

The Covid Pandemic, a period of significant financial stress?

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- What is Financial Stress?
 - Financial Stress is a disruption in the functioning of financial markets characterized by:
 - Increased uncertainty about the fundamental value of assets
 - Increased asymmetry of information
 - Unwillingness to hold risky or illiquid assets ^{1*}
 - Financial Crisis is a period of extreme stress in global financial markets and banking systems ^{2*}

^{1*} The OFR Financial Stress Index – US Department of Treasury – <https://www.financialresearch.gov/financial-stress-index/>

^{2*} Reserve Bank of Australia - <https://www.rba.gov.au/education/resources/explainers/the-global-financial-crisis.html>

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- Financial Stress Index (FSI)
 - FSIs can be used to quantify and mutually compare financial stresses / financial crises
 - Many FSIs have been designed since the Financial Crisis of 2008
 - FSIs are comprised of selected indicators (time series of market data) which best represent the financial markets.
 - FSIs differ based on the methodology used to combine the indicators (averages, PCAs, Dynamic Factor Models, Portfolio Theory)

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• OFR – FSI

- Office for Financial Research (US Treasury)
- Comprises 33 indicators in 5 categories
- Credit – credit spreads
- Equity – stock indices
- Funding – overnight rates, IR spreads
- Safe Assets – treasury note yields, exchange rates
- Volatility – VIX, implied volatilities

Decomposition of the OFR FSI on August 31, 2017

Indicator Category	Indicator	Coef.	Data	Wgt.	Data*	Contr.	Subtotal
Credit	BaML US Corporate Master (IG) (OAS)	0.242	-0.469	0.242	-0.469	-0.114	
	BaML US High Yield Corporate Master (HY) (OAS)	0.244	-0.683	0.244	-0.683	-0.167	
	BaML Euro Area Corp Bond Index (OAS)	0.229	-0.993	0.229	-0.993	-0.227	
	BaML Euro Area High Yield Bond Index (OAS)	0.165	0.059	0.165	0.059	0.010	
	BaML Japan Corporate (OAS)	0.181	0.053	0.181	0.053	0.010	
	JPMorgan CEMBI Strip Spread	0.209	-0.194	0.209	-0.194	-0.041	
	JPMorgan EMBI Global Strip Spread	0.128	-0.538	0.128	-0.538	-0.069	-0.597
Equity Valuation	MSCI Emerging Markets Index (P/B Ratio)	-0.144	0.554	0.144	-0.554	-0.080	
	MSCI Europe Index (P/B Ratio)	-0.192	0.375	0.192	-0.375	-0.072	
	NIKKEI 225 Index (P/B Ratio)	-0.172	-0.001	0.172	0.001	0.000	
	S&P 500 Index (P/B Ratio)	-0.196	0.449	0.196	-0.449	-0.088	-0.240
Funding	2-Year EUR/USD Cross-Currency Swap Spread	-0.106	-0.872	0.106	0.872	0.093	
	2-Year US Swap Spread	0.170	-0.774	0.170	-0.774	-0.132	
	2-Year USD/JPY Cross-Currency Swap Spread	-0.027	-1.570	0.027	1.570	0.043	
	3-Month EURIBOR – EONIA	0.205	-0.649	0.205	-0.649	-0.133	
	3-Month Japanese LIBOR – OIS	0.184	-0.700	0.184	-0.700	-0.129	
	3-Month LIBOR – OIS	0.196	-0.296	0.196	-0.296	-0.058	
	3-Month TED Spread	0.172	-0.298	0.172	-0.298	-0.051	-0.368
Safe Assets	10-Year US Treasury Note (yield)	-0.100	-0.036	0.100	0.036	0.004	
	10-Year German Bond (yield)	-0.091	0.512	0.091	-0.512	-0.047	
	Gold/USD Real Spot Exchange Rate	0.031	0.469	0.031	0.469	0.015	
	Japanese Yen/USD Spot Exchange Rate	-0.112	-0.042	0.112	0.042	0.005	
	Swiss Franc/USD Spot Exchange Rate	-0.008	-0.409	0.008	0.409	0.003	
	US Dollar Index (DXY)	0.047	-1.333	0.047	-1.333	-0.063	-0.083
Volatility	CBOE S&P 500 Volatility Index (VIX)	0.255	-1.131	0.255	-1.131	-0.288	
	Dow Jones EURO STOXX 50 Volatility Index (V2X)	0.207	-0.964	0.207	-0.964	-0.199	
	ICE Brent Crude Oil Futures (22-day realized vol.)	0.174	-0.446	0.174	-0.446	-0.078	
	Implied Volatility on 6-Month EUR/USD Options	0.197	-0.983	0.197	-0.983	-0.194	
	Implied Volatility on 6-Month USD/JPY Options	0.158	-0.690	0.158	-0.690	-0.109	
	JPMorgan Emerging Market Volatility Index	0.218	-0.929	0.218	-0.929	-0.202	
	Merrill Lynch Euro Swaptions Volatility Estimate	0.200	-1.482	0.200	-1.482	-0.296	
	Merrill Lynch US Swaptions Volatility Estimate	0.182	-1.389	0.182	-1.389	-0.252	
	NIKKEI Volatility Index	0.206	-1.101	0.206	-1.101	-0.226	-1.845

