To estimate the time-varying conditional correlations between the U.S. dollar exchange rate and each of the petroleum market returns, $\rho_{EX,PET,t}$, we follow the method developed by Darbar and Deb (2002) and Skintzi and Refenes (2006) by using the index function $\xi_{EX,PET,t}$.[5] This function is assumed to depend on the cross-market standardized innovations and its lagged values, as defined below. The conditional correlation that falls in the range $[-1,+1]$ can be expressed as a logistic transformation of the index function. That is,

$$\sigma_{EX,PET,t} = \rho_{EX,PET,t}\sigma_{EX,t}\sigma_{PET,t}, \tag{6}$$

$$\rho_{EX,PET,t} = 2\left(\frac{1}{1+\exp\left(-\xi_{EX,PET,t}\right)}\right)-1, \tag{7}$$

$$\xi_{EX,PET,t} = C_0 + C_1 z_{EX,t-1} z_{PET,t-1} + C_2 \xi_{EX.PET,t-1}. \tag{8}$$

[5] $\xi_{EX,PET,t} \in (-\infty,+\infty)$.