 panic in 2020, it took more than a year to reach new tops.

The FTSE100, a close "friend" of the DAX30 and CAC40, proves that European ties are not so strong as they are usually considered to be (see the results in Table 6 and Figure 6).

Table 6. Bear markets: drawdown and recovery analysis of FTSE100.

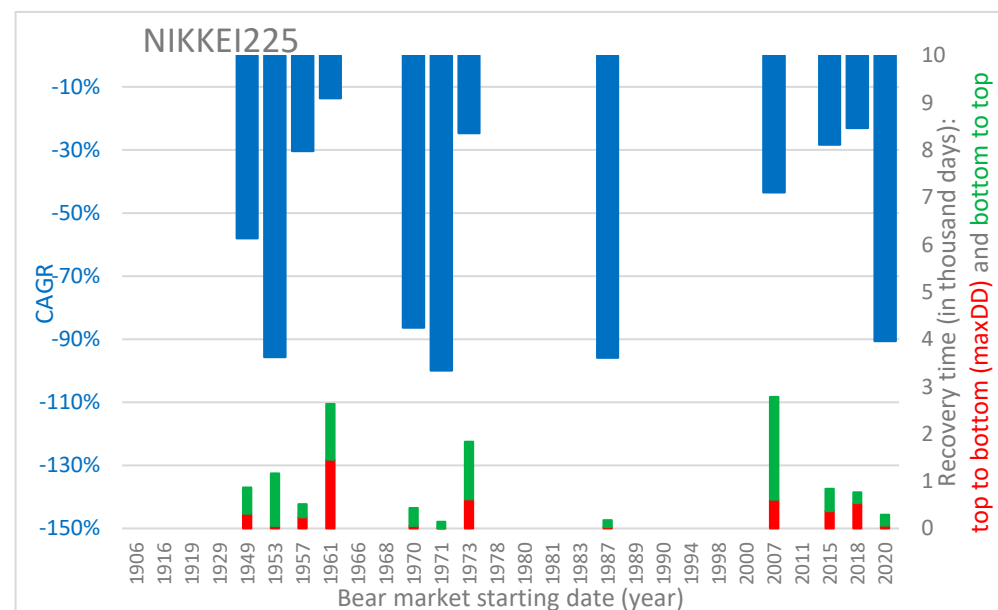| Index	Bear Market	MaxDD		#Days Down/Up	Recovery	CAGR
	From (Date)	(Points)	Day of MaxDD (Date)	Top-to-Bottom (#Days)	(#days)	
	To (Date)	(%)	Lowest Index Value (Points)	Bottom-to-Top (#Days)	Down vs. Recovery Ratio (%)	(maxDD. Top-to-Bottom)
FTSE100	1987-07-17 1990-01-03	878.2p. 35.9%	1987-11-09 1565.2	115 786	901 12.8%	−75.70%
	1998-07-21 1999-02-24	1530.3p. 24.8%	1998-10-05 4648.7	76 142	218 34.9%	−74.53%
	2000-01-04 2015-02-24	3643.2p. 52.6%	2003-03-12 3287	1163 4367	5530 21.0%	−20.88%
FTSE100 "inner-trend"	2007-06-18 2013-05-20	3220.3p. 47.8%	2009-03-03 3512.1	624 1539	2163 28.8%	−31.67%
FTSE100	2015-04-28 2016-12-28	1567.0p. 22.1%	2016-02-11 5537	289 321	610 47.4%	−27.02%
FTSE100 COVID			not recovered			

Figure 6. FTSE100: CAGR and recovery time of bear markets.

The behavior of the German, French and British blue-chip indices is highly varied. The greatest down–up cycle dynamics of the FTSE100 was achieved before the end of the 20th century. In the 21st century, the FTSE100 has faced difficulties with recovery: it took more than 15 years to reach new tops after the dot-com bubble and has still not recovered from the COVID-19 panic in 2020. The FTSE100 is the only world-leading index that failed to rebuild during the pandemic.

The NIKKEI225 exhibits significantly different behavior when compared to the other analyzed indices (see the results in Table 7 and Figure 7).

Table 7. Bear markets: drawdown and recovery analysis of NIKKEI 225.

