p5

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Abstract

Inaccurate forecasting, even if used to increase consumer confidence, seems to create catastrophic long-term results. By analyzing once-booming economies which experienced such catastrophes based on data provided by the IMF, we reach a conclusion that verifies just that; disproportionate, positive economic expectations are a precursor to economic collapse. Baseless yet optimistic forecasts made by private entities tend to yield similar results; overt optimism in forecasts may or may not facilitate short-term booms, but they do tend to wreck long-term havoc. This reproduction analyzes Beaudry and Willem's (2021), however, a notable observation is also made. A minor critique of their formula to calculate aggregates leads us to recomputing these values, which show their results to be slightly exaggerated, but their point is still applicable.

Introduction

Since fiat currencies first becoming mainstream, consumer confidence in alternative stores of value and currencies has varied greatly. In the twenty-first century, the emergence of Web 3.0 technologies such as blockchain and smart contracts has paved the way for new stores of value to enter the arena. In particular, this paper analyses consumer behavior regarding the alternate stores of value of the future and whether consumer confidence regarding them fluctuates just like with traditional stores of value, such as gold and precious stones. The paper tests the following hypothesis; does the level of cumulative consumer confidence influence the value of gold and cryptocurrencies? It then takes a step further and tries to predict future trends by pre-defining values for gold, cryptocurrencies and levels of consumer confidence in OECD member states, using multiple linear regression, followed by how different levels of consumer confidence influence the values of traditional stores of value, in this case represented by the value of gold and technologically savvy ones, measured by the value of Bitcoin

It should be noted that this paper compares the value of one cryptocurrency and the global value of gold and contrasts it with the levels of consumer confidence among OECD member states to test the aforementioned hypothesis. It will test the relationship that these three objects of interests share with each other individually and as a compounded result.

Data

How the data was obtained

This paper uses (R Core Team 2021) for statistical analyses with (Ushey et al. 2020) as the intergrated development environment. Relevant packages include (Wickham 2021), (Wickham, François, et al. 2021) and (Wickham and Miller 2021) for data management, manipulation and analysis.(Wickham, Chang, et al. 2021) is used for the purposes of graphing and data visualization. (Francois 2020) is used to generate a standardized citations that adhere to Bibtex standards. Multiple datasets were used. To analyze value points at various dates for cryptocurrencies a dataset from data.world.com ("Bitcoin USD (BTC-USD) Price History &Amp; Historical Data" 2022) was used. The data for consumer confidence among OECD member states was taken from the OECD website ("Consumer Confidence Index (CCI)" 2022). Gold values were taken from the World Gold Council ("Historical Gold Prices," n.d.).

Cleaning the data

For the dataset for consumer confidence among OECD member states ("Consumer Confidence Index (CCI)" 2022), a three-step cleaning process is applied. First, the Dplyer package (Wickham, François, et al. 2021) is used to select rows which show the cumulative OECD figures. Then the average for each month is calculated. This is followed by removing the figures for the entire OECD to make the dataset specific to OECD member states using the Tidyverse package (Wickham 2021). The data parsing for this dataset is concluded by converting the string values for each month to the date type (Grolemund and Wickham 2011).

The dataset used for cryptocurrencies ("Bitcoin USD (BTC-USD) Price History &Amp; Historical Data" 2022) is subject to only one data cleaning process, which consists of grouping rows by month to compare and contrast data from multiple datasets better. For gold, the dataset from the World Gold Council ("Historical Gold Prices," n.d.) is has two columns selected, one depicting the date and the other the value in United States' dollars. Then only the rows from the end of 2013 upto March 2022 are selected for further analysis.