OFR FSI -3.133

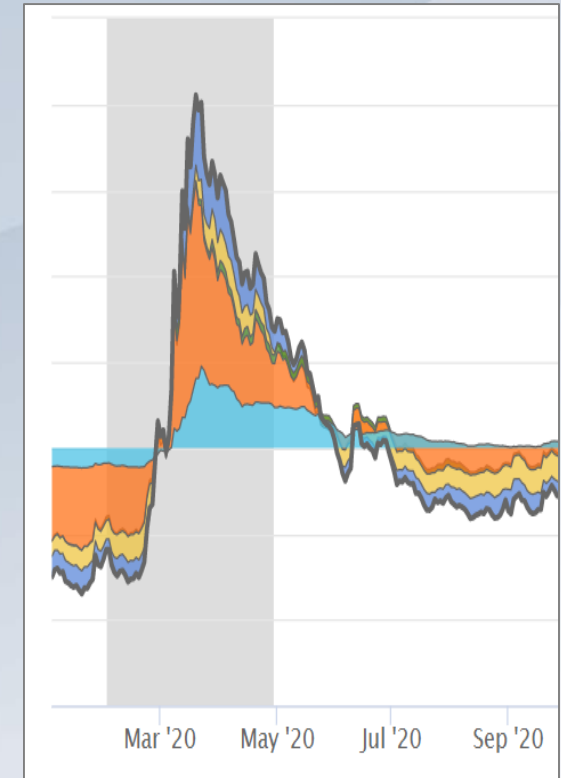
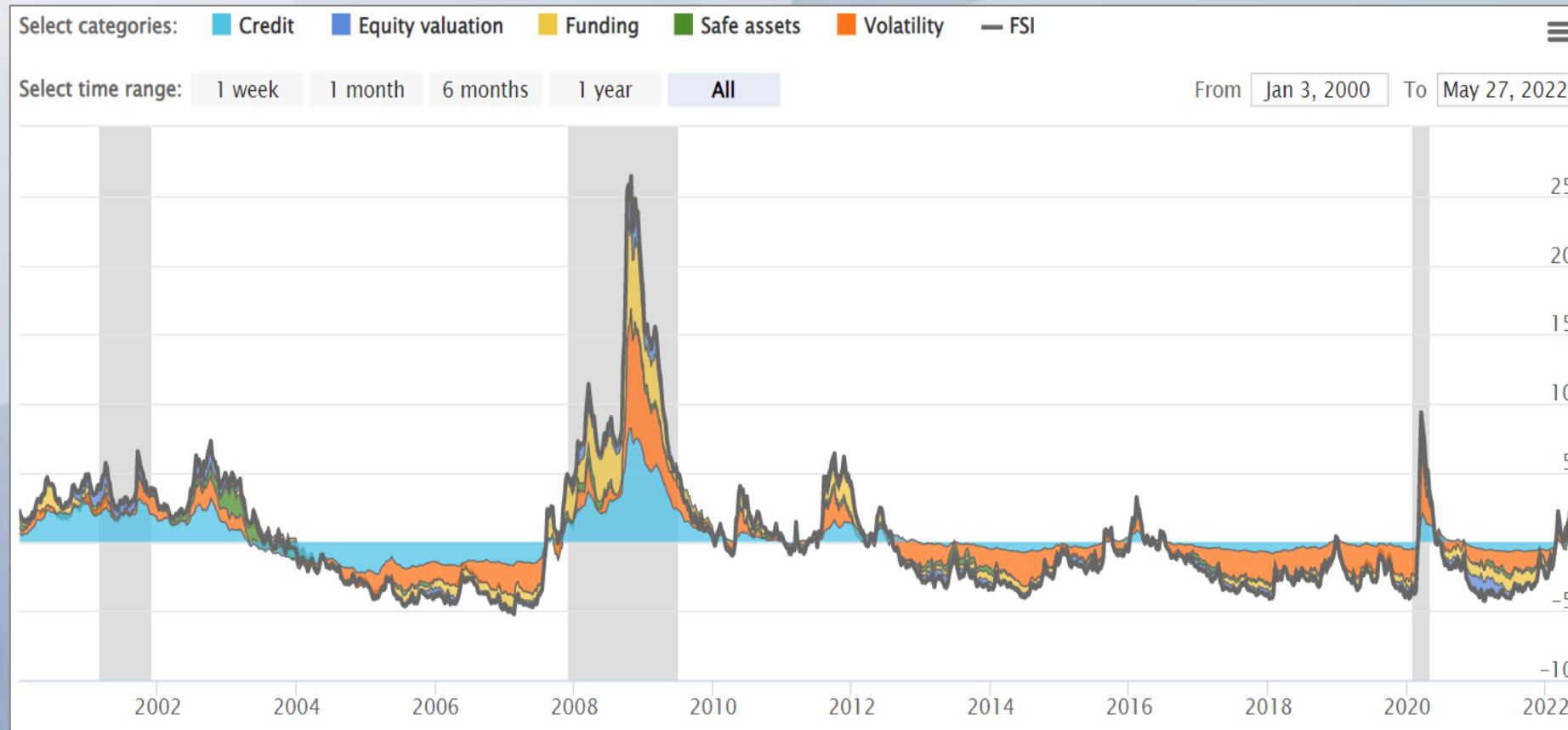
Sources: Bloomberg Finance L.P., Haver Analytics, OFR analysis

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- OFR – FSI - Idea
 - Financial stress manifests when the indicators move together
 - The extent of the simultaneous co-movement in the indicators reflects systemic financial stress.
- OFR – FSI - Methodology
 - Indicators are standardized (with a rolling window and until that date)
 - Signs of some indicators are flipped in a way that: Indicator \nearrow Stress \nearrow
 - Dimensionality-reduction method is performed (Dynamic factor model or PCA)
 - The degree of simultaneous co-movement is expressed through the 1st Principal Component
 - $Z_{(0-t),1} = W_{i,1}^T X_{i,(0-t)}$ for $t \in [0,T]$
- Pros and Cons
 - Ability to sum up various financial market indicators into one measure (Pro)
 - Decompose the FSI into constituent factors (Pro)
 - FSI is completely influenced by the choice of indicators (Con)

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- OFR – FSI



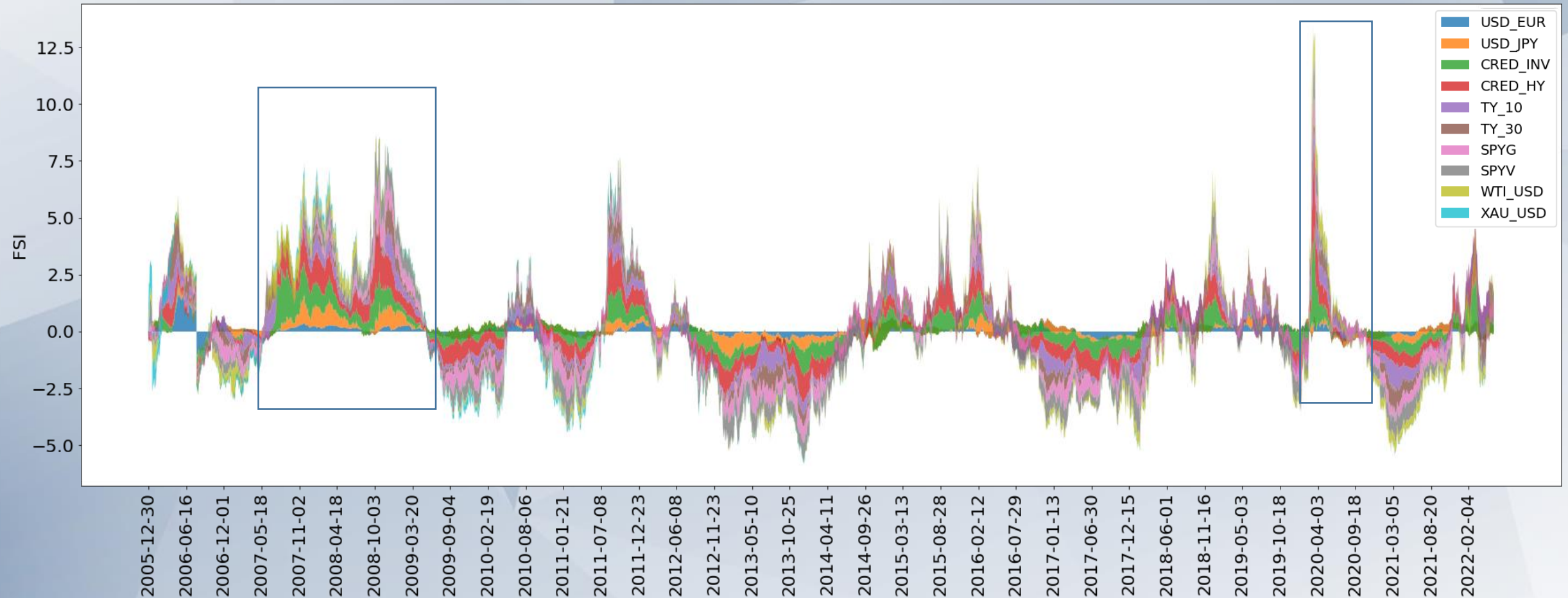
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- Custom made FSI

- Focus on the US Financial Market
- 10 Indicators in 4+ Asset Classes (Credit, Equity, Rates, FX, Commodities)
 - BaML US Corporate Master (IG) OAS
 - BaML US Corporate Master (HY) OAS
 - S&P 500 Growth Index (SPDR – SPYG - ETF)
 - S&P 500 Value Index (SPDR – SPYV - ETF)
 - US Treasury Note Yield 10 years
 - US Treasury Note Yield 30 Years
 - USD-EUR Spot
 - USD-JPY Spot
 - WTI-USD
 - XAU- USD
- Code available at: https://github.com/maleckicoa/FSI_Covid
- Data sources: FRED St Louis FED ; Investing.com ; Yahoo Finance

