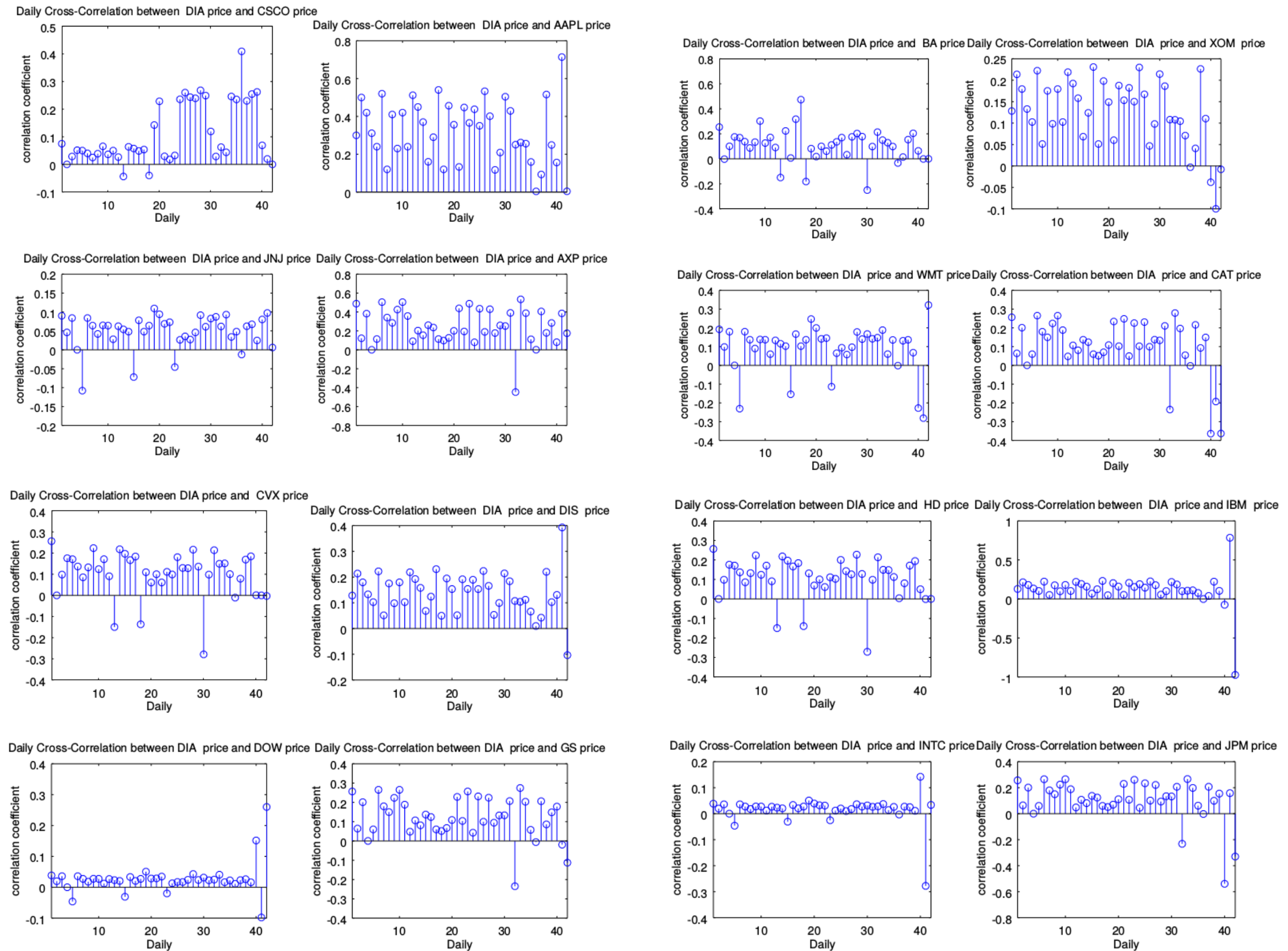


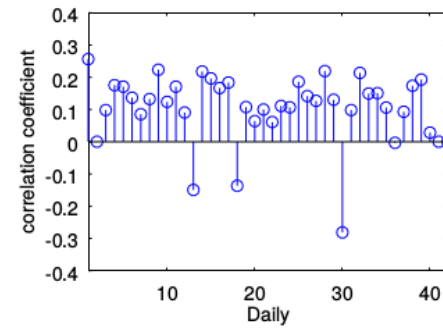
Online Appendix

Appendix A1

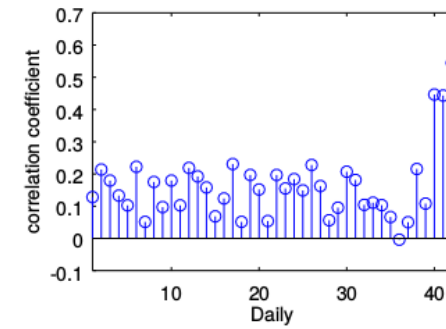
Figure 1: **Cross-Correlations between DIA ETF and its underlying Assets**



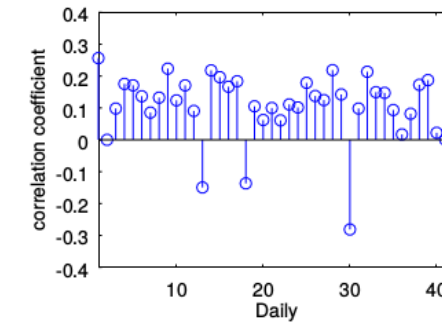
Daily Cross-Correlation between DIA price and KO price



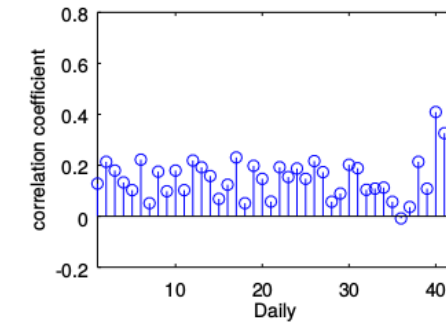
Daily Cross-Correlation between DIA price and MCD price



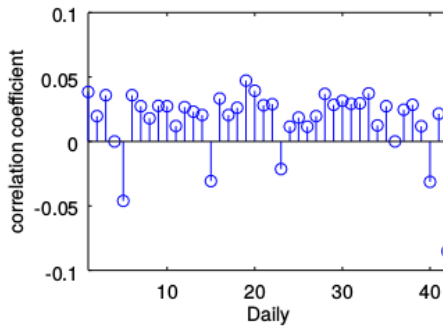
Daily Cross-Correlation between DIA price and MSFT price



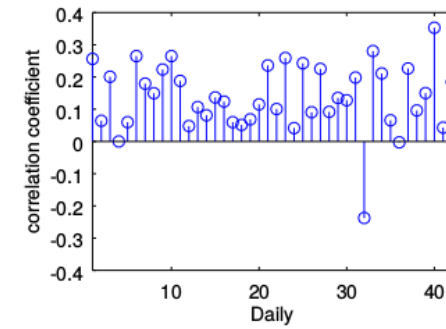
Daily Cross-Correlation between DIA price and NKE price



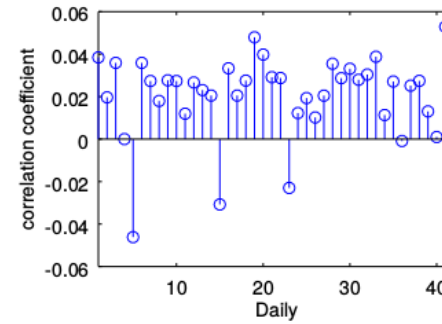
Daily Cross-Correlation between DIA price and MMM price



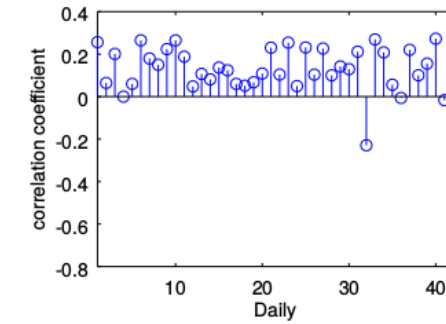
Daily Cross-Correlation between DIA price and MRK price



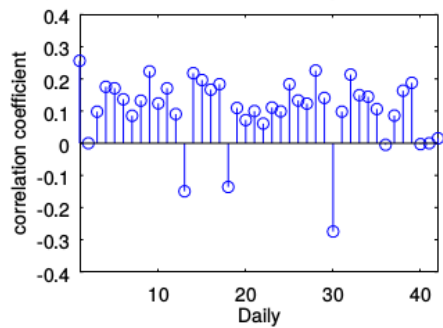
Daily Cross-Correlation between DIA price and PFE price



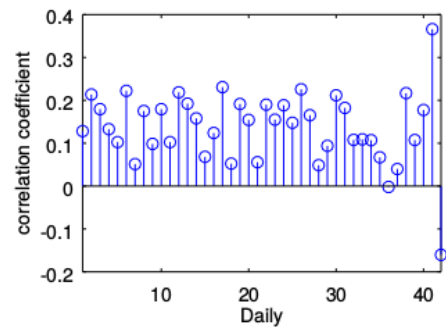
Daily Cross-Correlation between DIA price and PG price



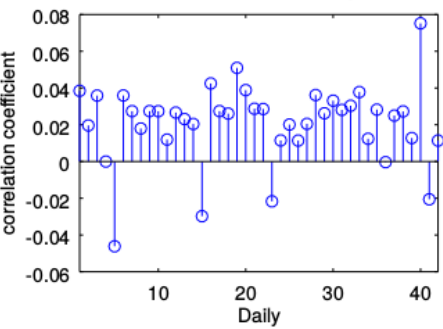
Daily Cross-Correlation between DIA price and TRV price



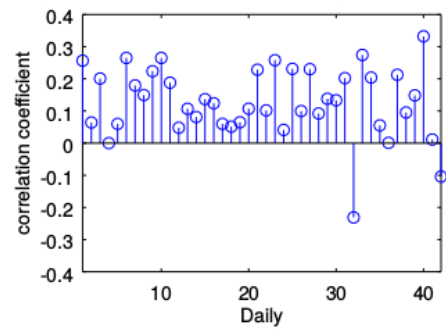
Daily Cross-Correlation between DIA price and UTX price



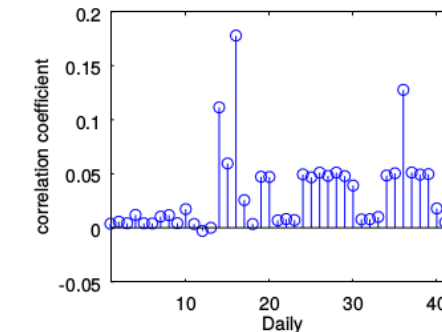
Daily Cross-Correlation between DIA price and V price