All three datasets' subset containing dates after September 2014 are then used for further analysis using the Tidyverse package (Wickham 2021).

```
## Rows: 2780 Columns: 7
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## dbl  (6): Open, High, Low, Close, Adj Close, Volume
## date (1): Date
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
## New names:
## Rows: 3556 Columns: 8
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (6): LOCATION, INDICATOR, SUBJECT, MEASURE, FREQUENCY, TIME
## dbl (1): Value
## lgl (1): Flag Codes
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
## # A tibble: 99 x 8
##    LOCATION INDICATOR SUBJECT  MEASURE   FREQUENCY TIME    Value `Flag Codes`
```

```
##    <chr>    <chr>     <chr>    <chr>     <chr>     <chr>   <dbl> <lgl>
##  1 OECD     CCI       AMPLITUD LTRENDIDX M         2014-01  99.6 NA
##  2 OECD     CCI       AMPLITUD LTRENDIDX M         2014-02  99.6 NA
##  3 OECD     CCI       AMPLITUD LTRENDIDX M         2014-03  99.7 NA
##  4 OECD     CCI       AMPLITUD LTRENDIDX M         2014-04  99.8 NA
##  5 OECD     CCI       AMPLITUD LTRENDIDX M         2014-05  99.9 NA
##  6 OECD     CCI       AMPLITUD LTRENDIDX M         2014-06  99.9 NA
##  7 OECD     CCI       AMPLITUD LTRENDIDX M         2014-07  99.9 NA
##  8 OECD     CCI       AMPLITUD LTRENDIDX M         2014-08  99.8 NA
##  9 OECD     CCI       AMPLITUD LTRENDIDX M         2014-09  99.9 NA
## 10 OECD     CCI       AMPLITUD LTRENDIDX M         2014-10  99.9 NA
## # ... with 89 more rows
```

```
## # A tibble: 2,780 x 9
##    Date        Open  High   Low Close `Adj Close`   Volume `cd$Date`
##    <date>     <dbl> <dbl> <dbl> <dbl>       <dbl>    <dbl> <date>
##  1 2014-09-17  466.  468.  452.  457.        457. 21056800 2014-09-17
##  2 2014-09-18  457.  457.  413.  424.        424. 34483200 2014-09-18
##  3 2014-09-19  424.  428.  385.  395.        395. 37919700 2014-09-19
##  4 2014-09-20  395.  423.  390.  409.        409. 36863600 2014-09-20
##  5 2014-09-21  408.  412.  393.  399.        399. 26580100 2014-09-21
##  6 2014-09-22  399.  407.  397.  402.        402. 24127600 2014-09-22
##  7 2014-09-23  402.  442.  396.  436.        436. 45099500 2014-09-23
##  8 2014-09-24  436.  436.  421.  423.        423. 30627700 2014-09-24
##  9 2014-09-25  423.  424.  409.  412.        412. 26814400 2014-09-25
## 10 2014-09-26  411.  415.  400.  404.        404. 21460800 2014-09-26
## # ... with 2,770 more rows, and 1 more variable: `ymd(cd$Date)` <date>
```

```
## # A tibble: 520 x 4
##    Name                `US dollar...2` `cg$Name`          `ymd(cg$Name)`
##    <dttm>                        <dbl> <dttm>              <date>
##  1 1978-12-31 00:00:00             208. 1978-12-31 00:00:00 1978-12-31
##  2 1979-01-31 00:00:00             227. 1979-01-31 00:00:00 1979-01-31
##  3 1979-02-28 00:00:00             246. 1979-02-28 00:00:00 1979-02-28
##  4 1979-03-30 00:00:00             242. 1979-03-30 00:00:00 1979-03-30
##  5 1979-04-30 00:00:00             239. 1979-04-30 00:00:00 1979-04-30
##  6 1979-05-31 00:00:00             258. 1979-05-31 00:00:00 1979-05-31
##  7 1979-06-29 00:00:00             279. 1979-06-29 00:00:00 1979-06-29
##  8 1979-07-31 00:00:00             295. 1979-07-31 00:00:00 1979-07-31
##  9 1979-08-31 00:00:00             301. 1979-08-31 00:00:00 1979-08-31
## 10 1979-09-28 00:00:00             355. 1979-09-28 00:00:00 1979-09-28
## # ... with 510 more rows
```

```
##    Group.1         x cc$Group.1 ym(cc$Group.1)
## 1  2014-01  99.91242    2014-01     2014-01-01
## 2  2014-02  99.94379    2014-02     2014-02-01
## 3  2014-03 100.06098    2014-03     2014-03-01
## 4  2014-04 100.18615    2014-04     2014-04-01
## 5  2014-05 100.25094    2014-05     2014-05-01
## 6  2014-06 100.24152    2014-06     2014-06-01
## 7  2014-07 100.16056    2014-07     2014-07-01
## 8  2014-08 100.05199    2014-08     2014-08-01
## 9  2014-09 100.02069    2014-09     2014-09-01
```

