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Does the Turbulence of the Stock Market Terrify Consumers? Evidence from a Panel of U.S. States Using Pooled Mean Group Estimation

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Abstract

This paper elucidates the influence of stock market volatility on U.S. consumption using pooled mean group (PMG) estimation of 46 states over the period from 1998 to 2017. The findings confirm that the PMG estimates of the effect of stock market volatility on consumption are robust to the lag order, lag selection criteria, and outliers compared with the mean group (MG) and the dynamic fixed effect (DFE) methods. I find that stock market volatility reduces total consumption, nondurables, services, and durables consumption. However, durables consumption responds to stock market volatility to a greater degree than nondurables and services consumption, and adjusts more quickly to market disequilibria. Although Romer (1999) identified the adverse effect of stock market volatility on durables consumption during the Great Depression, the current investigation reveals that the stability of the stock market plays a critical role in redressing market disequilibria and influences not only durables consumption but also nondurables and services consumption. In addition, the data provides evidence to reject the null of no cointegration among the models' variables, which contrasts with the pervasive view concerning the consumption function. Since the short-run income elasticities are far less than the long-run ones, I reconfirm that the permanent income hypothesis (PIH) is valid in the US. As a result, the short-run efficacy of macroeconomic policies in terms of resolving market disequilibria is limited, as it takes time for consumers to build confidence in the permanency of their income.

JEL classification: E21.

Keywords: Stock market volatility; Consumption; Uncertainty hypothesis; Permanent income hypothesis; Panel cointegration.

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1 Introduction

"Uncertainty is worse than knowing the truth, no matter how bad."[1]

Since the Great Depression, the role of uncertainty in market disequilibria has remained at the center of the spectrum. Although the investigation into the source of the economic downturn that occurred in 1930 has continued, some evidence indicates that the main determinant of the chaos was consumption. The pioneering "uncertainty hypothesis" (Romer, 1990) states that the uncertainty associated with the 1929 stock market crash reduced durables consumption. While recent literature confirms that the uncertainty hypothesis is valid, some evidence contrasts with the concept. For example, Greasley et al. (2001) support the views advanced by Romer (1990) concerning the cause of the Great Depression while adding income uncertainty to Romer's explanation, Ejarque (2007) argues that expenditure on irreversible durable goods increased during the Great Depression.

Following Romer (1990), some economists extended his argument by claiming that the primary source of business cycles is uncertainty, which affects economic activity through different links.[2] If we consider the crucial role of consumption in economic activity, it is reasonable to postulate consumption[3] as the main source of fluctuations (Figure 1 illustrates that the fluctuation in terms of consumption that occurred during the Great Recession of 2007–2008 was larger and lasted longer compared with the fluctuation that occurred in the recession of 2001–2002). In other words, when consumers receive instability signals from markets, they postpone their purchasing plans, which can slow economic activity[4] until consumers regain their confidence in the permanency of their income. Therefore, the efficacy of macroeconomic policy tools designed to redress market disequilibria depends on the level of confidence they can create among consumers.

Economist have developed different indexes for measuring uncertainty. For example,

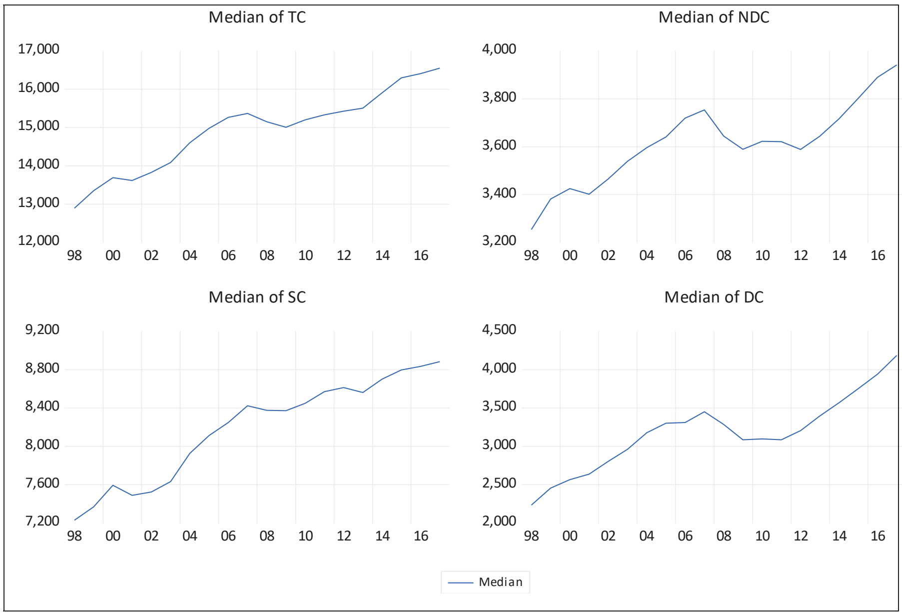
[1] The Magazine of Wall Street.