Daily Cross-Correlation between DIA price and WBA price



Daily Cross-Correlation between DIA price and UNH price



Daily Cross-Correlation between DIA price and VZ price

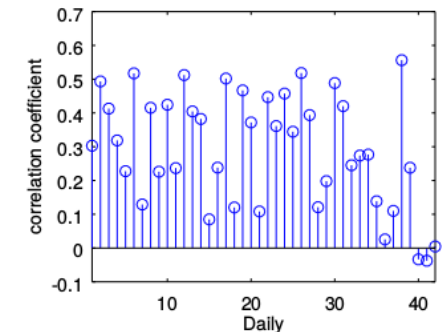
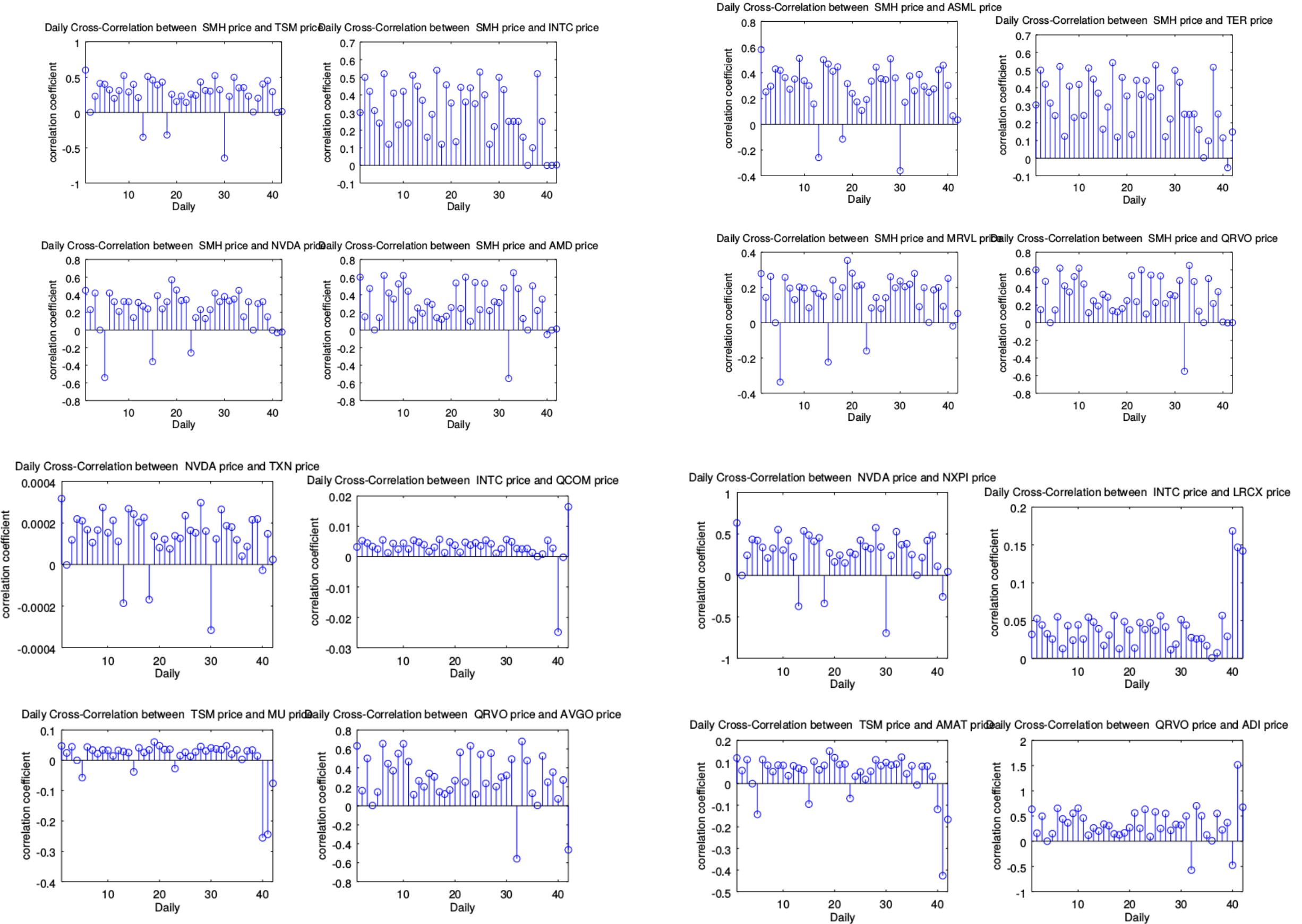
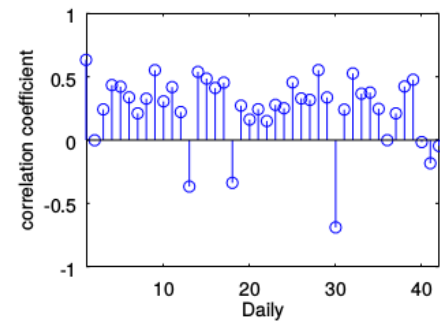


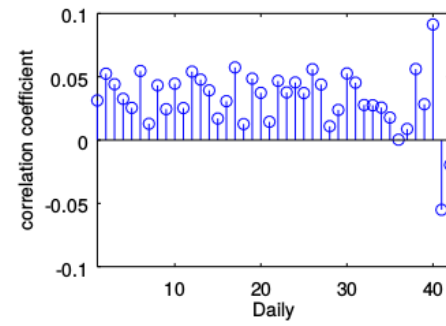
Figure 2: Cross-Correlations between SMH ETF and its underlying Assets



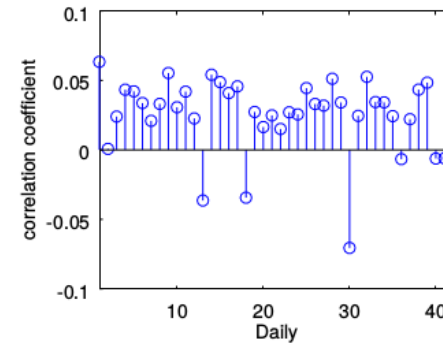
Daily Cross-Correlation between NVDA price and KLAC price



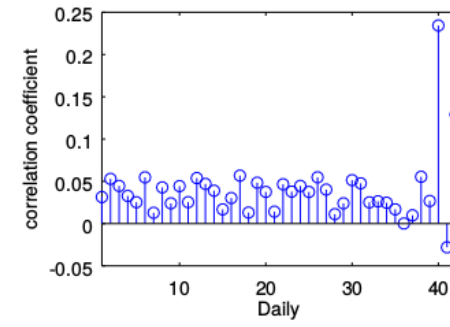
Daily Cross-Correlation between INTC price and XLNX price



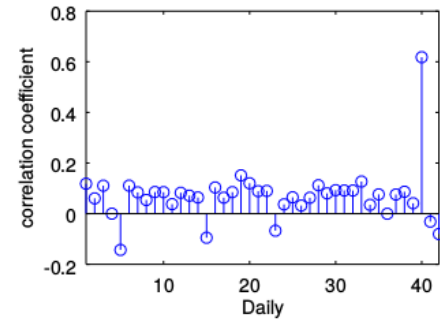
Daily Cross-Correlation between NVDA price and CDNS price



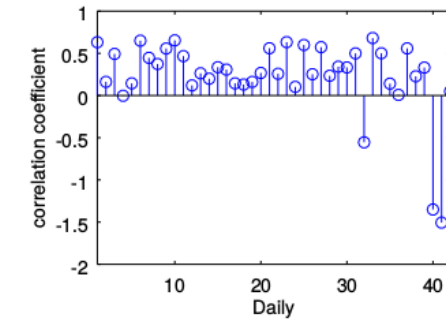
Daily Cross-Correlation between INTC price and SWKS price



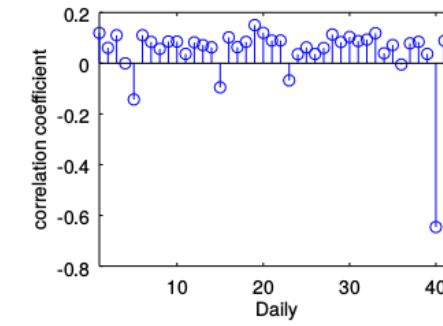
Daily Cross-Correlation between TSM price and STM price



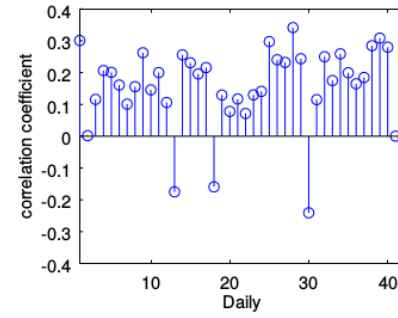
Daily Cross-Correlation between QRVO price and MCHP price



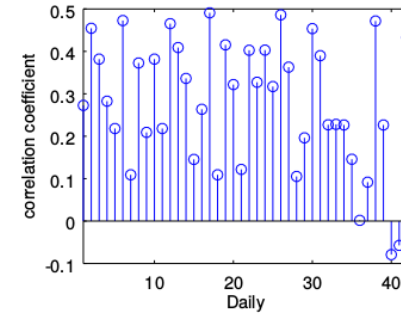
Daily Cross-Correlation between TSM price and MXIM price