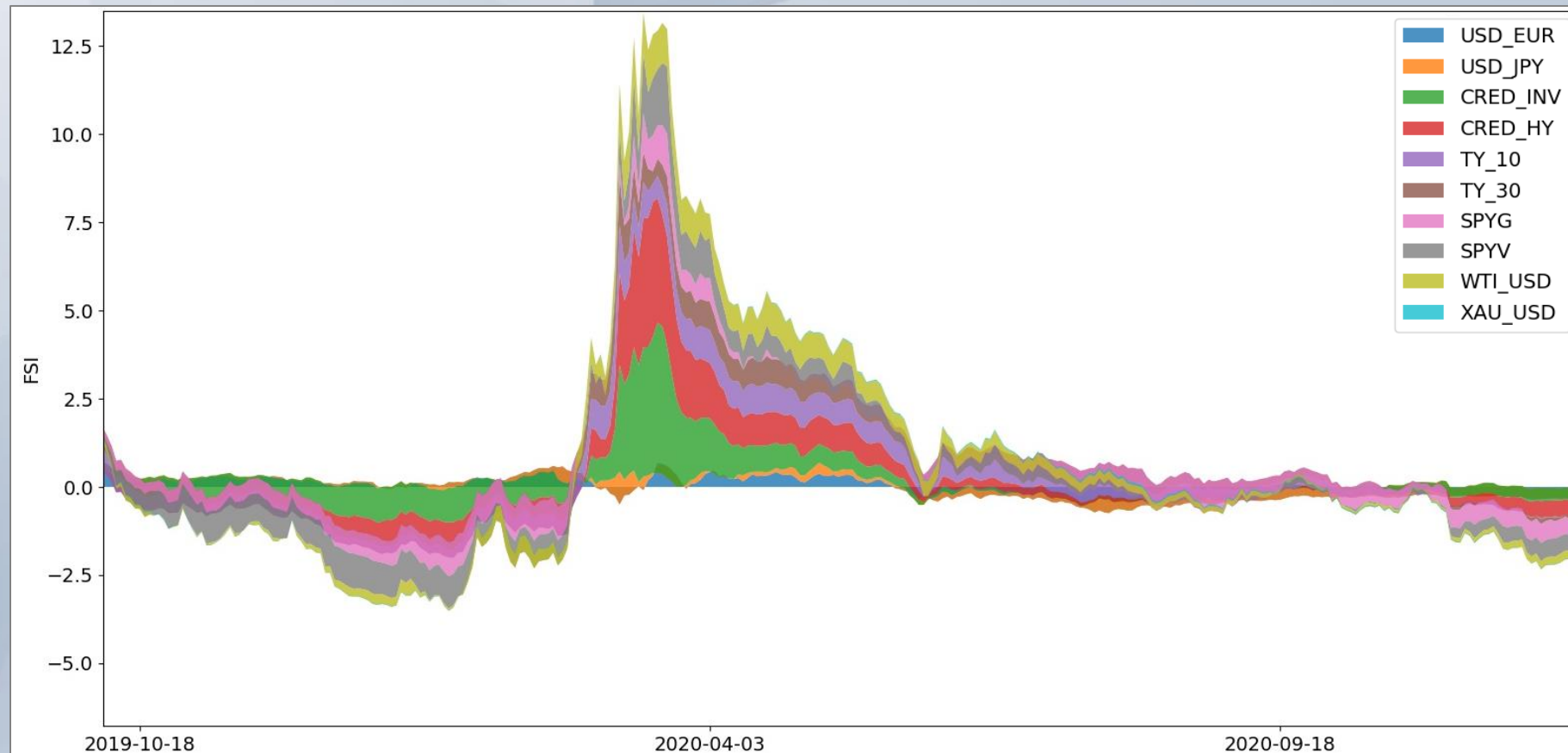
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- Custom made FSI



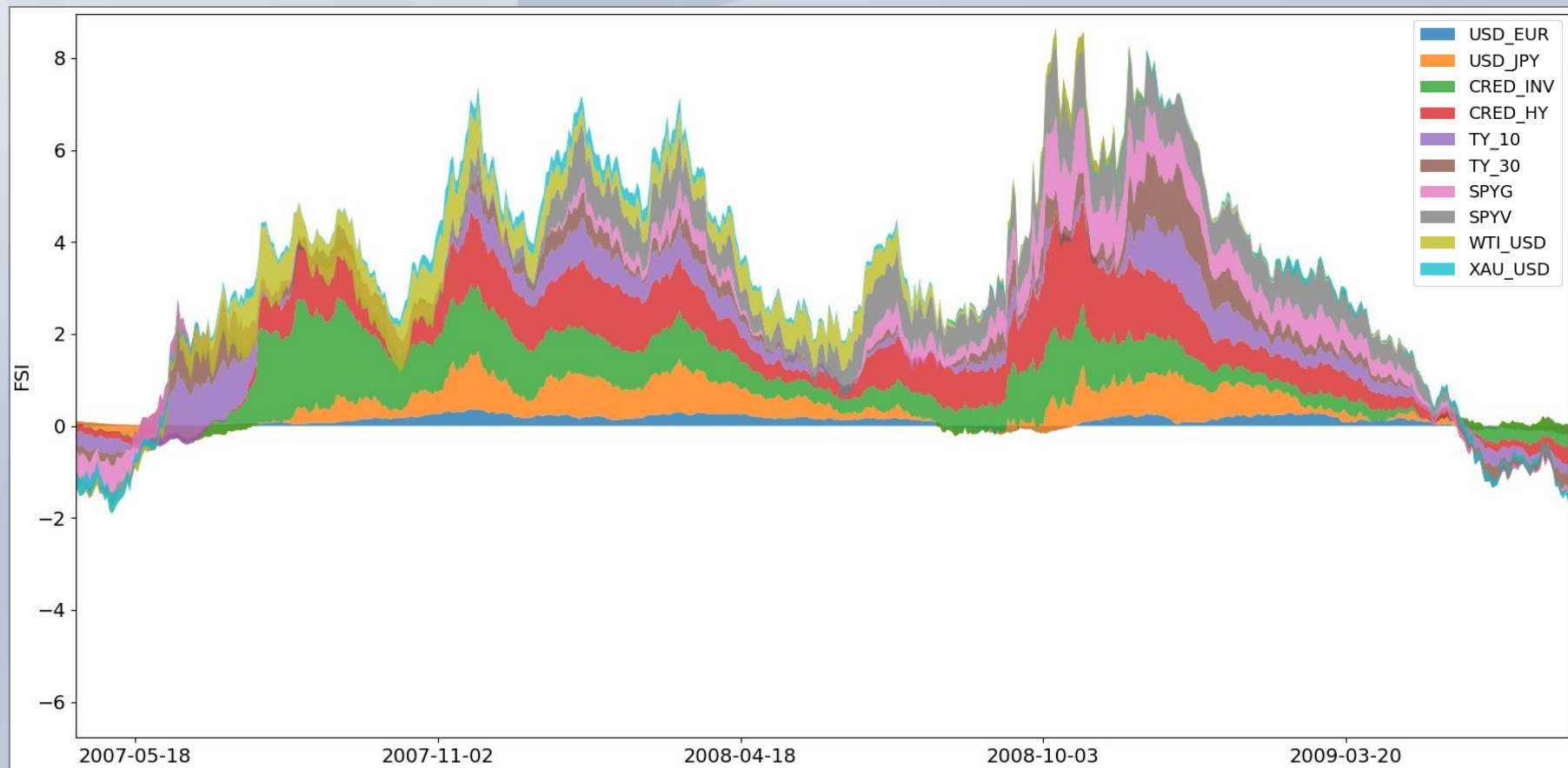
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- FSI – Covid 19 Pandemic