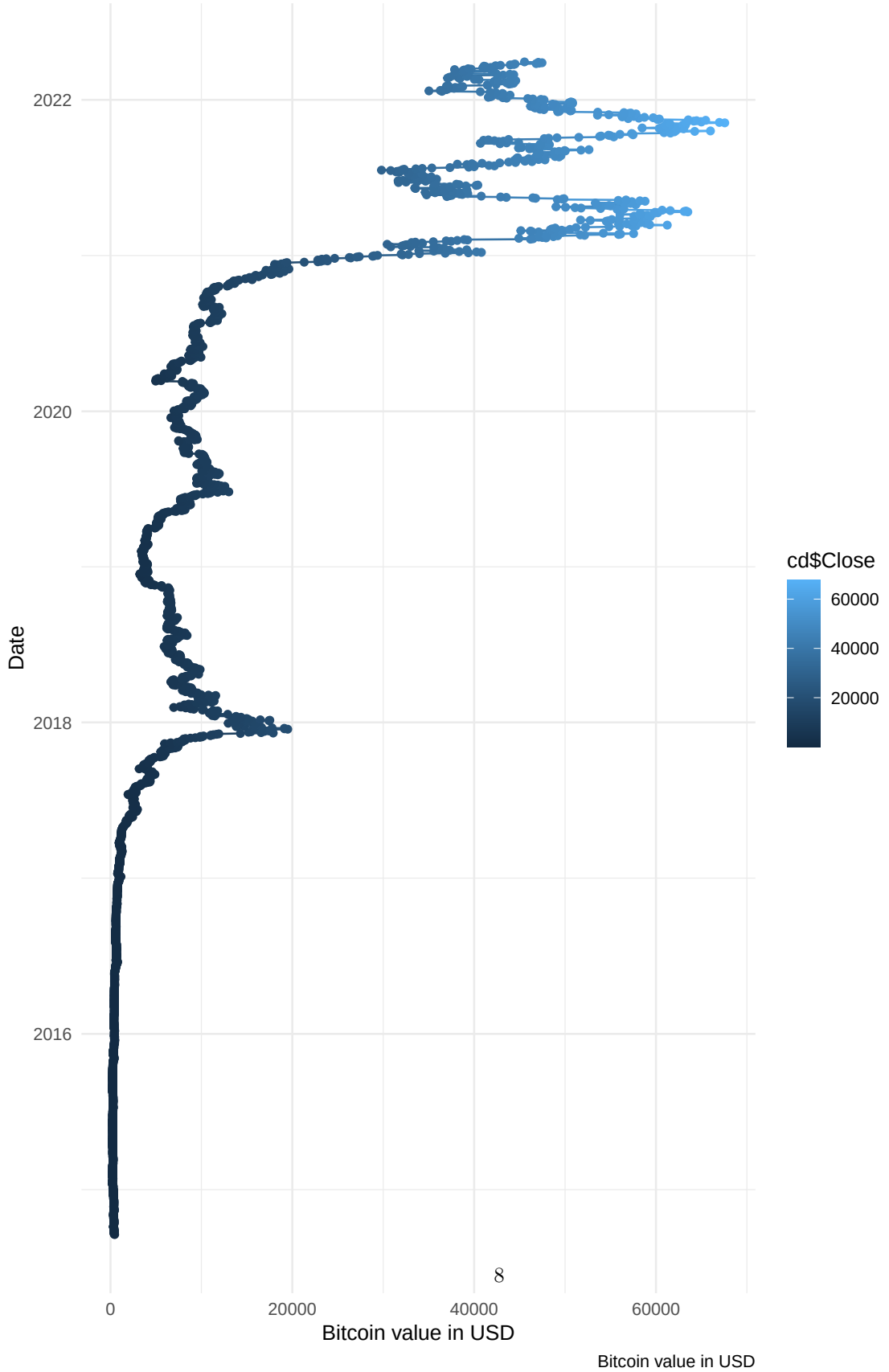
```
## 10 2014-10 100.07958    2014-10     2014-10-01
## 11 2014-11 100.14416    2014-11     2014-11-01
## 12 2014-12 100.24431    2014-12     2014-12-01
## 13 2015-01 100.35170    2015-01     2015-01-01
## 14 2015-02 100.47598    2015-02     2015-02-01
## 15 2015-03 100.56504    2015-03     2015-03-01
## 16 2015-04 100.59051    2015-04     2015-04-01
## 17 2015-05 100.51809    2015-05     2015-05-01
## 18 2015-06 100.37719    2015-06     2015-06-01
## 19 2015-07 100.22771    2015-07     2015-07-01
## 20 2015-08 100.16292    2015-08     2015-08-01
## 21 2015-09 100.18954    2015-09     2015-09-01
## 22 2015-10 100.33632    2015-10     2015-10-01
## 23 2015-11 100.49419    2015-11     2015-11-01
## 24 2015-12 100.55454    2015-12     2015-12-01
## 25 2016-01 100.46316    2016-01     2016-01-01
## 26 2016-02 100.30359    2016-02     2016-02-01
## 27 2016-03 100.18324    2016-03     2016-03-01
## 28 2016-04 100.15234    2016-04     2016-04-01
## 29 2016-05 100.18726    2016-05     2016-05-01
## 30 2016-06 100.22381    2016-06     2016-06-01
## 31 2016-07 100.23624    2016-07     2016-07-01
## 32 2016-08 100.31007    2016-08     2016-08-01
## 33 2016-09 100.43350    2016-09     2016-09-01
## 34 2016-10 100.52790    2016-10     2016-10-01
## 35 2016-11 100.54984    2016-11     2016-11-01
## 36 2016-12 100.50788    2016-12     2016-12-01
## 37 2017-01 100.44205    2017-01     2017-01-01
## 38 2017-02 100.44111    2017-02     2017-02-01
## 39 2017-03 100.54189    2017-03     2017-03-01
## 40 2017-04 100.68044    2017-04     2017-04-01
## 41 2017-05 100.80535    2017-05     2017-05-01
## 42 2017-06 100.90308    2017-06     2017-06-01
## 43 2017-07 100.99663    2017-07     2017-07-01
## 44 2017-08 101.08277    2017-08     2017-08-01
## 45 2017-09 101.19422    2017-09     2017-09-01
## 46 2017-10 101.29117    2017-10     2017-10-01
## 47 2017-11 101.35656    2017-11     2017-11-01
## 48 2017-12 101.40994    2017-12     2017-12-01
## 49 2018-01 101.44290    2018-01     2018-01-01
## 50 2018-02 101.44190    2018-02     2018-02-01
## 51 2018-03 101.42436    2018-03     2018-03-01
## 52 2018-04 101.42836    2018-04     2018-04-01
## 53 2018-05 101.44302    2018-05     2018-05-01
## 54 2018-06 101.43625    2018-06     