Daily Cross-Correlation between SMH price and ON price

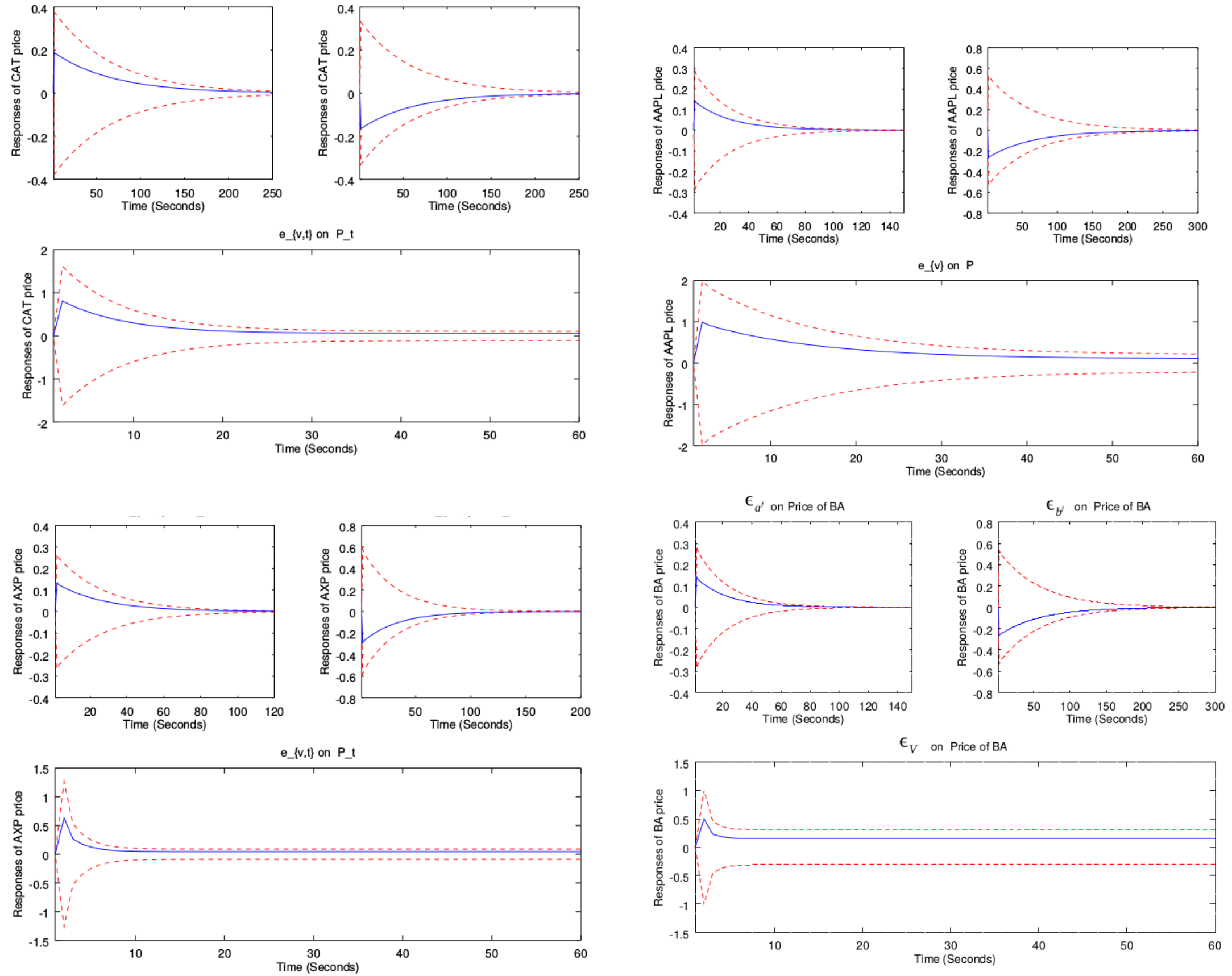


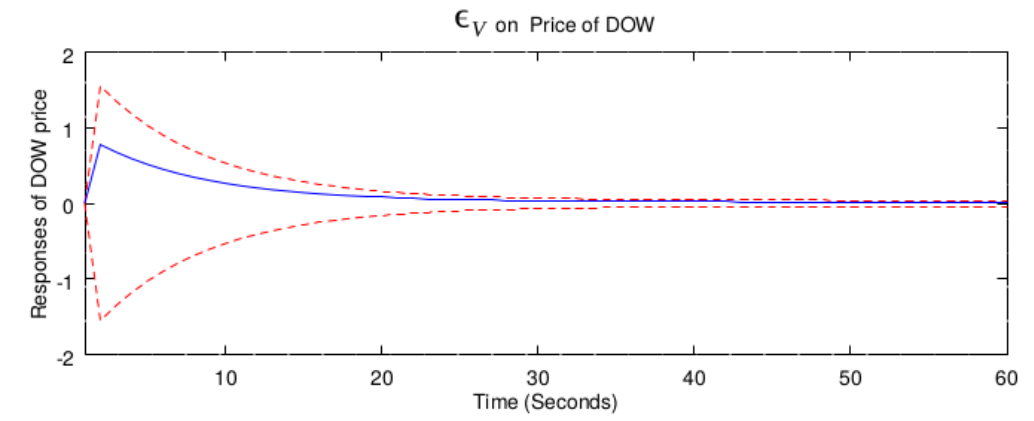
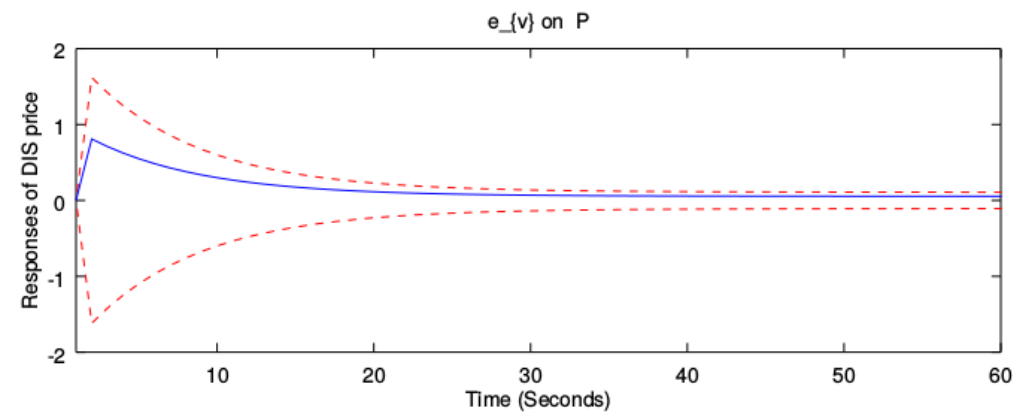
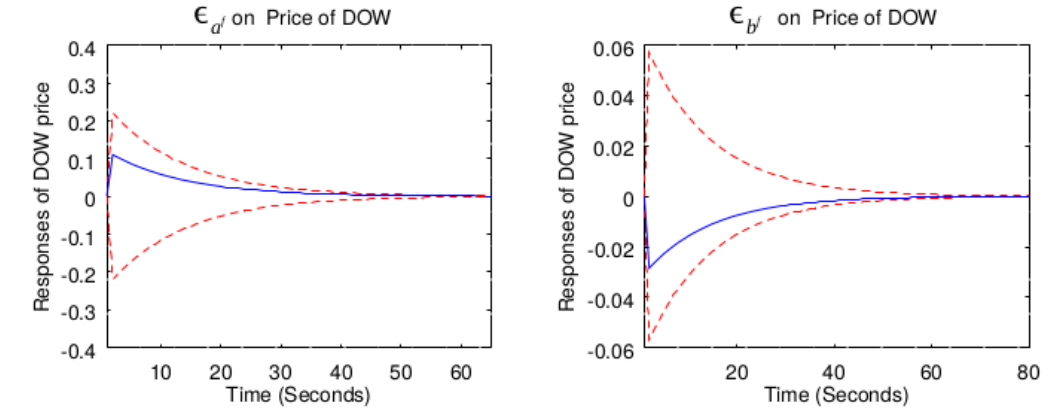
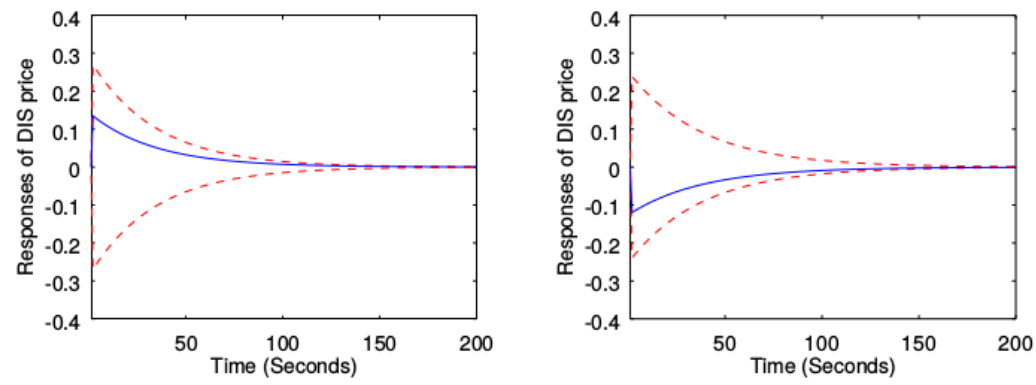
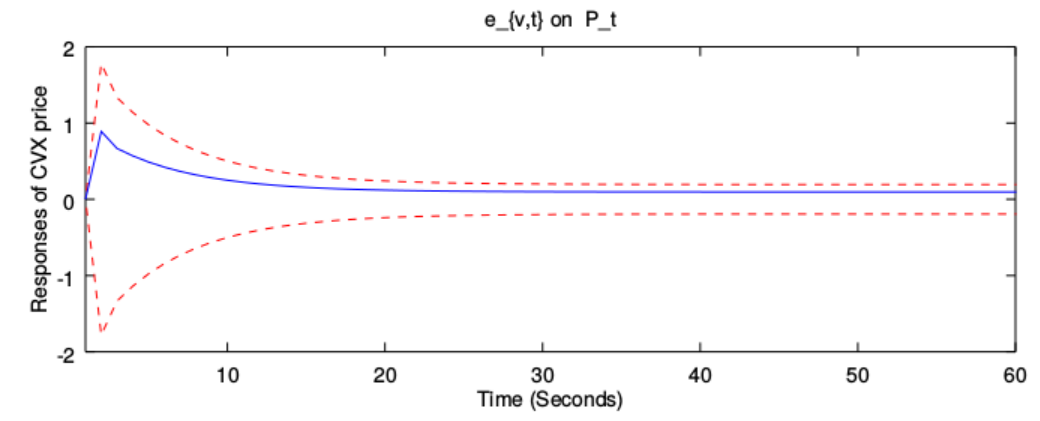
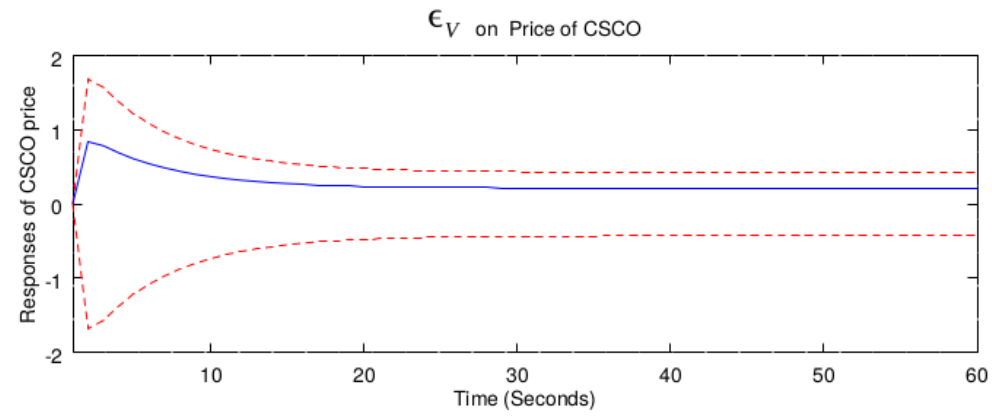
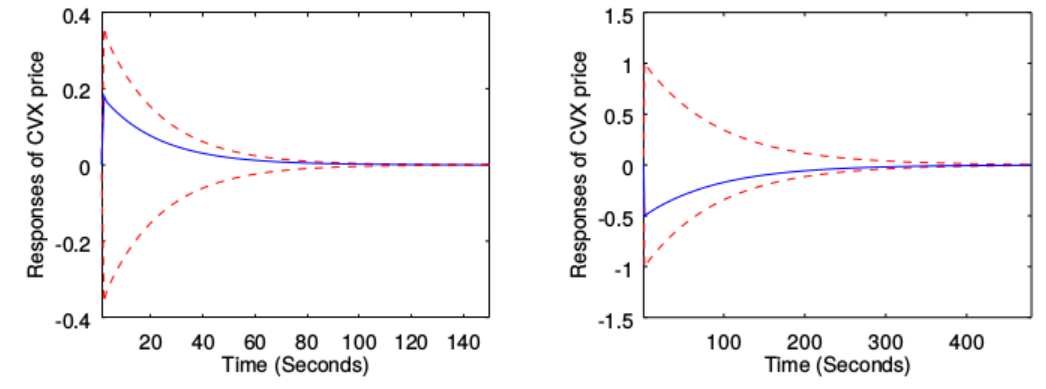
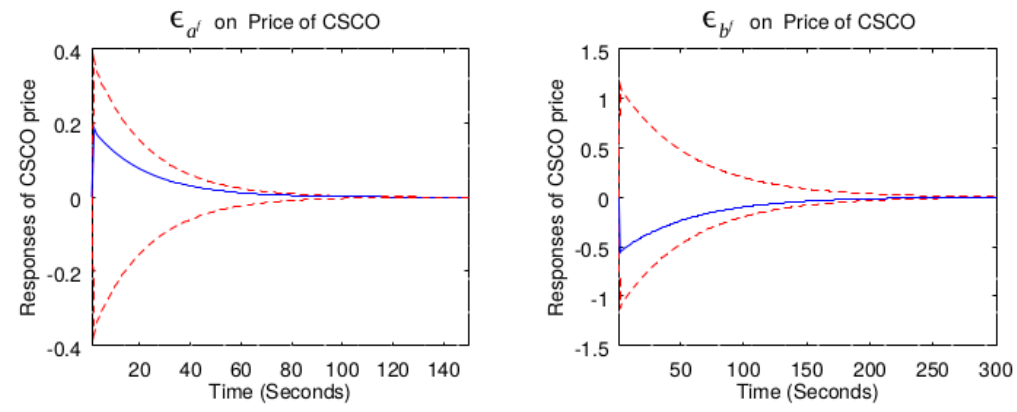
Daily Cross-Correlation between SMH price and OLED price