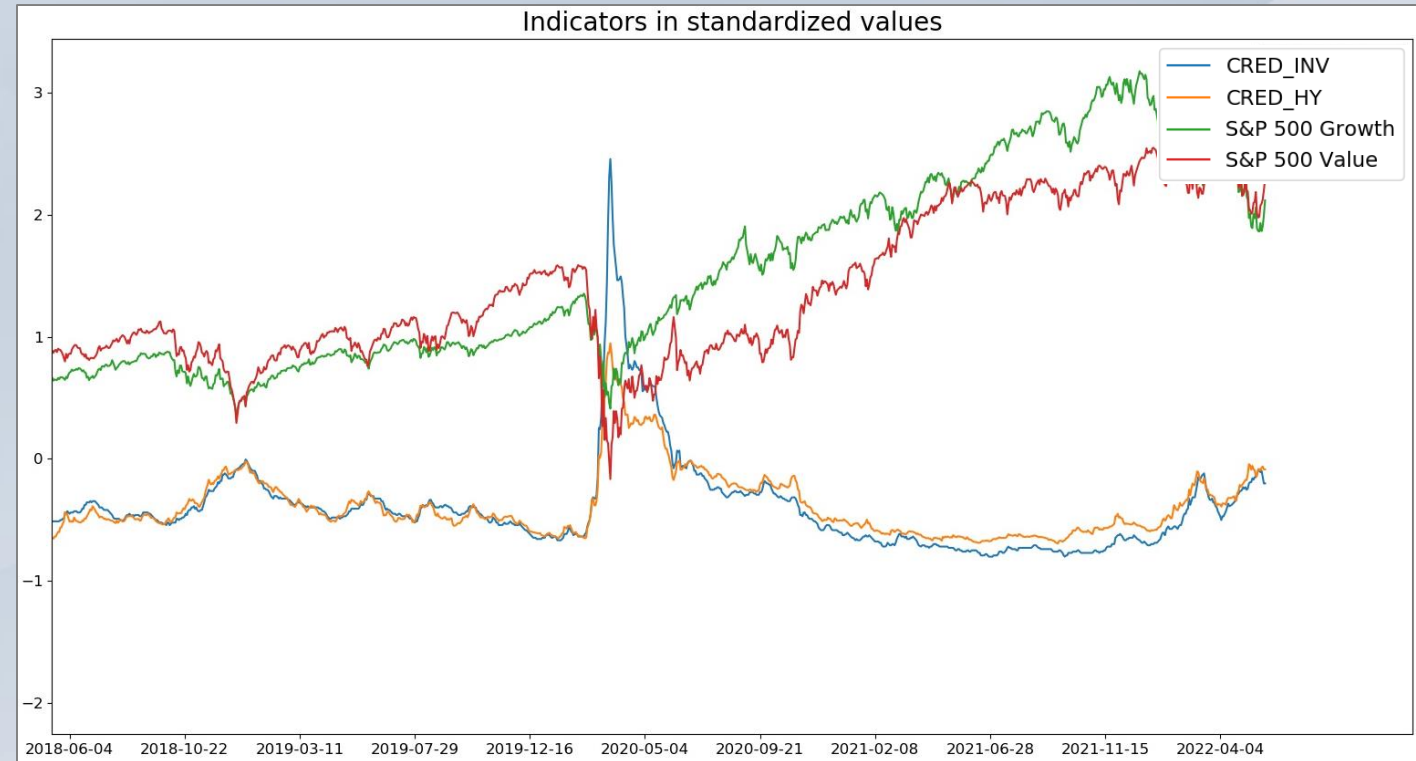
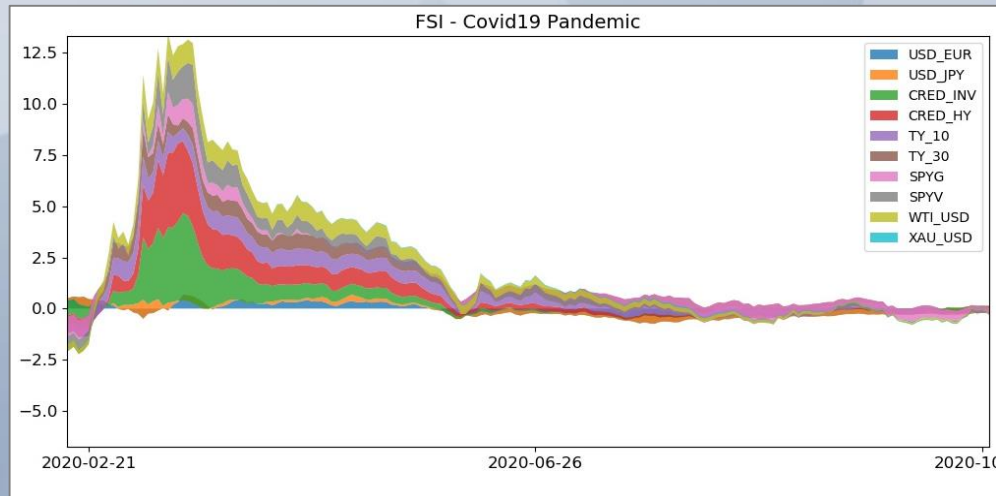
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- FSI – Financial Crisis of 2008/2009



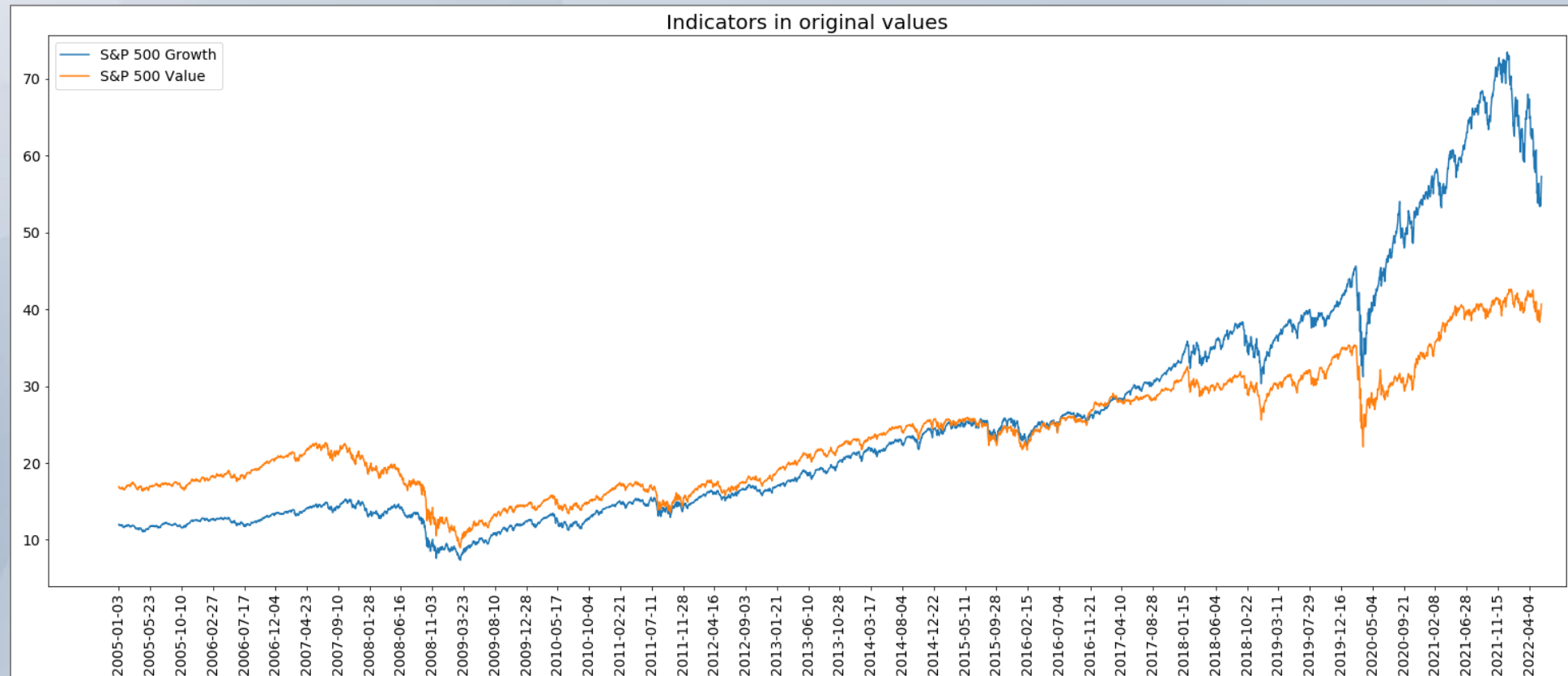
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- Covid Crisis impact on Financial Markets
 - Credit spreads (standardized) experienced more stress than Equity prices



