Journal of
*Risk and Financial Management*

*Article*

# Closed-End Fund Discounts and Economic Policy Uncertainty

**Nazif Durmaz**

Global Business School, Kean University, 303-Q Hynes Hall, Union, NJ 07083, USA; ndurmaz@kean.edu;
Tel.: +1-908-737-4188

**Abstract:** This paper empirically tests the determinants of closed-end fund (CEF) prices by employing cointegration and error-correction modeling with an advanced ARDL framework. Since CEF shares generally trade at discounts to their net asset value (NAV), we modeled CEF prices, including volatility and economic policy indices along with their NAVs. The present study consists of 31 monthly frequency CEF discount data from January 1999 to April 2018 and economic policy uncertainty (EPU) with ten subindices. This paper finds evidence for cointegration in many of the series and statistically significant coefficients in the short- and long-run estimates of the included subindices.

**Keywords:** closed-end fund; discount; economic policy uncertainty; ARDL

## 1. Introduction

A closed-end fund is an investment vehicle that raises capital by issuing a fixed number of shares that are traded in the secondary market, which investors buy and sell like any stock depending on the market value of the underlying investments of the fund. Closed-end fund (CEF) shares trade at their market prices and at discounts to their NAV (value of all fund assets (fewer liabilities) divided by the number of outstanding shares) but seldomly at premiums. This inconsistency between NAV and market price has been the topic of many research papers for a long time. The garnered popularity of CEFs in finance literature is due to their deviations from efficient market theory, which make them a puzzling anomaly. Contrary to open-end funds (OEF), the trading of CEF shares takes place in the secondary market, while OEFs are traded from and to the fund. Thus, OEF share prices are the same as their net asset value (NAV). A CEF trades at a premium when its shares trade above its NAV and a discount when its shares trade below. Hence, secondary market demand and supply forces determine the price of the shares of CEFs. Pontiff (1996) and Gemmill and Thomas (2002) suggest that due to arbitrage costs, discounts cannot be easily arbitraged away. CEF shares are not redeemed on demand, and discounts to the NAV ratio are highly variable. When a CEF converts to an OEF or liquidates, then discounts or premiums fade away.

For instance, Anderson et al. (2016) propose a mechanism based on bond market illiquidity and find evidence that returns processes for prices and asset values have characteristics of a random walk for equity CEFs, while CEF bond funds returns are more predictable. For equity funds, Anderson et al. (2013) point to proof of a link between CEF discounts and the VIX index following the market meltdown of 2007.

In this paper, we use 10 different economic policy uncertainty (EPU) subindices, EPU, and the volatility index (VIX) along with CEF net asset values to explain price variations in CEFs. Developed by Baker et al. (2016), the EPU index captures uncertainty from newspapers, policy, and other economic indicators. The authors carefully use three different components to gather factors and make them into a new index. The first component is constructed by policy-related economic uncertainty coming from the coverage of 10 large newspapers. The second component investigates the expiration of the federal tax code, and the third one deals with a disagreement of economic forecasters published in the Federal Reserve Bank of Philadelphia Survey.

check for updates

**Citation:** Durmaz, Nazif. 2023. Closed-End Fund Discounts and Economic Policy Uncertainty. *Journal of Risk and Financial Management* 16: 200. https://doi.org/10.3390/jrfm16030200

Academic Editor: Thanasis Stengos

Received: 8 February 2023
Revised: 3 March 2023
Accepted: 11 March 2023
Published: 14 March 2023

Our paper aims to broaden the literature in a few ways. First, we use monthly discount data of 31 closed-end mutual funds and study the effects of the economic policy uncertainty index and its subcategories on these CEFs by applying an ARDL methodology. This technique allows for the formal analysis and quantification of mean reversion. The purpose of the present study is to test the effect of the economic policy uncertainty index on CEF premiums and discounts to NAV. This paper finds strong evidence for cointegration in many of the series and statistically significant coefficients for the included subindices. Thereupon, Section 2 discusses earlier CEF research. In Section 3, we introduce the models and estimation methodology. Section 4 reports the empirical results. Finally, Section 5 discusses the conclusion and data definition while sources are provided in the Appendices A and B.

## 2. Literature Review

A complete and efficient market suggests that a portfolio of securities' market value will be equal to the total value of the individual securities. Yet, discounts on CEFs have caught the attention of academicians. Abraham et al. (1993) find that bond CEFs tends to trade at a premium to NAV, whereas equity CEFs usually trade at a discount. CEF's initial public offerings (IPO) are usually traded at a premium to their NAV, and a study by Hanley et al. (1996) explains this as the brokers' choice of marketing such funds to less informed traders. It is empirically known that over the years, discounts to NAV vary significantly in CEFs. Malkiel (1977, 1995), Thompson (1978), and Pontiff (1995) are some studies which argue that if investors buy CEFs with high discounts to NAV and sell short CEFs with low discounts to NAV, these trading strategies may be profitable. Excess returns are expected whenever discounts exhibit mean reversion behavior over the course of time, but as CEF share prices increase, discounts diminish. Mean reversion behavior suggests that share price and NAV are in equilibrium. Either CEF prices fluctuate around the mean of some discounts, or their price and NAV are close to each other. Thus, when discounts are around a long-term mean, unexpectedly large discounts are expected to get closer to the mean discount over some period. Unlike earlier studies that point out these periods of potential excess returns, the present study focuses on the mechanics of time-varying mean reversion development.

Brogaard and Detzel (2015) use the EPU index in future return prediction in the financial market and find that the EPU is an economically important risk factor for equities. Pastor and Veronesi (2012) state that at the announcement of a policy change, on average, stock prices should fall, and the decline could be drastic if the uncertainty about government policy is large. The authors also add that policy changes should increase volatilities and correlations among stocks. Pastor and Veronesi (2013) find that political uncertainty causes a risk premium that is larger during weaker economic conditions. Stocks also become more volatile and correlated when the economy is weak.

Aye et al. (2018) study the asymmetric volatility puzzle, and the effect of political uncertainty on stock market fluctuations shows that political risk exposure could be a factor to jump risks in the cross-section of returns.

A study by Gilchrist et al. (2014) points out a negative relationship between the EPU and bond prices and finds that financial distortions are the main cause through which fluctuations in uncertainty affect macroeconomic outcomes. In a US market study by Li et al. (2015), the effects of the EPU index are correlated with stock and bond markets. In a similar study, Fang et al. (2017) conclude the EPU has a negative influence on the long-term stock–bond correlation of US equity markets. Another longer dataset to examine the effect of the EPU on US stock markets by Arouri et al. (2016) concludes that an increase in policy uncertainty significantly reduces stock returns and also shows that this effect is stronger and more persistent during periods of extreme volatility. Holmes and Maghrebi (2016) conclude that stock market volatility is positively correlated to the unemployment rate in the US.

A study of international uncertainty spillovers by Christou et al. (2017) shows that the home country EPU negatively affects stock returns, and the US EPU negatively affects stock returns in all countries except Australia. Li and Peng (2017) reveal the changes in the US EPU that have negative effects on the comovements of China's stock markets. Ko and Lee (2015) emphasize that earlier studies continuously indicate a significant negative relationship between the EPU and stock market. Some studies on different countries have mixed outcomes in economic uncertainty and stock market relationships. Notably, there is still dispute on the direction and power of the link between stock markets and the EPU index in emerging markets. Li et al. (2016) point out that there are bidirectional causal relationships between EPU and stock returns, but the association between EPU and stock returns is weak in some cases. Carrière-Swallow and Céspedes (2013) indicate that emerging economies suffer deeper and more prolonged impacts from uncertainty shocks. On the other hand, Das and Kumar (2018) argue that in emerging markets, this effect is in fact minor.

## 3. The Model and Method

The present study intends to make a distinguishment between the short-run effects of economic policy uncertainty indices from their long-run effects on CEF market prices. Hence, following the empirical literature, we employ the error-correction approach. The present study uses cointegration and error-correction techniques to establish the level of cointegration and the dynamic variation between CEF prices and NAVs and economic policy uncertainty indices. With the help of these tests, one may conclude whether CEF share prices are linked to NAVs and indices and, in that case, proceed to estimate the speed of adjustments. If the results from the previous tests conclude a specific CEF's price and NAV and the indices to be cointegrated, it should follow that the discount is mean-reverting.

At the reduced level, our CEF market price model takes account of Bahmani-Oskooee and Saha (2018) and the long-run specification of the market price of CEF i, as in Equation (1).

$$\ln P_t^i \;=\; a + b\, \ln NAV_t^i + c\, \ln X_t^j + \varepsilon_t^i \tag{1}$$

where $\ln P_t^i$ is the log[1] of CEF price, $i$ = 1, 2, . . . , 31. $\ln NAV_t^i$, is the log of the net asset value of corresponding CEF, $i$ = 1, 2, . . . , 31. $\ln X_t^j$ is the log of economic policy uncertainty, its subindices, and VIX index, $j$ = 1, 2, . . . , 12. Finally, $\varepsilon_t^i$ is a random error term.

We expect an estimate of coefficient b to be positive, implying that as the net asset value of a fund grows, the market price of that corresponding CEF rises. In the short run, an estimate of coefficient c is expected to be negative since a rise in ln$X$ means a higher risk in which government policies and regulatory outlines are unclear for the near future. Consequently, businesses and individuals may delay spending and investment plans due to uncertainty in the markets. However, in the long run, our expectation of the estimate of coefficient c is positive.

After discussing the above estimates that belong to the long run model of Equation (1), we now move to assess the short-run effects of the uncertainty index. Here, we will continue identifying Equation (1) as an error-correction model. For this, as the previous literature suggests, we too use Pesaran et al.'s (2001) bounds testing approach and convert Equation (1) into Equation (2):

$$\begin{aligned}\Delta \ln P_t^i = \;& \alpha_0 + \textstyle\sum_{k=1}^{n1} \beta_k \Delta \ln P_{t-k}^i + \textstyle\sum_{k=0}^{n2} \varphi_k \Delta \ln NAV_{t-k}^i \\ & + \sum_{k=0}^{n3} \theta_k \Delta \ln X_{t-k}^i + \delta_0 \ln P_{t-1}^i + \delta_1 \ln NAV_{t-1}^i \\ & + \delta_2 \ln X_{t-1}^i + \omega_t \end{aligned} \tag{2}$$

Short-run effects are determined by the signs and magnitudes of the coefficients of first-differenced variables. In Equation (2), the estimates[2] $\delta_1$ and $\delta_2$ measure $\delta_0$, which is the normalized value of the long-run effects. For a valid estimated long-run effect, Pesaran et al. (2001) suggest two tests for cointegration. The first one is the F-test where it implies the formed joint significance of lagged level variables. The other test is using the $t$-test to emphasize the proven significance of $\delta_0$ in Equation (2)[3]. Nonstandard distributions of these two tests set out new critical values which make up the degree of integration of the variables. A principal necessity of the ARDL Bounds test is that the dependent variable must be I(1), and the included regressors may be I(0) or I(1). Additionally, Pesaran et al. (2001) propose that most macrovariables are a natural combination of I(0) and I(1) as in the present study. Consequently, authors' continued argument for another advantage of employing this approach is that it is not necessary for pre-unit-root testing[4].

### *3.1. Data Description*

Our study utilizes monthly discount data of 31 closed-end mutual funds from January 1999 to April 2018. In order to reduce noise, the dataset was converted from daily frequency data by using the end of the month observations. There are 14 core funds, 6 corporate debt funds, and 11 general bond fund CEFs. The sample includes the funds with the complete daily price and NAV series available from the following sources: the Closed-End Fund Center (cefa.com) and Morningstar (morningstar.com). The present study makes sure that each CEF satisfies the following criteria: First, the bond funds come from the Closed-End Fund Association's "General Bond" and "Corporate Debt BBB Rated Funds" categories, while stock funds are chosen from "Core Funds". Second, the selected funds must have at least $50 million of (US) assets (as of 8 May 2018).

Past studies mostly find CEFs to be nonstationary. Using a high daily financial price dataset for the unit root test, studies likely reject the unit root null hypothesis, which does not make this approach a proper statistical inference. To eliminate such a problem, instead, we use the monthly frequency while maintaining a long span in the dataset. Commonly, unit root tests have non-normal and nonstandard asymptotic distributions. After checking our data with a conventional augmented Dickey–Fuller (ADF) test for 31 monthly frequency CEF discount data from January 1999 to April 2018, we conclude that our series are either I(0) or I(1)[5].

### *3.2. EPU Indices*

Baker et al. (2016) began building an EPU index by normalizing each of the three components of the EPU by their standard deviations before January 2012. Then, the authors used weights of half news-based policy index and one-sixth of three components to calculate the average of the components. To form the categorical subindices of the EPU index, a news database, Access World, which consists of over 2000 US based newspapers was combed through for economic, uncertainty, and policy terms results. Finally, the authors calculated each subindex by the associated search.

Appendix A shows the EPU index, 10 subindices of EPU, and the VIX. The VIX is an index built by the Chicago Board Options Exchange to indicate the market's expected volatility for the next 30 days.

## 4. Empirical Results and Discussion

As discussed in Section 1, the purpose of this paper is to estimate an error-correction model (2) for each of the 31 CEF discount data. Because the dataset is monthly for each CEF, we chose to impose a maximum of 12 lags on each first-differenced variable included in the study and employed an Akaike's Information Criterion (AIC) to decide on the optimum lags.

Nevertheless, as a consequence of the volume of the output, we condensed the short-run discoveries by stating that in Model (2). As shown in Panel A of Table 1, there are 15 discount data in which there is at least 1 significant coefficient attached to the economic policy uncertainty index (min at the 10% significance level). These CEFs are ADX, GAB, GAM, RMT, SOR, TY, GRF, SPE, INSI, MIN, MCI, MPV, DUC, KMM, and JHI. Clearly, in the short run, almost half of the CEFs are affected by the EPU index positively. Eight of these CEFs are from Core, two are from Corporate Debt, and the remaining are from General Bond Funds. It appears the CEFs from Core and General Bond Funds are much more sensitive to good or bad news than Corporate Debt CEFs, and investors see these CEFs as an opportunity in uncertain times.

The EPU index carried a long-run significant coefficient (at least at the 10 % level of significance) in 14 CEFs. ADX, GAB, USA, GRF, SPE, VBF, MIN, PAI, DUC, PCM, JHI, MCR, MMT, and PPT all have positive effects. Hence, economic uncertainty affects many of the CEFs directly. These findings are parallel with the literature of similar studies on CEFs.

As for the long run effect of the other variable, NAV seems to be the main determinant of CEF price in almost all the discount data except for GAM and MPV. This is not surprising behavior to find from most CEFs, as it also aligns with previous studies (Anderson et al. 2016; Bleaney and Smith 2005; Chay and Trzcinka 1999).

Next, we move on to determine cointegration to check the significance for the above long-run estimates. The diagnostics column in Panel B of Table 1 reports the outputs of the F-test for the joint significance of the lagged level variables along with other diagnostic statistics. Cointegration is supported only in two CEFs given its upper bound critical value of 4.01. For the remainder of the CEFs, we counted on an alternative test. Here, we followed the previous studies of Bahmani-Oskooee et al. (2010) and generated the error term, ECM, by employing long-run normalized coefficients from Table 1 and long-run Model (1) where we produced the error term for an alternative cointegration test.

**Table 1.** Short-Run Coefficient Estimates—Linear ARDL—Model P = f (NAV, EPU).

| | **Panel A** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **FUNDS** | **Short-Run Coefficient Estimates** | | | | | | | | | |
| | **$\Delta$ *Ln* $EPU_t$** | **$\Delta$ *Ln* $EPU_{t-1}$** | **$\Delta$ *Ln* $EPU_{t-2}$** | **$\Delta$ *Ln* $EPU_{t-3}$** | **$\Delta$ *Ln* $EPU_{t-4}$** | **$\Delta$ *Ln* $EPU_{t-5}$** | **$\Delta$ *Ln* $EPU_{t-6}$** | **$\Delta$ *Ln* $EPU_{t-7}$** | **$\Delta$ *Ln* $EPU_{t-8}$** | **$\Delta$ *Ln* $EPU_{t-9}$** |
| ADX | 0.00 (2.26) ‡ | | | | | | | | | |
| GAB | 0.01 (2.94) ‡ | | | | | | | | | |
| GAM | 0.00 (0.81) | 0.01 (2.22) ‡ | 0.01 (1.88) † | 0.01 (1.45) | 0.01 (1.62) | 0.01 (2.11) ‡ | 0.01 (2.45) ‡ | | | |
| FUND | 0.00 (1.17) | | | | | | | | | |
| RMT | −0.01 (−1.00) | 0.00 (−0.80) | −0.01 (−2.46) ‡ | | | | | | | |
| RVT | 0.00 (−0.52) | | | | | | | | | |
| SOR | 0.00 (0.53) | 0.02 (2.79) ‡ | | | | | | | | |
| TY | 0.00 (1.66) † | | | | | | | | | |
| USA | 0.00 (−0.04) | | | | | | | | | |
| GRF | 0.00 (−0.27) | −0.02 (−2.35) ‡ | | | | | | | | |
| SPE | 0.00 (−1.02) | −0.01 (−2.17) ‡ | −0.01 (−2.11) ‡ | | | | | | | |
| CRF | −0.01 (−0.92) | | | | | | | | | |
| CLM | −0.01 (−0.99) | | | | | | | | | |
| CET | 0.00 (1.11) | | | | | | | | | |
| INSI | 0.00 (−0.54) | 0.00 (0.20) | 0.00 (1.00) | 0.01 (1.79) † | 0.01 (2.89) ‡ | | | | | |
| VBF | 0.01 (1.21) | | | | | | | | | |
| MGF | 0.00 (−0.80) | | | | | | | | | |
| MIN | 0.00 (0.42) | −0.01 (−1.93) † | −0.01 (−2.04) ‡ | −0.01 (−1.86) † | | | | | | |
| ICB | 0.00 (0.51) | | | | | | | | | |
| PAI | 0.00 (0.22) | | | | | | | | | |
| MCI | −0.05 (−3.06) ‡ | −0.04 (−2.31) ‡ | −0.03 (−1.57) | −0.03 (−1.71) † | 0.00 (0.23) | −0.02 (−0.96) | −0.04 (−2.35) ‡ | | | |
| MPV | −0.02 (−2.22) ‡ | −0.03 (−2.27) ‡ | −0.03 (−2.75) ‡ | −0.01 (−0.56) | 0.00 (0.13) | −0.02 (−1.81) † | −0.03 (−2.72) ‡ | | | |
| DUC | 0.00 (−0.28) | 0.01 (1.40) | 0.00 (−0.28) | −0.01 (−1.59) | 0.01 (1.84) † | | | | | |
| KST | −0.01 (−0.97) | | | | | | | | | |