2018-06-01
## 55 2018-07 101.40806    2018-07     2018-07-01
## 56 2018-08 101.29867    2018-08     2018-08-01
## 57 2018-09 101.15880    2018-09     2018-09-01
## 58 2018-10 101.01952    2018-10     2018-10-01
## 59 2018-11 100.91191    2018-11     2018-11-01
## 60 2018-12 100.86417    2018-12     2018-12-01
## 61 2019-01 100.87887    2019-01     2019-01-01
## 62 2019-02 100.93491    2019-02     2019-02-01
## 63 2019-03 100.95977    2019-03     2019-03-01
```

```
## 64 2019-04 100.92975    2019-04     2019-04-01
## 65 2019-05 100.87397    2019-05     2019-05-01
## 66 2019-06 100.80039    2019-06     2019-06-01
## 67 2019-07 100.74598    2019-07     2019-07-01
## 68 2019-08 100.68151    2019-08     2019-08-01
## 69 2019-09 100.61843    2019-09     2019-09-01
## 70 2019-10 100.57699    2019-10     2019-10-01
## 71 2019-11 100.60963    2019-11     2019-11-01
## 72 2019-12 100.65192    2019-12     2019-12-01
## 73 2020-01 100.54857    2020-01     2020-01-01
## 74 2020-02 100.09379    2020-02     2020-02-01
## 75 2020-03  99.06820    2020-03     2020-03-01
## 76 2020-04  97.89563    2020-04     2020-04-01
## 77 2020-05  97.53433    2020-05     2020-05-01
## 78 2020-06  97.69142    2020-06     2020-06-01
## 79 2020-07  97.94312    2020-07     2020-07-01
## 80 2020-08  98.15957    2020-08     2020-08-01
## 81 2020-09  98.29231    2020-09     2020-09-01
## 82 2020-10  98.31616    2020-10     2020-10-01
## 83 2020-11  98.31140    2020-11     2020-11-01
## 84 2020-12  98.44083    2020-12     2020-12-01
## 85 2021-01  98.62181    2021-01     2021-01-01
## 86 2021-02  98.95591    2021-02     2021-02-01
## 87 2021-03  99.44478    2021-03     2021-03-01
## 88 2021-04  99.98631    2021-04     2021-04-01
## 89 2021-05 100.39845    2021-05     2021-05-01
## 90 2021-06 100.64487    2021-06     2021-06-01
## 91 2021-07 100.66785    2021-07     2021-07-01
## 92 2021-08 100.60820    2021-08     2021-08-01
## 93 2021-09 100.53052    2021-09     2021-09-01
## 94 2021-10 100.35783    2021-10     2021-10-01
## 95 2021-11 100.09547    2021-11     2021-11-01
## 96 2021-12  99.81667    2021-12     2021-12-01
## 97 2022-01  99.44687    2022-01     2022-01-01
## 98 2022-02  98.96226    2022-02     2022-02-01
## 99 2022-03  97.85111    2022-03     2022-03-01
```