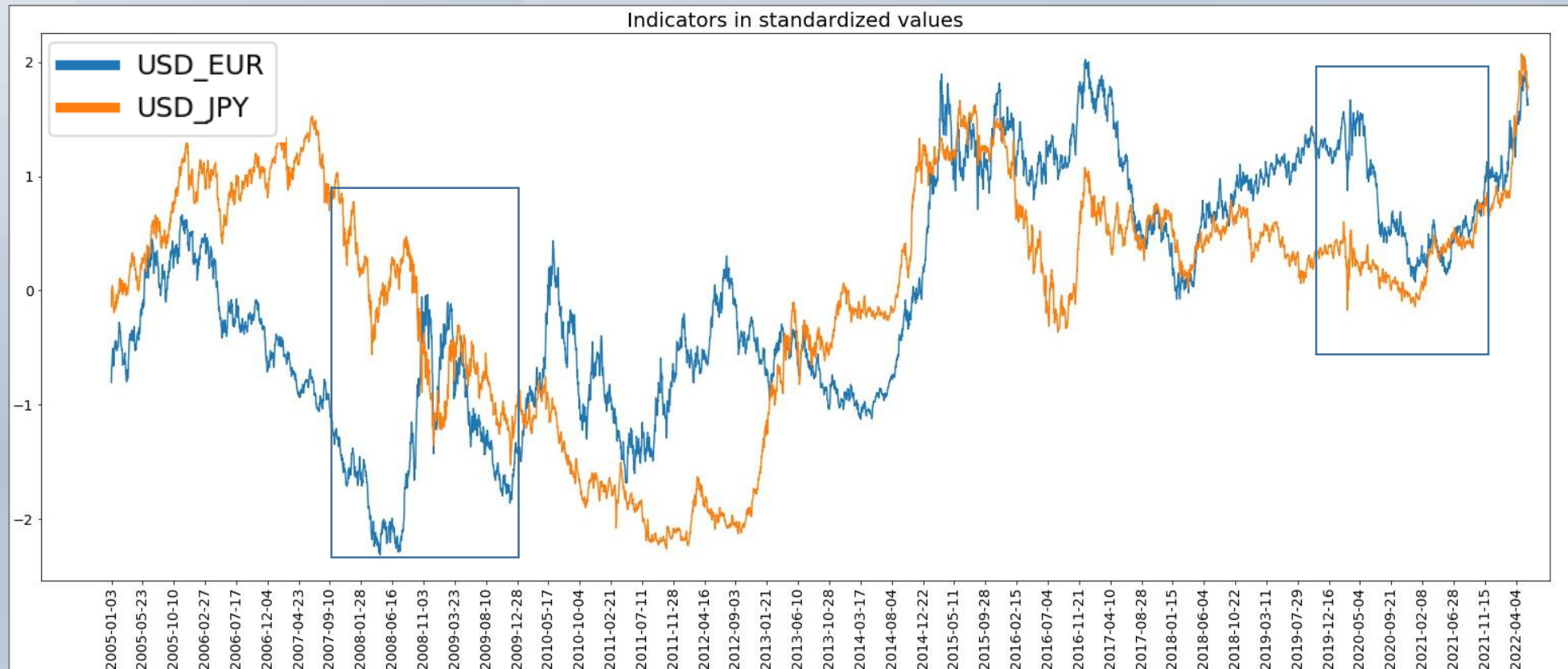
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- Covid Crisis impact on Financial Markets
 - Growth Stocks performed better than Value Stocks



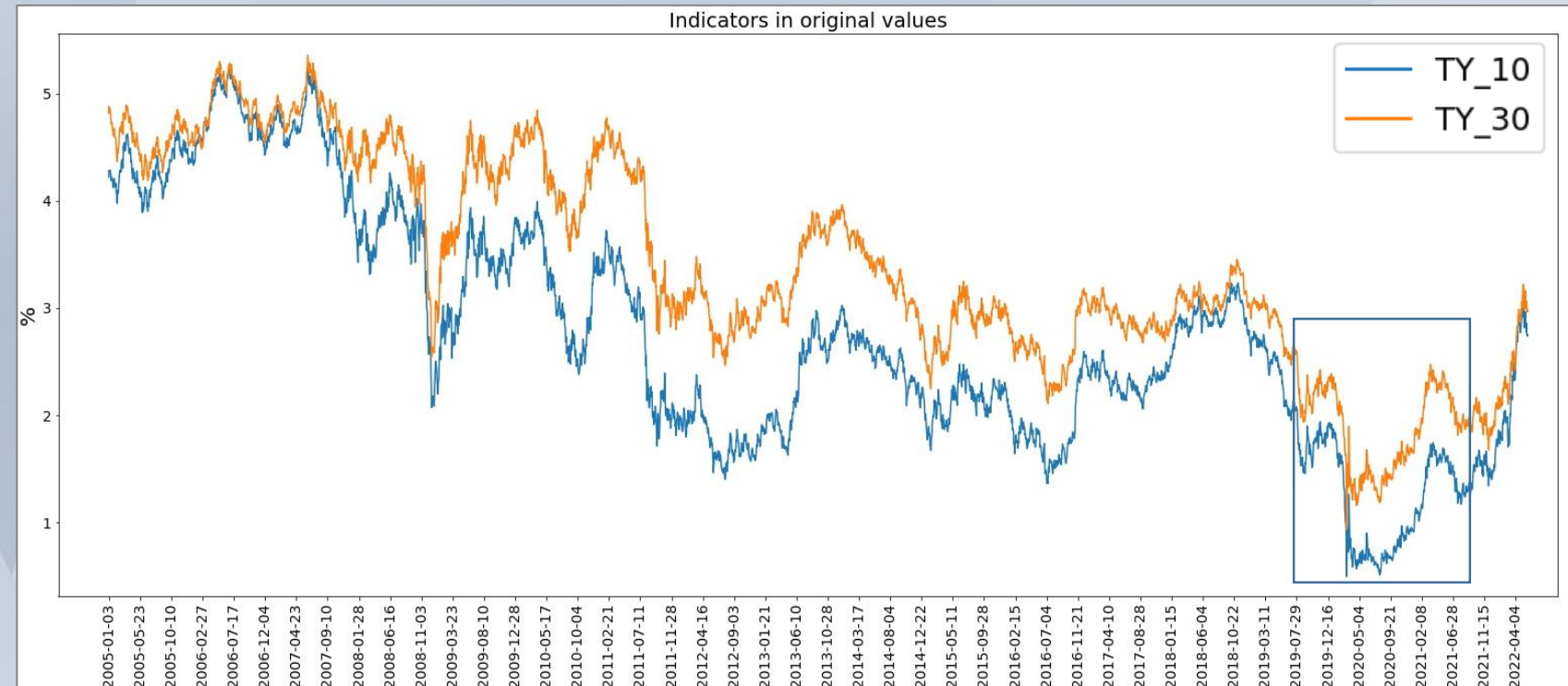
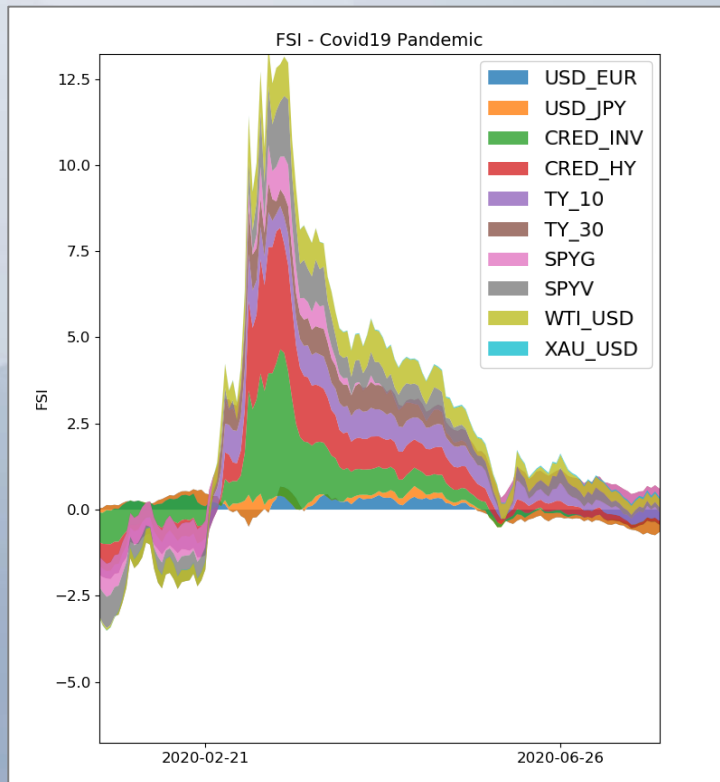
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- Covid Crisis impact on Financial Markets
 - USD was mostly stable