**Table 1.** *Cont.*

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| PCM | −0.01 (−0.94) | | | | | | | | | |
| KMM | −0.01 (−1.57) | 0.01 (1.34) | 0.00 (−0.47) | −0.01 (−2.06) ‡ | | | | | | |
| JHI | −0.01 (−1.50) | 0.00 (0.56) | 0.00 (0.18) | −0.01 (−1.67) † | 0.00 (0.07) | 0.01 (2.28) ‡ | | | | |
| PIM | 0.00 (−0.82) | | | | | | | | | |
| MCR | 0.00 (0.95) | | | | | | | | | |
| MMT | 0.00 (−0.65) | | | | | | | | | |
| PPT | −0.01 (−1.62) | | | | | | | | | |
| | **Panel B** | | | | | | | | | |
| **FUNDS** | **LR Coefficient Estimates** | | | **Diagnostic Statistics Associated with Linear ARDL Model** | | | | | | |
| | *Constant* | *Ln NAV* | *Ln EPU* | *F Stat* | *ECM$_{t-1}$* | *LM* | *RESET* | *CUSUM* | *C-SQ* | *Adj. $R^2$* |
| ADX | −0.86 (−2.69) ‡ | 1.18 (15.74) ‡ | 0.05 (1.69) † | 2.22 | −0.07 (2.40) | 17.76 | 6.25 ‡ | S | US | 0.96 |
| GAB | −1.38 (−3.00) ‡ | 1.31 (12.41) ‡ | 0.18 (2.63) ‡ | 2.01 | −0.08 (3.43) † | 11.09 | 2.79 † | S | US | 0.84 |
| GAM | −10.11 (−0.31) | 2.93 (0.47) | 0.66 (0.30) | 2.53 | −0.01 (0.31) | 23.13 ‡ | 3.10 † | US | US | 0.95 |
| FUND | −1.38 (−2.21) ‡ | 1.47 (8.17) ‡ | 0.07 (1.04) | 0.95 | −0.06 (2.79) | 22.22 ‡ | 1.24 | S | US | 0.90 |
| RMT | −1.34 (−2.11) ‡ | 1.36 (9.84) ‡ | 0.09 (1.07) | 3.24 | −0.06 (2.69) | 10.19 | 0.19 | S | US | 0.92 |
| RVT | −2.17 (−1.81) † | 1.53 (5.63) ‡ | 0.14 (1.12) | 3.00 | −0.03 (2.29) | 18.64 † | 2.79 † | S | US | 0.93 |
| SOR | 0.09 (0.03) | 1.10 (2.31) ‡ | −0.12 (−0.47) | 2.18 | −0.02 (1.31) | 3.88 | 2.01 | US | US | 0.87 |
| TY | −0.88 (−1.88) † | 1.14 (12.42) ‡ | 0.07 (1.34) | 2.89 | −0.06 (2.21) | 16.48 | 2.21 | S | US | 0.93 |
| USA | −1.34 (−2.61) ‡ | 1.29 (13.15) ‡ | 0.16 (1.83) † | 1.42 | −0.05 (3.05) | 15.13 | 0.37 | S | US | 0.86 |
| GRF | −2.72 (−3.01) ‡ | 1.77 (7.08) ‡ | 0.21 (2.09) ‡ | 1.67 | −0.08 (3.13) | 8.46 | 0.88 | S | US | 0.50 |
| SPE | −0.47 (−2.12) ‡ | 1.06 (13.97) ‡ | 0.04 (2.22) ‡ | 5.31 ‡ | −0.15 (4.60) ‡ | 5.87 | 2.02 | US | US | 0.76 |
| CRF | 2.27 (1.05) | 0.97 (4.36) ‡ | −0.42 (−0.94) | 1.76 | −0.03 (1.85) | 9.42 | 0.08 | US | US | 0.35 |
| CLM | 1.25 (1.19) | 0.98 (10.67) ‡ | −0.20 (−0.94) | 0.75 | −0.05 (2.19) | 17.64 | 3.93 ‡ | S | US | 0.52 |
| CET | −1.56 (−1.88) † | 1.35 (6.91) ‡ | 0.05 (0.90) | 1.90 | −0.06 (1.82) | 14.40 | 0.36 | S | US | 0.92 |
| INSI | −0.61 (−1.31) | 1.14 (8.11) ‡ | 0.02 (0.80) | 1.94 | −0.11 (3.32) † | 14.86 | 0.07 | S | US | 0.70 |
| VBF | 0.09 (0.16) | 0.81 (4.44) ‡ | 0.09 (4.56) ‡ | 3.86 | −0.14 (4.86) ‡ | 9.20 | 0.15 | S | US | 0.52 |
| MGF | 0.05 (0.15) | 0.81 (5.61) ‡ | 0.06 (1.57) | 2.91 | −0.07 (2.91) | 17.79 | 1.18 | S | US | 0.42 |
| MIN | −0.26 (−2.13) ‡ | 0.84 (16.30) ‡ | 0.11 (5.63) ‡ | 4.37 † | −0.11 (4.97) ‡ | 5.45 | 4.24 ‡ | S | US | 0.57 |
| ICB | 0.12 (0.24) | 0.91 (5.96) ‡ | 0.01 (0.53) | 2.91 | −0.09 (3.12) | 17.95 | 0.68 | S | US | 0.63 |
| PAI | −0.05 (−0.14) | 0.90 (8.46) ‡ | 0.06 (2.70) ‡ | 2.27 | −0.17 (4.35) ‡ | 3.12 | 5.57 ‡ | S | US | 0.63 |
| MCI | 0.64 (0.44) | 0.83 (2.07) ‡ | −0.02 (−0.12) | 3.18 | −0.08 (2.24) | 9.19 | 4.93 ‡ | S | US | 0.14 |
| MPV | 1.31 (0.85) | 0.57 (1.28) | −0.03 (−0.18) | 3.70 | −0.05 (1.88) | 12.83 | 0.09 | S | US | 0.12 |
| DUC | −1.22 (−4.29) ‡ | 1.35 (13.17) ‡ | 0.08 (2.41) ‡ | 2.08 | −0.15 (3.43) † | 14.24 | 0.99 | US | US | 0.55 |
| KST | −0.51 (−0.38) | 1.03 (2.23) ‡ | 0.08 (0.86) | 2.32 | −0.05 (2.52) | 17.17 | 0.05 | US | US | 0.69 |
| PCM | −0.92 (−1.81) † | 1.14 (9.37) ‡ | 0.14 (1.94) † | 1.37 | −0.09 (3.06) | 13.67 | 0.02 | S | US | 0.61 |
| KMM | −0.36 (−0.36) | 1.02 (2.83) ‡ | 0.07 (0.76) | 2.13 | −0.06 (2.58) | 16.11 | 0.53 | S | US | 0.66 |
| JHI | 0.28 (0.27) | 0.71 (2.28) ‡ | 0.13 (1.70) † | 2.38 | −0.06 (2.77) | 7.09 | 0.46 | S | S | 0.55 |
| PIM | −0.16 (−0.55) | 0.90 (9.08) ‡ | 0.06 (1.54) | 1.31 | −0.10 (3.15) | 16.48 | 0.01 | S | US | 0.53 |
| MCR | −0.36 (−1.60) | 1.03 (10.98) ‡ | 0.04 (4.47) ‡ | 3.65 | −0.21 (5.35) ‡ | 34.57 ‡ | 5.55 ‡ | S | S | 0.74 |
| MMT | −0.35 (−1.69) † | 1.02 (10.20) ‡ | 0.05 (3.33) ‡ | 3.28 | −0.15 (4.94) ‡ | 34.01 ‡ | 0.01 | US | US | 0.72 |
| PPT | −0.15 (−0.55) | 0.85 (7.91) ‡ | 0.08 (2.64) ‡ | 2.84 | −0.13 (3.84) ‡ | 12.27 | 1.53 | S | US | 0.58 |

Notes: a. Numbers inside the parentheses are values of t-ratios. b. ‡ and † indicate significance at 5% level and 10% level, respectively. c. At the 5% (10%) significance level, when there are 3 exogenous variables (k = 2), the upper bound critical value of the F-test is 4.85 (4.14), respectively. These values are from Pesaran et al. (2001, Table CI-Case III, p. 300). d. Number inside the parenthesis next to $ECM_{t-1}$ is the absolute value of the t-ratio. Its upper bound critical value at the 5% (10%) significance level is −3.53 (−3.21) when k = 2, and these come from Pesaran et al. (2001, Table CII-Case III, p. 303). e. LM is Lagrange multiplier test of residual serial correlation. It is distributed as $\chi^2$ with one degree of freedom (12th order). Its critical value at 5% (10%) significance level is 21.02 (18.54). f. RESET is Ramsey's test for misspecification. It is distributed as $\chi^2$ with one degree of freedom. Its critical value at 5% (10%) significance level is 3.84 (4.24).

After that, we substituted the linear combination of lagged variables in error-correction Model (2) by $ECM_{t-1}$. For each first differenced variable, we estimated each model by imposing the same number of optimum lags. Determining if cointegration is found depends on whether $ECM_{t-1}$ successfully carries a significantly negative coefficient. Checking the reported results, 10 of the CEFs are statistically significant at the 10 percent level of significance and have the negative sign. Thus, we concluded that these 10 CEFs are cointegrated.

Table 1 also reports a few more diagnostic statistics. The Lagrange multiplier statistic checks for serial correlation in each case and has a $\chi^2$ distribution with 12 degrees of freedom since the dataset is monthly. Given its critical value of 21.02 at the 5% level of significance, there is evidence of autocorrelation in only 5 models, concluding that in most CEF cases, the residuals do not suffer from autocorrelation.

To check if the models are correctly specified, we employed Ramsey's RESET test. Similar to the previous test, RESET also follows a $\chi^2$ distribution but only with one degree of freedom. We found that this test is significant only in 9 models given its critical values at the 5% and 10% significance levels. We then concluded that more models are correctly specified. Lastly, we used the recognized CUSUM and CUSUMSQ tests to the residuals of each optimum model in order to test for the short-run and long-run coefficient estimate stability. The table shows stable coefficients with the "S" mark and the unstable with "US". It is clear that most of the estimates are stable at least by the CUSUM test. We can finally comment from the size of the adjusted $R^2$ that the estimated models have good fit.

There are sixteen CEF data in which the short-run coefficients have at least one significant estimate attached to the monetary policy (MP) subindex in Table 2. In the short run, 11 of the CEF are affected by the MP subindex negatively: FUND, RMI, GRF, MCI, MPV, DUC, KST, PCM, KMM, JHI, and PPT. Four of them are affected positively: ADX, GAB, SOR, and ICB. SPE is the only one with mixed significant coefficients. Visibly, in the short run, more CEF are affected by the MP index negatively.

**Table 2.** Short-Run Coefficient Estimates—Linear ARDL—Model P = f (NAV, MP).

| | **Panel A** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **FUNDS** | **Short-Run Coefficient Estimates** | | | | | | | | | |
| | $\Delta$ *Ln* $MP_t$ | $\Delta$ *Ln* $MP_{t-1}$ | $\Delta$ *Ln* $MP_{t-2}$ | $\Delta$ *Ln* $MP_{t-3}$ | $\Delta$ *Ln* $MP_{t-4}$ | $\Delta$ *Ln* $MP_{t-5}$ | $\Delta$ *Ln* $MP_{t-6}$ | $\Delta$ *Ln* $MP_{t-7}$ | $\Delta$ *Ln* $MP_{t-8}$ | $\Delta$ *Ln* $MP_{t-9}$ |
| ADX | 0.00 (0.84) | 0.00 (−2.20) ‡ | 0.00 (−2.24) ‡ | 0.00 (−2.72) ‡ | 0.00 (−1.96) † | 0.00 (−0.53) | 0.00 (0.07) | 0.00 (0.46) | 0.00 (−2.78) ‡ | |
| GAB | 0.01 (2.07) ‡ | | | | | | | | | |
| GAM | 0.00 (0.29) | | | | | | | | | |
| FUND | 0.00 (−0.38) | 0.00 (−0.68) | −0.01 (−2.43) ‡ | 0.00 (−1.57) | | | | | | |
| RMT | −0.01 (−2.73) ‡ | −0.01 (−2.16) ‡ | −0.01 (−2.77) ‡ | 0.00 (−1.82) † | | | | | | |
| RVT | 0.00 (−1.18) | | | | | | | | | |
| SOR | 0.00 (0.24) | 0.01 (2.72) ‡ | 0.00 (1.48) | | | | | | | |
| TY | 0.00 (0.73) | | | | | | | | | |
| USA | 0.00 (−0.97) | | | | | | | | | |
| GRF | 0.00 (−0.79) | −0.01 (−2.51) ‡ | | | | | | | | |
| SPE | 0.00 (−0.70) | −0.01 (−2.20) ‡ | 0.00 (−2.03) ‡ | | | | | | | |
| CRF | −0.01 (−1.21) | | | | | | | | | |
| CLM | −0.01 (−1.30) | | | | | | | | | |
| CET | 0.00 (1.36) | | | | | | | | | |
| INSI | 0.00 (−1.19) | | | | | | | | | |
| VBF | 0.00 (0.41) | | | | | | | | | |
| MGF | 0.00 (0.09) | | | | | | | | | |
| MIN | 0.00 (−0.49) | | | | | | | | | |
| ICB | 0.00 (−1.14) | 0.00 (1.30) | 0.00 (0.71) | 0.00 (0.73) | 0.01 (2.73) ‡ | 0.01 (2.25) ‡ | | | | |
| PAI | 0.00 (−0.90) | | | | | | | | | |
| MCI | −0.02 (−3.06) ‡ | | | | | | | | | |

**Table 2.** *Cont.*

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| MPV | −0.01 (−2.40) ‡ | | | | | | | | | |
| DUC | 0.00 (−0.90) | 0.00 (−0.58) | −0.01 (−1.54) | −0.01 (−2.90) ‡ | 0.00 (−0.24) | 0.00 (−0.93) | −0.01 (−1.72) † | 0.00 (−0.43) | 0.00 (−1.22) | −0.01 (−3.13) ‡ |
| KST | −0.01 (−2.06) ‡ | | | | | | | | | |
| PCM | −0.01 (−2.03) ‡ | | | | | | | | | |
| KMM | −0.01 (−1.43) | 0.00 (0.41) | −0.01 (−1.25) | −0.01 (−2.32) ‡ | | | | | | |
| JHI | −0.01 (−1.86) † | | | | | | | | | |
| PIM | 0.00 (−1.58) | | | | | | | | | |
| MCR | 0.00 (−0.54) | | | | | | | | | |
| MMT | 0.00 (−0.88) | | | | | | | | | |
| PPT | −0.01 (−2.24) ‡ | | | | | | | | | |
| | **Panel B** | | | | | | | | | |
| **FUNDS** | **LR Coefficient Estimates** | | | **Diagnostic Statistics Associated with Linear ARDL Model** | | | | | | |
| | ***Constant*** | ***Ln NAV*** | ***Ln MP*** | ***F Stat*** | ***$ECM_{t-1}$*** | ***LM*** | ***RESET*** | ***CUSUM*** | ***C-SQ*** | ***Adj. $R^2$*** |
| ADX | −0.67 (−5.00) ‡ | 1.12 (33.42) ‡ | 0.05 (2.94) ‡ | 2.82 | −0.11 (3.29) † | 18.97 † | 3.49 † | S | US | 0.96 |
| GAB | −0.73 (−2.56) ‡ | 1.19 (12.52) ‡ | 0.09 (1.96) † | 2.67 | −0.08 (3.11) | 12.20 | 2.10 | S | US | 0.84 |
| GAM | −1.73 (−2.31) ‡ | 1.27 (8.40) ‡ | 0.15 (2.28) ‡ | 2.51 | −0.04 (2.19) | 20.91 † | 4.49 ‡ | S | US | 0.95 |
| FUND | −1.61 (−3.34) ‡ | 1.49 (10.39) ‡ | 0.12 (2.21) ‡ | 1.49 | −0.07 (3.33) † | 22.17 ‡ | 1.58 | S | US | 0.90 |
| RMT | −1.04 (−3.04) ‡ | 1.31 (13.81) ‡ | 0.05 (1.06) | 3.77 | −0.07 (3.14) | 9.41 | 0.02 | S | US | 0.93 |
| RVT | −1.50 (−2.29) ‡ | 1.40 (7.49) ‡ | 0.08 (1.20) | 3.31 | −0.04 (2.61) | 19.12 † | 2.75 † | S | US | 0.93 |
| SOR | 1.34 (0.35) | 0.95 (1.52) | −0.28 (−0.57) | 2.25 | −0.01 (0.89) | 4.37 | 2.35 | US | US | 0.87 |
| TY | −0.55 (−1.69) † | 1.10 (13.77) ‡ | 0.02 (0.67) | 3.16 | −0.06 (2.07) | 19.00 † | 1.97 | S | US | 0.93 |
| USA | −0.66 (−2.47) ‡ | 1.19 (14.77) ‡ | 0.05 (0.89) | 1.53 | −0.05 (3.03) | 24.86 ‡ | 0.09 | S | US | 0.86 |
| GRF | −1.76 (−3.29) ‡ | 1.52 (7.81) ‡ | 0.13 (2.03) ‡ | 1.19 | −0.08 (3.10) | 10.64 | 0.89 | S | US | 0.50 |
| SPE | −0.46 (−1.55) | 1.09 (11.65) ‡ | 0.02 (0.95) | 2.83 | −0.12 (3.97) ‡ | 7.82 | 0.84 | US | US | 0.75 |
| CRF | 1.68 (1.24) | 1.09 (4.32) ‡ | −0.40 (−1.13) | 1.36 | −0.03 (1.88) | 9.43 | 0.04 | US | US | 0.35 |
| CLM | 0.97 (1.68) † | 1.01 (12.26) ‡ | −0.17 (−1.19) | 0.84 | −0.05 (2.65) | 17.76 | 3.84 † | S | US | 0.51 |
| CET | −1.24 (−2.55) ‡ | 1.28 (9.80) ‡ | 0.04 (1.25) | 1.97 | −0.07 (2.15) | 17.17 | 0.23 | S | US | 0.92 |
| INSI | −0.52 (−1.15) | 1.11 (7.63) ‡ | 0.02 (1.43) | 1.67 | −0.11 (3.51) † | 15.00 | 0.02 | S | US | 0.69 |
| VBF | 0.50 (0.56) | 0.72 (2.44) ‡ | 0.06 (2.39) ‡ | 2.23 | −0.09 (3.78) ‡ | 8.18 | 1.20 | S | US | 0.51 |
| MGF | 0.32 (0.88) | 0.80 (3.98) ‡ | 0.00 (0.09) | 2.95 | −0.05 (2.55) | 21.53 ‡ | 0.83 | S | US | 0.42 |
| MIN | 0.35 (1.42) | 0.68 (4.69) ‡ | 0.05 (1.41) | 3.32 | −0.05 (2.93) | 9.91 | 1.91 | S | US | 0.54 |
| ICB | 0.63 (0.80) | 0.80 (3.51) ‡ | −0.03 (−0.66) | 1.91 | −0.08 (2.57) | 12.68 | 0.73 | US | US | 0.64 |
| PAI | 0.59 (1.61) | 0.70 (5.33) ‡ | 0.03 (1.60) | 2.21 | −0.12 (4.22) ‡ | 13.26 | 6.92 ‡ | S | US | 0.62 |
| MCI | 3.60 (1.45) | 0.16 (0.23) | −0.31 (−1.56) | 2.84 | −0.07 (1.89) | 9.28 | 3.47 † | S | US | 0.11 |
| MPV | 3.32 (1.49) | 0.12 (0.19) | −0.24 (−1.37) | 3.45 | −0.05 (1.77) | 10.18 | 0.90 | S | US | 0.06 |
| DUC | −0.82 (−2.78) ‡ | 1.14 (7.27) ‡ | 0.11 (2.19) ‡ | 2.84 | −0.13 (3.14) | 13.89 | 0.85 | US | US | 0.56 |
| KST | −0.41 (−0.34) | 1.06 (2.43) ‡ | 0.05 (0.85) | 2.58 | −0.05 (2.70) | 15.55 | 0.06 | US | US | 0.70 |
| PCM | −0.36 (−0.97) | 1.04 (7.95) ‡ | 0.08 (1.31) | 1.48 | −0.08 (2.66) | 13.52 | 0.03 | S | US | 0.62 |
| KMM | −0.68 (−0.73) | 1.14 (3.33) ‡ | 0.08 (1.21) | 2.40 | −0.06 (2.68) | 15.49 | 0.36 | S | US | 0.66 |
| JHI | 1.16 (0.99) | 0.46 (1.10) | 0.10 (1.37) | 2.35 | −0.05 (2.52) | 7.40 | 0.50 | US | S | 0.54 |
| PIM | 0.11 (0.52) | 0.81 (7.49) ‡ | 0.04 (1.28) | 1.27 | −0.09 (3.17) | 16.51 | 0.01 | S | US | 0.54 |
| MCR | 0.11 (0.28) | 0.88 (5.24) ‡ | 0.02 (1.34) | 2.98 | −0.12 (3.97) ‡ | 22.99 ‡ | 9.48 ‡ | S | US | 0.73 |
| MMT | −0.31 (−1.12) | 1.06 (7.79) ‡ | 0.03 (1.63) | 2.23 | −0.11 (4.00) ‡ | 24.31 ‡ | 1.21 | S | US | 0.72 |
| PPT | 0.27 (1.12) | 0.69 (5.40) ‡ | 0.05 (1.86) † | 2.85 | −0.10 (3.58) ‡ | 8.89 | 0.99 | S | US | 0.58 |

Notes: a. Numbers inside the parentheses are values of t-ratios. b. ‡ and † indicate significance at 5% level and 10% level, respectively. c. At the 5% (10%) significance level, when there are 3 exogenous variables (k = 2), the upper bound critical value of the F-test is 4.85 (4.14), respectively. These values are from Pesaran et al. (2001, Table CI-Case III, p. 300). d. Number inside the parenthesis next to $ECM_{t-1}$ is the absolute value of the t-ratio. Its upper bound critical value at the 5% (10%) significance level is −3.53 (−3.21) when k = 2, and these come from Pesaran et al. (2001, Table CII-Case III, p. 303). e. LM is Lagrange multiplier test of residual serial correlation. It is distributed as $\chi^2$ with one degree of freedom (12th order). Its critical value at 5% (10%) significance level is 21.02 (18.54). f. RESET is Ramsey's test for misspecification. It is distributed as $\chi^2$ with one degree of freedom. Its critical value at 5% (10%) significance level is 3.84 (4.24).

The MP index carried a significant long-run coefficient in eight CEF data. Although none have a significant F-test to establish cointegration, an alternative ECM test supports cointegration in nine of the CEF data with a significant negative coefficient. In nine cases, we observed autocorrelation, and seven cases fail the RESET test for the MP index.

Table 3 provides results for the fiscal policy (FP) subindex. In FP cases, fifteen of the CEFs have at least one significant estimate in their short-run coefficients. FP subindex affected 11 CEFs positively: ADX, GAB, GAM, INSI, VBF, MIN, ICB, PAI, DUC, MCR, and MMT. Four of them are affected negatively: SOR, SPE, MCI, and MPV. In the short run, more CEFs are affected by the MP index positively. The FP index carries a significant long-run coefficient in 11 of the cases. Only one has a significant F-test to establish cointegration. An alternative ECM test supports cointegration in 11 of the CEF data with a significant negative coefficient. While seven cases report autocorrelation, eight cases fail the RESET test for the FP index.