[2] For example, see Basu and Bundick (2017), Leduc and Liu (2016), and Bloom (2014).

[3] Consumption accounts for approximately 68% of the U.S. GDP.

[4] Foerster (2014).

Figure 1: Total Consumption (TC), Nondurables (NDC), Services (SC), and Durables (DC).



Note: The graphs illustrate the medians across states.

Sanchez, and Yurdagul (2013) measure economic uncertainty using the level of cash holding in companies, Baker et al. (2016) provide an index for policy uncertainty, Menegatti (2010) calculates uncertainty considering the deviations of the output from its expected value, and the Michigan Survey of Consumers gauges consumers' perceived uncertainty. However, a "well-known and observable index of ex ante stock market volatility" is the Chicago Board Options Exchange Volatility Index (VIX).[5] The VIX, which is used to gauge economic uncertainty,[6] applies "options prices for the Standard & Poor's 500 (S&P 500) up to 30 days in the future to determine the implied volatility of stock market prices" (Foerster, 2014). The VIX is an appropriate measurement of uncertainty, as the stock market reacts rapidly to new information regarding aggregate economic activity. It is worth mentioning that the VIX reached its peak at the beginning of the 2001–2002 and 2007–2008 recessions. One could thus interpret the VIX as being capable of signaling an upcoming recession.

The researchers have applid a broad range of models and methodologies and obtained

[5]Basu and Bundick (2017).

[6]The VIX sometimes is referred to the fear gauge (Carr, 2017).

mixed results. For example, Poterba and Samwick (1995) found, using the Panel Study of Income Dynamics, that stock market fluctuations increase consumption, especially that of durables, in the US. However, the authors mentioned that, “It is [also] possible that the effect of stock price fluctuations on consumption operates through channels other than a direct wealth effect, for example by altering consumer confidence.” If one translates “stock price fluctuations” as “uncertainty,” the results presented in the paper would be controversial, as they indicate a positive and significant effect of stock market fluctuations. I imagine that the ignorance of the income variable as one of the important determinants of consumers’ purchasing plan in addition to the lack of long-run and short-run dynamics in the model resulted in economically implausible coefficients.

Choudhry (2003) investigated the effect of stock market volatility on U.S. consumer expenditure over the period from 1978 to 2000. The paper applied the means of the Johansen multivariate cointegration procedure and the error correction method using monthly data and found that stock market volatility has a significant (but small) effect on total consumption, durables, and nondurables, but not on services. While stock market volatility affects durables negatively, it influences nondurables positively. Although the paper includes the income variable in the model, the short-run coefficients are insignificant (and negative for services). Furthermore, the results indicate that the long-run coefficients are economically implausible. For example, the long-run income elasticity for durables (0.964) is lower than for nondurables (1.178), which contradicts with economic theories indicating that durables are more responsive to income than nondurables. In addition, total expenditure income elasticity (1.77) was found to be very large and does not meet empirical expectations that consider, at most, a unity of income elasticity.[7] If we consider the long-run and short-run coefficients, the results do not support the PIH.

In a working paper, Raunig and Scharler (2011) investigated the effect of stock market volatility on durables, nondurables, and investment using post-war U.S. data. The paper

[7] “Most theories of aggregate consumption suggest that income elasticity equals one.” (Pesaran et al., 1999)

applied the GMM method to estimate the models. The researchers found a considerable adverse effect of stock market volatility on durables but a less pronounced and significant effect on nondurables. Although the authors distinguished between income volatility and stock market volatility as different possible sources of uncertainty, it should be noted that the former captures the PIH while the latter detects the uncertainty hypothesis. The paper provides some evidence to validate the uncertainty hypothesis (Romer, 1999) by adding the VIX to the models; however, the authors did not provide the results with which to determine the effects of the change on the other variables in the models. In addition, the failure to consider the short- and long-run dynamics and the ignorance of services, which accounts for approximately 70% of aggregate consumption, are the main shortcomings of the paper.