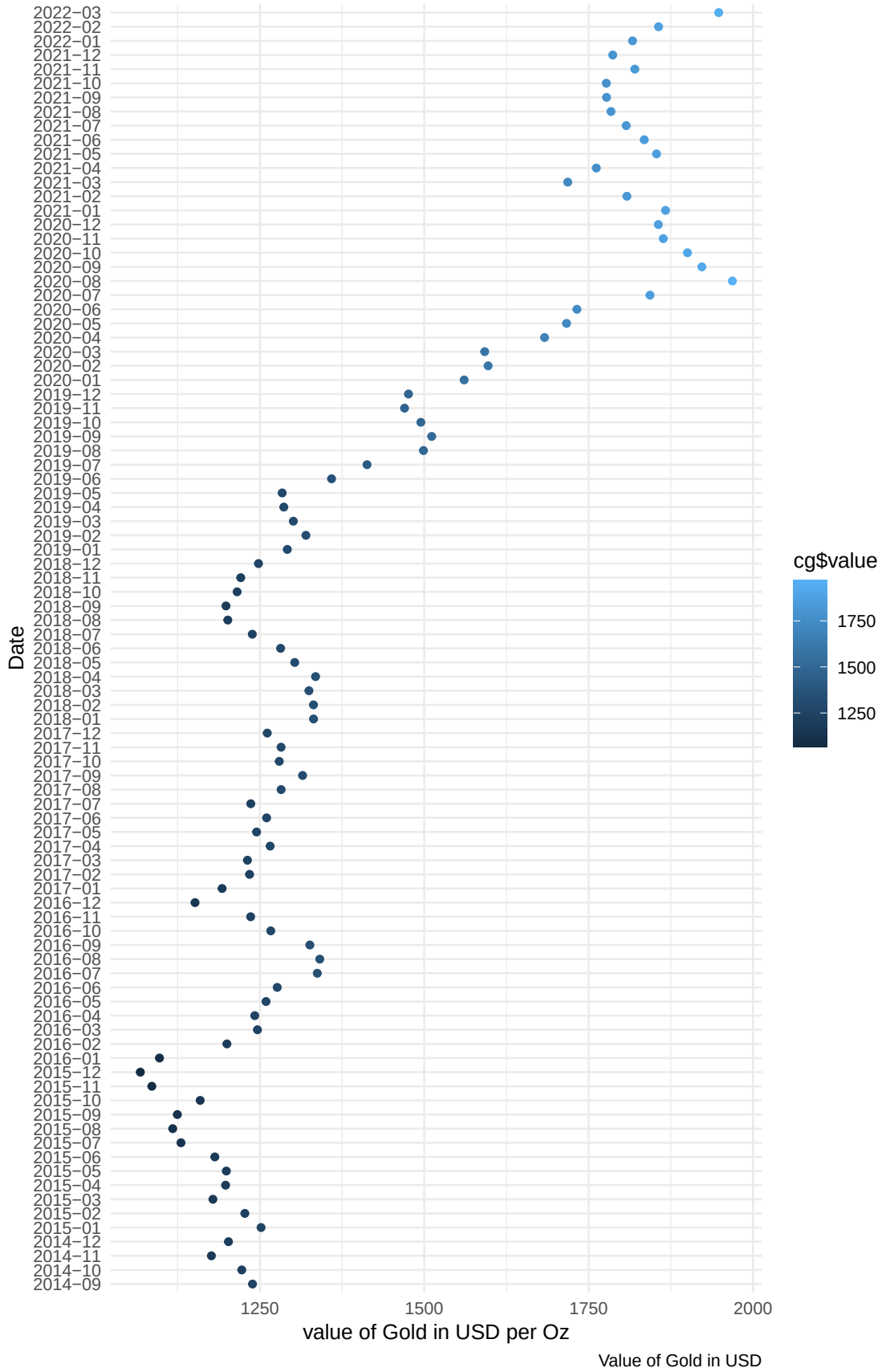
Results

Comparing results from each dataset with another individually

A comparison between gold and Bitcoin



Bitcoin value in USD


Date
2022−03
2022−02
2022−01
2021−12
2021−11
2021−10
2021−09
2021−08
2021−07
2021−06
2021−05
2021−04
2021−03
2021−02
2021−01
2020−12
2020−11
2020−10
2020−09
2020−08
2020−07
2020−06
2020−05
2020−04
2020−03