**Table 3.** Short-Run Coefficient Estimates—Linear ARDL—Model P = f (NAV, FP).

| | **Panel A** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **FUNDS** | **Short-Run Coefficient Estimates** | | | | | | | | | |
| | **$\Delta$ *Ln* $FP_t$** | **$\Delta$ *Ln* $FP_{t-1}$** | **$\Delta$ *Ln* $FP_{t-2}$** | **$\Delta$ *Ln* $FP_{t-3}$** | **$\Delta$ *Ln* $FP_{t-4}$** | **$\Delta$ *Ln* $FP_{t-5}$** | **$\Delta$ *Ln* $FP_{t-6}$** | **$\Delta$ *Ln* $FP_{t-7}$** | **$\Delta$ *Ln* $FP_{t-8}$** | **$\Delta$ *Ln* $FP_{t-9}$** |
| ADX | 0.00 (2.31) ‡ | | | | | | | | | |
| GAB | 0.01 (2.73) ‡ | | | | | | | | | |
| GAM | 0.00 (1.28) | 0.01 (2.78) ‡ | 0.01 (1.81) † | 0.01 (2.03) ‡ | 0.01 (1.80) † | 0.01 (2.30) ‡ | 0.01 (2.43) ‡ | | | |
| FUND | 0.00 (1.54) | | | | | | | | | |
| RMT | 0.00 (0.92) | | | | | | | | | |
| RVT | 0.00 (0.90) | | | | | | | | | |
| SOR | 0.00 (−0.37) | 0.01 (1.79) † | −0.01 (−1.73) † | | | | | | | |
| TY | 0.00 (1.39) | | | | | | | | | |
| USA | 0.00 (0.26) | | | | | | | | | |
| GRF | 0.01 (1.63) | | | | | | | | | |
| SPE | 0.00 (−1.22) | −0.01 (−1.46) | −0.01 (−2.04) ‡ | | | | | | | |
| CRF | −0.01 (−0.63) | | | | | | | | | |
| CLM | 0.00 (−0.56) | | | | | | | | | |
| CET | 0.00 (0.67) | | | | | | | | | |
| INSI | 0.00 (0.64) | 0.00 (−0.15) | 0.00 (0.46) | 0.01 (2.45) ‡ | 0.01 (2.36) ‡ | −0.01 (−1.75) † | | | | |
| VBF | 0.01 (3.26) ‡ | | | | | | | | | |
| MGF | 0.00 (1.00) | | | | | | | | | |
| MIN | 0.01 (4.35) ‡ | | | | | | | | | |
| ICB | 0.00 (0.89) | 0.00 (1.15) | 0.00 (0.52) | 0.01 (2.24) ‡ | 0.01 (2.41) ‡ | | | | | |
| PAI | 0.01 (2.28) ‡ | | | | | | | | | |
| MCI | −0.03 (−2.68) ‡ | −0.02 (−1.76) † | −0.02 (−1.81) † | −0.01 (−0.88) | 0.03 (2.10) ‡ | | | | | |
| MPV | −0.01 (−1.72) † | −0.02 (−2.15) ‡ | −0.03 (−3.83) ‡ | 0.01 (1.14) | 0.01 (1.80) † | | | | | |
| DUC | 0.00 (0.77) | 0.01 (1.85) † | 0.00 (−0.95) | 0.00 (0.13) | 0.01 (1.77) † | −0.01 (−1.54) | 0.01 (1.68) † | | | |
| KST | 0.00 (0.88) | | | | | | | | | |
| PCM | 0.00 (0.03) | 0.01 (1.10) | −0.01 (−1.52) | | | | | | | |
| KMM | 0.00 (0.84) | | | | | | | | | |
| JHI | 0.00 (−0.56) | | | | | | | | | |
| PIM | 0.00 (0.80) | | | | | | | | | |
| MCR | 0.01 (4.57) ‡ | | | | | | | | | |
| MMT | 0.01 (3.14) ‡ | | | | | | | | | |
| PPT | −0.01 (−1.13) | | | | | | | | | |

**Table 3.** *Cont.*

| FUNDS | Panel B | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | LR Coefficient Estimates | | | Diagnostic Statistics Associated with Linear ARDL Model | | | | | | |
| | *Constant* | *Ln NAV* | *Ln FP* | *F Stat* | $ECM_{t\text{-}1}$ | *LM* | *RESET* | *CUSUM* | *C-SQ* | *Adj.* $R^2$ |
| ADX | −0.79 (−2.90) ‡ | 1.18 (16.13) ‡ | 0.04 (1.76) † | 2.19 | −0.07 (2.46) | 15.67 | 6.90 ‡ | S | US | 0.96 |
| GAB | −1.15 (−2.91) ‡ | 1.33 (11.70) ‡ | 0.12 (2.49) ‡ | 1.89 | −0.08 (3.35) † | 12.21 | 2.40 | S | US | 0.84 |
| GAM | −5.61 (−0.31) | 2.38 (0.53) | 0.09 (0.18) | 2.44 | −0.01 (0.32) | 23.01 ‡ | 2.93 † | S | US | 0.95 |
| FUND | −1.39 (−2.38) ‡ | 1.48 (7.81) ‡ | 0.07 (1.23) | 0.97 | −0.05 (2.63) | 21.53 ‡ | 1.82 | S | US | 0.90 |
| RMT | −0.98 (−1.95) † | 1.29 (9.46) ‡ | 0.04 (0.80) | 3.18 | −0.05 (2.35) | 13.41 | 0.43 | S | US | 0.92 |
| RVT | −1.59 (−1.76) † | 1.46 (5.91) ‡ | 0.05 (0.79) | 2.98 | −0.03 (2.32) | 19.47 † | 3.14 † | S | US | 0.93 |
| SOR | −0.77 (−0.29) | 1.18 (2.22) ‡ | 0.00 (−0.01) | 2.35 | −0.01 (1.17) | 4.43 | 2.65 | US | US | 0.87 |
| TY | −0.72 (−1.90) † | 1.13 (12.92) ‡ | 0.04 (1.19) | 2.68 | −0.06 (2.21) | 15.35 | 2.06 | S | US | 0.93 |
| USA | −1.27 (−3.20) ‡ | 1.32 (13.70) ‡ | 0.12 (2.26) ‡ | 1.43 | −0.06 (3.27) † | 10.97 | 0.47 | S | US | 0.86 |
| GRF | −2.21 (−2.72) ‡ | 1.75 (6.41) ‡ | 0.11 (1.64) | 1.52 | −0.08 (2.91) | 9.08 | 1.59 | S | US | 0.49 |
| SPE | −0.34 (−1.75) † | 1.03 (14.24) ‡ | 0.03 (2.51) ‡ | 5.42 ‡ | −0.16 (4.75) ‡ | 3.87 | 1.76 | US | US | 0.76 |
| CRF | 1.36 (0.75) | 0.98 (3.98) ‡ | −0.21 (−0.65) | 1.88 | −0.03 (1.76) | 9.47 | 0.00 | US | US | 0.35 |
| CLM | 0.70 (0.86) | 0.99 (10.12) ‡ | −0.08 (−0.55) | 0.74 | −0.04 (2.14) | 17.74 | 2.93 † | S | US | 0.52 |
| CET | −1.64 (−1.74) † | 1.42 (5.59) ‡ | 0.02 (0.59) | 2.18 | −0.05 (1.62) | 12.22 | 0.82 | S | US | 0.92 |
| INSI | −0.46 (−1.06) | 1.11 (7.91) ‡ | 0.01 (0.49) | 1.94 | −0.11 (3.31) † | 12.25 | 0.18 | S | US | 0.70 |
| VBF | 0.68 (1.17) | 0.66 (3.33) ‡ | 0.06 (4.07) ‡ | 3.89 | −0.14 (4.58) ‡ | 9.93 | 0.40 | S | US | 0.52 |
| MGF | 0.15 (0.48) | 0.82 (5.45) ‡ | 0.03 (1.17) | 2.56 | −0.06 (2.70) | 20.56 † | 1.16 | S | US | 0.42 |
| MIN | −0.09 (−0.85) | 0.86 (15.95) ‡ | 0.07 (5.38) ‡ | 4.11 | −0.11 (4.95) ‡ | 5.33 | 4.64 ‡ | S | US | 0.57 |
| ICB | 0.12 (0.28) | 0.94 (6.39) ‡ | 0.00 (−0.19) | 2.63 | −0.10 (3.20) | 16.54 | 0.27 | US | US | 0.63 |
| PAI | 0.10 (0.31) | 0.88 (8.38) ‡ | 0.03 (2.54) ‡ | 2.29 | −0.17 (4.25) ‡ | 6.01 | 5.41 ‡ | S | US | 0.63 |
| MCI | 1.26 (0.80) | 0.57 (1.09) | −0.01 (−0.07) | 3.02 | −0.07 (1.96) | 5.83 | 2.94 † | S | US | 0.15 |
| MPV | 1.48 (1.01) | 0.55 (1.15) | −0.05 (−0.46) | 3.54 | −0.05 (1.75) | 12.17 | 0.08 | S | US | 0.14 |
| DUC | −1.14 (−3.99) ‡ | 1.37 (12.80) ‡ | 0.05 (2.15) ‡ | 1.50 | −0.14 (3.20) | 20.03 † | 0.62 | US | US | 0.54 |
| KST | −0.22 (−0.18) | 0.98 (2.15) ‡ | 0.05 (0.80) | 2.73 | −0.05 (2.49) | 16.79 | 0.01 | US | US | 0.69 |
| PCM | −0.72 (−1.83) † | 1.14 (9.97) ‡ | 0.10 (2.12) ‡ | 1.33 | −0.09 (3.16) | 12.32 | 0.32 | S | US | 0.61 |
| KMM | −0.16 (−0.19) | 0.98 (2.88) ‡ | 0.04 (0.86) | 2.37 | −0.06 (2.65) | 17.26 | 0.34 | S | US | 0.64 |
| JHI | 0.28 (0.34) | 0.76 (2.93) ‡ | 0.09 (2.42) ‡ | 2.31 | −0.07 (3.27) † | 8.12 | 0.77 | S | US | 0.53 |
| PIM | 0.06 (0.20) | 0.87 (7.95) ‡ | 0.02 (0.91) | 0.91 | −0.10 (3.01) | 16.82 | 0.43 | S | US | 0.52 |
| MCR | −0.27 (−1.48) | 1.01 (12.66) ‡ | 0.03 (5.98) ‡ | 3.78 | −0.24 (6.18) ‡ | 28.78 ‡ | 4.55 ‡ | S | S | 0.76 |
| MMT | −0.30 (−1.52) | 1.02 (10.14) ‡ | 0.04 (3.48) ‡ | 3.35 | −0.15 (4.81) ‡ | 20.97 † | 0.00 | S | US | 0.72 |
| PPT | 0.01 (0.03) | 0.84 (7.18) ‡ | 0.05 (2.16) ‡ | 2.41 | −0.13 (3.51) † | 14.81 | 1.71 | S | US | 0.57 |

Notes: a. Numbers inside the parentheses are values of t-ratios. b. ‡ and † indicate significance at 5% level and 10% level, respectively. c. At the 5% (10%) significance level, when there are 3 exogenous variables (k = 2), the upper bound critical value of the F-test is 4.85 (4.14), respectively. These values are from Pesaran et al. (2001, Table CI-Case III, p. 300). D. Number inside the parenthesis next to $ECM_{t-1}$ is the absolute value of the t-ratio. Its upper bound critical value at the 5% (10%) significance level is −3.53 (−3.21) when k = 2, and these come from Pesaran et al. (2001, Table CII-Case III, p. 303). e. LM is Lagrange multiplier test of residual serial correlation. It is distributed as $\chi^2$ with one degree of freedom (12th order). Its critical value at 5% (10%) significance level is 21.02 (18.54). f. RESET is Ramsey's test for misspecification. It is distributed as $\chi^2$ with one degree of freedom. Its critical value at 5% (10%) significance level is 3.84 (4.24).

Table 4 reports the TAX subindex results. Similar to previous findings, sixteen CEFs data have a short-run coefficient with at least one significant estimate. Ten CEFs are affected positively by the TAX subindex: ADX, GAB, GAM, FUND, VBF, MIN, ICB, PAI, DUC, MCR, and MMT. While SPE and MPV are affected negatively, INSI, MCI, and SOR have mixed significant results. In the short run, the TAX subindex affected the CEFs positively. In 14 CEF data, the TAX index carries a significant long-run coefficient. In one case, the F-test for cointegration is significant. An alternative ECM test supports cointegration in 12 of the CEF data with a significant negative coefficient. Six cases report autocorrelation, and eight cases report misspecification for the TAX index.

**Table 4.** Short-Run Coefficient Estimates—Linear ARDL—Model P = f (NAV, TAX).

**Panel A**

| FUNDS | Short-Run Coefficient Estimates | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $\Delta$ *Ln* $TAX_t$ | $\Delta$ *Ln* $TAX_{t-1}$ | $\Delta$ *Ln* $TAX_{t-2}$ | $\Delta$ *Ln* $TAX_{t-3}$ | $\Delta$ *Ln* $TAX_{t-4}$ | $\Delta$ *Ln* $TAX_{t-5}$ | $\Delta$ *Ln* $TAX_{t-6}$ | $\Delta$ *Ln* $TAX_{t-7}$ | $\Delta$ *Ln* $TAX_{t-8}$ | $\Delta$ *Ln* $TAX_{t-9}$ |
| ADX | 0.00 (2.32) ‡ | | | | | | | | | |
| GAB | 0.01 (2.54) ‡ | | | | | | | | | |
| GAM | 0.00 (1.46) | 0.01 (2.62) ‡ | 0.01 (1.76) † | 0.01 (1.86) † | 0.01 (1.96) † | 0.01 (2.38) ‡ | 0.01 (2.37) ‡ | | | |
| FUND | 0.01 (2.18) ‡ | 0.01 (2.05) ‡ | 0.00 (−0.41) | 0.01 (2.26) ‡ | 0.01 (1.61) | | | | | |
| RMT | 0.00 (1.20) | | | | | | | | | |
| RVT | 0.00 (1.15) | | | | | | | | | |
| SOR | 0.00 (−0.28) | 0.01 (1.80) † | −0.01 (−1.79) † | | | | | | | |
| TY | 0.00 (1.40) | | | | | | | | | |
| USA | 0.00 (0.12) | | | | | | | | | |
| GRF | 0.01 (1.63) | | | | | | | | | |
| SPE | 0.00 (−1.07) | −0.01 (−1.43) | −0.01 (−1.75) † | 0.00 (1.40) | | | | | | |
| CRF | −0.01 (−0.73) | | | | | | | | | |
| CLM | 0.00 (−0.63) | | | | | | | | | |
| CET | 0.00 (0.53) | | | | | | | | | |
| INSI | 0.00 (0.69) | 0.00 (−0.39) | 0.00 (0.66) | 0.01 (2.51) ‡ | 0.01 (2.45) ‡ | −0.01 (−1.97) † | | | | |
| VBF | 0.01 (3.40) ‡ | | | | | | | | | |
| MGF | 0.00 (1.12) | | | | | | | | | |
| MIN | 0.01 (4.24) ‡ | | | | | | | | | |
| ICB | 0.00 (1.22) | 0.00 (0.96) | 0.00 (0.77) | 0.01 (2.28) ‡ | 0.01 (2.48) ‡ | | | | | |
| PAI | 0.01 (2.22) ‡ | | | | | | | | | |
| MCI | −0.03 (−2.67) ‡ | −0.02 (−1.67) † | −0.02 (−1.60) | −0.01 (−0.86) | 0.03 (2.12) ‡ | | | | | |
| MPV | −0.01 (−1.72) † | −0.02 (−2.61) ‡ | −0.03 (−4.28) ‡ | | | | | | | |
| DUC | 0.00 (0.66) | 0.01 (1.65) † | | | | | | | | |
| KST | 0.00 (0.95) | | | | | | | | | |
| PCM | 0.00 (0.02) | 0.01 (1.41) | | | | | | | | |
| KMM | 0.00 (1.00) | | | | | | | | | |
| JHI | 0.00 (−0.26) | | | | | | | | | |
| PIM | 0.00 (0.92) | | | | | | | | | |
| MCR | 0.01 (4.69) ‡ | | | | | | | | | |
| MMT | 0.01 (3.29) ‡ | | | | | | | | | |
| PPT | −0.01 (−1.10) | | | | | | | | | |

**Panel B**

| FUNDS | LR Coefficient Estimates | | | Diagnostic Statistics Associated with Linear ARDL Model | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Constant* | *Ln NAV* | *Ln TAX* | *F Stat* | $ECM_{t\text{-}1}$ | *LM* | *RESET* | *CUSUM* | *C-SQ* | *Adj.* $R^2$ |
| ADX | −0.78 (−2.93) ‡ | 1.18 (16.50) ‡ | 0.04 (1.77) † | 2.15 | −0.07 (2.48) | 15.98 | 6.81 ‡ | S | US | 0.96 |
| GAB | −1.11 (−2.80) ‡ | 1.32 (11.64) ‡ | 0.11 (2.35) ‡ | 1.90 | −0.08 (3.29) † | 11.43 | 2.37 | S | US | 0.84 |
| GAM | −6.25 (−0.28) | 2.50 (0.47) | 0.13 (0.20) | 2.43 | −0.01 (0.29) | 23.59 ‡ | 3.22 † | S | US | 0.95 |
| FUND | −1.30 (−2.02) ‡ | 1.53 (6.75) ‡ | 0.02 (0.43) | 0.97 | −0.05 (2.22) | 11.50 | 0.23 | S | US | 0.91 |
| RMT | −1.10 (−2.03) ‡ | 1.31 (9.22) ‡ | 0.06 (0.99) | 3.13 | −0.05 (2.33) | 13.42 | 0.58 | S | US | 0.92 |
| RVT | −1.75 (−1.83) † | 1.49 (5.83) ‡ | 0.07 (0.96) | 2.99 | −0.03 (2.30) | 20.20 † | 2.92 † | S | US | 0.93 |
| SOR | −1.14 (−0.38) | 1.23 (2.11) ‡ | 0.03 (0.15) | 2.30 | −0.01 (1.13) | 4.66 | 2.45 | US | US | 0.87 |
| TY | −0.71 (−1.93) † | 1.13 (13.19) ‡ | 0.04 (1.21) | 2.69 | −0.06 (2.23) | 15.29 | 2.16 | S | US | 0.93 |
| USA | −1.29 (−3.26) ‡ | 1.31 (14.03) ‡ | 0.13 (2.32) ‡ | 1.46 | −0.06 (3.30) † | 11.14 | 0.51 | S | US | 0.86 |
| GRF | −2.19 (−2.75) ‡ | 1.74 (6.53) ‡ | 0.11 (1.66) † | 1.59 | −0.08 (2.92) | 9.90 | 1.52 | S | US | 0.49 |
| SPE | −0.37 (−1.73) † | 1.05 (13.56) ‡ | 0.03 (1.93) † | 5.15 ‡ | −0.14 (4.34) ‡ | 4.37 | 1.44 | US | US | 0.76 |
| CRF | 1.53 (0.85) | 0.97 (4.09) ‡ | −0.24 (−0.75) | 1.85 | −0.03 (1.79) | 9.57 | 0.01 | US | US | 0.35 |

**Table 4.** *Cont.*

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| CLM | 0.75 (0.93) | 0.99 (10.26) ‡ | −0.09 (−0.62) | 0.78 | −0.04 (2.15) | 17.53 | 2.92 † | S | US | 0.52 |
| CET | −1.58 (−1.78) † | 1.40 (5.84) ‡ | 0.02 (0.50) | 2.16 | −0.05 (1.65) | 12.05 | 0.77 | S | US | 0.92 |
| INSI | −0.46 (−1.06) | 1.11 (7.97) ‡ | 0.01 (0.49) | 1.87 | −0.11 (3.30) † | 11.79 | 0.19 | S | US | 0.71 |
| VBF | 0.59 (1.05) | 0.69 (3.62) ‡ | 0.06 (4.30) ‡ | 3.55 | −0.14 (4.68) ‡ | 9.98 | 0.33 | S | US | 0.52 |
| MGF | 0.13 (0.43) | 0.82 (5.57) ‡ | 0.03 (1.30) | 2.47 | −0.06 (2.76) | 20.33 † | 1.33 | S | US | 0.42 |
| MIN | −0.09 (−0.78) | 0.85 (15.23) ‡ | 0.07 (5.15) ‡ | 3.73 | −0.10 (4.84) ‡ | 5.41 | 5.66 ‡ | S | US | 0.57 |
| ICB | 0.11 (0.27) | 0.94 (6.53) ‡ | 0.00 (−0.09) | 2.48 | −0.10 (3.23) † | 16.65 | 0.20 | US | US | 0.64 |
| PAI | 0.11 (0.36) | 0.88 (8.33) ‡ | 0.03 (2.49) ‡ | 2.28 | −0.17 (4.22) ‡ | 6.19 | 5.18 ‡ | S | US | 0.63 |
| MCI | 1.22 (0.79) | 0.58 (1.15) | −0.01 (−0.08) | 3.05 | −0.08 (2.02) | 6.10 | 2.84 † | S | US | 0.15 |
| MPV | 1.22 (0.85) | 0.56 (1.16) | 0.00 (0.00) | 3.47 | −0.04 (1.73) | 13.54 | 0.05 | S | US | 0.13 |
| DUC | −1.14 (−4.17) ‡ | 1.37 (13.33) ‡ | 0.05 (2.32) ‡ | 1.60 | −0.15 (3.49) † | 21.65 ‡ | 0.21 | US | US | 0.53 |
| KST | −0.30 (−0.24) | 1.00 (2.20) ‡ | 0.06 (0.86) | 2.63 | −0.05 (2.51) | 16.62 | 0.00 | US | US | 0.69 |
| PCM | −0.66 (−1.59) | 1.13 (9.29) ‡ | 0.09 (1.86) † | 1.32 | −0.09 (2.98) | 11.63 | 0.22 | S | US | 0.61 |
| KMM | −0.26 (−0.31) | 1.00 (2.99) ‡ | 0.05 (1.01) | 2.31 | −0.06 (2.68) | 16.54 | 0.37 | S | US | 0.64 |
| JHI | 0.33 (0.39) | 0.74 (2.71) ‡ | 0.09 (2.19) ‡ | 2.19 | −0.07 (3.15) | 8.46 | 0.80 | S | US | 0.53 |
| PIM | 0.03 (0.11) | 0.87 (8.30) ‡ | 0.03 (1.06) | 0.94 | −0.10 (3.07) | 16.49 | 0.40 | S | US | 0.52 |
| MCR | −0.31 (−1.68) † | 1.02 (12.91) ‡ | 0.04 (6.25) ‡ | 3.47 | −0.23 (6.26) ‡ | 20.92 † | 4.84 ‡ | US | US | 0.75 |
| MMT | −0.34 (−1.72) † | 1.04 (10.50) ‡ | 0.04 (3.65) ‡ | 3.14 | −0.15 (4.89) ‡ | 20.97 † | 0.00 | S | US | 0.72 |
| PPT | −0.01 (−0.02) | 0.84 (7.39) ‡ | 0.05 (2.28) ‡ | 2.44 | −0.13 (3.57) ‡ | 13.96 | 1.53 | S | US | 0.57 |

Notes: a. Numbers inside the parentheses are values of t-ratios. b. ‡ and † indicate significance at 5% level and 10% level, respectively. c. At the 5% (10%) significance level, when there are 3 exogenous variables (k = 2), the upper bound critical value of the F-test is 4.85 (4.14), respectively. These values are from Pesaran et al. (2001, Table CI-Case III, p. 300). d. Number inside the parenthesis next to $ECM_{t-1}$ is the absolute value of the t-ratio. Its upper bound critical value at the 5% (10%) significance level is −3.53 (−3.21) when k = 2, and these come from Pesaran et al. (2001, Table CII-Case III, p. 303). e. LM is Lagrange multiplier test of residual serial correlation. It is distributed as $\chi^2$ with one degree of freedom (12th order). Its critical value at 5% (10%) significance level is 21.02 (18.54). f. RESET is Ramsey's test for misspecification. It is distributed as $\chi^2$ with one degree of freedom. Its critical value at 5% (10%) significance level is 3.84 (4.24).

For the government spending (GS) index in Table 5, nineteen CEF cases have at least one significant short-run coefficient. Sixteen CEFs are affected positively by the GS subindex: ADX, GAB, GAM, SOR, TY, USA, GRF, INSI, VBF, MIN, ICB, PAI, DUC, PCM, MCR, and MMT. While SPE and MCI are affected negatively, MPV reports mixed significant coefficients. Almost all CEFs are affected positively by the GS subindex. Twelve of these GS carry a significant coefficient in the long run. While four CEF cases have F-test cointegrations, the ECM coefficient has a significant negative coefficient in ten of the CEF data. Seven cases reported fail the LM, and another seven cases fail the RESET.