In this paper, I investigate the validity of the uncertainty hypothesis and the PIH using a standard consumption function. I examine the effect of uncertainty by applying the pooled mean group (PMG) method. I estimate the short- and long-run effect of uncertainty, which also helps to capture the validity of the PIH.

The advantages of the panel data method (greater data variation, less collinearity, and more degrees of freedom) have recently proven attractive to research economists in the literature. Panel data models either assume different intercepts and slopes for all groups (pooled ordinary least square) or different intercepts and the same slopes for all groups (fixed-effects and random-effects). Unlike the conventional panel approaches, in their approach, Pesaran et al. (1999) considered economic convergence and constructed the PMG estimator, which allows for having different short-run coefficients (heterogeneity) and identical long-run coefficients (homogeneity).[8] Empirically, the PMG method performs better than conventional methods, such as the mean group estimator (MG) and dynamic fixed-effects estimator, and is robust to lag orders, lag selection criteria, and outliers.

To construct the PMG model, Pesaran et al. (1999) employed the autoregressive dis-

[8]Factors such as common technologies, budget and solvency constraints, and arbitrage conditions affect all groups similarly (Pesaran et al., 1999).

tributed lag (ARDL)[9] approach to cointegration for specific countries. The ARDL approach to cointegration works despite having endogenous regressors in the model and has empirical power over previous methods such as dynamic ordinary least squares (DOLS), fully modified ordinary least squares (FMOLS), and maximum likelihood estimation (MLE).[10] While the ARDL occasionally provides economically implausible coefficients for specific groups[11] due to excessive aggregation, sample-specific omitted variables, or measurement errors correlated with the regressors, the PMG estimates of the long-run coefficients tend to be reasonable.

This paper is organized as follows. Section 2 presents the model and methodology. Section 3 presents the empirical results, and Section 4 concludes the study .

2 Model and Methodology

For the sake of empirical comparison, I follow the methods of Pesaran et al. (1999) and use a standard consumption function of the Davidson et al. (1978)[12] type for a sample of 46 U.S. states. I assume that the long-run consumption function is as follows:

$$c_{it} = \theta_{0i} + \theta_{1i} y_{it}^{d} + \theta_{2i} \pi_{it} + \theta_{3i} \nu_{it} + \upsilon_{it} \tag{1}$$

$$i = 1, 2, ..., N, \ t = 1, 2, ..., T,$$

where c_{it} it is the logarithm of real consumption per capita,[13] y_{it}^{d} is the logarithm of real per capita disposable income, π_{it} is the logarithm of the consumer price index (the rate of inflation),[14] and ν_{it} is the logarithm of stock market volatility.[15] I expect that $\theta_{1i} > 0$,

[9] Pesaran and Shin (1999).

[10] Panopoulou and Pittis (2004).

[11] For example, Bahmani-Oskooee and Nayeri (2020) applied the linear and nonlinear ARDL approach and found a long-run positive effect of policy uncertainty on U.S. consumption, which is economically implausible.

[12] Pesaran et al. (1999) used the method for a sample of OECD countries, including the US.

[13] I estimate the model for total, nondurables, services, and durables consumption.

[14] I have the consumer price index for all items, nondurables, services, and durables. The inflation variable is a proxy for various wealth effects.

[15] I use the VIX to measure stock market volatility. Since higher VIX values demonstrate wider ranges of possible outcomes for the S&P 500, one would translate this to a higher level of uncertainty that reduces

$\theta_{2i} < 0$, and $\theta_{3i} < 0$. I apply the PMG procedure to estimate the long-run coefficients. To measure real per capita disposable income, I deflate per capita disposable income using the consumer price index for all items.[16] For consumption, I deflate personal per capita expenditure by the corresponding consumer price indexes. I have data for 46 U.S. states over the period from 1998 to 2017.[17] I assume that each of these variables are $I(1)$, which makes υ_{it} an $I(0)$ for all i.[18] I impose a maximum lag of one to obtain the ARDL$(1, 1, 1, 1)$ equation as follows:

$$c_{it} = \mu_i + \delta_{10i} y_{it}^d + \delta_{11i} y_{i,t-1}^d + \delta_{20i} \pi_{it} + \delta_{21i} \pi_{i,t-1} + \delta_{30i} \nu_{it} + \delta_{31i} \nu_{i,t-1} + \lambda_i c_{i,t-1} + \varepsilon_{it} \tag{2}$$