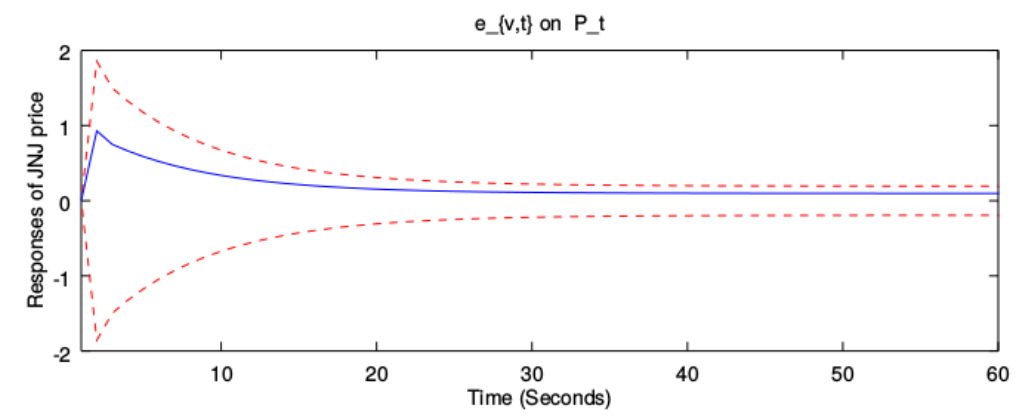
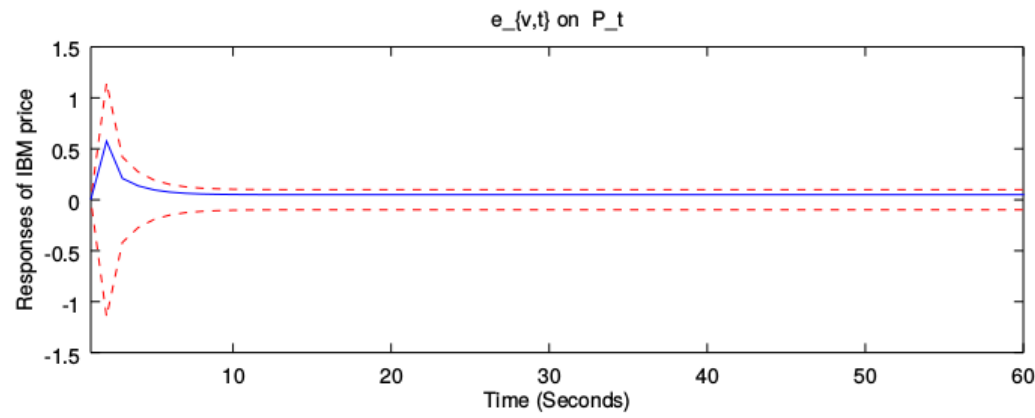
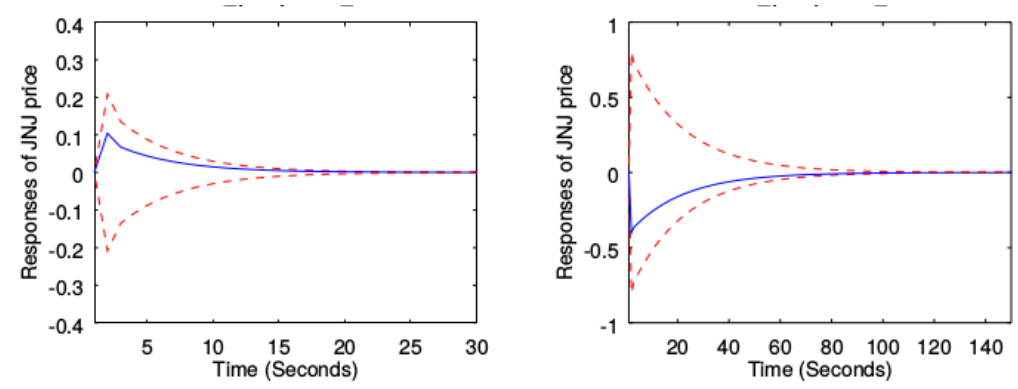
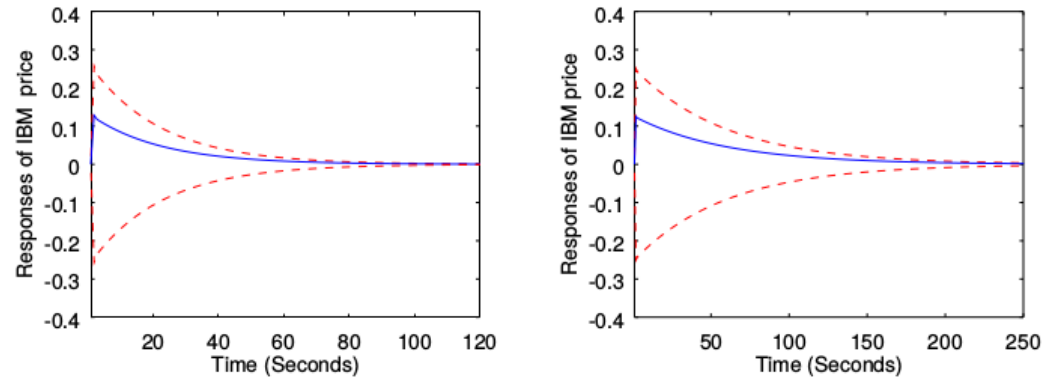
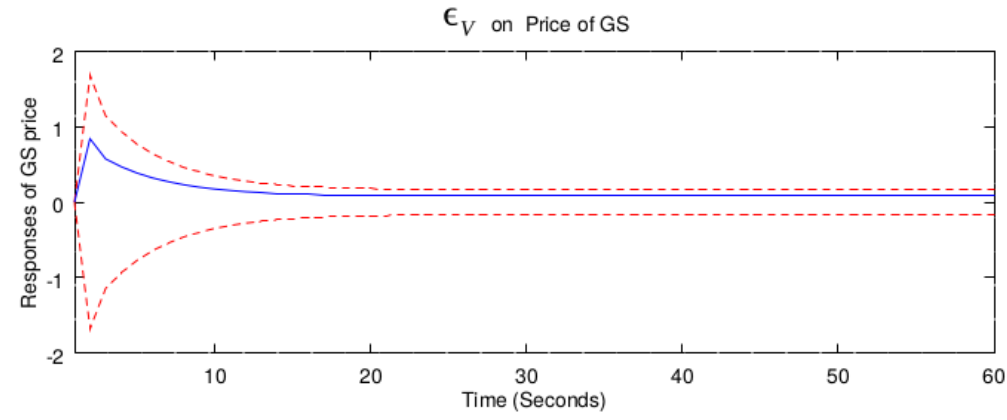
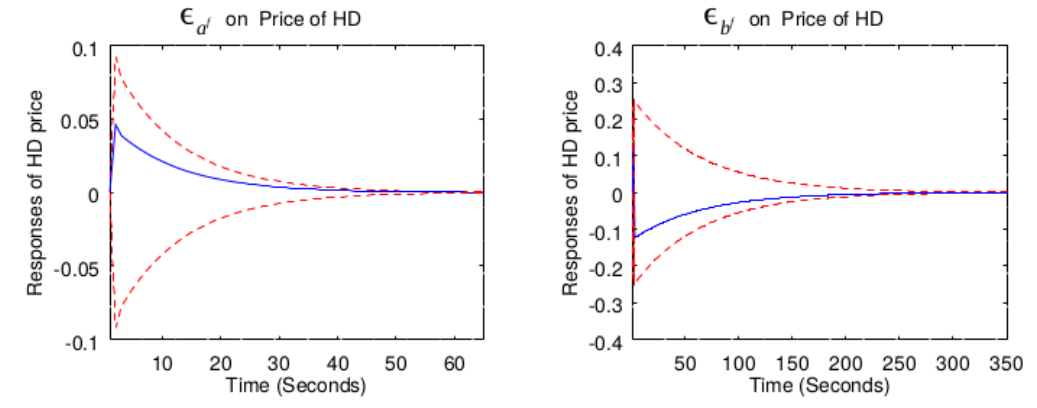
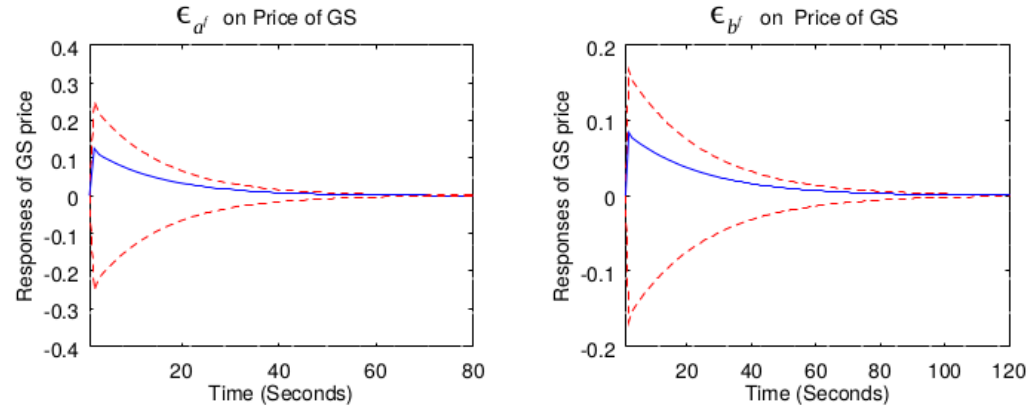