The health care (HC) index in Table 6 has twenty-three CEFs having at least one short-run coefficient that is significant. Eighteen of these significant short-run coefficients are affected positively by the HC subindex: ADX, GAB, GAM, FUND, TY, USA, GRF, CET, INSI, VBF, MGF, MIN, DUC, PCM, PIM, MCR, MMT, and PPT. While SPE, MCI, MPV, and JHI are affected negatively, PAI has mixed significant coefficients. It is clear that almost all CEFs are affected positively by the GS subindex. Fifteen of them carry a significant coefficient in the long run. The HC index reports four F-test and eleven ECM *t*-test cointegrations. In five cases, the HC model fails the LM test and fails RESET in four cases.

Per the national security (NS) index in Table 7, ten CEF data have at least one short-run coefficient that is significant. ADX, GAM, PAI, DUC, and MCR are affected by the NS subindex positively. RMT, GRF, MCI, and MPV are affected negatively, and JHI has mixed results. In eight cases, the long-run coefficient is significant. While NS is not significant for cointegration with the F-test in any cases, for 12 cases, the ECM coefficient is significant for an alternative cointegration test. Nine cases report autocorrelation, and six of them report misspecification for the NS index.

**Table 5.** Short-Run Coefficient Estimates—Linear ARDL—Model P = f (NAV, GS).

**Panel A**

| FUNDS | Short-Run Coefficient Estimates | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $\Delta$ *Ln* $GS_t$ | $\Delta$ *Ln* $GS_{t-1}$ | $\Delta$ *Ln* $GS_{t-2}$ | $\Delta$ *Ln* $GS_{t-3}$ | $\Delta$ *Ln* $GS_{t-4}$ | $\Delta$ *Ln* $GS_{t-5}$ | $\Delta$ *Ln* $GS_{t-6}$ | $\Delta$ *Ln* $GS_{t-7}$ | $\Delta$ *Ln* $GS_{t-8}$ | $\Delta$ *Ln* $GS_{t-9}$ |
| ADX | 0.00 (2.43) ‡ | | | | | | | | | |
| GAB | 0.01 (2.80) ‡ | | | | | | | | | |
| GAM | 0.00 (1.21) | 0.01 (2.75) ‡ | 0.00 (1.87) † | 0.01 (2.92) ‡ | 0.00 (1.69) † | 0.00 (2.92) ‡ | 0.01 (3.10) ‡ | | | |
| FUND | 0.00 (1.34) | | | | | | | | | |
| RMT | 0.00 (0.44) | | | | | | | | | |
| RVT | 0.00 (0.24) | | | | | | | | | |
| SOR | 0.00 (0.26) | 0.01 (1.99) ‡ | | | | | | | | |
| TY | 0.00 (2.49) ‡ | 0.01 (2.65) ‡ | 0.00 (1.15) | 0.00 (1.40) | 0.00 (1.87) † | 0.01 (3.26) ‡ | 0.01 (3.86) ‡ | 0.00 (1.91) † | | |
| USA | 0.00 (2.30) ‡ | | | | | | | | | |
| GRF | 0.01 (2.18) ‡ | | | | | | | | | |
| SPE | 0.00 (−0.76) | 0.00 (−0.92) | −0.01 (−2.56) ‡ | | | | | | | |
| CRF | 0.00 (−0.70) | | | | | | | | | |
| CLM | 0.00 (−0.42) | | | | | | | | | |
| CET | 0.00 (0.96) | | | | | | | | | |
| INSI | 0.00 (2.19) ‡ | 0.00 (0.38) | 0.00 (0.42) | 0.01 (3.15) ‡ | 0.00 (2.66) ‡ | | | | | |
| VBF | 0.00 (2.56) ‡ | | | | | | | | | |
| MGF | 0.00 (0.68) | | | | | | | | | |
| MIN | 0.01 (4.63) ‡ | | | | | | | | | |
| ICB | 0.00 (0.84) | 0.00 (0.67) | 0.00 (0.52) | 0.01 (2.84) ‡ | 0.00 (2.24) ‡ | 0.00 (1.97) † | | | | |
| PAI | 0.00 (2.11) ‡ | | | | | | | | | |
| MCI | −0.01 (−1.89) † | −0.01 (−1.66) † | −0.02 (−2.91) ‡ | −0.01 (−1.07) | 0.02 (2.14) ‡ | | | | | |
| MPV | −0.01 (−1.45) | −0.01 (−2.68) ‡ | −0.02 (−3.61) ‡ | 0.00 (−0.31) | 0.01 (2.10) ‡ | | | | | |
| DUC | 0.00 (1.42) | 0.00 (1.46) | 0.00 (−0.01) | 0.00 (0.90) | 0.00 (1.49) | 0.00 (−0.76) | 0.01 (3.04) ‡ | | | |
| KST | 0.00 (0.53) | | | | | | | | | |
| PCM | 0.00 (2.30) ‡ | | | | | | | | | |
| KMM | 0.00 (0.68) | | | | | | | | | |
| JHI | 0.00 (−0.39) | | | | | | | | | |
| PIM | 0.00 (0.75) | | | | | | | | | |
| MCR | 0.01 (4.93) ‡ | | | | | | | | | |
| MMT | 0.00 (3.60) ‡ | | | | | | | | | |
| PPT | 0.00 (1.10) | | | | | | | | | |

**Panel B**

| FUNDS | LR Coefficient Estimates | | | Diagnostic Statistics Associated with Linear ARDL Model | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Constant* | *Ln NAV* | *Ln GS* | *F Stat* | $ECM_{t-1}$ | *LM* | *RESET* | *CUSUM* | *C-SQ* | *Adj.* $R^2$ |
| ADX | −0.69 (−3.40) ‡ | 1.17 (18.92) ‡ | 0.02 (1.94) † | 2.69 | −0.08 (2.74) | 16.93 | 5.80 ‡ | S | US | 0.96 |
| GAB | −0.96 (−3.02) ‡ | 1.33 (12.00) ‡ | 0.08 (2.58) ‡ | 2.02 | −0.08 (3.42) † | 12.44 | 2.47 | S | US | 0.84 |
| GAM | −0.64 (−0.39) | 1.18 (2.86) ‡ | −0.04 (−0.51) | 2.62 | −0.02 (0.95) | 23.17 ‡ | 2.18 | S | US | 0.95 |
| FUND | −1.23 (−2.42) ‡ | 1.47 (7.70) ‡ | 0.04 (1.09) | 1.09 | −0.05 (2.55) | 20.92 † | 1.59 | S | US | 0.90 |
| RMT | −0.76 (−2.02) ‡ | 1.25 (10.22) ‡ | 0.01 (0.41) | 3.55 | −0.05 (2.41) | 13.28 | 0.27 | S | US | 0.92 |
| RVT | −1.17 (−1.67) † | 1.38 (6.33) ‡ | 0.01 (0.23) | 3.04 | −0.04 (2.44) | 19.00 † | 3.74 † | S | US | 0.93 |
| SOR | −0.88 (−0.39) | 1.22 (2.41) ‡ | −0.01 (−0.09) | 2.62 | −0.02 (1.21) | 3.06 | 2.44 | US | US | 0.87 |
| TY | −0.31 (−0.91) | 1.08 (11.71) ‡ | −0.02 (−0.60) | 2.71 | −0.05 (1.77) | 19.44 † | 3.59 † | S | US | 0.94 |
| USA | −0.98 (−3.20) ‡ | 1.30 (13.35) ‡ | 0.07 (2.02) ‡ | 1.60 | −0.06 (3.15) | 11.92 | 0.28 | S | US | 0.86 |
| GRF | −2.19 (−3.05) ‡ | 1.79 (6.69) ‡ | 0.09 (2.06) ‡ | 1.46 | −0.08 (3.05) | 7.93 | 1.76 | S | US | 0.49 |
| SPE | −0.26 (−1.29) | 1.02 (13.49) ‡ | 0.02 (2.51) ‡ | 5.67 ‡ | −0.15 (4.66) ‡ | 3.66 | 1.74 | US | US | 0.76 |

**Table 5.** *Cont.*

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| CRF | 1.11 (0.80) | 0.97 (3.98) ‡ | −0.16 (−0.71) | 1.97 | −0.03 (1.77) | 9.38 | 0.02 | US | US | 0.35 |
| CLM | 0.50 (0.82) | 0.99 (10.00) ‡ | −0.04 (−0.42) | 0.74 | −0.04 (2.12) | 17.86 | 2.86 † | S | US | 0.52 |
| CET | −1.73 (−1.73) † | 1.44 (5.21) ‡ | 0.02 (0.78) | 2.15 | −0.05 (1.58) | 12.79 | 0.95 | S | US | 0.92 |
| INSI | −0.42 (−0.96) | 1.11 (7.64) ‡ | 0.00 (0.08) | 2.18 | −0.11 (3.26) † | 9.62 | 0.32 | S | US | 0.71 |
| VBF | 1.02 (1.49) | 0.59 (2.52) ‡ | 0.03 (3.13) ‡ | 4.48 † | −0.12 (4.12) ‡ | 10.25 | 0.99 | S | US | 0.51 |
| MGF | 0.24 (0.74) | 0.82 (5.00) ‡ | 0.02 (0.76) | 2.68 | −0.06 (2.53) | 20.99 † | 0.86 | S | US | 0.42 |
| MIN | 0.01 (0.07) | 0.86 (17.53) ‡ | 0.05 (5.94) ‡ | 4.95 ‡ | −0.11 (5.20) ‡ | 5.00 | 2.71 | S | US | 0.58 |
| ICB | 0.08 (0.19) | 0.96 (6.35) ‡ | −0.01 (−0.72) | 2.78 | −0.09 (3.17) | 13.85 | 0.48 | US | US | 0.64 |
| PAI | 0.19 (0.60) | 0.87 (7.93) ‡ | 0.02 (2.29) ‡ | 2.31 | −0.16 (4.15) ‡ | 6.41 | 6.29 ‡ | S | US | 0.63 |
| MCI | 0.12 (0.15) | 0.94 (3.40) ‡ | 0.04 (0.75) | 3.18 | −0.11 (2.72) | 6.35 | 3.25 † | S | US | 0.15 |
| MPV | 1.22 (0.95) | 0.56 (1.20) | 0.00 (−0.04) | 3.46 | −0.05 (1.75) | 8.52 | 0.19 | S | US | 0.13 |
| DUC | −1.01 (−3.57) ‡ | 1.36 (12.29) ‡ | 0.03 (1.80) † | 1.43 | −0.14 (3.08) | 16.16 | 0.83 | US | US | 0.54 |
| KST | 0.05 (0.04) | 0.93 (2.07) ‡ | 0.02 (0.51) | 3.25 | −0.05 (2.52) | 17.19 | 0.00 | U | US | 0.69 |
| PCM | −0.47 (−1.37) | 1.12 (9.41) ‡ | 0.06 (1.89) † | 1.54 | −0.09 (3.06) | 13.00 | 0.47 | S | US | 0.61 |
| KMM | 0.00 (−0.01) | 0.95 (2.79) ‡ | 0.02 (0.70) | 2.71 | −0.06 (2.62) | 18.23 | 0.30 | S | US | 0.64 |
| JHI | 0.43 (0.58) | 0.75 (3.05) ‡ | 0.07 (2.63) ‡ | 2.89 | −0.07 (3.33) † | 8.45 | 0.81 | S | S | 0.53 |
| PIM | 0.08 (0.31) | 0.88 (7.72) ‡ | 0.02 (0.84) | 0.79 | −0.09 (2.89) | 15.55 | 0.03 | US | US | 0.52 |
| MCR | −0.13 (−0.77) | 0.97 (12.63) ‡ | 0.02 (6.37) ‡ | 4.80 † | −0.24 (6.44) ‡ | 30.13 ‡ | 4.59 ‡ | S | S | 0.76 |
| MMT | −0.11 (−0.61) | 0.95 (10.29) ‡ | 0.03 (4.01) ‡ | 4.11 | −0.16 (5.28) ‡ | 31.28 ‡ | 0.02 | S | US | 0.73 |
| PPT | 0.24 (0.84) | 0.78 (5.75) ‡ | 0.02 (1.30) | 2.15 | −0.11 (3.22) † | 11.75 | 2.05 | US | US | 0.56 |

Notes: a. Numbers inside the parentheses are values of t-ratios. b. ‡ and † indicate significance at 5% level and 10% level, respectively. c. At the 5% (10%) significance level, when there are 3 exogenous variables (k = 2), the upper bound critical value of the F-test is 4.85 (4.14), respectively. These values are from Pesaran et al. (2001, Table CI-Case III, p. 300). d. Number inside the parenthesis next to $ECM_{t-1}$ is the absolute value of the t-ratio. Its upper bound critical value at the 5% (10%) significance level is −3.53 (−3.21) when k = 2, and these come from Pesaran et al. (2001, Table CII-Case III, p. 303). e. LM is Lagrange multiplier test of residual serial correlation. It is distributed as $\chi^2$ with one degree of freedom (12th order). Its critical value at 5% (10%) significance level is 21.02 (18.54). f. RESET is Ramsey's test for misspecification. It is distributed as $\chi^2$ with one degree of freedom. Its critical value at 5% (10%) significance level is 3.84 (4.24).

**Table 6.** Short-Run Coefficient Estimates—Linear ARDL—Model P = f (NAV, HC).

| | **Panel A** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **FUNDS** | **Short-Run Coefficient Estimates** | | | | | | | | | |
| | **$\Delta$ *Ln* $HC_t$** | **$\Delta$ *Ln* $HC_{t-1}$** | **$\Delta$ *Ln* $HC_{t-2}$** | **$\Delta$ *Ln* $HC_{t-3}$** | **$\Delta$ *Ln* $HC_{t-4}$** | **$\Delta$ *Ln* $HC_{t-5}$** | **$\Delta$ *Ln* $HC_{t-6}$** | **$\Delta$ *Ln* $HC_{t-7}$** | **$\Delta$ *Ln* $HC_{t-8}$** | **$\Delta$ *Ln* $HC_{t-9}$** |
| ADX | 0.00 (2.62) ‡ | | | | | | | | | |
| GAB | 0.01 (1.84) † | | | | | | | | | |
| GAM | 0.00 (2.14) ‡ | 0.01 (3.57) ‡ | 0.01 (2.72) ‡ | 0.00 (1.99) ‡ | 0.01 (2.66) ‡ | 0.01 (2.60) ‡ | 0.01 (3.83) ‡ | 0.00 (1.53) | | |
| FUND | 0.01 (1.53) | 0.01 (2.81) ‡ | 0.00 (0.76) | 0.01 (2.82) ‡ | 0.00 (1.42) | | | | | |
| RMT | 0.00 (0.70) | | | | | | | | | |
| RVT | 0.00 (1.00) | | | | | | | | | |
| SOR | 0.00 (0.49) | | | | | | | | | |
| TY | 0.00 (2.17) ‡ | 0.00 (1.65) † | | | | | | | | |
| USA | 0.01 (2.50) ‡ | | | | | | | | | |
| GRF | 0.01 (2.09) ‡ | | | | | | | | | |
| SPE | 0.00 (−0.71) | 0.00 (−1.21) | −0.01 (−2.00) ‡ | | | | | | | |
| CRF | 0.01 (0.87) | | | | | | | | | |
| CLM | 0.00 (−0.43) | | | | | | | | | |
| CET | 0.01 (2.11) ‡ | | | | | | | | | |
| INSI | 0.00 (0.94) | 0.00 (0.08) | 0.00 (0.20) | 0.01 (2.09) ‡ | 0.01 (2.15) ‡ | 0.00 (−1.60) | | | | |
| VBF | 0.01 (3.11) ‡ | | | | | | | | | |

**Table 6.** *Cont.*

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| MGF | 0.00 (1.73) † | | | | | | | | | |
| MIN | 0.01 (2.82) ‡ | −0.01 (−2.79) ‡ | −0.01 (−3.48) ‡ | 0.00 (−1.72) † | | | | | | |
| ICB | 0.00 (0.92) | | | | | | | | | |
| PAI | 0.00 (0.99) | 0.00 (1.12) | 0.00 (0.05) | 0.00 (0.55) | 0.01 (1.89) † | −0.01 (−1.96) † | | | | |
| MCI | −0.02 (−2.10) ‡ | −0.02 (−1.52) | −0.04 (−3.65) ‡ | | | | | | | |
| MPV | −0.01 (−0.82) | −0.01 (−2.21) ‡ | −0.02 (−3.49) ‡ | | | | | | | |
| DUC | 0.01 (1.91) † | 0.01 (1.42) | −0.01 (−1.60) | | | | | | | |
| KST | 0.00 (1.03) | | | | | | | | | |
| PCM | 0.01 (2.52) ‡ | | | | | | | | | |
| KMM | 0.00 (1.52) | | | | | | | | | |
| JHI | 0.00 (0.65) | 0.00 (0.11) | −0.01 (−1.61) | −0.01 (−1.98) ‡ | | | | | | |
| PIM | 0.00 (1.70) † | | | | | | | | | |
| MCR | 0.01 (4.04) ‡ | | | | | | | | | |
| MMT | 0.00 (2.67) ‡ | | | | | | | | | |
| PPT | 0.01 (1.80) † | | | | | | | | | |
| | **Panel B** | | | | | | | | | |
| **FUNDS** | **LR Coefficient Estimates** | | | | **Diagnostic Statistics Associated with Linear ARDL Model** | | | | | |
| | ***Constant*** | ***Ln NAV*** | ***Ln HC*** | ***F Stat*** | $ECM_{t-1}$ | ***LM*** | ***RESET*** | ***CUSUM*** | ***C-SQ*** | ***Adj. $R^2$*** |
| ADX | −0.90 (−2.45) ‡ | 1.21 (12.50) ‡ | 0.04 (1.60) | 2.06 | −0.06 (2.19) | 17.48 | 6.03 ‡ | S | US | 0.96 |
| GAB | −1.11 (−2.17) ‡ | 1.36 (9.01) ‡ | 0.09 (1.67) † | 1.88 | −0.07 (2.91) | 13.18 | 2.14 | S | US | 0.84 |
| GAM | −1.72 (−0.47) | 1.45 (1.64) | −0.02 (−0.14) | 2.33 | −0.01 (0.67) | 24.63 ‡ | 1.95 | S | US | 0.95 |
| FUND | −0.99 (−2.13) ‡ | 1.46 (8.33) ‡ | −0.01 (−0.24) | 0.76 | −0.06 (2.51) | 7.70 | 0.04 | S | US | 0.91 |
| RMT | −0.89 (−1.85) † | 1.27 (9.56) ‡ | 0.03 (0.62) | 3.06 | −0.05 (2.30) | 13.19 | 0.26 | S | US | 0.92 |
| RVT | −1.71 (−1.64) | 1.49 (5.31) ‡ | 0.06 (0.81) | 2.93 | −0.03 (2.10) | 19.17 † | 3.28 † | US | US | 0.93 |
| SOR | −1.88 (−0.49) | 1.34 (1.86) † | 0.10 (0.37) | 2.42 | −0.01 (0.92) | 3.71 | 2.13 | US | US | 0.87 |
| TY | −0.66 (−1.41) | 1.14 (9.82) ‡ | 0.02 (0.55) | 2.81 | −0.05 (1.72) | 15.94 | 2.56 | S | US | 0.93 |
| USA | −1.40 (−2.57) ‡ | 1.36 (10.33) ‡ | 0.12 (1.86) † | 1.63 | −0.05 (2.81) | 15.58 | 0.26 | S | US | 0.86 |
| GRF | −2.77 (−2.48) ‡ | 1.92 (5.32) ‡ | 0.14 (1.74) † | 1.61 | −0.07 (2.74) | 9.85 | 1.68 | S | US | 0.49 |
| SPE | −0.28 (−1.38) | 1.01 (13.04) ‡ | 0.03 (2.24) ‡ | 7.00 ‡ | −0.15 (4.55) ‡ | 3.69 | 1.60 | S | US | 0.75 |
| CRF | 2.08 (0.95) | 0.92 (3.63) ‡ | −0.30 (−0.84) | 1.61 | −0.03 (1.75) | 9.91 | 0.07 | US | US | 0.35 |
| CLM | 0.64 (0.72) | 0.99 (9.45) ‡ | −0.06 (−0.43) | 0.73 | −0.04 (2.10) | 17.86 | 2.46 | S | US | 0.52 |
| CET | −1.79 (−1.42) | 1.46 (4.39) ‡ | 0.03 (0.53) | 1.67 | −0.04 (1.38) | 13.62 | 0.96 | S | US | 0.92 |
| INSI | −0.51 (−1.17) | 1.13 (7.87) ‡ | 0.01 (0.60) | 1.94 | −0.11 (3.44) † | 13.30 | 0.28 | S | US | 0.70 |
| VBF | 0.98 (1.46) | 0.57 (2.45) ‡ | 0.05 (3.54) ‡ | 4.83 † | −0.12 (4.40) ‡ | 11.52 | 0.61 | S | US | 0.51 |
| MGF | 0.00 (−0.01) | 0.87 (6.85) ‡ | 0.04 (2.12) ‡ | 2.60 | −0.07 (3.10) | 18.85 † | 0.99 | S | US | 0.43 |
| MIN | −0.28 (−3.26) ‡ | 0.93 (24.91) ‡ | 0.08 (7.94) ‡ | 4.80 † | −0.15 (5.75) ‡ | 5.73 | 1.17 | S | US | 0.59 |
| ICB | 0.19 (0.43) | 0.88 (5.75) ‡ | 0.02 (0.91) | 3.26 | −0.09 (3.18) | 18.32 | 0.46 | US | US | 0.63 |
| PAI | 0.04 (0.11) | 0.91 (7.34) ‡ | 0.03 (1.78) † | 2.24 | −0.15 (3.76) ‡ | 7.31 | 4.69 ‡ | S | US | 0.64 |
| MCI | 0.75 (0.70) | 0.64 (1.59) | 0.06 (0.79) | 3.30 | −0.09 (2.33) | 7.30 | 2.48 | S | US | 0.14 |
| MPV | 0.87 (0.85) | 0.62 (1.65)0 | 0.04 (0.47) | 3.53 | −0.05 (2.02) | 13.27 | 0.35 | S | US | 0.09 |
| DUC | −1.22 (−4.47) ‡ | 1.41 (14.40) ‡ | 0.04 (2.38) ‡ | 1.32 | −0.16 (3.65) ‡ | 16.22 | 0.84 | US | US | 0.53 |
| KST | −0.09 (−0.07) | 0.91 (1.88) † | 0.06 (0.86) | 2.73 | −0.04 (2.28) | 15.92 | 0.01 | US | US | 0.69 |
| PCM | −0.78 (−1.73) † | 1.17 (9.08) ‡ | 0.09 (1.97) † | 1.21 | −0.09 (3.03) | 12.49 | 0.86 | S | US | 0.61 |
| KMM | −0.23 (−0.30) | 0.95 (2.84) ‡ | 0.07 (1.37) | 2.47 | −0.06 (2.66) | 12.73 | 0.55 | US | US | 0.65 |
| JHI | −0.40 (−0.68) | 0.94 (5.12) ‡ | 0.12 (4.10) ‡ | 1.91 | −0.10 (3.98) ‡ | 6.59 | 0.68 | S | S | 0.54 |
| PIM | −0.15 (−0.61) | 0.93 (9.59) ‡ | 0.04 (1.99) ‡ | 0.99 | −0.11 (3.53) † | 17.73 | 0.88 | US | US | 0.53 |

**Table 6.** *Cont.*

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| MCR | −0.04 (−0.18) | 0.91 (9.22) ‡ | 0.03 (4.89) ‡ | 4.14 † | −0.19 (5.51) ‡ | 23.93 ‡ | 4.93 ‡ | S | US | 0.75 |
| MMT | −0.20 (−0.91) | 0.98 (8.47) ‡ | 0.03 (2.79) ‡ | 3.33 | −0.13 (4.47) ‡ | 22.21 ‡ | 0.09 | US | US | 0.72 |
| PPT | 0.00 (0.02) | 0.84 (6.92) ‡ | 0.04 (2.16) ‡ | 2.42 | −0.12 (3.68) ‡ | 12.67 | 2.31 | US | US | 0.56 |

Notes: a. Numbers inside the parentheses are values of t-ratios. b. ‡ and † indicate significance at 5% level and 10% level, respectively. c. At the 5% (10%) significance level, when there are 3 exogenous variables (k = 2), the upper bound critical value of the F-test is 4.85 (4.14), respectively. These values are from Pesaran et al. (2001, Table CI-Case III, p. 300). d. Number inside the parenthesis next to $ECM_{t-1}$ is the absolute value of the t-ratio. Its upper bound critical value at the 5% (10%) significance level is −3.53 (−3.21) when k = 2, and these come from Pesaran et al. (2001, Table CII-Case III, p. 303). e. LM is Lagrange multiplier test of residual serial correlation. It is distributed as $\chi^2$ with one degree of freedom (12th order). Its critical value at 5% (10%) significance level is 21.02 (18.54). f. RESET is Ramsey's test for misspecification. It is distributed as $\chi^2$ with one degree of freedom. Its critical value at 5% (10%) significance level is 3.84 (4.24).