Index	Bear Market From (Date) To (Date)	MaxDD (Points) (%)	Day of MaxDD (Date) Lowest Index Value (Points)	#Days Down/Up Top-to-Bottom (#Days) Bottom-to-Top (#Days)	Recovery (#Days) Down vs. Recovery Ratio (%)	CAGR (maxDD. Top-to-Bottom)
NIKKEI 225	1949-09-02 1952-01-14	91.6p. 51.8%	1950-07-06 85.3	307 557	864 35.5%	−58.04%
	1953-02-05 1956-04-13	179.3p. 37.8%	1953-04-01 295.2	55 1108	1163 4.7%	−95.72%
	1957-05-06 1958-10-04	123.9p. 20.8%	1957-12-27 471.5	235 281	516 45.5%	−30.42%
	1961-07-19 1968-09-30	809.3p. 44.2%	1965-07-12 1020.5	1454 1176	2630 55.3%	−13.64%
	1970-04-07 1971-06-15	604.8p. 23.9%	1970-05-27 1929.6	50 384	434 11.5%	−86.35%
	1971-08-16 1972-01-05	565.0p. 20.7%	1971-08-24 2162.8	8 134	142 5.6%	−100.00%
	1973-02-01 1978-02-07	2060.1p. 38.0%	1974-10-09 3355.1	615 1217	1832 33.6%	−24.75%
	1987-10-15 1988-04-07	5609.0p. 21.1%	1987-11-11 21037	27 148	175 15.4%	−95.91%
	1989-12-29 top 38916p.			not recovered		
"inner-trend"	2007-07-10 2015-02-19	11207.0p. 61.4%	2009-03-10 7055	609 2172	2781 21.9%	−43.47%
	2015-06-25 2017-10-11	5916.0p. 28.3%	2016-06-24 14952	365 474	839 43.5%	−28.37%
	2018-10-03 2020-11-06	7717.8p. 31.8%	2020-03-19 16552.8	533 232	765 69.7%	−23.07%
"inner-trendCOVID"	2020-01-21 2020-11-05	7530.7p. 31.3%	2020-03-19 16552.8	58 231	289 20.1%	−90.57%

Figure 7. NIKKEI225: CAGR and recovery time of bear markets.

A CAGR in bear markets at levels exceeding −90% is nothing new to the NIKKEI225 (in 1953, 1971, 1987 and, of course, 2020), as well as recoveries taking less than one year (1971/2, 1988 and 2020). Putting aside the lack of recovery from the breakdown that started in 1989, the rest of the down–up cycles show high dynamics, a wide range of varying levels of maxDD and an unpredictable recovery time.

4. Conclusions

The research proved and strongly confirmed that the COVID-19 breakdown was the fastest and the most dynamic bear market in the history of the majority of the principal

markets. Additionally, the recovery after the downtrend occurred at the highest speed ever, bringing new tops mostly in the same year that the breakdown happened. These results positively verify the hypothesis.

The results with the usage of the methodological approach presented in this paper are correlated with the results of other authors' research studies mentioned in the Introduction.

5. Discussion

Naturally, not all markets behave the same way. Some of them—the CAC40 and FTSE100—are ponderous after every breakdown, have great difficulties with recovery and are not able to achieve new tops before a new bear market comes along. On the other hand, there are indices—the S&P500, DJIA and DAX30—which finish every bear market with a strong uptrend that leads to values at historical highs, which in turn start a new downtrend from the highly elevated levels.

Although the COVID-19 bear market was, in general, the fastest down–up cycle in history, it cannot be said that markets regularly accelerate their speed of price changes. Some of the 21st century bear markets were even slower than the 20th century downtrends. No general tendency in volatility or recovery can be observed, so similar trends to the COVID-19 bear market must be seen as rather random.

However, due to the increased dynamics of breakdown and impressive recovery in 2020, individual investors should take into account such market behavior in their strategies for future deals. Higher volatility and the speed of price changes require stricter money management rules and more rapid investment decisions.

Changes in market dynamics, if they are tradeable (i.e., without gaps), attract traders to invest more often and more regularly. Higher volatility, wider price ranges and strong directional trends, which are represented here with CAGR and the time of recovery, allow investors to be active in the decision-making process and actually prevent habituation to a stable trend, which contributes to dormant vigilance.

6. Implications

The results presented in this article lead to further issues. One of these is increased individual investors' engagement in a period of higher dynamics on financial markets. The question is whether the high volatility attracts individuals or whether increased trader activity induces larger price changes. The second issue arising from this research and interesting for future studies is the reason for greater activity among individual traders from households. This may be due to better financial liquidity, more free time outside a regular job, common and easy access to markets through electronic channels, changes in financial literacy and inclusion, etc.

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