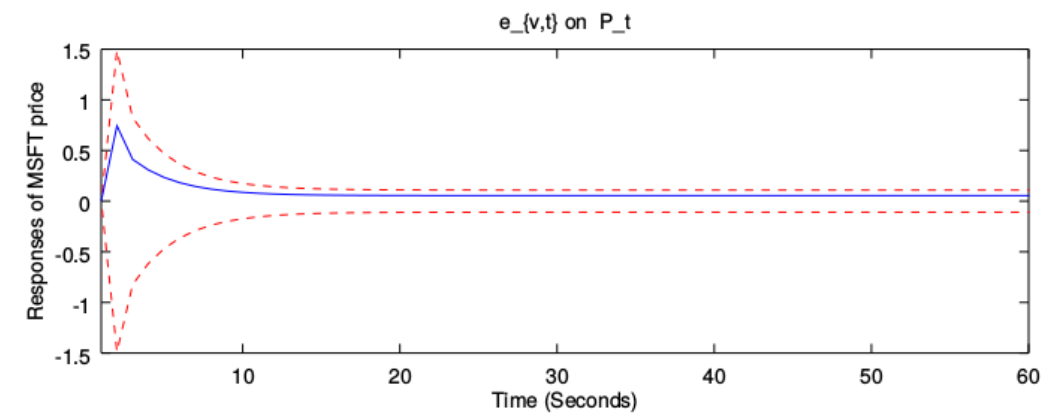
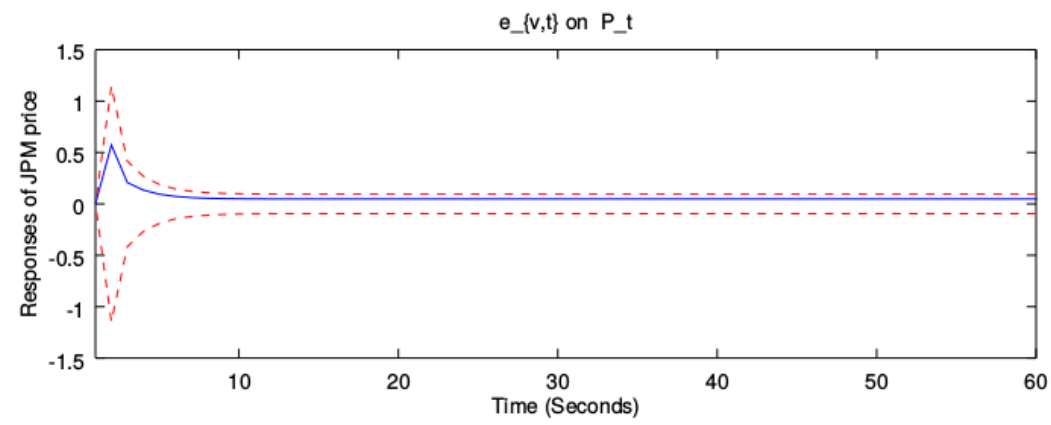
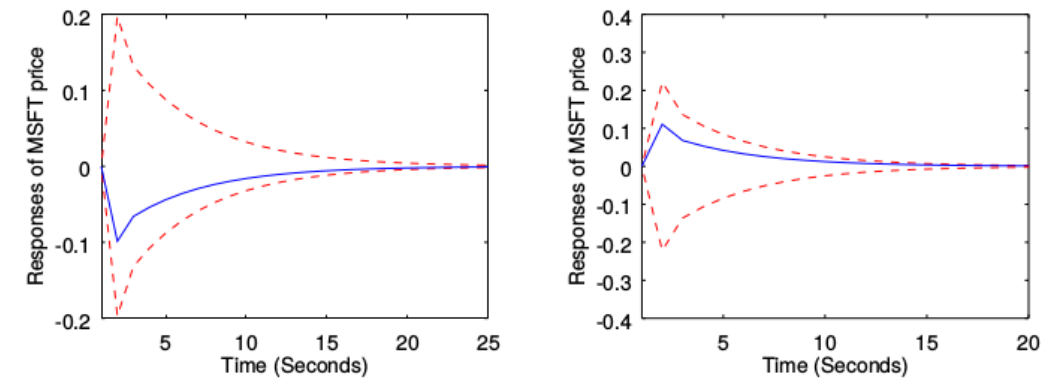
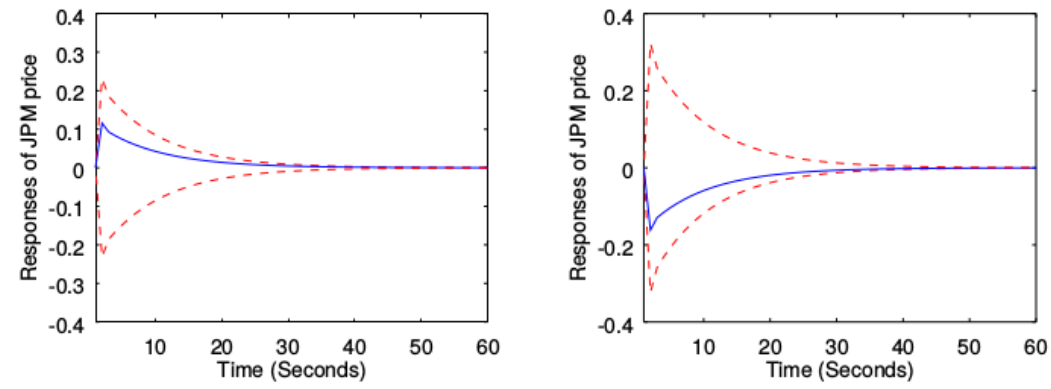
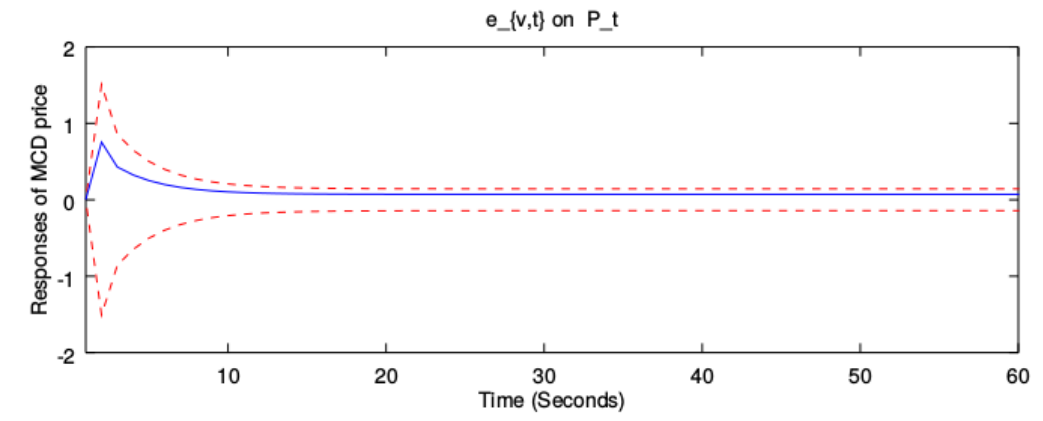
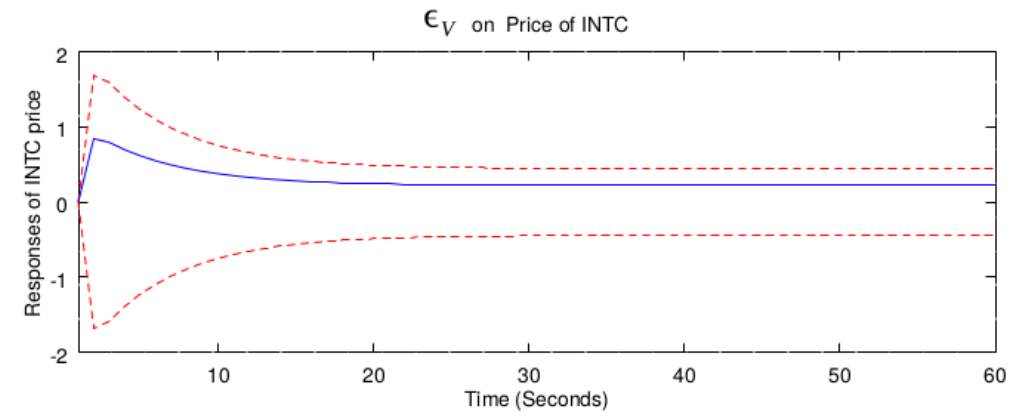
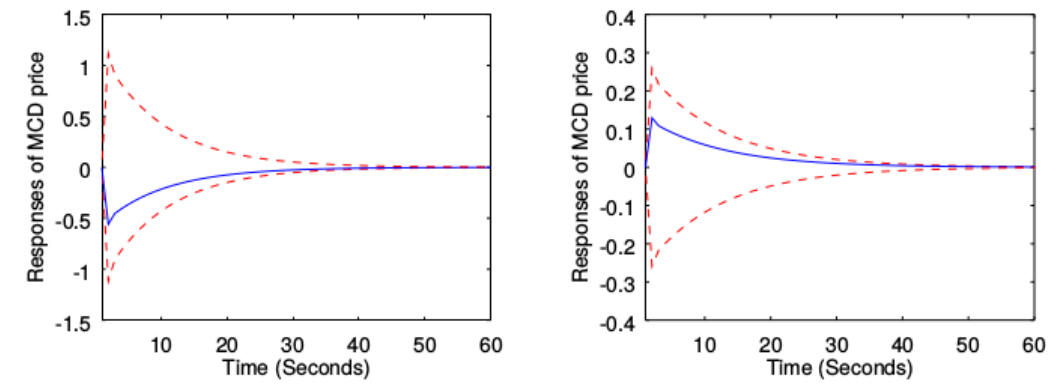
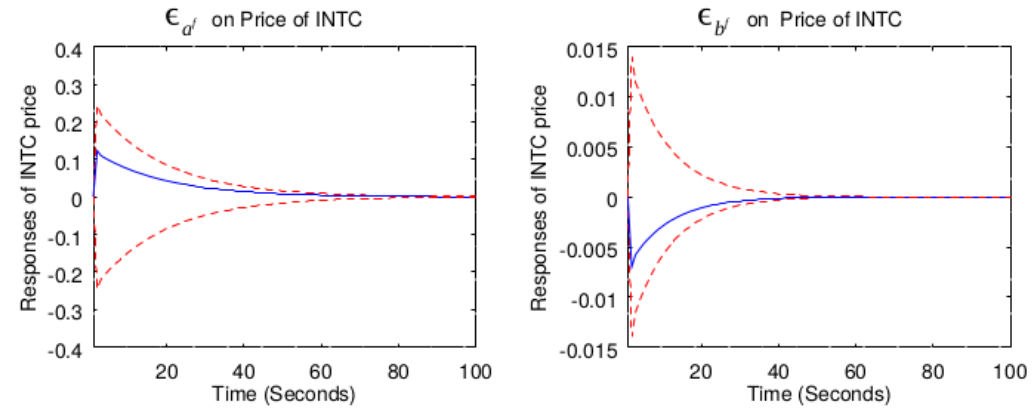
Appendix B1