**Table 7.** Short-Run Coefficient Estimates—Linear ARDL—Model P = f (NAV, NS).

| | **Panel A** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **FUNDS** | **Short-Run Coefficient Estimates** | | | | | | | | | |
| | **$\Delta$ *Ln* $NS_t$** | **$\Delta$ *Ln* $NS_{t-1}$** | **$\Delta$ *Ln* $NS_{t-2}$** | **$\Delta$ *Ln* $NS_{t-3}$** | **$\Delta$ *Ln* $NS_{t-4}$** | **$\Delta$ *Ln* $NS_{t-5}$** | **$\Delta$ *Ln* $NS_{t-6}$** | **$\Delta$ *Ln* $NS_{t-7}$** | **$\Delta$ *Ln* $NS_{t-8}$** | **$\Delta$ *Ln* $NS_{t-9}$** |
| ADX | 0.00 (1.27) | 0.00 (−1.57) | 0.00 (−2.25) ‡ | 0.00 (−2.80) ‡ | | | | | | |
| GAB | 0.00 (0.99) | | | | | | | | | |
| GAM | 0.00 (−0.40) | 0.01 (3.02) ‡ | 0.01 (2.57) ‡ | 0.00 (1.28) | 0.01 (2.46) ‡ | 0.01 (2.93) ‡ | 0.01 (2.84) ‡ | | | |
| FUND | 0.00 (0.38) | | | | | | | | | |
| RMT | 0.00 (−0.66) | −0.01 (−2.62) ‡ | −0.01 (−2.71) ‡ | 0.00 (−1.43) | | | | | | |
| RVT | 0.00 (−0.19) | | | | | | | | | |
| SOR | 0.00 (−0.38) | | | | | | | | | |
| TY | 0.00 (0.86) | | | | | | | | | |
| USA | 0.00 (0.19) | | | | | | | | | |
| GRF | 0.00 (0.23) | −0.01 (−1.12) | 0.00 (−0.09) | 0.00 (−0.42) | 0.01 (0.94) | 0.01 (0.70) | −0.01 (−1.49) | 0.01 (1.10) | −0.01 (−1.75) † | |
| SPE | 0.00 (1.07) | | | | | | | | | |
| CRF | 0.01 (1.09) | | | | | | | | | |
| CLM | 0.00 (−0.11) | | | | | | | | | |
| CET | 0.00 (0.67) | | | | | | | | | |
| INSI | 0.00 (1.07) | | | | | | | | | |
| VBF | 0.00 (1.44) | | | | | | | | | |
| MGF | 0.00 (−0.75) | | | | | | | | | |
| MIN | 0.00 (1.10) | | | | | | | | | |
| ICB | 0.00 (−1.29) | | | | | | | | | |
| PAI | 0.00 (1.94) † | | | | | | | | | |
| MCI | −0.02 (−2.74) ‡ | | | | | | | | | |
| MPV | −0.01 (−1.42) | −0.02 (−2.83) ‡ | −0.02 (−3.09) ‡ | −0.01 (−1.54) | −0.01 (−1.45) | −0.01 (−2.15) ‡ | −0.02 (−2.74) ‡ | | | |
| DUC | 0.01 (2.24) ‡ | | | | | | | | | |
| KST | 0.00 (0.39) | | | | | | | | | |
| PCM | 0.00 (0.17) | | | | | | | | | |
| KMM | 0.00 (0.54) | | | | | | | | | |
| JHI | 0.00 (−0.31) | 0.00 (0.89) | 0.00 (−0.66) | −0.01 (−1.94) † | 0.00 (−0.31) | 0.01 (2.10) ‡ | | | | |
| PIM | 0.00 (0.33) | | | | | | | | | |
| MCR | 0.00 (−1.79) † | | | | | | | | | |
| MMT | 0.00 (−1.28) | | | | | | | | | |
| PPT | 0.00 (−0.52) | | | | | | | | | |

**Table 7.** *Cont.*

| FUNDS | Panel B | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | LR Coefficient Estimates | | | Diagnostic Statistics Associated with Linear ARDL Model | | | | | | |
| | *Constant* | *Ln NAV* | *Ln NS* | *F Stat* | $ECM_{t-1}$ | *LM* | *RESET* | *CUSUM* | *C-SQ* | *Adj.* $R^2$ |
| ADX | −0.62 (−5.24) ‡ | 1.12 (35.14) ‡ | 0.03 (2.97) ‡ | 3.98 | −0.12 (3.63) ‡ | 20.34 † | 5.80 ‡ | S | US | 0.96 |
| GAB | −0.58 (−2.36) ‡ | 1.21 (12.72) ‡ | 0.04 (1.16) | 1.98 | −0.08 (2.76) | 12.11 | 1.28 | S | US | 0.84 |
| GAM | 0.68 (0.23) | 0.97 (1.96) † | −0.18 (−0.45) | 2.56 | −0.01 (0.64) | 24.88 ‡ | 3.23 † | US | US | 0.95 |
| FUND | −1.42 (−3.10) ‡ | 1.45 (9.63) ‡ | 0.10 (1.98) ‡ | 2.18 | −0.06 (2.90) | 17.95 | 1.13 | S | US | 0.90 |
| RMT | −1.21 (−4.54) ‡ | 1.30 (17.38) ‡ | 0.09 (2.65) ‡ | 3.55 | −0.08 (3.74) ‡ | 10.64 | 1.05 | S | US | 0.93 |
| RVT | −1.60 (−3.33) ‡ | 1.39 (9.99) ‡ | 0.10 (2.33) ‡ | 3.27 | −0.05 (3.25) † | 24.14 ‡ | 0.90 | S | US | 0.93 |
| SOR | −0.31 (−0.12) | 1.14 (2.15) ‡ | −0.07 (−0.33) | 2.17 | −0.01 (1.04) | 4.25 | 2.67 | US | US | 0.87 |
| TY | −0.55 (−1.86) † | 1.10 (14.67) ‡ | 0.02 (0.81) | 3.17 | −0.06 (2.18) | 16.15 | 1.85 | US | US | 0.93 |
| USA | −0.80 (−3.96) ‡ | 1.20 (19.16) ‡ | 0.08 (2.19) ‡ | 2.94 | −0.07 (3.50) † | 26.30 ‡ | 0.03 | S | US | 0.86 |
| GRF | −1.64 (−3.41) ‡ | 1.51 (8.99) ‡ | 0.10 (1.58) | 1.36 | −0.10 (2.45) | 13.75 | 2.54 | S | US | 0.51 |
| SPE | −0.40 (−1.60) | 1.08 (12.60) ‡ | 0.01 (1.08) | 2.02 | −0.13 (4.13) ‡ | 6.59 | 0.51 | US | US | 0.75 |
| CRF | −1.52 (−0.54) | 1.03 (3.14) ‡ | 0.46 (0.78) | 3.16 | −0.02 (1.34) | 10.78 | 0.08 | US | US | 0.34 |
| CLM | 0.35 (0.54) | 1.00 (10.28) ‡ | −0.02 (−0.11) | 2.02 | −0.04 (2.08) | 18.67 † | 1.64 | S | US | 0.52 |
| CET | −1.20 (−2.52) ‡ | 1.29 (9.56) ‡ | 0.02 (0.70) | 2.10 | −0.07 (2.06) | 17.38 | 0.38 | US | US | 0.92 |
| INSI | −0.38 (−0.90) | 1.07 (7.74) ‡ | 0.02 (1.14) | 1.69 | −0.11 (3.49) † | 13.67 | 0.14 | S | US | 0.69 |
| VBF | 1.01 (1.06) | 0.59 (1.85) † | 0.03 (1.55) | 2.18 | −0.09 (3.51) † | 10.50 | 2.44 | S | US | 0.50 |
| MGF | 0.38 (0.98) | 0.84 (4.30) ‡ | −0.03 (−0.71) | 2.52 | −0.05 (2.51) | 22.98 ‡ | 0.47 | S | US | 0.42 |
| MIN | 0.36 (1.43) | 0.72 (5.33) ‡ | 0.03 (1.11) | 2.67 | −0.05 (2.88) | 8.09 | 3.48 † | S | US | 0.54 |
| ICB | 0.50 (0.93) | 0.84 (4.85) ‡ | −0.03 (−1.14) | 1.77 | −0.09 (2.94) | 17.52 | 1.30 | S | US | 0.63 |
| PAI | 0.49 (1.73) † | 0.75 (7.24) ‡ | 0.03 (2.05) ‡ | 2.62 | −0.15 (4.05) ‡ | 6.08 | 5.01 ‡ | S | US | 0.63 |
| MCI | 3.60 (1.35) | 0.12 (0.15) | −0.29 (−1.44) | 2.84 | −0.07 (1.80) | 7.79 | 3.00 † | S | US | 0.11 |
| MPV | 0.70 (0.54) | 0.70 (1.79) † | 0.04 (0.35) | 3.14 | −0.07 (2.18) | 12.62 | 1.14 | S | US | 0.11 |
| DUC | −0.85 (−3.04) ‡ | 1.27 (10.58) ‡ | 0.04 (1.92) † | 2.54 | −0.14 (3.36) † | 11.73 | 0.04 | US | US | 0.51 |
| KST | −0.08 (−0.06) | 0.97 (2.12) ‡ | 0.02 (0.39) | 2.52 | −0.05 (2.64) | 17.78 | 0.00 | US | US | 0.69 |
| PCM | −0.37 (−1.41) | 1.02 (10.27) ‡ | 0.09 (2.36) ‡ | 1.61 | −0.10 (3.49) † | 12.36 | 0.04 | S | US | 0.61 |
| KMM | −0.16 (−0.16) | 1.00 (2.64) ‡ | 0.03 (0.57) | 2.13 | −0.06 (2.56) | 19.99 † | 0.14 | S | US | 0.64 |
| JHI | 1.28 (1.10) | 0.45 (1.07) | 0.08 (1.12) | 2.19 | −0.05 (2.51) | 8.25 | 1.32 | S | S | 0.54 |
| PIM | 0.22 (0.85) | 0.81 (6.53) ‡ | 0.01 (0.35) | 1.45 | −0.08 (2.61) | 16.20 | 0.16 | US | US | 0.52 |
| MCR | 0.46 (0.79) | 0.76 (3.10) ‡ | 0.00 (0.05) | 2.82 | −0.08 (3.06) | 19.14 † | 6.38 ‡ | US | US | 0.72 |
| MMT | −0.32 (−1.14) | 1.07 (7.87) ‡ | 0.02 (1.58) | 2.08 | −0.12 (3.89) ‡ | 25.37 ‡ | 1.20 | US | US | 0.72 |
| PPT | 0.34 (1.25) | 0.71 (5.34) ‡ | 0.03 (1.18) | 2.59 | −0.10 (3.34) † | 12.31 | 1.38 | US | US | 0.56 |

Notes: a. Numbers inside the parentheses are values of t-ratios. b. ‡ and † indicate significance at 5% level and 10% level, respectively. c. At the 5% (10%) significance level, when there are 3 exogenous variables (k = 2), the upper bound critical value of the F-test is 4.85 (4.14), respectively. These values are from Pesaran et al. (2001, Table CI-Case III, p. 300). d. Number inside the parenthesis next to $ECM_{t-1}$ is the absolute value of the t-ratio. Its upper bound critical value at the 5% (10%) significance level is −3.53 (−3.21) when k = 2, and these come from Pesaran et al. (2001, Table CII-Case III, p. 303). e. LM is Lagrange multiplier test of residual serial correlation. It is distributed as $\chi^2$ with one degree of freedom (12th order). Its critical value at 5% (10%) significance level is 21.02 (18.54). f. RESET is Ramsey's test for misspecification. It is distributed as $\chi^2$ with one degree of freedom. Its critical value at 5% (10%) significance level is 3.84 (4.24).

Entitlement programs (ENT) in Table 8 has at least one short-run coefficient that is significant in eighteen cases. Sixteen of these significant short-run coefficients are affected positively by the ENT subindex: ADX, GAB, GAM, FUND, SOR, USA, GRF, SPE, VBF, MIN, PAI, DUC, PCM, KMM, MCR, and MMT. MCI and MPV are affected negatively. The ENT subindex also has a positive effect on most CEF data. In 14 cases, the long-run coefficient carries a significant coefficient. Cointegration is supported in two cases using the F-test for the ENT index; for twelve cases, cointegration is supported using the ECM *t*-test. Per diagnostic tests, LM fails in six cases, and RESET fails in five cases.

**Table 8.** Short-Run Coefficient Estimates—Linear ARDL—Model P = f (NAV, ENT).

**Panel A**

| FUNDS | Short-Run Coefficient Estimates | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $\Delta$ *Ln* $ENT_t$ | $\Delta$ *Ln* $ENT_{t-1}$ | $\Delta$ *Ln* $ENT_{t-2}$ | $\Delta$ *Ln* $ENT_{t-3}$ | $\Delta$ *Ln* $ENT_{t-4}$ | $\Delta$ *Ln* $ENT_{t-5}$ | $\Delta$ *Ln* $ENT_{t-6}$ | $\Delta$ *Ln* $ENT_{t-7}$ | $\Delta$ *Ln* $ENT_{t-8}$ | $\Delta$ *Ln* $ENT_{t-9}$ |
| ADX | 0.00 (3.13) ‡ | | | | | | | | | |
| GAB | 0.01 (3.14) ‡ | | | | | | | | | |
| GAM | 0.00 (1.34) | 0.00 (2.27) ‡ | | | | | | | | |
| FUND | 0.01 (2.71) ‡ | 0.01 (3.05) ‡ | 0.00 (−0.08) | 0.01 (2.37) ‡ | 0.00 (1.46) | | | | | |
| RMT | 0.00 (1.09) | | | | | | | | | |
| RVT | 0.00 (1.59) | | | | | | | | | |
| SOR | 0.00 (0.20) | 0.01 (1.95) † | | | | | | | | |
| TY | 0.00 (1.45) | | | | | | | | | |
| USA | 0.01 (2.89) ‡ | | | | | | | | | |
| GRF | 0.01 (1.98) ‡ | | | | | | | | | |
| SPE | 0.00 (−0.40) | 0.00 (−1.96) † | 0.00 (−1.91) † | | | | | | | |
| CRF | −0.01 (−1.36) | | | | | | | | | |
| CLM | −0.01 (−1.65) | | | | | | | | | |
| CET | 0.00 (1.12) | | | | | | | | | |
| INSI | 0.00 (0.94) | | | | | | | | | |
| VBF | 0.01 (3.25) ‡ | | | | | | | | | |
| MGF | 0.00 (0.92) | | | | | | | | | |
| MIN | 0.01 (3.12) ‡ | 0.00 (−1.65) † | 0.00 (−2.48) ‡ | | | | | | | |
| ICB | 0.00 (1.19) | | | | | | | | | |
| PAI | 0.01 (1.94) † | 0.00 (1.45) | 0.00 (1.38) | 0.00 (1.14) | 0.01 (3.05) ‡ | | | | | |
| MCI | −0.01 (−1.47) | −0.01 (−1.78) † | | | | | | | | |
| MPV | −0.01 (−0.97) | −0.02 (−2.66) ‡ | −0.01 (−2.68) ‡ | | | | | | | |
| DUC | 0.01 (2.77) ‡ | | | | | | | | | |
| KST | 0.00 (1.16) | | | | | | | | | |
| PCM | 0.01 (2.78) ‡ | | | | | | | | | |
| KMM | 0.01 (2.19) ‡ | | | | | | | | | |
| JHI | 0.00 (0.20) | | | | | | | | | |
| PIM | 0.00 (0.11) | | | | | | | | | |
| MCR | 0.01 (4.39) ‡ | | | | | | | | | |
| MMT | 0.00 (3.48) ‡ | | | | | | | | | |
| PPT | 0.00 (−0.66) | | | | | | | | | |

**Panel B**

| FUNDS | LR Coefficient Estimates | | | Diagnostic Statistics Associated with Linear ARDL Model | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Constant* | *Ln NAV* | *Ln ENT* | *F Stat* | $ECM_{t\text{-}1}$ | *LM* | *RESET* | *CUSUM* | *C-SQ* | *Adj.* $R^2$ |
| ADX | −0.76 (−3.14) ‡ | 1.17 (17.81) ‡ | 0.04 (2.05) ‡ | 2.51 | −0.07 (2.55) | 16.83 | 5.91 ‡ | S | US | 0.96 |
| GAB | −1.01 (−3.07) ‡ | 1.29 (12.76) ‡ | 0.10 (2.71) ‡ | 2.25 | −0.08 (3.45) † | 9.93 | 2.67 | S | US | 0.84 |
| GAM | −6.99 (−0.46) | 2.50 (0.76) | 0.31 (0.43) | 2.36 | −0.01 (0.46) | 23.07 ‡ | 2.30 | S | US | 0.95 |
| FUND | −1.18 (−2.04) ‡ | 1.51 (7.18) ‡ | 0.01 (0.22) | 0.99 | −0.05 (2.34) | 8.09 | 0.24 | S | US | 0.91 |
| RMT | −0.96 (−2.11) ‡ | 1.28 (9.79) ‡ | 0.04 (0.89) | 3.95 | −0.05 (2.24) | 13.68 | 0.43 | S | US | 0.92 |
| RVT | −1.89 (−1.88) † | 1.51 (5.55) ‡ | 0.09 (1.15) | 3.43 | −0.03 (2.11) | 23.12 ‡ | 2.63 | S | US | 0.93 |
| SOR | −2.08 (−0.63) | 1.38 (2.14) ‡ | 0.11 (0.51) | 2.66 | −0.01 (1.07) | 4.71 | 1.85 | US | US | 0.87 |
| TY | −0.71 (−1.74) † | 1.13 (11.56) ‡ | 0.03 (1.11) | 2.64 | −0.05 (1.98) | 15.86 | 2.10 | S | US | 0.93 |
| USA | −1.14 (−3.12) ‡ | 1.28 (13.45) ‡ | 0.11 (2.15) ‡ | 1.61 | −0.05 (3.01) | 9.51 | 0.37 | S | US | 0.86 |
| GRF | −1.99 (−2.85) ‡ | 1.67 (6.74) ‡ | 0.10 (1.83) † | 1.97 | −0.08 (2.99) | 6.94 | 1.39 | S | US | 0.49 |
| SPE | −0.28 (−1.28) | 1.02 (12.12) ‡ | 0.03 (1.91) † | 4.70 † | −0.14 (4.41) ‡ | 3.72 | 1.32 | US | US | 0.75 |
| CRF | 2.02 (1.47) | 0.94 (4.66) ‡ | −0.33 (−1.32) | 1.87 | −0.03 (1.99) | 9.59 | 0.23 | US | US | 0.35 |
| CLM | 1.20 (1.78) † | 0.97 (11.38) ‡ | −0.18 (−1.44) | 0.61 | −0.05 (2.31) | 17.17 | 4.85 ‡ | S | US | 0.52 |