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2020−01
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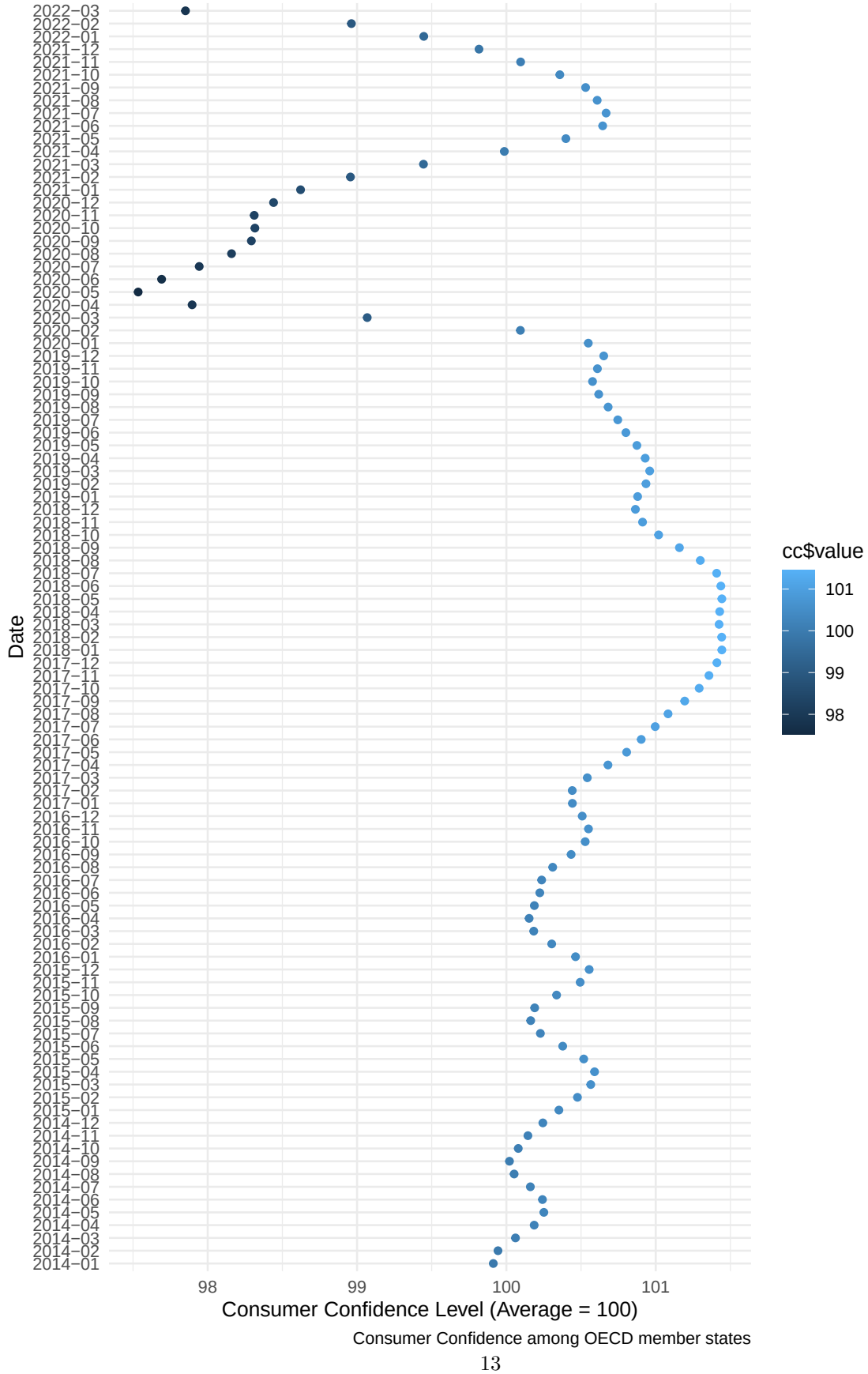
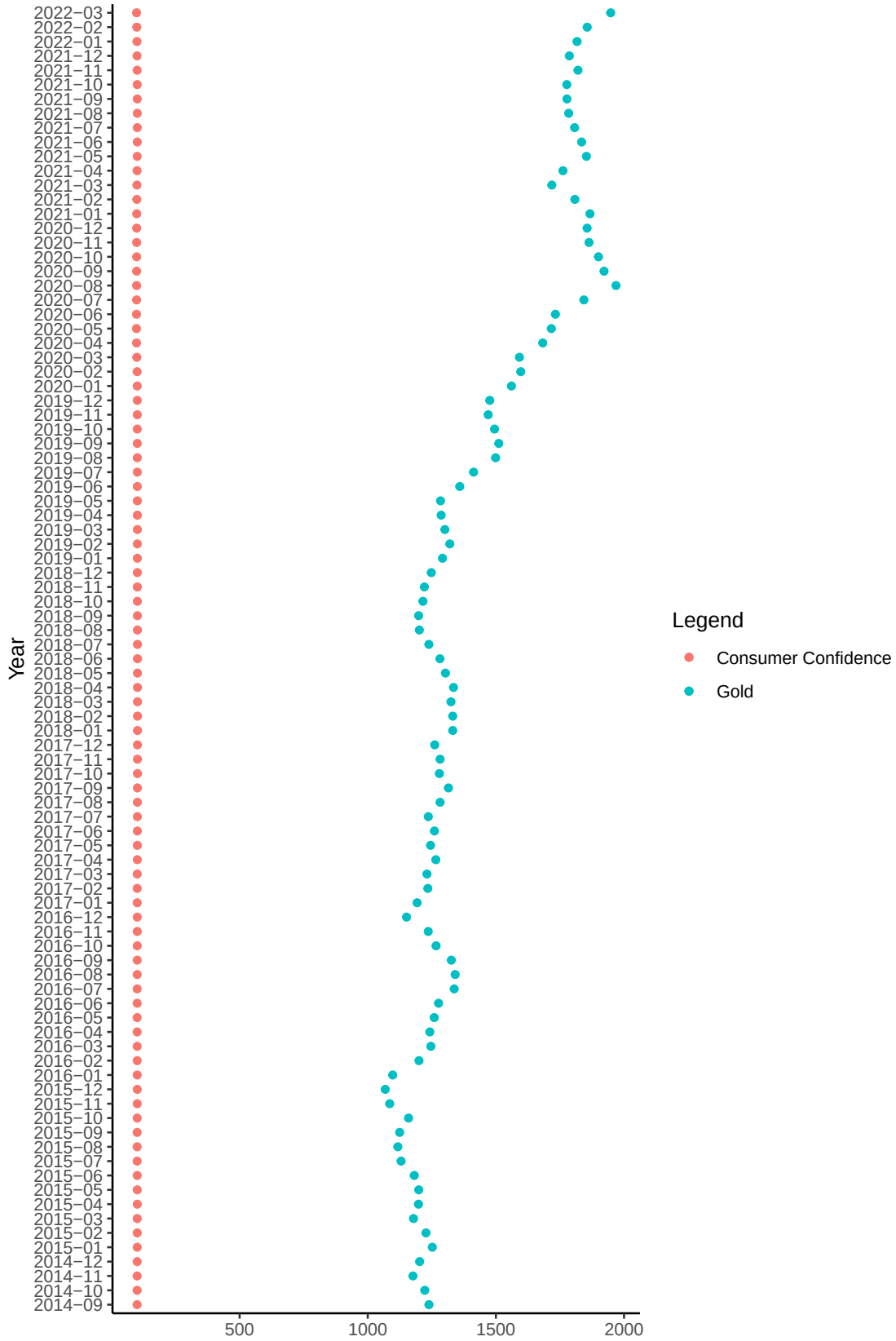
2015−08
2015−07
2015−06
2015−05
2015−04
2015−03
2015−02
2015−01
2014−12
2014−11
2014−10
2014−09
1250
1500
1750
2000
value of Gold in USD per Oz
cg$value
1750
1500
1250
Value of Gold in USD