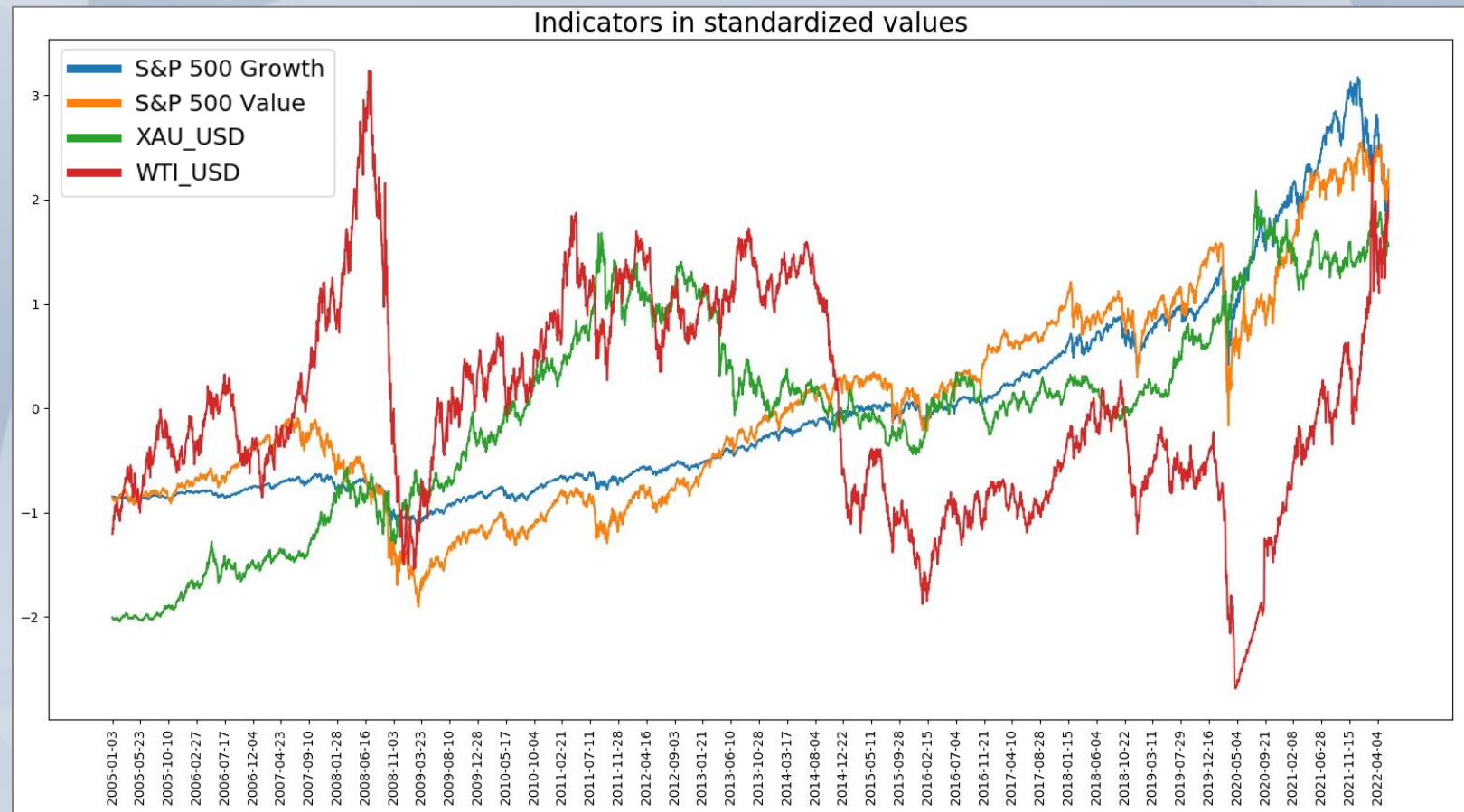
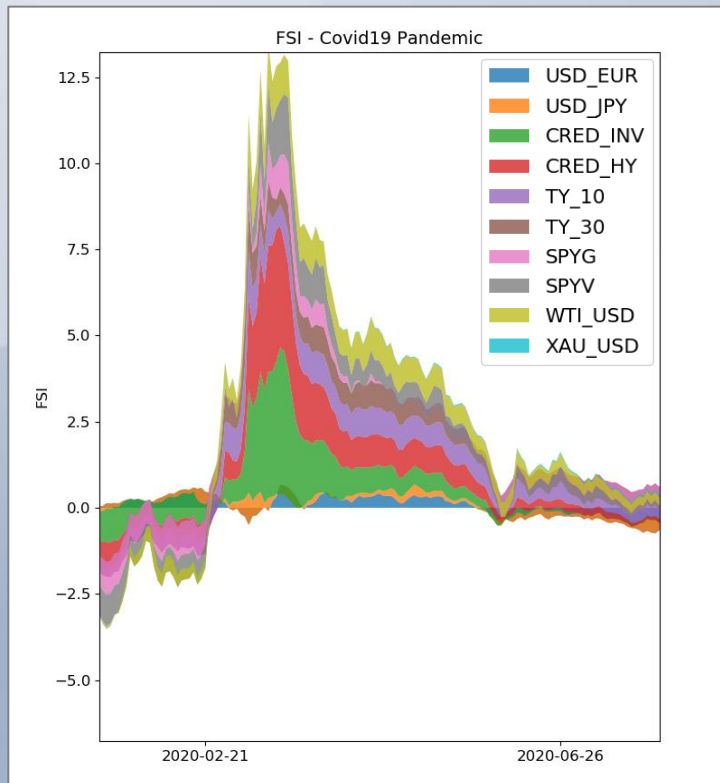
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- Covid Crisis impact on Financial Markets
 - Treasury Yields fell as investors run for safety