**Table 8.** *Cont.*

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| CET | −1.74 (−1.74) † | 1.43 (5.38) ‡ | 0.03 (0.86) | 1.63 | −0.05 (1.56) | 13.41 | 0.85 | S | US | 0.92 |
| INSI | −0.37 (−0.84) | 1.08 (7.34) ‡ | 0.01 (0.96) | 2.40 | −0.11 (3.43) † | 13.40 | 0.18 | S | US | 0.69 |
| VBF | 1.02 (1.49) | 0.56 (2.36) ‡ | 0.05 (3.54) ‡ | 3.76 | −0.12 (4.42) ‡ | 10.87 | 0.79 | S | US | 0.52 |
| MGF | 0.20 (0.62) | 0.81 (4.95) ‡ | 0.02 (1.00) | 2.38 | −0.06 (2.71) | 20.35 † | 0.90 | S | US | 0.42 |
| MIN | −0.09 (−0.87) | 0.85 (17.43) ‡ | 0.07 (5.98) ‡ | 3.84 | −0.12 (4.98) ‡ | 6.05 | 2.48 | S | US | 0.57 |
| ICB | 0.14 (0.34) | 0.89 (6.25) ‡ | 0.02 (1.21) | 3.02 | −0.10 (3.30) † | 18.88 † | 0.45 | S | US | 0.63 |
| PAI | 0.41 (1.06) | 0.81 (6.24) ‡ | 0.01 (0.44) | 2.26 | −0.13 (3.52) † | 10.43 | 5.82 ‡ | S | US | 0.64 |
| MCI | 0.54 (0.49) | 0.83 (2.26) ‡ | 0.01 (0.09) | 3.03 | −0.09 (2.31) | 10.76 | 3.40 † | S | US | 0.09 |
| MPV | 1.26 (0.91) | 0.55 (1.15) | 0.00 (−0.05) | 3.46 | −0.05 (1.75) | 14.43 | 0.40 | S | US | 0.08 |
| DUC | −1.10 (−4.53) ‡ | 1.37 (14.29) ‡ | 0.04 (2.61) ‡ | 1.63 | −0.16 (4.56) ‡ | 18.38 | 1.21 | US | US | 0.49 |
| KST | −0.17 (−0.15) | 0.95 (2.21) ‡ | 0.05 (1.06) | 2.91 | −0.05 (2.62) | 16.79 | 0.00 | US | US | 0.69 |
| PCM | −0.58 (−1.53) | 1.09 (9.04) ‡ | 0.09 (2.00) ‡ | 1.75 | −0.08 (2.93) | 13.37 | 0.35 | S | US | 0.61 |
| KMM | −0.46 (−0.69) | 1.03 (3.59) ‡ | 0.08 (2.01) ‡ | 2.50 | −0.07 (3.00) | 12.66 | 0.48 | S | US | 0.65 |
| JHI | 0.56 (0.71) | 0.68 (2.56) ‡ | 0.08 (2.38) ‡ | 2.38 | −0.07 (3.22) † | 8.53 | 0.94 | S | US | 0.53 |
| PIM | 0.25 (0.77) | 0.81 (5.90) ‡ | 0.00 (0.11) | 0.89 | −0.08 (2.45) | 16.83 | 0.22 | S | US | 0.52 |
| MCR | −0.07 (−0.36) | 0.93 (10.68) ‡ | 0.03 (5.40) ‡ | 4.28 † | −0.22 (6.00) ‡ | 34.14 ‡ | 7.10 ‡ | S | US | 0.75 |
| MMT | −0.10 (−0.54) | 0.93 (9.37) ‡ | 0.03 (3.72) ‡ | 4.09 | −0.16 (5.14) ‡ | 27.05 ‡ | 0.29 | US | US | 0.73 |
| PPT | 0.14 (0.54) | 0.79 (6.73) ‡ | 0.04 (1.95) † | 2.37 | −0.12 (3.57) ‡ | 13.29 | 2.60 | US | US | 0.57 |

Notes: a. Numbers inside the parentheses are values of t-ratios. b. ‡ and † indicate significance at 5% level and 10% level, respectively. c. At the 5% (10%) significance level, when there are 3 exogenous variables (k = 2), the upper bound critical value of the F-test is 4.85 (4.14), respectively. These values are from Pesaran et al. (2001, Table CI-Case III, p. 300). d. Number inside the parenthesis next to $ECM_{t-1}$ is the absolute value of the t-ratio. Its upper bound critical value at the 5% (10%) significance level is −3.53 (−3.21) when k = 2, and these come from Pesaran et al. (2001, Table CII-Case III, p. 303). e. LM is Lagrange multiplier test of residual serial correlation. It is distributed as $\chi^2$ with one degree of freedom (12th order). Its critical value at 5% (10%) significance level is 21.02 (18.54). f. RESET is Ramsey's test for misspecification. It is distributed as $\chi^2$ with one degree of freedom. Its critical value at 5% (10%) significance level is 3.84 (4.24).

Moving to Table 9 for the regulation (REG) index, we see at least one short-run coefficient that is significant in sixteen CEF cases. GAB, FUND, SOR, and MCR are affected positively by the REG subindex. Nine CEF cases, RMT, USA, GRF, SPE, CLM, MCI, MPV, PIM, and PPT, are affected negatively, and ADX, GAM, and MIN have mixed results. The negative effect of the REG subindex is more than positive. Twelve long-run coefficients are statistically significant. In three cases, cointegration is significant with the F-test, and eleven cases support cointegration with the ECM *t*-test. While four cases fail autocorrelation test, eight cases fail the specification.

**Table 9.** Short-Run Coefficient Estimates—Linear ARDL—Model P = f (NAV, REG).

| | **Panel A** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Short-Run Coefficient Estimates** | | | | | | | | | |
| **FUNDS** | $\Delta$ ***Ln*** $REG_t$ | $\Delta$ ***Ln*** $REG_{t-1}$ | $\Delta$ ***Ln*** $REG_{t-2}$ | $\Delta$ ***Ln*** $REG_{t-3}$ | $\Delta$ ***Ln*** $REG_{t-4}$ | $\Delta$ ***Ln*** $REG_{t-5}$ | $\Delta$ ***Ln*** $REG_{t-6}$ | $\Delta$ ***Ln*** $REG_{t-7}$ | $\Delta$ ***Ln*** $REG_{t-8}$ | $\Delta$ ***Ln*** $REG_{t-9}$ |
| ADX | 0.00 (−0.85) | 0.00 (−1.97) † | 0.00 (−1.62) | −0.01 (−3.48) ‡ | 0.00 (−2.54) ‡ | | | | | |
| GAB | 0.01 (2.48) ‡ | | | | | | | | | |
| GAM | 0.00 (−0.10) | 0.00 (1.04) | 0.01 (1.71) † | 0.00 (−1.76) † | | | | | | |
| FUND | 0.00 (−0.53) | 0.01 (2.04) ‡ | | | | | | | | |
| RMT | −0.01 (−1.72) † | | | | | | | | | |
| RVT | 0.00 (−1.02) | | | | | | | | | |
| SOR | 0.00 (−0.81) | 0.01 (2.16) ‡ | | | | | | | | |
| TY | 0.00 (0.74) | | | | | | | | | |
| USA | −0.01 (−2.19) ‡ | −0.01 (−2.41) ‡ | | | | | | | | |

**Table 9.** *Cont.*

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| GRF | −0.01 (−1.09) | −0.01 (−1.81) † | | | | | | | | |
| SPE | 0.00 (−1.33) | −0.01 (−2.62) ‡ | −0.01 (−1.73) † | | | | | | | |
| CRF | −0.02 (−1.33) | | | | | | | | | |
| CLM | −0.03 (−2.69) ‡ | | | | | | | | | |
| CET | 0.00 (−0.18) | | | | | | | | | |
| INSI | 0.00 (−1.60) | 0.00 (−1.56) | | | | | | | | |
| VBF | 0.00 (0.58) | | | | | | | | | |
| MGF | 0.00 (0.24) | | | | | | | | | |
| MIN | 0.00 (0.52) | −0.01 (−2.77) ‡ | −0.01 (−1.72) † | −0.01 (−2.57) ‡ | 0.00 (−1.67) † | | | | | |
| ICB | 0.00 (0.46) | | | | | | | | | |
| PAI | 0.00 (0.52) | | | | | | | | | |
| MCI | −0.04 (−2.94) ‡ | −0.03 (−2.41) ‡ | −0.02 (−1.55) | −0.03 (−1.87) † | 0.00 (0.15) | −0.03 (−2.03) ‡ | −0.03 (−2.70) ‡ | | | |
| MPV | −0.01 (−1.85) † | −0.02 (−2.50) ‡ | −0.02 (−2.20) ‡ | −0.01 (−1.44) | −0.01 (−0.66) | −0.02 (−2.74) ‡ | −0.03 (−3.96) ‡ | | | |
| DUC | 0.00 (0.18) | | | | | | | | | |
| KST | 0.00 (0.00) | | | | | | | | | |
| PCM | 0.00 (−0.17) | | | | | | | | | |
| KMM | −0.01 (−1.25) | | | | | | | | | |
| JHI | 0.00 (0.12) | | | | | | | | | |
| PIM | 0.00 (−0.30) | −0.01 (−1.74) † | | | | | | | | |
| MCR | 0.00 (2.49) ‡ | | | | | | | | | |
| MMT | 0.00 (−1.42) | 0.00 (−1.54) | | | | | | | | |
| PPT | 0.00 (−1.08) | −0.01 (−2.46) ‡ | | | | | | | | |
| | **Panel B** | | | | | | | | | |
| **FUNDS** | **LR Coefficient Estimates** | | | **Diagnostic Statistics Associated with Linear ARDL Model** | | | | | | |
| | ***Constant*** | ***Ln NAV*** | ***Ln REG*** | ***F Stat*** | $ECM_{t-1}$ | ***LM*** | ***RESET*** | ***CUSUM*** | ***C-SQ*** | ***Adj.*** $R^2$ |
| ADX | −0.80 (−2.82) ‡ | 1.17 (17.48) ‡ | 0.04 (1.57) | 2.42 | −0.08 (2.73) | 15.93 | 4.91 ‡ | S | US | 0.96 |
| GAB | −1.73 (−2.02) ‡ | 1.46 (6.89) ‡ | 0.18 (1.77) † | 1.17 | −0.06 (2.49) | 11.46 | 2.95 † | S | US | 0.84 |
| GAM | −1.99 (−0.46) | 1.41 (1.62) | 0.08 (0.28) | 3.07 | −0.01 (0.63) | 12.65 | 1.39 | US | US | 0.95 |
| FUND | −0.80 (−1.52) | 1.37 (8.41) ‡ | −0.01 (−0.19) | 1.32 | −0.06 (2.79) | 20.30 † | 0.18 | S | US | 0.90 |
| RMT | −0.56 (−1.06) | 1.22 (9.42) ‡ | −0.01 (−0.19) | 2.97 | −0.06 (2.51) | 14.02 | 0.08 | S | US | 0.92 |
| RVT | −1.51 (−1.18) | 1.44 (4.74) ‡ | 0.04 (0.39) | 2.76 | −0.03 (2.01) | 16.58 | 3.80 † | US | US | 0.93 |
| SOR | 0.24 (0.12) | 1.06 (2.69) ‡ | −0.11 (−0.65) | 2.39 | −0.02 (1.32) | 3.88 | 2.79 † | US | US | 0.87 |
| TY | −0.60 (−1.59) | 1.11 (13.05) ‡ | 0.02 (0.69) | 3.16 | −0.06 (2.12) | 16.24 | 2.59 | S | US | 0.93 |
| USA | −1.47 (−1.86) † | 1.35 (8.82) ‡ | 0.15 (1.31) | 1.33 | −0.05 (2.61) | 13.37 | 0.29 | S | US | 0.87 |
| GRF | −3.18 (−2.21) ‡ | 1.97 (4.81) ‡ | 0.21 (1.58) | 1.83 | −0.06 (2.60) | 5.60 | 1.00 | S | US | 0.50 |
| SPE | −0.38 (−1.72) † | 1.04 (13.33) ‡ | 0.03 (1.89) † | 6.09 ‡ | −0.14 (4.40) ‡ | 5.01 | 2.61 | US | US | 0.75 |
| CRF | 3.19 (1.40) | 0.88 (4.06) ‡ | −0.52 (−1.26) | 1.71 | −0.03 (1.95) | 9.73 | 0.45 | US | US | 0.35 |
| CLM | 1.07 (1.09) | 0.95 (11.23) ‡ | −0.13 (−0.76) | 0.45 | −0.05 (2.62) | 21.84 ‡ | 3.66 † | S | US | 0.52 |
| CET | −1.06 (−1.73) † | 1.28 (7.95) ‡ | −0.01 (−0.19) | 2.44 | −0.06 (1.87) | 16.81 | 0.38 | US | US | 0.92 |
| INSI | −0.61 (−1.37) | 1.13 (8.14) ‡ | 0.03 (1.52) | 2.21 | −0.12 (3.65) ‡ | 12.34 | 0.05 | S | US | 0.69 |
| VBF | 0.41 (0.67) | 0.73 (3.51) ‡ | 0.07 (3.92) ‡ | 5.45 ‡ | −0.13 (4.60) ‡ | 9.41 | 0.16 | S | US | 0.52 |
| MGF | −0.13 (−0.49) | 0.88 (7.62) ‡ | 0.07 (2.47) ‡ | 4.11 | −0.08 (3.21) † | 18.54 | 0.74 | S | US | 0.43 |
| MIN | −0.36 (−3.20) ‡ | 0.92 (20.72) ‡ | 0.10 (6.48) ‡ | 5.45 ‡ | −0.13 (5.33) ‡ | 6.07 | 0.73 | S | US | 0.57 |
| ICB | 0.17 (0.38) | 0.90 (5.82) ‡ | 0.01 (0.47) | 3.71 | −0.09 (3.13) | 17.27 | 0.73 | S | US | 0.62 |
| PAI | −0.22 (−0.45) | 0.97 (6.62) ‡ | 0.05 (2.07) ‡ | 2.20 | −0.15 (4.04) ‡ | 7.19 | 7.10 ‡ | S | US | 0.63 |
| MCI | 0.38 (0.40) | 0.89 (2.90) ‡ | 0.01 (0.10) | 3.41 | −0.10 (2.62) | 8.76 | 5.87 ‡ | S | US | 0.15 |
| MPV | 1.08 (1.05) | 0.61 (1.71) † | 0.00 (−0.02) | 3.60 | −0.05 (2.25) | 13.89 | 0.48 | S | US | 0.10 |
| DUC | −1.30 (−3.94) ‡ | 1.42 (12.75) ‡ | 0.05 (2.04) ‡ | 2.30 | −0.15 (3.48) † | 13.88 | 1.10 | US | US | 0.51 |
| KST | 0.20 (0.17) | 0.90 (2.05) ‡ | 0.00 (0.00) | 2.40 | −0.05 (2.49) | 16.56 | 0.00 | US | US | 0.68 |

**Table 9.** *Cont.*

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| PCM | −0.84 (−1.30) | 1.18 (7.47) ‡ | 0.10 (1.34) | 1.10 | −0.08 (2.64) | 12.11 | 0.53 | S | US | 0.60 |
| KMM | −0.16 (−0.18) | 0.95 (2.64) ‡ | 0.05 (0.75) | 2.14 | −0.06 (2.51) | 14.13 | 0.52 | S | US | 0.65 |
| JHI | −0.37 (−0.38) | 0.92 (3.21) ‡ | 0.12 (2.29) ‡ | 2.11 | −0.07 (3.20) | 9.48 | 1.18 | S | US | 0.53 |
| PIM | −0.37 (−1.29) | 0.97 (10.04) ‡ | 0.07 (2.31) ‡ | 0.94 | −0.12 (3.66) ‡ | 17.79 | 0.92 | S | US | 0.53 |
| MCR | 0.00 (0.01) | 0.89 (6.50) ‡ | 0.03 (2.71) ‡ | 3.78 | −0.14 (4.49) ‡ | 20.95 † | 7.08 ‡ | S | US | 0.74 |
| MMT | −0.22 (−0.88) | 0.99 (7.62) ‡ | 0.03 (1.88) † | 3.25 | −0.12 (4.13) ‡ | 21.22 ‡ | 0.17 | S | US | 0.72 |
| PPT | −0.40 (−1.43) | 0.96 (9.01) ‡ | 0.09 (3.26) ‡ | 2.29 | −0.14 (4.22) ‡ | 14.68 | 2.01 | S | US | 0.58 |

Notes: a. Numbers inside the parentheses are values of t-ratios. b. ‡ and † indicate significance at 5% level and 10% level, respectively. c. At the 5% (10%) significance level, when there are 3 exogenous variables (k = 2), the upper bound critical value of the F-test is 4.85 (4.14), respectively. These values are Pesaran et al. (2001, Table CI-Case III, p. 300). d. Number inside the parenthesis next to $ECM_{t-1}$ is the absolute value of the t-ratio. Its upper bound critical value at the 5% (10%) significance level is −3.53 (−3.21) when k = 2, and these come from Pesaran et al. (2001, Table CII-Case III, p. 303). e. LM is Lagrange multiplier test of residual serial correlation. It is distributed as $\chi^2$ with one degree of freedom (12th order). Its critical value at 5% (10%) significance level is 21.02 (18.54). f. RESET is Ramsey's test for misspecification. It is distributed as $\chi^2$ with one degree of freedom. Its critical value at 5% (10%) significance level is 3.84 (4.24).

Turning to Table 10, the financial regulation (FREG) index has at least one short-run coefficient that is significant in nineteen cases. Five of the significant short-run coefficients are affected positively by the FREG subindex: FUND, CRF, ICB, PAI, and MCR. Eleven CEF cases, ADX, USA, GRF, SPE, CLM, CET, MGF, DUC, KST, PCM, and MMT, are affected negatively, and finally PIM, KMM, and PPT report mixed results. Clearly, the FREG subindex has more negatively affected CEF cases. Twelve cases report a significant long-run coefficient. The F-test supports cointegration in three cases, and the ECM *t*-test supports cointegration in six cases. While thirteen cases fail autocorrelation, five of them fail the RESET.

**Table 10.** Short-Run Coefficient Estimates—Linear ARDL—Model P = f (NAV, FREG).

| **Panel A** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **FUNDS** | **Short-Run Coefficient Estimates** | | | | | | | | | |
| | **Δ *Ln* $FREG_t$** | **Δ *Ln* $FREG_{t-1}$** | **Δ *Ln* $FREG_{t-2}$** | **Δ *Ln* $FREG_{t-3}$** | **Δ *Ln* $FREG_{t-4}$** | **Δ *Ln* $FREG_{t-5}$** | **Δ *Ln* $FREG_{t-6}$** | **Δ *Ln* $FREG_{t-7}$** | **Δ *Ln* $FREG_{t-8}$** | **Δ *Ln* $FREG_{t-9}$** |
| ADX | 0.00 (−0.28) | −0.01 (−1.91) † | | | | | | | | |
| GAB | 0.00 (0.45) | | | | | | | | | |
| GAM | 0.00 (−1.21) | | | | | | | | | |
| FUND | 0.00 (1.68) † | | | | | | | | | |
| RMT | 0.00 (0.02) | | | | | | | | | |
| RVT | 0.00 (0.23) | | | | | | | | | |
| SOR | −0.01 (−0.92) | | | | | | | | | |
| TY | 0.00 (0.60) | | | | | | | | | |
| USA | 0.00 (−0.22) | −0.01 (−1.93) † | | | | | | | | |
| GRF | 0.00 (0.55) | −0.03 (−1.95) † | −0.02 (−1.52) | −0.03 (−2.56) ‡ | −0.01 (−1.63) | | | | | |
| SPE | 0.00 (−0.76) | −0.04 (−3.90) ‡ | −0.04 (−3.54) ‡ | −0.03 (−3.44) ‡ | −0.04 (−4.11) ‡ | −0.04 (−4.01) ‡ | −0.03 (−4.00) ‡ | −0.03 (−3.85) ‡ | −0.03 (−4.28) ‡ | −0.01 (−2.48) ‡ |
| CRF | −0.01 (−0.51) | 0.04 (2.80) ‡ | | | | | | | | |
| CLM | 0.00 (−0.70) | −0.03 (−1.42) | −0.03 (−1.41) | −0.03 (−1.46) | −0.03 (−1.77) † | −0.02 (−1.37) | −0.02 (−1.01) | −0.01 (−0.42) | −0.01 (−0.97) | −0.01 (−1.86) † |
| CET | 0.00 (0.27) | −0.04 (−3.35) ‡ | −0.03 (−3.15) ‡ | −0.04 (−3.49) ‡ | −0.04 (−3.25) ‡ | −0.04 (−3.39) ‡ | −0.04 (−3.26) ‡ | −0.04 (−4.10) ‡ | −0.03 (−3.52) ‡ | −0.01 (−2.43) ‡ |
| INSI | 0.00 (−0.62) | | | | | | | | | |
| VBF | 0.00 (0.35) | | | | | | | | | |
| MGF | 0.00 (−0.52) | −0.01 (−1.97) † | −0.01 (−2.04) † | −0.01 (−2.48) ‡ | −0.02 (−2.94) ‡ | −0.01 (−2.50) ‡ | −0.01 (−2.60) ‡ | −0.01 (−3.05) ‡ | −0.01 (−1.51) | −0.01 (−2.36) ‡ |