Lets combine the results to see if any significant correlation exists. We begin by combining the two datasets, creating a new one in the process.

```
## Error in ‘check_required_aesthetics()‘:
## ! geom_point requires the following missing aesthetics: y
```

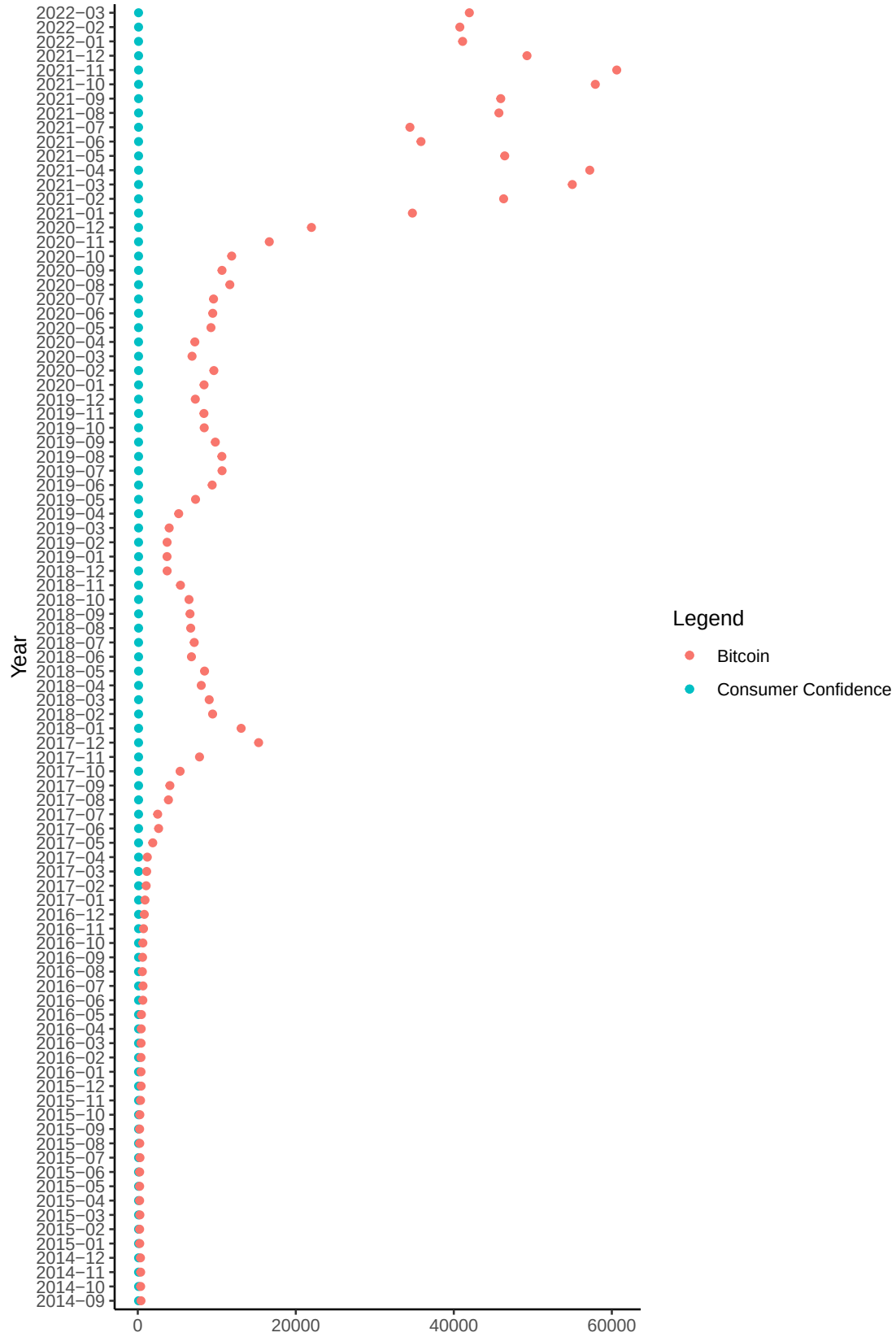
Consumer confidence in OECD member states relative to the price of gold