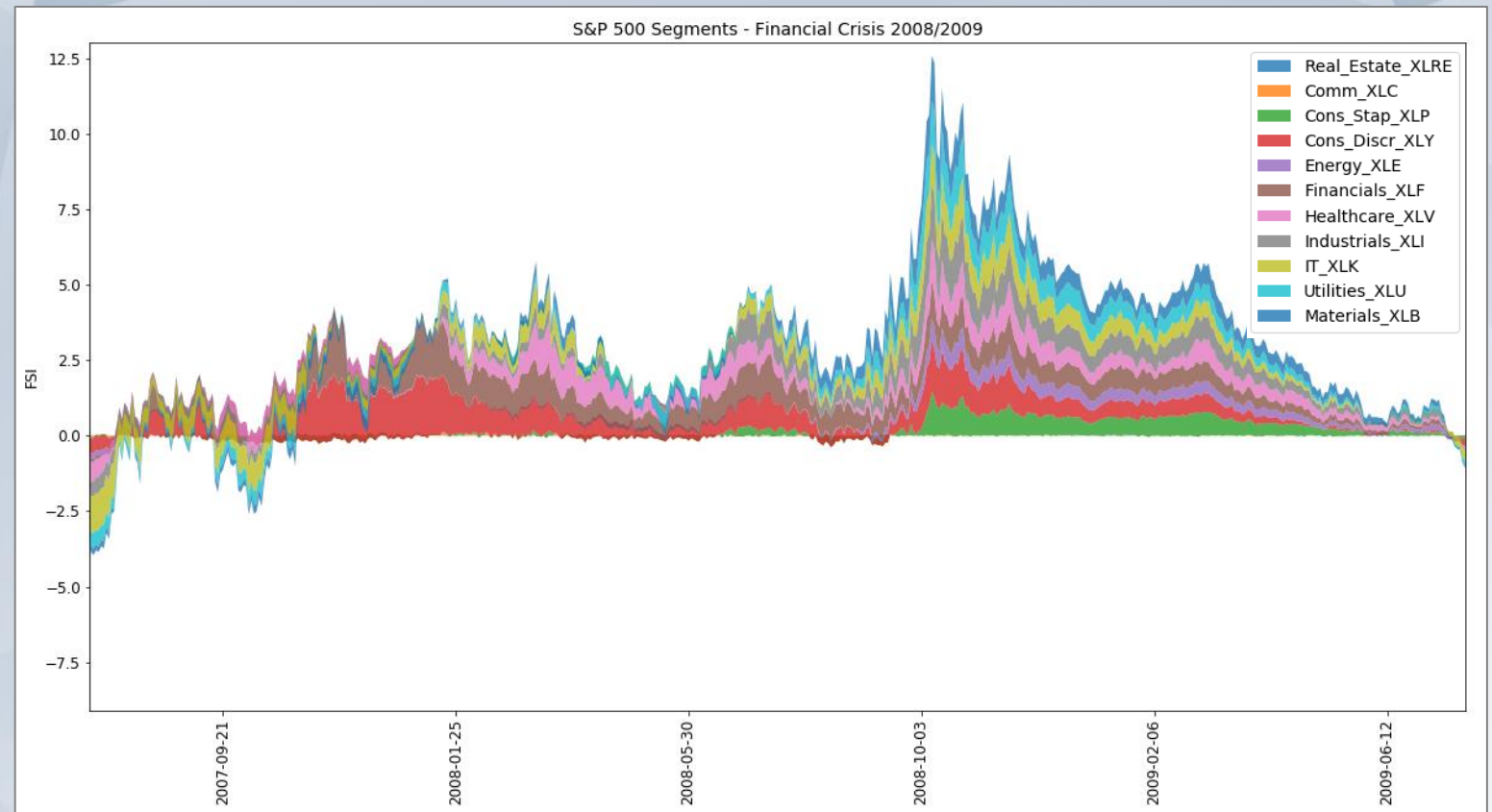
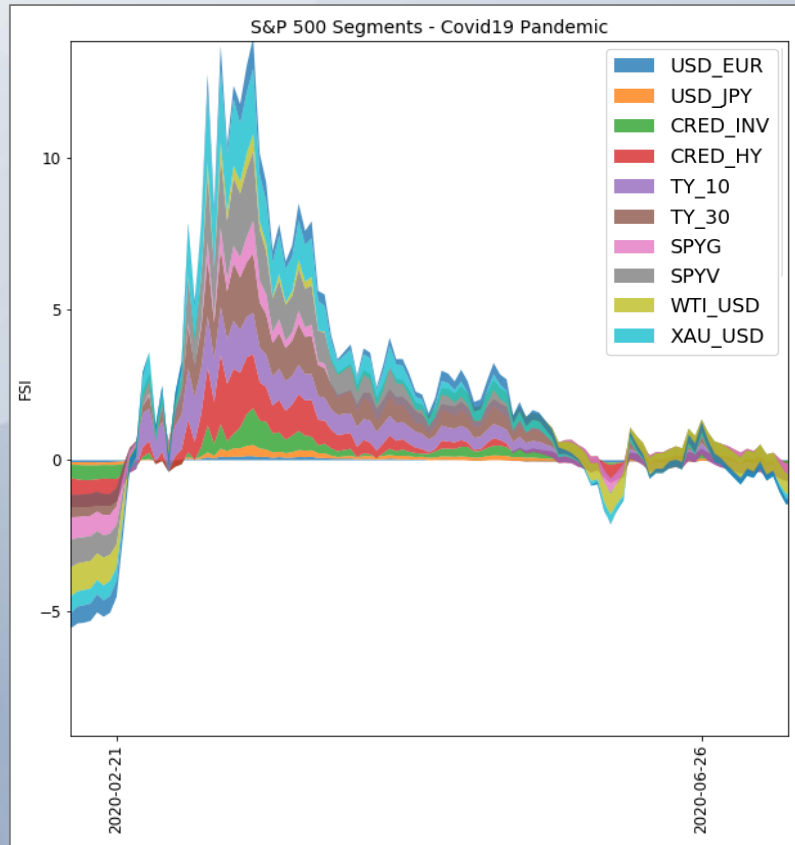
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- Covid Crisis impact on Financial Markets
 - Gold – price quite uncorrelated with other assets
 - Oil – high price volatility