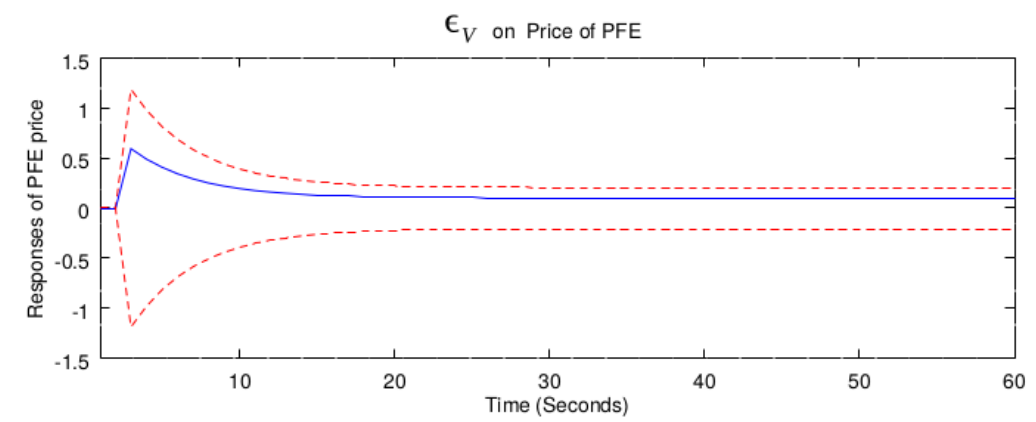
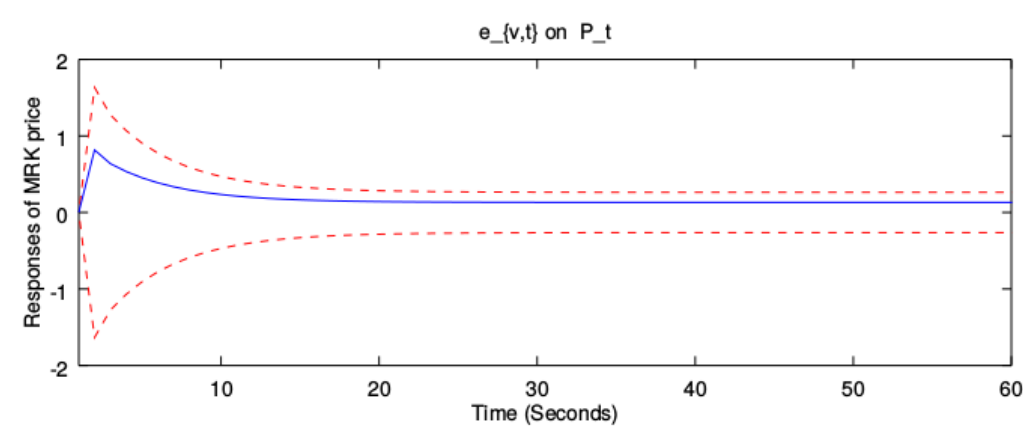
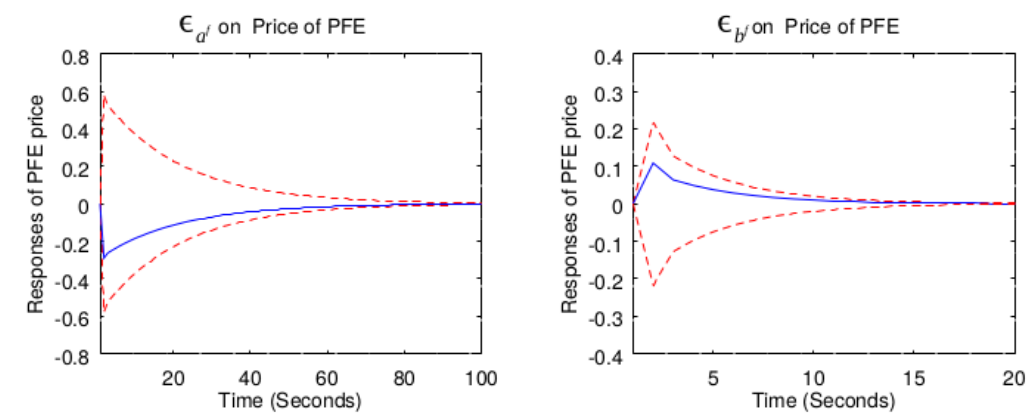
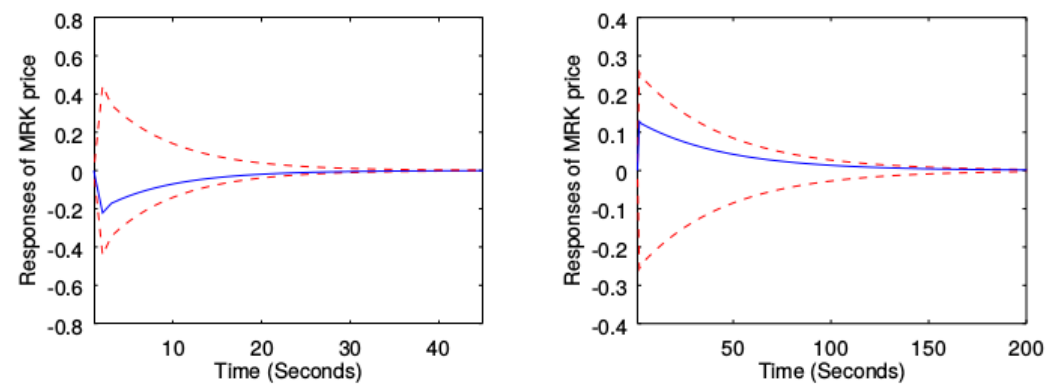
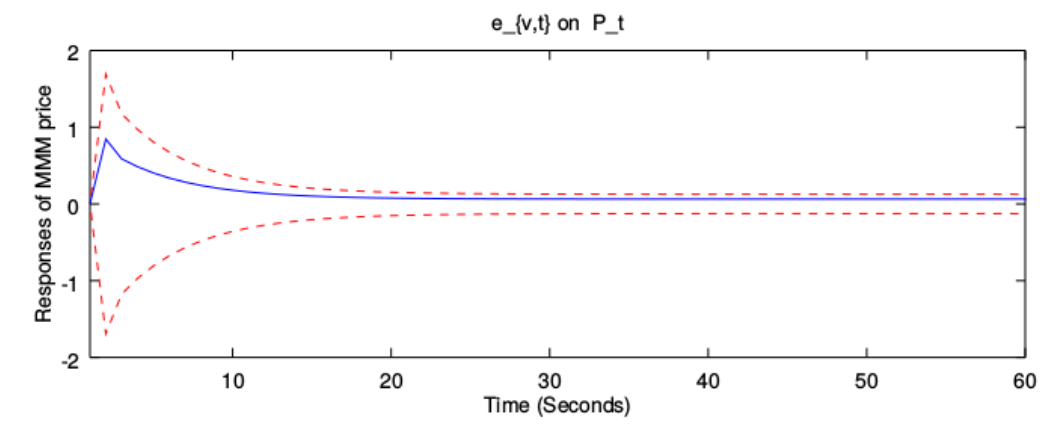
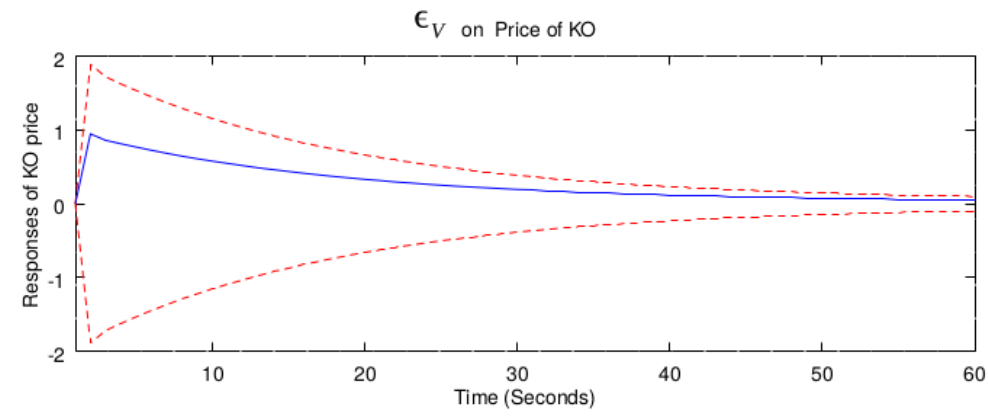
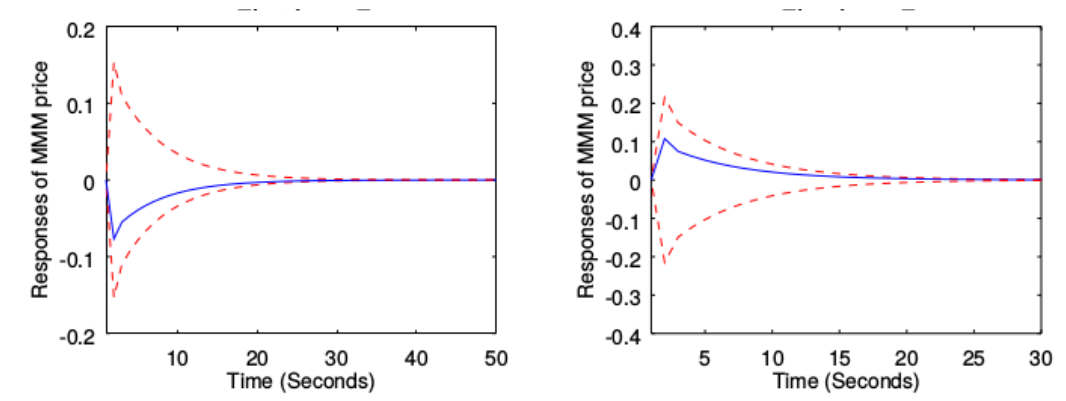
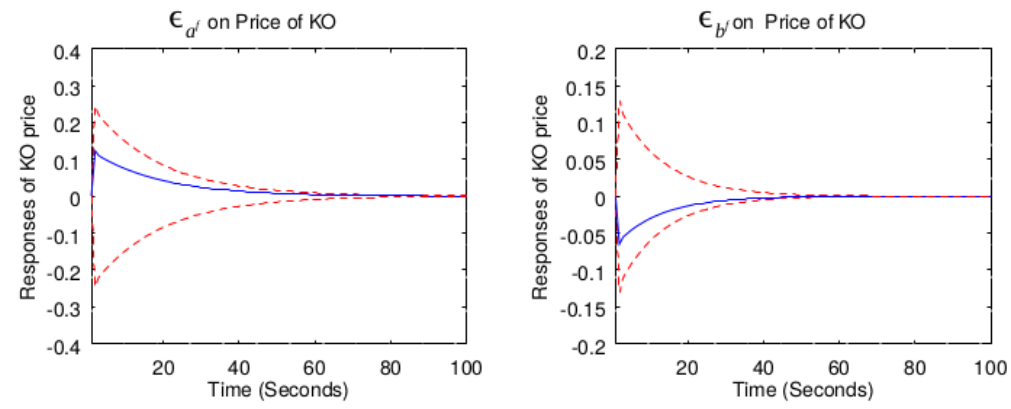
Figure 3: Impulse Responses of the underlying assets of DIA ETF