Therefore, the error correction equation is

$$\Delta c_{it} = \phi_i (c_{i,t-1} - \theta_{0i} - \theta_{1i} y_{it}^d - \theta_{2i} \pi_{it} - \theta_{3i} \nu_{it}) - \delta_{11i} \Delta y_{it}^d - \delta_{21i} \Delta \pi_{it} - \delta_{31i} \Delta \nu_{it} + \varepsilon_{it} \tag{3}$$

where

$$\theta_{0i} = \frac{\mu_i}{1-\lambda_i},\ \theta_{1i} = \frac{\delta_{10i} + \delta_{11i}}{1-\lambda_i},\ \theta_{2i} = \frac{\delta_{20i} + \delta_{21i}}{1-\lambda_i},\ \theta_{3i} = \frac{\delta_{30i} + \delta_{31i}}{1-\lambda_i},\ \phi_i = -(1-\lambda_i)$$

Pesaran et al. (1999) employed maximum likelihood (ML) estimation to estimate the long-run coefficients, restricting the long-run coefficients to be identical (homogeneity) across groups, and used the average across the groups for group-wide mean estimates of the short-run coefficients.

To compute PMG estimators, Pesaran et al. (1999) proposed two likelihood-based algorithms: the "back-substitution" algorithm and the "Newton-Raphson" algorithm. They wrote a computational econometrics program using the GAUSS platform. I modify the pro-

the aggregate economic activity (Foerster, 2014).

[16] Data are collected from the Federal Reserve of Saint Luis and the U.S. Bureau of Labor Statistics.

[17] See the appendix for the list of states used in the models.

[18] I apply Kao's (1999) residual-based test for cointegration in the panel data, which possesses a better size and power properties, and reject the null hypothesis of no cointegration between the variables in total, nondurables, services, and durables consumption models (the t-statistics are -5.08, -3.94, -2.35, and -9.64, respectively).

gram and follow the computation process, assuming maximum lags of one to estimate the models. Primarily, I use the Bayesian information criterion (SBC) to determine the optimal lags. To examine whether the models are robust to the choice of lag order, I also use the Akaike information criterion (AIC). In addition, I remove the outliers and nine rich states from the models to investigate the probable changes in coefficients.

3 Empirical Results

Theoretically, I expect that in the long-run, income positively affects and inflation and uncertainty (stock market volatility) negatively affect consumption regardless of having total consumption or one of its categories—nondurables, services, or durables—as a dependent variable. However, the magnitude would be different for the aggregated consumption and its categories. In addition, I expect the effect to be stronger for durables than for nondurables.[19] For services, I postulate that the magnitude of the impact of uncertainty will be weaker than durables. Moreover, I expect to have smaller coefficients in the short-run than in the long-run. These smaller coefficients would translate to the process of consumers' confidence creation, which takes time.

In general, I observe that disposable income, inflation, and stock market volatility coefficients are significant and carry the correct sign. These findings are more economically plausible than previous estimations in the literature using other estimation methods, such as the ARDL, DOLS, and FMOLS.[20] When I check the robustness of the findings, the PMG estimates are robust in responding to the outliers, the lag selection criteria, and the lag order in the models, but this is not the case for the MG and DFE methods.

According to the diagnostics tests (see Table 1) the state-specific estimates of the total consumption model based on the ARDL specification perform well. Since at the 5% level,

[19] Bahmani-Oskooee and Nayeri (2020).

[20] For the sake of empirical comparison, I apply the DOLS and FMOLS methods to estimate the models. The results confirm that the PMG performs better than other methods using the same data set (see Table 13 and 14).

only one state (Ohio) indicates evidence of serial correlation and only two states (Louisiana and New Jersey) have evidence of misspecification, among 46 states in all, the model's results indicate that it demonstrates acceptable performance. It is worth mentioning that as long as a model does not suffer from serial correlation, having endogenous or omitted variables is not an issue. However, an approach should address the endogeneity issue by providing a reliable solution rather than making unreliable assumptions to avoid the problem.[21]

The PMG method results in an income coefficient of 0.84, which is significant at the 5% level (Table 2) using the SBC lag selection criteria to select the lag order.[22] In addition, inflation and uncertainty coefficients carry a significant coefficient of -0.36 and -0.14, respectively.[23] The speed of adjustment coefficient confirms the existence of cointegration among the variables in the model (-0.18).[24] Thus, it takes approximately 3.3 years for an existing disequilibrium to be reduced by 50% (half-life disequilibrium).