s for the price of Gold in USD and consumer confidence among OECD member states

Prices of Gold in USD per Oz and consumer confidence in the OECD



for the price of Bitcoin in USD and consumer confidence among OECD member states

Prices of Bitcoin in USD and consumer confidence in the OECD

Discussion

The findings of this paper

In the absence of supply-related restrictions, gold and Bitcoin behave similarly in the context of demand. However, the variation in the prices of Bitcoin increased significantly at the dawn of the COVID-19 pandemic. One explanation for why the change in the prices of gold did not mirror the change in the prices of Bitcoin is the emergence of supply chain issues which Bitcoin was not subject to, and a general reluctance to avoid the exchange of tangible good to avoid the transmission of COVID-19.

Trends that stood out

Consumer confidence levels had little to no impact on the price of gold, contrasting previous academic literature on the topic (Cai, Cheung, and Wong 2001). Furthermore,

Future Research

Explore government policy reaction to control crypto and tax and regulate it.

Since April 2017, any perceived correlation between the prices of Bitcoin and Gold was incorrect. The contrast became even more stark during the start of the COVID-19 pandemic, however this can be attributed to supply issues rather than just a lack of demand-driven price volatality, since unlike Bitcoin, gold is a tangible object and disrupted supply lines could have played a part. Exploring this phenomenon is beyond the scope of this paper.

"Bitcoin USD (BTC-USD) Price History &Amp; Historical Data." 2022. *Yahoo! Finance*. Yahoo! https://finance.yahoo.com/quote/BTC-USD/history?period1=1410825600&period2=1651017600&interval=1d&filter=history&frequency=1d&includeAdjustedClose=true.

Cai, Jun, Yan-Leung Cheung, and Michael C. S. Wong. 2001. "What Moves the Gold Market?" *Journal of Futures Markets* 21 (3): 257–78. https://doi.org/https://doi.org/10.1002/1096-9934(200103)21:3%3C257::AID-FUT4%3E3.0.CO;2-W.

"Consumer Confidence Index (CCI)." 2022. *Leading Indicators*. https://doi.org/10.1787/46434d78-en.

Francois, Romain. 2020. *Bibtex: Bibtex Parser*. https://github.com/romainfrancois/bibtex.

Grolemund, Garrett, and Hadley Wickham. 2011. "Dates and Times Made Easy with lubridate." *Journal of Statistical Software*. https://www.jstatsoft.org/v40/i03/.

"Historical Gold Prices." n.d. /home/primus/Downloads/Prices.xlsx.

R Core Team. 2021. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.

Ushey, Kevin, JJ Allaire, Hadley Wickham, and Gary Ritchie. 2020. *Rstudioapi: Safely Access the RStudio API*. https://github.com/rstudio/rstudioapi.

Wickham, Hadley. 2021. *Tidyverse: Easily Install and Load the Tidyverse*. https://CRAN.R-project.org/package=tidyverse.

Wickham, Hadley, Winston Chang, Lionel Henry, Thomas Lin Pedersen, Kohske Takahashi, Claus Wilke, Kara Woo, Hiroaki Yutani, and Dewey Dunnington. 2021. *Ggplot2: Create Elegant Data Visualisations Using the Grammar of Graphics*. https://CRAN.R-project.org/package=ggplot2.

Wickham, Hadley, Romain François, Lionel Henry, and Kirill Müller. 2021. *Dplyr: A Grammar of Data Manipulation*. https://CRAN.R-project.org/package=dplyr.

Wickham, Hadley, and Evan Miller. 2021. *Haven: Import and Export SPSS, Stata and SAS Files*. https://CRAN.R-project.org/package=haven.