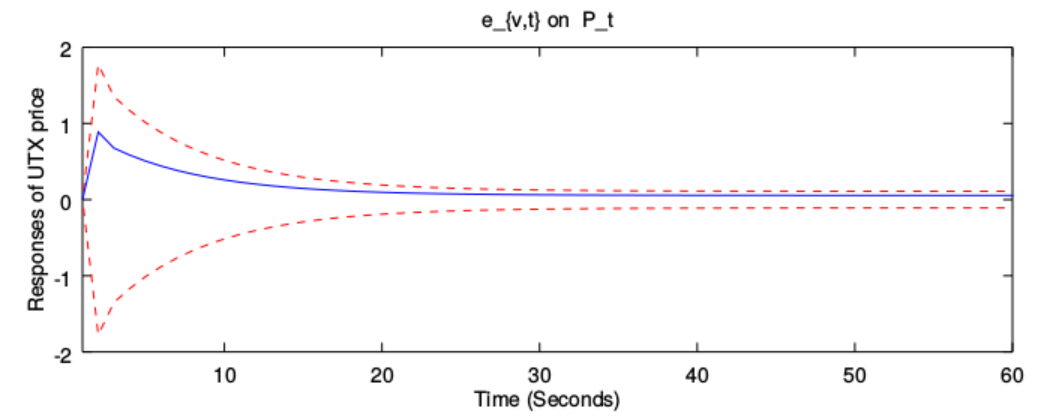
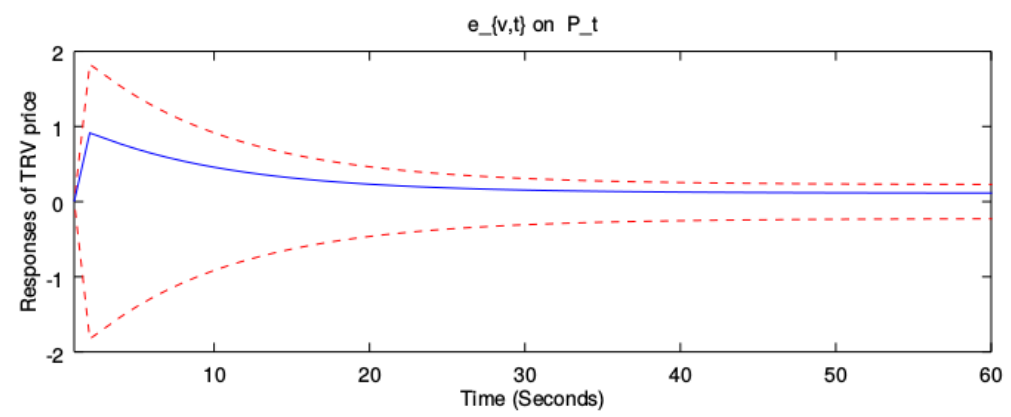
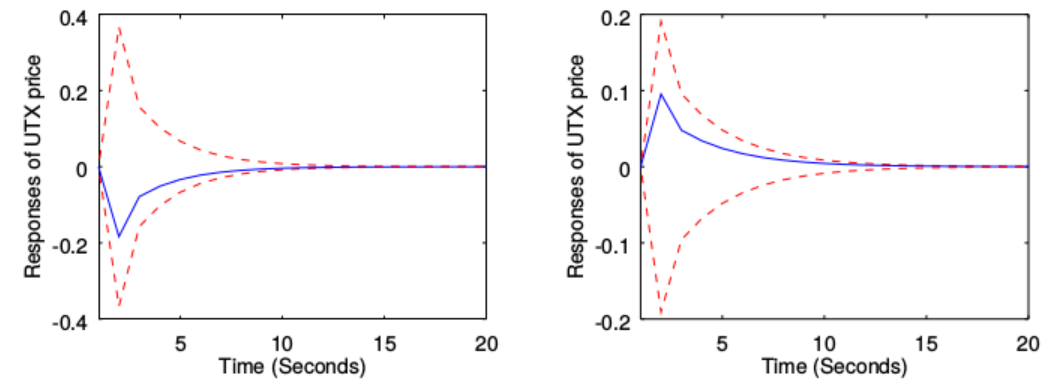
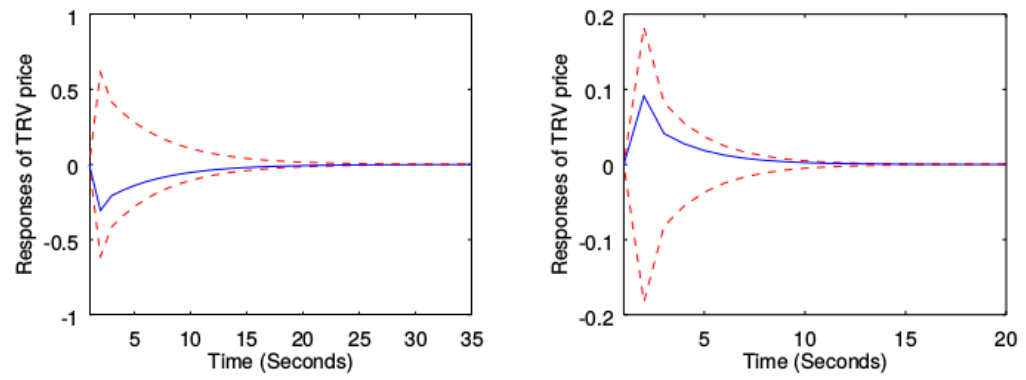
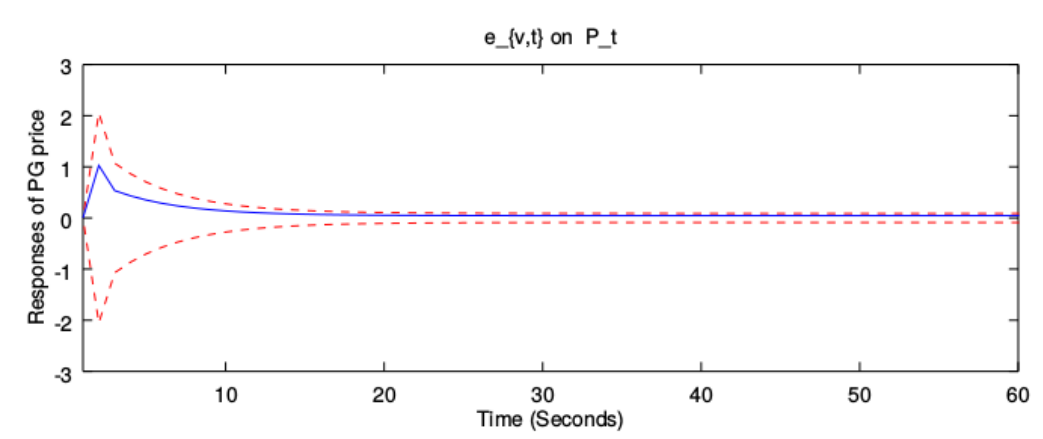
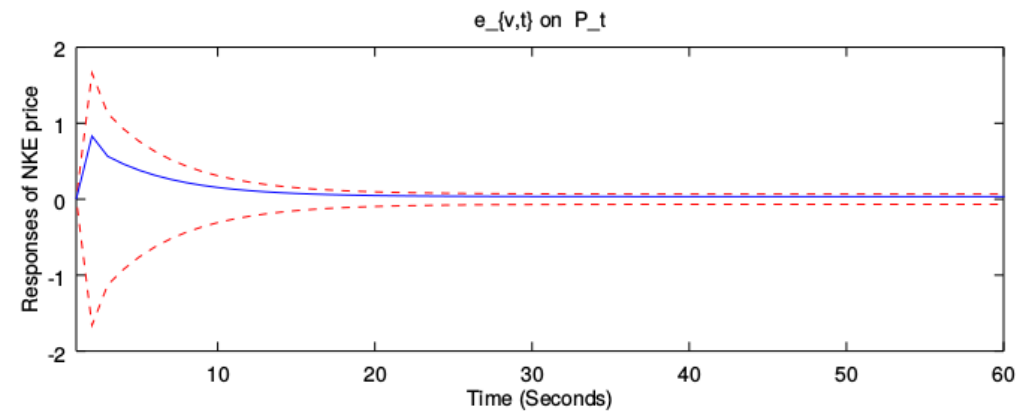
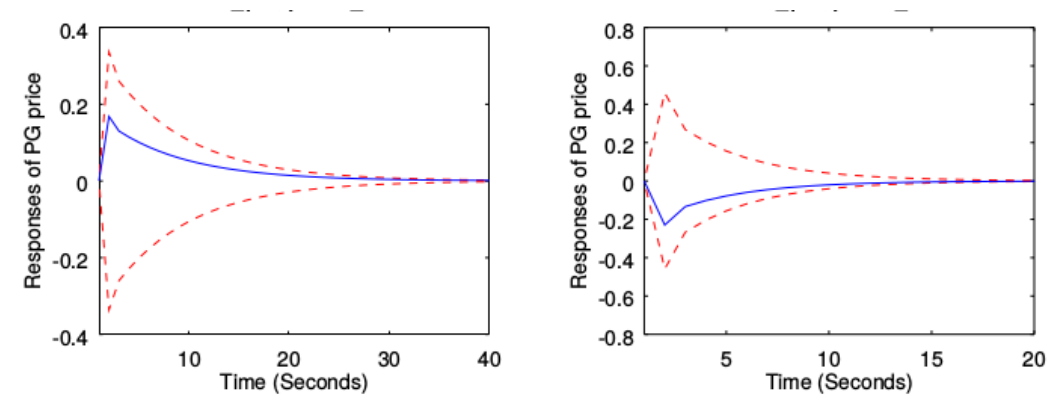
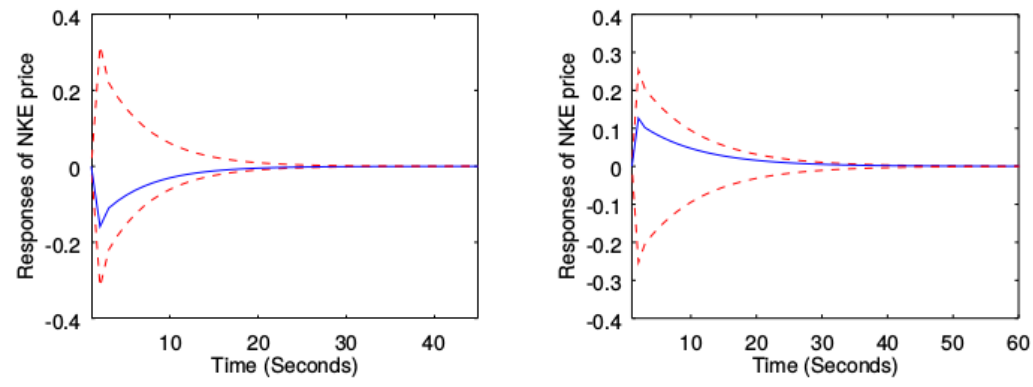