**Table 10.** *Cont.*

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| MIN | 0.00 (−0.24) | | | | | | | | | |
| ICB | 0.00 (0.47) | 0.03 (3.97) ‡ | 0.02 (3.75) ‡ | 0.01 (1.92) † | | | | | | |
| PAI | 0.00 (0.13) | 0.00 (0.79) | 0.01 (1.33) | 0.00 (−0.20) | 0.00 (0.18) | 0.01 (1.31) | 0.00 (−0.25) | 0.00 (−0.44) | 0.01 (2.26) ‡ | |
| MCI | −0.01 (−0.89) | | | | | | | | | |
| MPV | −0.01 (−1.33) | | | | | | | | | |
| DUC | 0.00 (−0.18) | −0.01 (−1.65) | −0.01 (−0.97) | −0.02 (−3.00) ‡ | −0.02 (−2.30) ‡ | −0.01 (−1.14) | −0.02 (−2.63) ‡ | −0.02 (−3.20) ‡ | | |
| KST | −0.01 (−2.12) ‡ | | | | | | | | | |
| PCM | −0.01 (−1.70) † | 0.00 (0.14) | 0.00 (0.02) | −0.01 (−0.42) | −0.01 (−0.43) | 0.00 (−0.15) | 0.00 (−0.36) | 0.00 (−0.12) | −0.01 (−1.16) | −0.01 (−2.46) ‡ |
| KMM | −0.01 (−2.03) † | 0.02 (2.36) ‡ | 0.02 (3.19) ‡ | | | | | | | |
| JHI | 0.00 (−1.23) | | | | | | | | | |
| PIM | −0.01 (−2.30) ‡ | 0.04 (2.09) ‡ | 0.05 (2.51) ‡ | 0.04 (1.95) † | 0.03 (1.78) † | 0.02 (1.53) | 0.01 (0.73) | 0.01 (0.88) | 0.00 (−0.51) | −0.01 (−1.59) |
| MCR | 0.00 (−1.40) | 0.02 (1.97) † | 0.02 (2.24) ‡ | 0.01 (2.11) ‡ | 0.01 (1.11) | 0.01 (1.69) | | | | |
| MMT | −0.01 (−1.73) † | | | | | | | | | |
| PPT | −0.01 (−1.69) † | 0.02 (2.34) ‡ | 0.02 (3.54) ‡ | 0.02 (2.56) ‡ | 0.01 (1.77) † | 0.01 (2.24) ‡ | | | | |
| | **Panel B** | | | | | | | | | |
| **FUNDS** | **LR Coefficient Estimates** | | | **Diagnostic Statistics Associated with Linear ARDL Model** | | | | | | |
| | ***Constant*** | ***Ln NAV*** | ***Ln FREG*** | ***F Stat*** | ***$ECM_{t-1}$*** | ***LM*** | ***RESET*** | ***CUSUM*** | ***C-SQ*** | ***Adj. $R^2$*** |
| ADX | −2.74 (−0.38) | 1.65 (0.91) | 0.20 (0.36) | 1.15 | −0.04 (0.39) | 14.41 | 2.59 | S | S | 0.94 |
| GAB | −1.12 (−0.82) | 1.28 (2.94) ‡ | 0.14 (1.28) | 0.89 | −0.09 (1.37) | 12.42 | 5.30 ‡ | S | US | 0.65 |
| GAM | −0.79 (−1.55) | 1.19 (9.71) ‡ | 0.01 (0.47) | 8.55 ‡ | −0.18 (2.26) | 13.63 | 0.46 | US | US | 0.86 |
| FUND | −0.89 (−4.77) ‡ | 1.36 (14.60) ‡ | 0.02 (1.96) † | 0.76 | −0.22 (2.79) | 13.99 | 0.74 | S | S | 0.93 |
| RMT | −2.21 (−1.43) | 1.71 (3.13) ‡ | 0.10 (1.38) | 0.30 | −0.06 (1.33) | 14.57 | 0.11 | S | S | 0.96 |
| RVT | −5.35 (−0.69) | 2.59 (1.05) | 0.25 (0.86) | 0.26 | −0.02 (0.78) | 22.23 ‡ | 0.13 | S | S | 0.93 |
| SOR | −7.41 (−0.54) | 3.10 (0.80) | −0.14 (−0.41) | 2.85 | −0.04 (0.61) | 11.09 | 0.20 | S | US | 0.73 |
| TY | −0.11 (−0.35) | 0.97 (12.36) ‡ | 0.01 (0.58) | 3.92 | −0.13 (2.01) | 16.18 | 2.42 | S | S | 0.91 |
| USA | −0.94 (−0.84) | 1.12 (3.85) ‡ | 0.17 (1.34) | 2.96 | −0.10 (1.93) | 22.25 ‡ | 0.19 | S | S | 0.78 |
| GRF | −0.61 (−0.74) | 1.10 (3.93) ‡ | 0.11 (2.17) ‡ | 1.52 | −0.32 (3.32) † | 12.32 | 0.54 | S | S | 0.43 |
| SPE | −0.03 (−0.05) | 0.87 (4.04) ‡ | 0.06 (6.61) ‡ | 3.92 | −0.69 (4.18) ‡ | 29.33 ‡ | 0.04 | S | S | 0.53 |
| CRF | 12.31 (12.78) ‡ | −1.48 (−8.21) ‡ | −0.15 (−3.81) ‡ | 2.91 | −0.45 (5.28) ‡ | 13.63 | 0.07 | S | S | 0.52 |
| CLM | −0.45 (−0.32) | 1.09 (4.86) ‡ | −0.05 (−0.72) | 2.77 | 0.30 (1.80) | 22.17 ‡ | 1.32 | S | S | 0.88 |
| CET | −2.71 (−3.30) ‡ | 1.56 (8.67) ‡ | 0.17 (3.00) ‡ | 0.78 | −0.26 (2.62) | 23.54 ‡ | 1.67 | S | S | 0.94 |
| INSI | 6.69 (0.82) | −1.29 (−0.48) | 0.04 (0.99) | 1.16 | −0.07 (1.16) | 13.79 | 0.88 | S | S | 0.55 |
| VBF | 0.21 (0.07) | 0.84 (0.89) | 0.05 (2.09) ‡ | 2.62 | −0.13 (1.86) | 5.89 | 0.75 | S | S | 0.39 |
| MGF | 5.97 (0.85) | −2.24 (−0.60) | 0.08 (0.98) | 2.58 | −0.12 (1.04) | 39.41 ‡ | 2.89 † | S | US | 0.87 |
| MIN | −1.24 (−1.29) | 1.59 (3.23) ‡ | 0.00 (−0.23) | 7.87 ‡ | −0.18 (2.06) | 17.38 | 0.21 | US | S | 0.58 |
| ICB | 108.82 (0.22) | −35.46 (−0.21) | −1.41 (−0.22) | 5.86 ‡ | −0.02 (0.23) | 13.81 | 0.30 | S | S | 0.57 |
| PAI | −0.65 (−0.17) | 1.22 (0.88) | −0.01 (−0.07) | 1.68 | −0.06 (0.88) | 15.48 | 9.17 ‡ | S | S | 0.64 |
| MCI | 2.32 (2.57) ‡ | 0.10 (0.27) | −0.03 (−0.82) | 3.21 | −0.22 (2.39) | 19.91 † | 0.07 | S | S | 0.15 |
| MPV | 2.68 (2.60) ‡ | −0.05 (−0.11) | −0.05 (−1.15) | 1.21 | −0.15 (1.65) | 20.46 † | 0.94 | S | US | 0.34 |
| DUC | −0.40 (−0.47) | 1.08 (3.15) ‡ | 0.05 (2.73) ‡ | 2.42 | −0.31 (2.96) | 4.72 | 6.30 ‡ | S | S | 0.55 |
| KST | 0.30 (0.25) | 1.00 (2.26) ‡ | −0.06 (−1.91) † | 1.30 | −0.25 (3.32) † | 10.73 | 0.14 | S | S | 0.45 |
| PCM | 10.22 (0.55) | −3.00 (−0.42) | 0.04 (0.38) | 2.19 | −0.09 (0.88) | 19.92 † | 0.10 | S | S | 0.37 |
| KMM | 3.67 (2.91) ‡ | −0.46 (−0.96) | −0.13 (−2.14) ‡ | 1.01 | −0.21 (2.86) | 13.90 | 0.86 | S | S | 0.54 |
| JHI | −1.14 (−0.27) | 1.44 (1.08) | −0.06 (−0.54) | 0.74 | −0.05 (0.76) | 19.95 † | 0.58 | US | S | 0.49 |
| PIM | 3.98 (4.41) ‡ | −0.90 (−2.31) ‡ | −0.09 (−2.48) ‡ | 1.92 | −0.53 (4.51) ‡ | 37.85 ‡ | 8.07 ‡ | S | US | 0.61 |

**Table 10.** *Cont.*

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| MCR | 8.15 (2.63) ‡ | −2.36 (−1.88) † | −0.17 (−2.28) ‡ | 1.90 | −0.17 (2.27) | 25.04 ‡ | 0.17 | S | S | 0.65 |
| MMT | 2.17 (1.44) | −0.06 (−0.08) | −0.06 (−1.25) | 2.27 | −0.13 (1.55) | 15.56 | 0.02 | US | S | 0.50 |
| PPT | 2.43 (4.18) ‡ | −0.21 (−0.80) | −0.04 (−2.07) ‡ | 2.86 | −0.58 (5.57) ‡ | 25.71 ‡ | 1.14 | S | S | 0.65 |

Notes: a. Numbers inside the parentheses are values of t-ratios. b. ‡ and † indicate significance at 5% level and 10% level, respectively. c. At the 5% (10%) significance level, when there are 3 exogenous variables (k = 2), the upper bound critical value of the F-test is 4.85 (4.14), respectively. These values are Pesaran et al. (2001, Table CI-Case III, p. 300). d. Number inside the parenthesis next to $ECM_{t-1}$ is the absolute value of the t-ratio. Its upper bound critical value at the 5% (10%) significance level is −3.53 (−3.21) when k = 2, and these come from Pesaran et al. (2001, Table CII-Case III, p. 303). e. LM is Lagrange multiplier test of residual serial correlation. It is distributed as $\chi^2$ with one degree of freedom (12th order). Its critical value at 5% (10%) significance level is 21.02 (18.54). f. RESET is Ramsey's test for misspecification. It is distributed as $\chi^2$ with one degree of freedom. Its critical value at 5% (10%) significance level is 3.84 (4.24).

Table 11 shows, the trade policy (TRDP) subindex. Only four cases have a short-run coefficient significant. USA, ICB, PCM, and JHI are all positively affected. One case has a statistically significant long-run coefficient. No cases support cointegration with the F-test, but six of them report cointegration using an ECM test.

**Table 11.** Short-Run Coefficient Estimates—Linear ARDL—Model P = f (NAV, TRDP).

| | **Panel A** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **FUNDS** | **Short-Run Coefficient Estimates** | | | | | | | | | |
| | $\Delta\, Ln\ TRDP_t$ | $\Delta\, Ln\ TRDP_{t-1}$ | $\Delta\, Ln\ TRDP_{t-2}$ | $\Delta\, Ln\ TRDP_{t-3}$ | $\Delta\, Ln\ TRDP_{t-4}$ | $\Delta\, Ln\ TRDP_{t-5}$ | $\Delta\, Ln\ TRDP_{t-6}$ | $\Delta\, Ln\ TRDP_{t-7}$ | $\Delta\, Ln\ TRDP_{t-8}$ | $\Delta\, Ln\ TRDP_{t-9}$ |
| ADX | 0.00 (−1.44) | | | | | | | | | |
| GAB | 0.00 (0.87) | | | | | | | | | |
| GAM | 0.00 (1.14) | | | | | | | | | |
| FUND | 0.00 (0.06) | | | | | | | | | |
| RMT | 0.00 (0.79) | | | | | | | | | |
| RVT | 0.00 (−0.62) | 0.00 (−1.64) | | | | | | | | |
| SOR | 0.00 (0.49) | | | | | | | | | |
| TY | 0.00 (−0.77) | | | | | | | | | |
| USA | 0.00 (−1.00) | 0.00 (−1.97) † | | | | | | | | |
| GRF | 0.00 (−1.26) | | | | | | | | | |
| SPE | 0.00 (0.17) | | | | | | | | | |
| CRF | 0.00 (0.50) | 0.02 (1.37) | 0.02 (1.24) | 0.00 (−0.02) | 0.01 (0.77) | 0.00 (−0.40) | 0.01 (0.54) | −0.01 (−1.09) | 0.01 (1.06) | −0.01 (−1.37) |
| CLM | 0.00 (0.51) | | | | | | | | | |
| CET | 0.00 (−0.06) | | | | | | | | | |
| INSI | 0.00 (0.92) | | | | | | | | | |
| VBF | 0.00 (−1.22) | | | | | | | | | |
| MGF | 0.00 (0.16) | | | | | | | | | |
| MIN | 0.00 (1.08) | | | | | | | | | |
| ICB | 0.00 (2.29) ‡ | | | | | | | | | |
| PAI | 0.00 (0.98) | | | | | | | | | |
| MCI | −0.01 (−1.64) | | | | | | | | | |
| MPV | 0.00 (−0.13) | | | | | | | | | |
| DUC | 0.00 (0.99) | | | | | | | | | |
| KST | 0.00 (1.00) | | | | | | | | | |
| PCM | 0.00 (1.91) † | | | | | | | | | |
| KMM | 0.00 (0.84) | | | | | | | | | |
| JHI | 0.00 (1.76) † | | | | | | | | | |
| PIM | 0.00 (−0.20) | | | | | | | | | |
| MCR | 0.00 (1.17) | | | | | | | | | |

**Table 11.** *Cont.*

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| MMT | 0.00 (0.66) | | | | | | | | | |
| PPT | 0.00 (0.03) | | | | | | | | | |
| | **Panel B** | | | | | | | | | |
| **FUNDS** | **LR Coefficient Estimates** | | | **Diagnostic Statistics Associated with Linear ARDL Model** | | | | | | |
| | *Constant* | *Ln NAV* | *Ln TRDP* | *F Stat* | $ECM_{t-1}$ | *LM* | *RESET* | *CUSUM* | *C-SQ* | *Adj.* $R^2$ |
| ADX | −0.46 (−3.57) ‡ | 1.13 (22.10) ‡ | −0.01 (−1.37) | 2.37 | −0.08 (2.66) | 16.41 | 7.83 ‡ | S | US | 0.96 |
| GAB | −0.58 (−1.76) † | 1.24 (9.70) ‡ | 0.03 (0.80) | 1.04 | −0.06 (2.54) | 11.86 | 1.72 | S | US | 0.84 |
| GAM | −2.36 (−0.52) | 1.46 (1.49) | 0.13 (0.45) | 2.17 | −0.01 (0.51) | 21.30 ‡ | 2.12 | S | US | 0.95 |
| FUND | −0.88 (−2.58) ‡ | 1.38 (9.81) ‡ | 0.00 (0.06) | 1.31 | −0.06 (2.79) | 20.98 † | 0.45 | S | US | 0.90 |
| RMT | −0.78 (−2.35) ‡ | 1.25 (11.01) ‡ | 0.02 (0.70) | 2.67 | −0.05 (2.36) | 14.74 | 0.39 | S | US | 0.92 |
| RVT | −1.62 (−1.85) † | 1.41 (5.82) ‡ | 0.11 (1.12) | 3.16 | −0.03 (1.93) | 20.31 † | 3.03 † | S | US | 0.93 |
| SOR | −1.46 (−0.59) | 1.29 (2.41) ‡ | 0.06 (0.44) | 2.28 | −0.02 (1.22) | 3.80 | 2.18 | US | US | 0.87 |
| TY | −0.39 (−1.92) † | 1.10 (15.36) ‡ | −0.01 (−0.74) | 3.00 | −0.06 (2.19) | 15.60 | 2.06 | S | US | 0.93 |
| USA | −0.63 (−2.55) ‡ | 1.19 (13.60) ‡ | 0.05 (0.98) | 1.14 | −0.05 (2.78) | 12.06 | 0.00 | S | US | 0.86 |
| GRF | −1.20 (−2.02) ‡ | 1.63 (5.58) ‡ | −0.07 (−1.10) | 1.12 | −0.06 (2.47) | 9.72 | 1.46 | S | US | 0.49 |
| SPE | −0.31 (−1.24) | 1.07 (11.84) ‡ | 0.00 (0.17) | 1.43 | −0.12 (3.92) ‡ | 5.05 | 0.53 | US | US | 0.75 |
| CRF | 1.75 (1.12) | 0.98 (4.65) ‡ | −0.35 (−1.02) | 1.65 | −0.03 (1.80) | 7.28 | 0.40 | US | US | 0.38 |
| CLM | 0.02 (0.02) | 1.02 (9.21) ‡ | 0.06 (0.46) | 0.90 | −0.04 (1.87) | 17.15 | 1.85 | S | US | 0.52 |
| CET | −1.37 (−2.01) ‡ | 1.37 (6.64) ‡ | 0.00 (−0.06) | 1.69 | −0.05 (1.69) | 11.74 | 0.73 | S | US | 0.92 |
| INSI | −0.28 (−0.62) | 1.05 (6.83) ‡ | 0.01 (0.91) | 2.04 | −0.10 (3.38) † | 14.96 | 0.34 | S | US | 0.69 |
| VBF | 1.56 (1.36) | 0.43 (1.11) | 0.02 (0.73) | 2.86 | −0.08 (3.21) | 10.93 | 2.95 † | S | US | 0.50 |
| MGF | 0.29 (0.70) | 0.81 (4.11) ‡ | 0.00 (0.16) | 2.49 | −0.05 (2.52) | 21.31 ‡ | 1.03 | S | US | 0.42 |
| MIN | 0.33 (1.13) | 0.76 (5.25) ‡ | 0.03 (0.98) | 2.76 | −0.05 (2.64) | 8.78 | 2.83 † | S | US | 0.54 |
| ICB | 0.18 (0.50) | 0.87 (6.77) ‡ | 0.03 (2.26) ‡ | 2.73 | −0.11 (3.66) ‡ | 15.14 | 0.55 | S | US | 0.63 |
| PAI | 0.75 (2.10) ‡ | 0.68 (5.09) ‡ | 0.01 (0.98) | 2.76 | −0.12 (4.18) ‡ | 15.15 | 9.24 ‡ | S | US | 0.61 |
| MCI | 1.04 (0.99) | 0.80 (2.11) ‡ | −0.10 (−1.38) | 2.84 | −0.08 (2.22) | 7.79 | 2.99 † | S | US | 0.09 |
| MPV | 1.12 (1.11) | 0.60 (1.52) | −0.01 (−0.13) | 2.99 | −0.05 (1.95) | 11.80 | 1.58 | S | US | 0.04 |
| DUC | −0.92 (−2.94) ‡ | 1.35 (11.07) ‡ | 0.01 (0.93) | 1.17 | −0.13 (3.12) | 12.98 | 0.00 | US | US | 0.50 |
| KST | −0.13 (−0.12) | 0.97 (2.36) ‡ | 0.04 (0.98) | 2.34 | −0.05 (2.73) | 17.46 | 0.10 | US | US | 0.69 |
| PCM | −0.27 (−0.77) | 1.03 (7.59) ‡ | 0.06 (1.41) | 1.75 | −0.07 (2.55) | 12.02 | 0.60 | S | US | 0.60 |
| KMM | 0.03 (0.04) | 0.91 (2.56) ‡ | 0.03 (0.80) | 2.05 | −0.06 (2.52) | 14.33 | 0.02 | S | US | 0.64 |
| JHI | 1.10 (0.81) | 0.51 (1.09) | 0.09 (1.26) | 1.58 | −0.04 (2.14) | 11.21 | 2.67 | S | US | 0.52 |
| PIM | 0.30 (1.11) | 0.80 (6.08) ‡ | 0.00 (−0.20) | 0.88 | −0.08 (2.69) | 17.42 | 0.21 | US | US | 0.52 |
| MCR | 0.23 (0.56) | 0.84 (4.71) ‡ | 0.01 (1.14) | 2.82 | −0.11 (3.84) ‡ | 22.58 ‡ | 12.65 ‡ | S | US | 0.73 |
| MMT | −0.15 (−0.52) | 1.01 (6.91) ‡ | 0.01 (0.66) | 1.83 | −0.10 (3.74) ‡ | 27.28 ‡ | 2.58 | US | US | 0.71 |
| PPT | 0.51 (1.69) † | 0.68 (4.40) ‡ | 0.00 (0.03) | 2.07 | −0.09 (3.19) | 11.84 | 1.82 | US | US | 0.56 |

Notes: a. Numbers inside the parentheses are values of t-ratios. b. ‡ and † indicate significance at 5% level and 10% level, respectively. c. At the 5% (10%) significance level, when there are 3 exogenous variables (k = 2), the upper bound critical value of the F-test is 4.85 (4.14), respectively. These values are Pesaran et al. (2001, Table CI-Case III, p. 300). d. Number inside the parenthesis next to $ECM_{t-1}$ is the absolute value of the t-ratio. Its upper bound critical value at the 5% (10%) significance level is −3.53 (−3.21) when k = 2, and these come from Pesaran et al. (2001, Table CII-Case III, p. 303). e. LM is Lagrange multiplier test of residual serial correlation. It is distributed as $\chi^2$ with one degree of freedom (12th order). Its critical value at 5% (10%) significance level is 21.02 (18.54). f. RESET is Ramsey's test for misspecification. It is distributed as $\chi^2$ with one degree of freedom. Its critical value at 5% (10%) significance level is 3.84 (4.24).

Finally, the volatility index (VIX) is displayed in Table 12. The VIX shows eighteen cases with at least one statistically significant short-run coefficient. Fourteen of these significant short-run coefficients are affected negatively by the VIX: ADX, FUND, RVT, USA, GRF, SPE, CET, INSI, MIN, MCI, MPV, PCM, MCR, and PPT. While GAM and VBF are affected positively, PIM and MMT report mixed significant coefficients. As can be seen, the VIX has a negative effect on CEFs in the short run. In six cases, the long-run coefficient is significant. In four cases, the F-test supports cointegration, but for eleven cases, the ECM supports cointegration.