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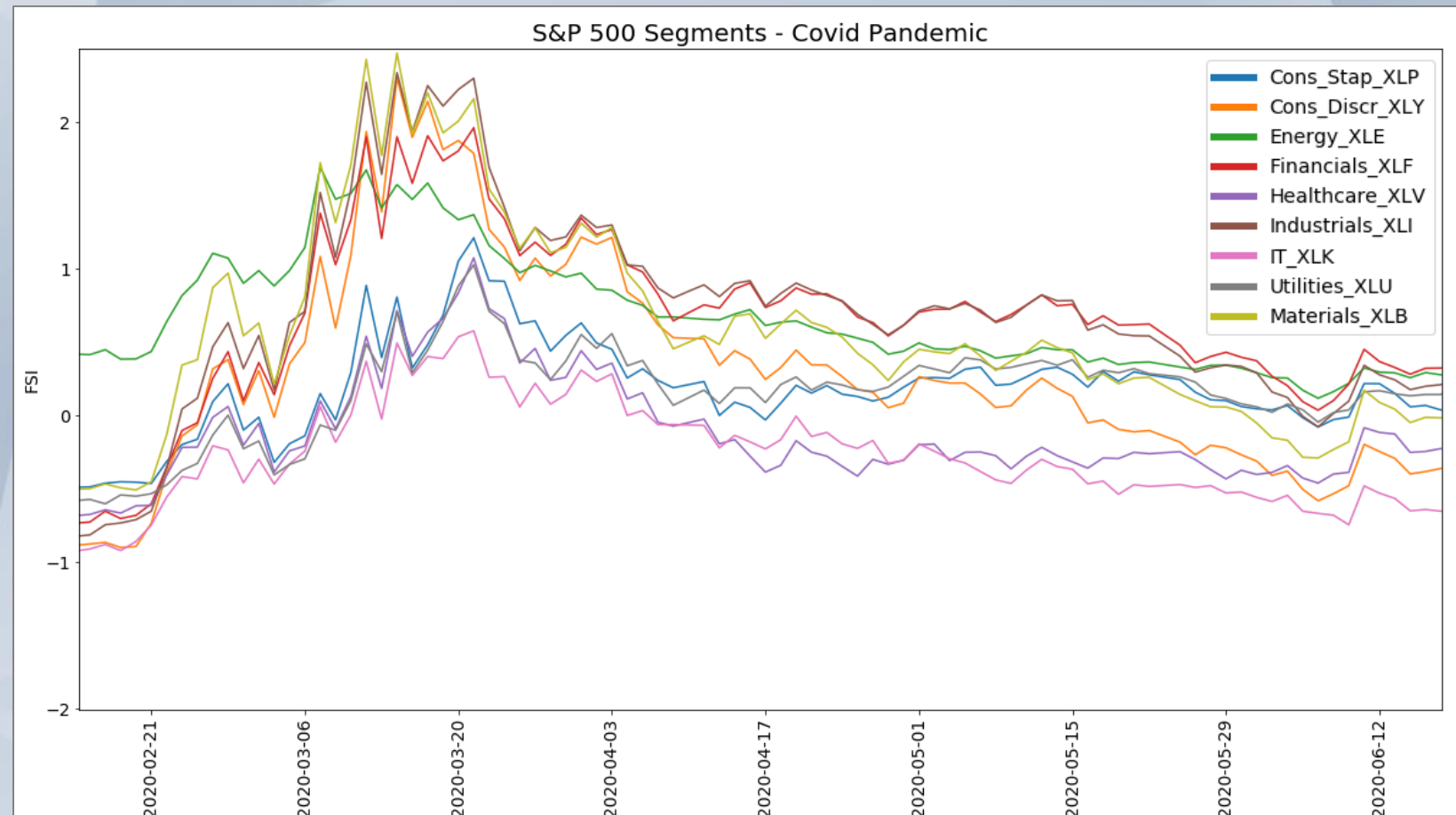
- Covid Crisis impact on S&P 500 Market Segments



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- Covid Crisis impact on S&P 500 Market Segments

- High Stress sectors
 - Materials
 - Consumer Discretionary
 - Energy
 - Financials
 - Industrials
- Low Stress sectors
 - Technology
 - Consumer Staples
 - Utilities
 - Healthcare
- Incomplete Data
 - Real Estate
 - Communications

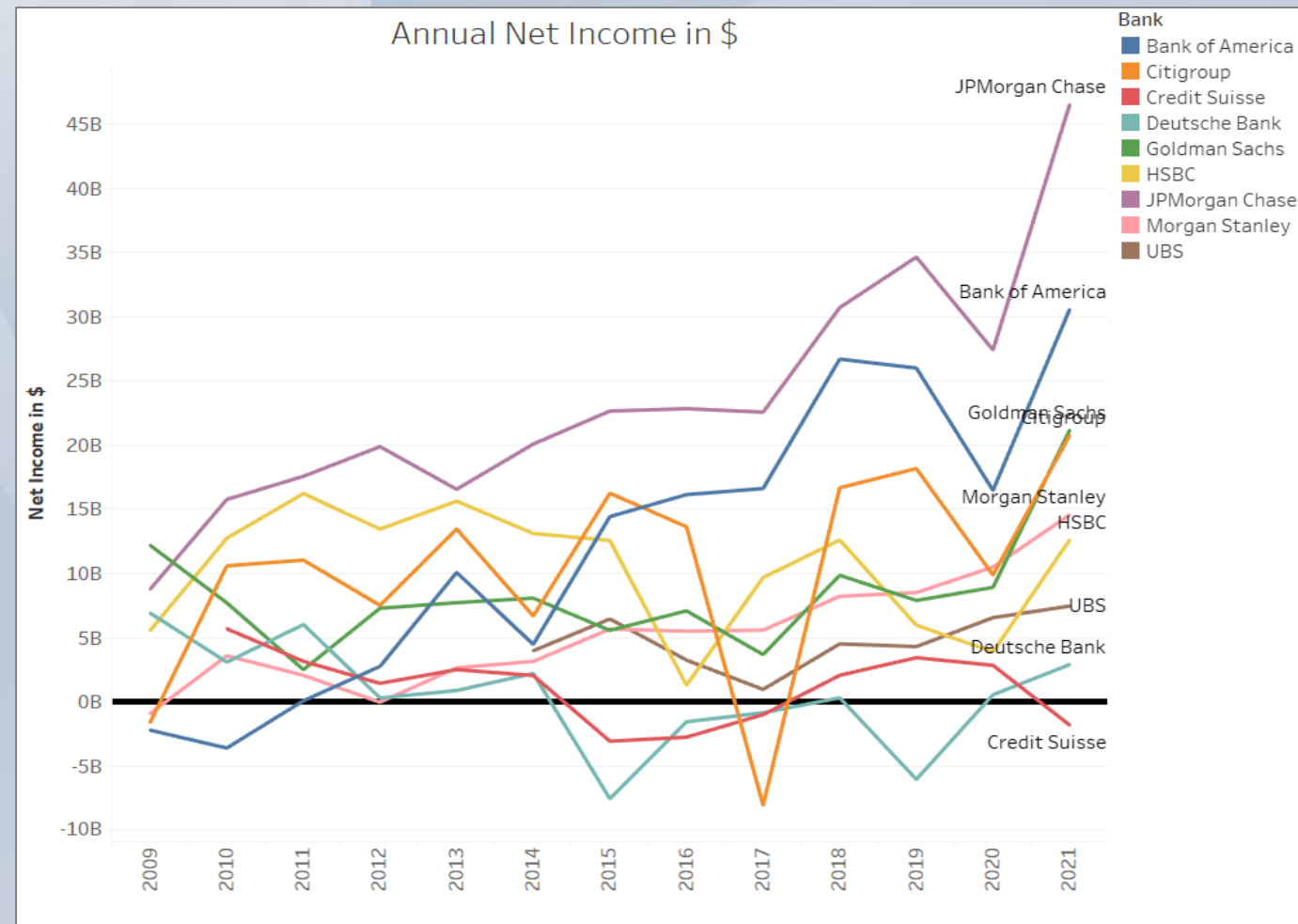


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- Managing the Risk
- Approaches would differ depending on the nature of the financial institution
- In Investment Banking (Market Making)
 - Shift towards more liquid assets
 - Update the Credit Ratings
 - Adapt the Stress Tests (adopt new scenarios)
 - Widen the bid offer spread

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- Effect on Investment Banks



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Thank you for your attention