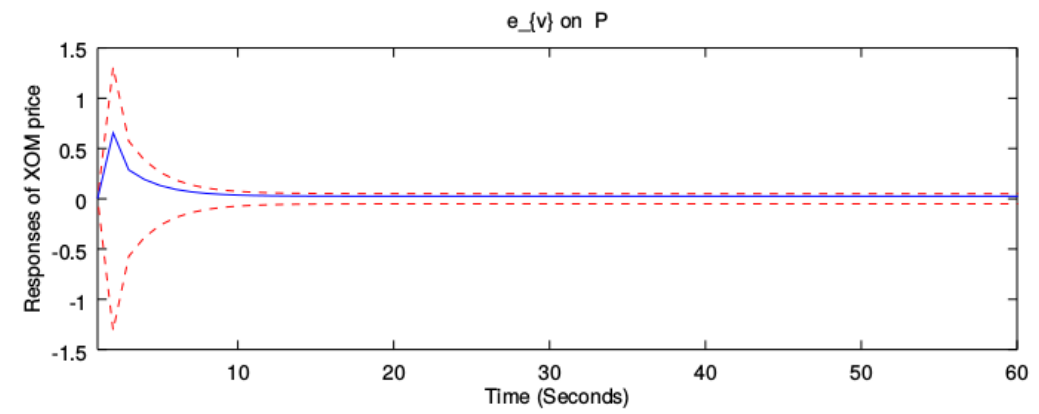
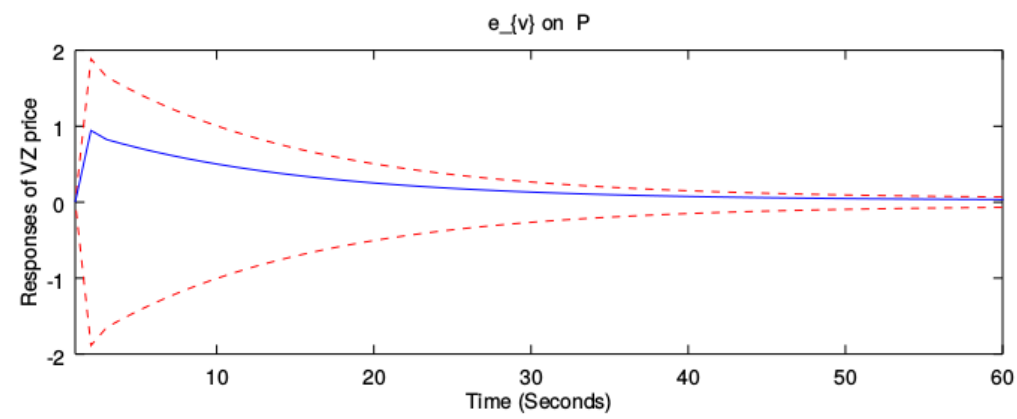
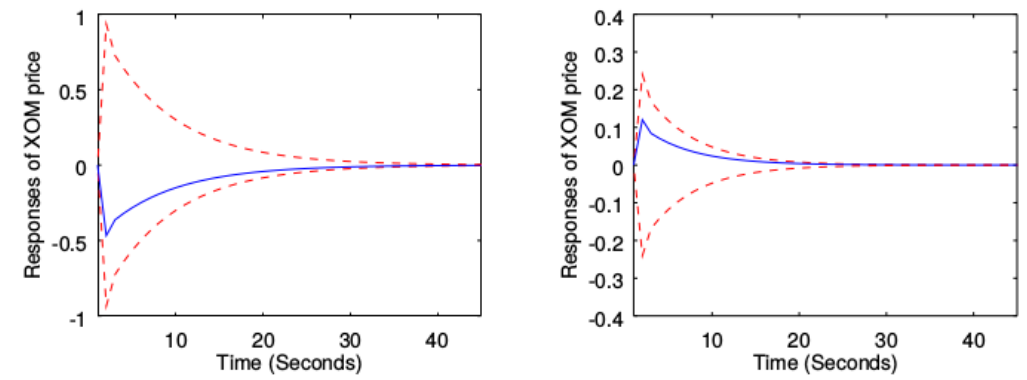
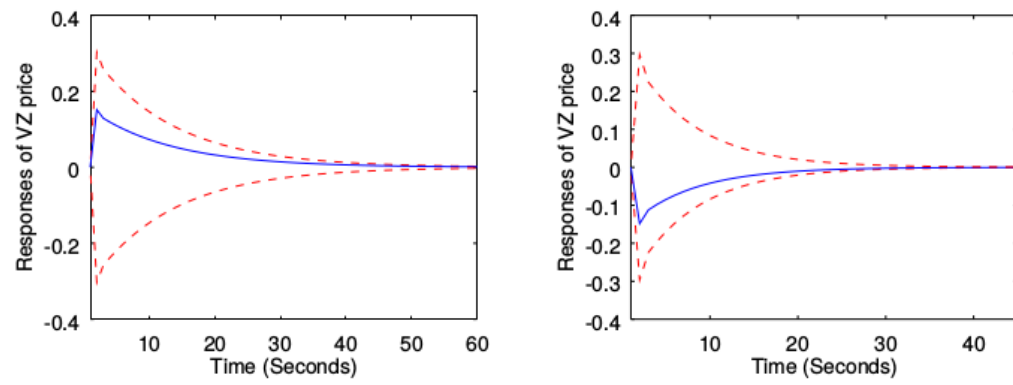
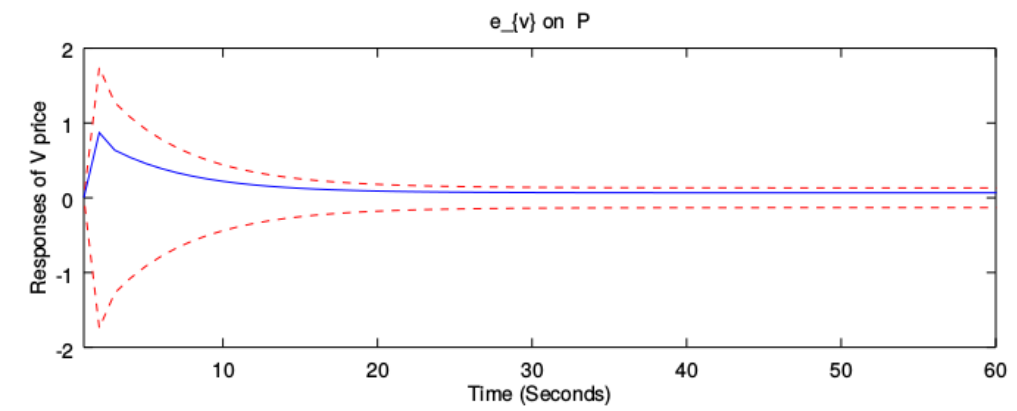
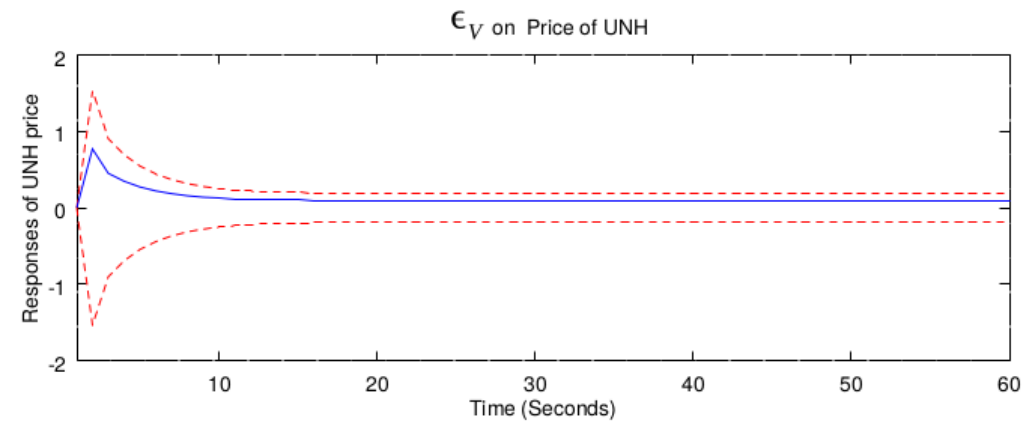
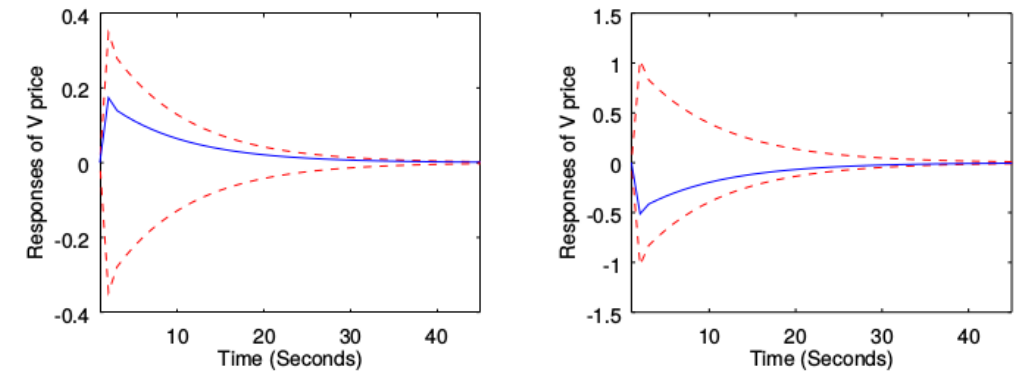
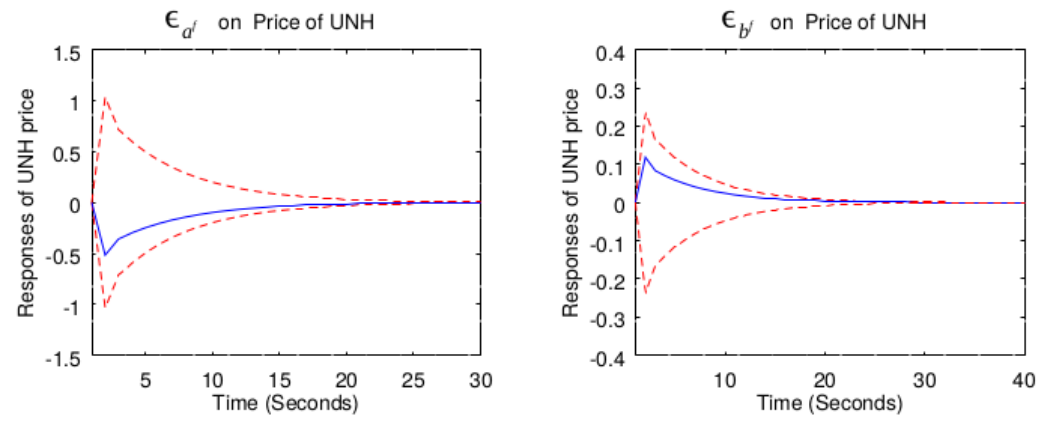


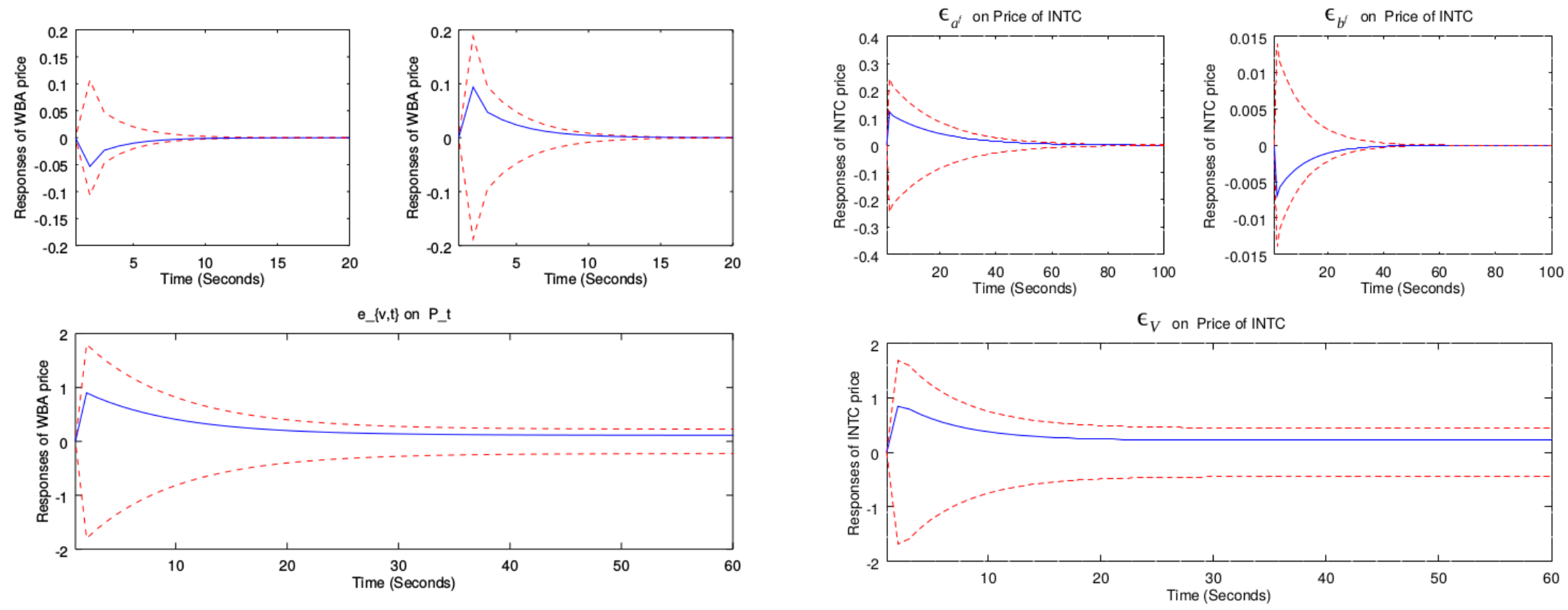












Appendix B2

Figure 4: **Impulse Responses of the underlying assets of SMH ETF**