**Table 12.** Short-Run Coefficient Estimates—Linear ARDL—Model P = f (NAV, VIX).

**Panel A**

| FUNDS | Short-Run Coefficient Estimates | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $\Delta$ *Ln* $VIX_t$ | $\Delta$ *Ln* $VIX_{t-1}$ | $\Delta$ *Ln* $VIX_{t-2}$ | $\Delta$ *Ln* $VIX_{t-3}$ | $\Delta$ *Ln* $VIX_{t-4}$ | $\Delta$ *Ln* $VIX_{t-5}$ | $\Delta$ *Ln* $VIX_{t-6}$ | $\Delta$ *Ln* $VIX_{t-7}$ | $\Delta$ *Ln* $VIX_{t-8}$ | $\Delta$ *Ln* $VIX_{t-9}$ |
| ADX | 0.00 (0.69) | −0.01 (−1.42) | −0.01 (−2.37) ‡ | −0.02 (−4.19) ‡ | −0.01 (−3.13) ‡ | −0.01 (−2.05) ‡ | | | | |
| GAB | 0.00 (0.33) | | | | | | | | | |
| GAM | 0.01 (1.76) † | | | | | | | | | |
| FUND | 0.01 (1.29) | −0.01 (−1.26) | −0.02 (−2.50) ‡ | −0.01 (−1.63) | | | | | | |
| RMT | −0.01 (−1.33) | | | | | | | | | |
| RVT | 0.00 (−0.41) | −0.02 (−2.03) ‡ | −0.02 (−2.63) ‡ | −0.02 (−2.54) ‡ | | | | | | |
| SOR | 0.00 (0.02) | | | | | | | | | |
| TY | 0.01 (1.54) | | | | | | | | | |
| USA | −0.01 (−1.75) † | −0.02 (−1.90) † | | | | | | | | |
| GRF | −0.01 (−0.39) | −0.05 (−3.20) ‡ | −0.02 (−1.51) | | | | | | | |
| SPE | −0.01 (−1.66) † | −0.02 (−3.26) ‡ | | | | | | | | |
| CRF | −0.01 (−0.70) | | | | | | | | | |
| CLM | −0.01 (−0.39) | | | | | | | | | |
| CET | −0.01 (−1.16) | −0.01 (−2.33) ‡ | | | | | | | | |
| INSI | −0.01 (−2.08) ‡ | | | | | | | | | |
| VBF | 0.00 (0.54) | 0.01 (0.82) | 0.02 (2.23) ‡ | 0.02 (2.64) ‡ | | | | | | |
| MGF | −0.01 (−1.23) | | | | | | | | | |
| MIN | −0.01 (−1.70) † | −0.01 (−3.22) ‡ | | | | | | | | |
| ICB | 0.00 (0.51) | | | | | | | | | |
| PAI | 0.00 (−0.56) | | | | | | | | | |
| MCI | −0.06 (−2.89) ‡ | −0.04 (−1.71) † | −0.05 (−2.26) ‡ | | | | | | | |
| MPV | −0.04 (−3.31) ‡ | −0.04 (−2.71) ‡ | −0.02 (−1.52) | 0.00 (−0.21) | −0.01 (−0.43) | −0.03 (−2.16) ‡ | −0.05 (−3.69) ‡ | | | |
| DUC | −0.01 (−1.22) | | | | | | | | | |
| KST | 0.00 (−0.50) | −0.02 (−1.59) | 0.02 (1.52) | | | | | | | |
| PCM | −0.03 (−2.88) ‡ | −0.04 (−3.42) ‡ | | | | | | | | |
| KMM | 0.00 (−0.15) | | | | | | | | | |
| JHI | −0.01 (−0.80) | −0.01 (−1.09) | 0.01 (1.46) | | | | | | | |
| PIM | −0.01 (−1.41) | −0.03 (−2.90) ‡ | −0.01 (−0.61) | 0.00 (0.17) | 0.03 (2.89) ‡ | 0.01 (1.46) | | | | |
| MCR | −0.01 (−1.10) | −0.02 (−2.71) ‡ | −0.01 (−1.70) † | −0.01 (−1.59) | −0.01 (−1.44) | 0.00 (0.71) | 0.00 (0.13) | −0.02 (−2.76) ‡ | −0.02 (−3.82) ‡ | −0.01 (−1.47) |
| MMT | −0.01 (−1.45) | −0.01 (−1.70) † | −0.01 (−1.48) | 0.00 (−0.52) | 0.00 (−0.25) | 0.02 (2.67) ‡ | 0.00 (0.56) | 0.00 (−0.90) | −0.01 (−2.37) ‡ | |
| PPT | −0.01 (−1.80) † | −0.03 (−3.33) ‡ | | | | | | | | |

**Panel B**

| FUNDS | LR Coefficient Estimates | | | Diagnostic Statistics Associated with Linear ARDL Model | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Constant* | *Ln NAV* | *Ln VIX* | *F Stat* | $ECM_{t-1}$ | *LM* | *RESET* | *CUSUM* | *C-SQ* | *Adj.* $R^2$ |
| ADX | −0.58 (−4.12) ‡ | 1.13 (29.54) ‡ | 0.03 (1.50) | 2.72 | −0.10 (3.44) † | 10.21 | 6.60 ‡ | S | US | 0.96 |
| GAB | −0.53 (−1.45) | 1.23 (10.42) ‡ | 0.03 (0.33) | 1.02 | −0.07 (2.66) | 12.18 | 2.83 † | S | US | 0.84 |
| GAM | −2.18 (−1.73) † | 1.41 (5.43) ‡ | 0.20 (1.48) | 2.71 | −0.03 (1.65) | 19.68 † | 0.16 | S | US | 0.95 |
| FUND | −1.58 (−2.47) ‡ | 1.55 (8.11) ‡ | 0.12 (1.24) | 2.03 | −0.06 (3.04) | 19.77 † | 0.31 | S | US | 0.90 |
| RMT | −0.30 (−0.76) | 1.19 (11.14) ‡ | −0.09 (−1.25) | 3.13 | −0.06 (2.91) | 10.43 | 0.06 | S | US | 0.92 |
| RVT | −1.44 (−1.56) | 1.47 (6.12) ‡ | 0.03 (0.21) | 3.19 | −0.04 (2.68) | 18.34 | 3.81 † | US | US | 0.93 |
| SOR | −0.87 (−0.35) | 1.20 (2.40) ‡ | 0.00 (0.02) | 2.18 | −0.02 (1.24) | 3.85 | 2.41 | US | US | 0.87 |
| TY | −0.11 (−0.36) | 1.04 (16.07) ‡ | −0.05 (−0.91) | 7.01 ‡ | −0.06 (2.32) | 15.05 | 1.67 | S | US | 0.93 |
| USA | −0.43 (−1.30) | 1.20 (14.32) ‡ | −0.01 (−0.15) | 1.28 | −0.05 (2.93) | 25.22 ‡ | 0.07 | S | US | 0.86 |
| GRF | −2.21 (−3.70) ‡ | 1.65 (8.65) ‡ | 0.24 (2.57) ‡ | 1.40 | −0.09 (3.51) † | 12.43 | 0.50 | S | US | 0.51 |

**Table 12.** *Cont.*

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SPE | −0.61 (−1.86) † | 1.14 (11.40) ‡ | 0.04 (1.24) | 2.19 | −0.13 (4.14) ‡ | 5.60 | 1.51 | US | US | 0.76 |
| CRF | 1.36 (0.83) | 1.05 (4.29) ‡ | −0.42 (−0.73) | 1.94 | −0.03 (1.79) | 9.63 | 0.05 | US | US | 0.35 |
| CLM | 0.57 (0.71) | 1.01 (10.06) ‡ | −0.12 (−0.39) | 0.47 | −0.04 (2.12) | 18.39 | 2.12 | S | US | 0.52 |
| CET | −1.92 (−1.45) | 1.48 (4.18) ‡ | 0.05 (0.58) | 1.55 | −0.04 (1.31) | 15.62 | 0.64 | S | S | 0.92 |
| INSI | −0.62 (−1.08) | 1.16 (6.60) ‡ | 0.02 (0.80) | 1.77 | −0.11 (3.44) † | 14.47 | 0.11 | S | US | 0.70 |
| VBF | −0.46 (−0.43) | 1.03 (3.05) ‡ | 0.11 (2.39) ‡ | 3.08 | −0.09 (3.39) † | 6.27 | 1.59 | S | US | 0.53 |
| MGF | 0.23 (0.77) | 0.73 (4.40) ‡ | 0.08 (1.59) | 4.78 † | −0.06 (2.97) | 18.21 | 1.05 | S | US | 0.43 |
| MIN | 0.21 (1.11) | 0.68 (5.61) ‡ | 0.12 (2.34) ‡ | 5.47 ‡ | −0.06 (3.48) † | 7.91 | 1.53 | S | US | 0.57 |
| ICB | −0.01 (−0.02) | 0.96 (5.03) ‡ | 0.02 (0.52) | 2.36 | −0.09 (3.13) | 17.70 | 0.73 | S | US | 0.63 |
| PAI | 0.99 (1.98) ‡ | 0.63 (3.91) ‡ | −0.02 (−0.56) | 2.43 | −0.12 (4.12) ‡ | 14.31 | 8.58 ‡ | S | US | 0.61 |
| MCI | 2.29 (1.57) | 0.51 (1.24) | −0.32 (−1.83) † | 2.89 | −0.10 (2.60) | 9.77 | 4.71 ‡ | S | US | 0.15 |
| MPV | 2.01 (1.71) † | 0.51 (1.47) | −0.24 (−1.60) | 3.41 | −0.07 (2.50) | 11.67 | 0.15 | US | US | 0.17 |
| DUC | −0.88 (−2.80) ‡ | 1.27 (9.20) ‡ | 0.07 (1.45) | 4.17 † | −0.12 (2.87) | 16.95 | 1.13 | US | US | 0.52 |
| KST | 0.74 (0.39) | 0.74 (1.19) | −0.05 (−0.34) | 2.51 | −0.05 (2.59) | 18.67 † | 0.03 | US | US | 0.69 |
| PCM | −0.05 (−0.11) | 1.03 (7.95) ‡ | 0.01 (0.19) | 1.57 | −0.08 (2.92) | 13.63 | 0.47 | S | US | 0.62 |
| KMM | 0.37 (0.31) | 0.85 (1.91) † | −0.02 (−0.15) | 2.20 | −0.06 (2.53) | 19.89 † | 0.13 | S | US | 0.64 |
| JHI | 0.49 (0.39) | 0.68 (1.70) † | 0.14 (1.20) | 3.00 | −0.05 (2.44) | 9.66 | 1.09 | S | US | 0.53 |
| PIM | 0.01 (0.05) | 0.80 (7.98) ‡ | 0.10 (2.14) ‡ | 1.74 | −0.10 (3.24) † | 12.10 | 0.13 | US | US | 0.57 |
| MCR | −0.10 (−0.23) | 0.94 (5.26) ‡ | 0.05 (1.85) † | 3.50 | −0.12 (4.00) ‡ | 25.33 ‡ | 5.74 ‡ | S | US | 0.75 |
| MMT | −0.15 (−0.46) | 0.98 (6.67) ‡ | 0.03 (1.13) | 3.09 | −0.11 (4.14) ‡ | 26.22 ‡ | 1.36 | US | US | 0.73 |
| PPT | 0.21 (0.75) | 0.73 (5.54) ‡ | 0.07 (1.54) | 3.14 | −0.10 (3.43) † | 12.45 | 0.31 | US | US | 0.58 |

Notes: a. Numbers inside the parentheses are values of t-ratios. b. ‡ and † indicate significance at 5% level and 10% level, respectively. c. At the 5% (10%) significance level, when there are 3 exogenous variables (k = 2), the upper bound critical value of the F-test is 4.85 (4.14), respectively. These values are Pesaran et al. (2001, Table CI-Case III, p. 300). d. Number inside the parenthesis next to $ECM_{t-1}$ is the absolute value of the t-ratio. Its upper bound critical value at the 5% (10%) significance level is −3.53 (−3.21) when k = 2, and these come from Pesaran et al. (2001, Table CII-Case III, p. 303). e. LM is Lagrange multiplier test of residual serial correlation. It is distributed as $\chi^2$ with one degree of freedom (12th order). Its critical value at 5% (10%) significance level is 21.02 (18.54). f. RESET is Ramsey's test for misspecification. It is distributed as $\chi^2$ with one degree of freedom. Its critical value at 5% (10%) significance level is 3.84 (4.24).

Appendix B below summarizes the number of cointegrations based on F-test and an alternative ECM *t*-tests. Only three cases from Tables 2, 7 and 11 have no cointegrations by F-test, but the alternative ECM *t*-test supports cointegration on each of the indices for a varying number of CEF cases.

## 5. Conclusions

The purpose of the present study was to test the effect of the economic policy uncertainty index on closed-end fund (CEF) prices. We used monthly discount data of 31 CEFs and studied the effects of the economic policy uncertainty index and its subcategories on CEF discount data. Our paper aims to broaden the literature in a few ways. We empirically tested the determinants of CEF prices by employing cointegration and error-correction modeling with an advanced ARDL framework. This technique allows for the formal analysis and quantification of mean reversion.

This paper finds evidence for cointegration and statistically significant coefficients in the short- and long-run estimates of the included subindices. Most of the series are affected positively by the subindices of economic uncertainty. The ADX, GAB, GAM, and FUND CEFs are mostly affected positively, and SPE, MCI, and MPV are mostly affected negatively in the short run. More than half of the CEF are affected by the EPU index. The subindices MP, REG, and FREG have significant short run negative effects. Other subindices FP, TAX, GS, HC, and ENT mostly have positive short run effects. The VIX has a negative effect in the short run. TRDP is the only subindex that was found to have a weak effect on the CEFs. This paper also reports evidence for cointegration in most of the series. It is normal to see a different output depending on limited features, such as the chosen time period, the fund size, the reported time interval of the NAV, etc.

We recommend future studies focus on the topic of mean reversion for CEFs by narrowing the scope of research and examining the underlying assets of each individual CEF. Differences in the asset size, market liquidity, and free float of shares can be used in the process of further examining what separates CEFs that show signs of mean reversion in the discount to their NAVs. Other approaches could include differences in market sentiment as well as detailed valuation breakdowns of CEF holdings through a fund-specific starting point.

The present paper offers an important policy implication since the employed policy uncertainties seem to have significant short run impacts on the movements of discounts or premia of closed-end funds. This suggests that investors should follow the policies related to monetary, regulation, health care, government spending, fiscal, and tax policies closely.

**Data Availability Statement:** Suggested data availability statements are available in the section "US Monthly EPU Index" at https://www.policyuncertainty.com/us_monthly.html (accessed on 7 February 2023).

**Acknowledgments:** Thanks for suggestions go to Hyeongwoo Kim, Bekir Yilmaz, and two referees of this journal.

**Conflicts of Interest:** The author declares no conflict of interest.

## Appendix A The Categorical Subindices of EPU Index

| | |
|---|---|
| EPU | 1. Economic policy uncertainty |
| MP | 2. Monetary policy |
| FP | 3. Fiscal policy (Taxes OR Spending) |
| TAX | 4. Taxes |
| GS | 5. Government spending |
| HC | 6. Health care |
| NS | 7. National security |
| ENT | 8. Entitlement programs |
| REG | 9. Regulation |
| FREG | 10. Financial regulation |
| TRDP | 11. Trade policy |
| VIX | 12. Volatility index |

## Appendix B The Summary of Cointegrations

| Tables and Index | # Cointegrations When F-Test Used | # Cointegrations When $ECM_{t-1}$ t-Test |
|---|---|---|
| 1. EPU | 2 | 10 |
| 2. MP | none | 9 |
| 3. FP | 1 | 11 |
| 4. TAX | 1 | 12 |
| 5. GS | 4 | 10 |
| 6. HC | 4 | 11 |
| 7. NS | none | 12 |
| 8. ENT | 2 | 12 |
| 9. REG | 3 | 11 |
| 10. FREG | 3 | 6 |
| 11. TRDP | none | 6 |
| 12. VIX | 4 | 11 |

**Funding:** This research received no external funding.

## Notes

1. In order to obtain better structured outcome than simple order, we use the log-linear order (Layson 1983; Kyophilavong et al. 2016).
2. Normalization implies dividing $\delta_1$ and $\delta_2$ by $\delta_0$.
3. The estimate of $\delta_0$ must be negative, see Bahmani-Oskooee (2020). For some other applications see Kisswani and Nusair (2014), Gogas and Pragidis (2015), Durmaz (2015), and Arize et al. (2017).
4. Bahmani-Oskooee and Tankui (2008) details this methodology and normalization technique.
5. To save up space we do not include unit root tables, but they can be provided upon request.

## References


Abraham, Abraham, Don Elan, and Alan J. Marcus. 1993. Does sentiment explain closed-end funds discount? Evidence from bond funds. *The Financial Review* 28: 607–16. [CrossRef]

Anderson, Seth, T. Randolph Beard, Hyeongwoo Kim, and Liliana V. Stern. 2016. The Short-Run Pricing Behavior of Closed-End Funds: Bond vs. Equity Funds. *Journal of Financial Services Research* 50: 363–86. [CrossRef]

Anderson, Seth, Thomas Randolph Beard, Hyeongwoo Kim, and Liliana V. Stern. 2013. Fear and Closed-End Fund Discounts. *Applied Economics Letters* 20: 956–59. [CrossRef]

Arize, Augustine C., John Malindretos, and Emmanuel U. Igwe. 2017. Do Exchange Rate Changes Improve the Trade Balance: An Asymmetric Nonlinear Cointegration Approach. *International Review of Economics and Finance* 49: 313–26. [CrossRef]

Arouri, Mohamed, Christophe Estay, Christophe Rault, and David Roubaud. 2016. Economic policy uncertainty and stock markets: Long-run evidence from the US. *Finance Research Letters* 18: 136–41. [CrossRef]

Aye, Goodness C., Mehmet Balcilar, Riza Demirer, and Rangan Gupta. 2018. Firm-level political risk and asymmetric volatility. *The Journal of Economic Asymmetries* 18: e00110. [CrossRef]

Bahmani-Oskooee, Mohsen, and Altin Tankui. 2008. The black market exchange rate vs. the official rate in testing PPP: Which rate fosters the adjustment process? *Economics Letters* 99: 40–43. [CrossRef]

Bahmani-Oskooee, Mohsen, and Sujata Saha. 2018. On the relation between exchange rates and stock prices: A non-linear ARDL approach and asymmetry analysis. *Journal of Economics and Finance* 42: 112–37. [CrossRef]

Bahmani-Oskooee, Mohsen, Zohre Ardalani, and Marzieh Bolhasani. 2010. Exchange-Rate Volatility and U.S. Commodity Trade with the Rest of the World. *International Review of Applied Economics* 24: 511–32. [CrossRef]

Bahmani-Oskooee, Mohsen. 2020. The J-curve and the effects of exchange rate changes on the trade balance. In *International Money and Finance*. Edited by F. L. Rivera-Batiz. Singapore: World Scientific Publishing Co., vol. 2.

Baker, Scott R., Nicholas Bloom, and Steven J. Davis. 2016. Measuring economic policy uncertainty. *The Quarterly Journal of Economics* 131: 1593–636. [CrossRef]

Bleaney, Michael F., and Richard Todd Smith. 2005. *Closed-End Funds in Emerging Markets*. Nottingham: Centre for Research in Economic Development and International Trade, University of Nottingham.

Brogaard, Jonathan, and Andrew Detzel. 2015. The asset-pricing implications of government economic policy uncertainty. *Management Science* 61: 3–18. [CrossRef]

Carrière-Swallow, Yan, and Luis Felipe Céspedes. 2013. The impact of uncertainty shocks in emerging economies. *Journal of International Economics* 90: 316–25. [CrossRef]

Chay, Jong-Bom, and Charles A. Trzcinka. 1999. Managerial performance and the cross-sectional pricing of closed-end funds. *Journal of Financial Economics* 52: 379–408. [CrossRef]

Christou, Christina, Juncal Cunado, Rangan Gupta, and Christis Hassapis. 2017. Economic policy uncertainty and stock market returns in Pacific Rim countries: Evidence based on a Bayesian panel VAR model. *Journal of Multinational Financial Management* 40: 92–102. [CrossRef]

Das, Debojyoti, and Surya Bhushan Kumar. 2018. International economic policy uncertainty and stock prices revisited: Multiple and Partial wavelet approach. *Economics Letters* 164: 100–8. [CrossRef]

Durmaz, Nazif. 2015. Industry Level J-Curve in Turkey. *Journal of Economic Studies* 42: 689–706. [CrossRef]

Fang, Libing, Honghai Yu, and Lei Li. 2017. The effect of economic policy uncertainty on the long-term correlation between US stock and bond markets. *Economic Modelling* 66: 139–45. [CrossRef]

Gemmill, Gordon, and Dylan C. Thomas. 2002. Noise trading, costly arbitrage, and asset prices: Evidence from closed-end funds. *The Journal of Finance* 57: 2571–94. [CrossRef]

Gilchrist, Simon, Jae W. Sim, and Egon Zakrajšek. 2014. *Uncertainty, Financial Frictions, and Investment Dynamics (No. w20038)*. Washington, DC: National Bureau of Economic Research.

Gogas, Periklis, and Ioannis Pragidis. 2015. Are there asymmetries in fiscal policy shocks? *Journal of Economic Studies* 42: 303–21. [CrossRef]

Hanley, Kathleen Weiss, Charles MC Lee, and Paul L. Seguin. 1996. The marketing of closed-end funds IPOs: Evidence from transactions data. *Journal of Financial Intermediation* 55: 127–59. [CrossRef]

Holmes, Mark J., and Nabil Maghrebi. 2016. Financial market impact on the real economy: An assessment of asymmetries and volatility linkages between the stock market and unemployment rate. *The Journal of Economic Asymmetries* 13: 1–7. [CrossRef]

Kisswani, Khalid M., and Salah A. Nusair. 2014. Nonlinear Convergence in Asian Interest and Inflation Rates. *Economic Change and Restructuring* 47: 155–86. [CrossRef]

Ko, Jun-Hyung, and Chang-Min Lee. 2015. International economic policy uncertainty and stock prices: Wavelet approach. *Economics Letters* 134: 118–22. [CrossRef]

Kyophilavong, Phouphet, Gazi Salah Uddin, and Muhammad Shahbaz. 2016. The Nexus between Financial Development and Economic Growth in Lao PDR. *Global Business Review* 17: 303–17. [CrossRef]

Layson, Stephen. 1983. Homicide and deterrence: Another view of the Canadian time-series evidence. *Canadian Journal of Economics* 16: 52–73. [CrossRef]

Li, Xiao-lin, Mehmet Balcilar, Rangan Gupta, and Tsangyao Chang. 2016. The causal relationship between economic policy uncertainty and stock returns in China and India: Evidence from a bootstrap rolling window approach. *Emerging Markets Finance and Trade* 52: 674–89. [CrossRef]

Li, Xiao-Ming, and Lu Peng. 2017. US economic policy uncertainty and co-movements between Chinese and US stock markets. *Economic Modelling* 61: 27–39. [CrossRef]

Li, Xiao-Ming, Bing Zhang, and Ruzhao Gao. 2015. Economic policy uncertainty shocks and stock–bond correlations: Evidence from the US market. *Economics Letters* 132: 91–96. [CrossRef]

Malkiel, Burton G. 1977. The Valuation of Closed-End Investment-Company Shares. *The Journal of Finance* 32: 847–58. [CrossRef]

Malkiel, Burton G. 1995. Returns from investing in equity mutual funds 1971 to 1991. *The Journal of Finance* 50: 549–72. [CrossRef]

Pastor, Lubos, and Pietro Veronesi. 2012. Uncertainty about government policy and stock prices. *The Journal of Finance* 67: 1219–64. [CrossRef]

Pastor, Lubos, and Pietro Veronesi. 2013. Political uncertainty and risk premia. *Journal of Financial Economics* 110: 520–45. [CrossRef]

Pesaran, M. Hashem, Yongcheol Shin, and Richard J. Smith. 2001. Bound Testing Approaches to the Analysis of Level Relationship. *Journal of Applied Econometrics* 16: 289–326. [CrossRef]

Pontiff, Jeffrey. 1995. Closed-End Fund Premiums and Returns; Implications for Financial Market Equilibrium. *Journal of Financial Economics* 37: 341–67. [CrossRef]

Pontiff, Jeffrey. 1996. Costly arbitrage: Evidence from closed-end funds. *The Quarterly Journal of Economics* 111: 1135–51. [CrossRef]

Thompson, Rex. 1978. The Information Content of Discounts and Premiums on Closed-End Fund Shares. *Journal of Financial Economics* 6: 151–86. [CrossRef]