Although the Hausman test confirms the equality of the PMG and MG estimations, the result changes when I remove the outliers. As Pesaran et al. (1999) confirmed, the Hausman test is misleading when the standard errors are large for the MG method. I remove the outliers, whereupon the results of the Hausman test changed and confirmed the PMG as an appropriate method. Moreover, I remove the rich states (Maryland, Connecticut, Alaska, Virginia, New Jersey, Massachusetts, New Hampshire, California, and Washington)[25] from the group to assess how the model responds. I observe that the long-run income elasticity increases to 0.91 and the inflation coefficient increases to -0.39, but the response to stock market volatility decreases to -0.12 (see Table 3). Although the coefficients change slightly, it is reasonable to obtain a higher response to income and price changes when we remove the nine richest states and a lower response to stock market volatility. Furthermore, the speed

[21] Income and consumption are determined simultaneously and are endogenous.
[22] The AIC reveals the same coefficients with a slight change.
[23] Pesaran et al. (1999) found an income elasticity of 0.90, inflation coefficient of -0.47, and speed of adjustment coefficient of -0.20 for a sample of OECD countries including the US.
[24] Pesaran and Smith (1995).
[25] The rank is based on the wealthiest U.S. states according to median household income reported by the Census Bureau's American Community Survey (Blystone, 2019).

of adjustment coefficient increases to -0.25.[26]

The findings (see Table 2) confirm that the PIH is valid in the US, as the short-run coefficients of income elasticity are far less than the long-run ones. The short-run income elasticities (level and first difference) are approximately 0.16 and 0.15, which means the effect of an income change is smaller in the short-run than in the long-run. In addition, both price level and uncertainty carry smaller coefficients in the short-run. Furthermore, I use the AIC lag criteria as an additional robustness check, and I observe that the coefficients change slightly. I believe the model is capable of capturing both effects of the uncertainty that arises regarding the stock market and the doubt on the permanency of income (PIH).

Table 4 presents the results for nondurables consumption. Since I have serial correlation in only one state (Oregon) and non-normality in only one state (Florida), the state-specific estimates and diagnostic results confirm that the model performs well. Although previous studies found a limited effect of the stock market on nondurables and occasionally a positive effect—which is not economically plausible—I found a significant and adverse effect of stock market volatility on nondurables. The income, inflation, and uncertainty coefficients are 0.72, -0.45, and -0.16, respectively, and are significant (see Table 5). The conjecture is that when consumers receive uncertainty signals from the stock market, they eliminate their unnecessary nondurables, prioritize them, and switch to cheaper nondurable products, as the findings confirm the reduction of nondurables in response to uncertainty.[27] However, the mechanism needs further investigation.

The speed of adjustment is -0.23 and is significant, which confirms the existence of cointegration. Therefore, it takes approximately 2.7 years for an existing disequilibrium to be reduced by 50% (half-life disequilibrium). Nondurables consumption is robust to the lag order, the lag selection criteria, and outliers when I use the PMG method, but the MG and DFE estimates are not robust to the changes. When I remove the rich states from the model,

[26]Interestingly, the findings are more similar to those of Pesaran et al. (1999) when I remove the richest states.

[27]Romer (1999) found a slight increase in nondurables consumption during the Great Depression.

I find that nondurables consumption responds more to the income changes, as the income elasticity increases to 0.87 (see Table 6). However, the inflation, stock market volatility, and speed of adjustment coefficients change slightly (-0.42, -0.13). The findings reveal that the short-run income coefficients (level, 0.17, and first difference, 0.05) are far less than the long-run coefficient. This finding means that for nondurables, the PIH is valid, together with the uncertainty hypothesis.

When I investigate services consumption, I observe that the model performs well in terms of serial correlation, except in Louisiana; functional form, except in Connecticut; and normality, except in Florida (see Table 7). Although the long-run income elasticity of services consumption (0.75) is close to the nondurables consumption income elasticity, the inflation coefficient is lower (-0.23) (see Table 8). In addition, services consumption responds less to stock market volatility (-0.12). One would interpret this finding as indicating the importance of the service sector to the U.S. economy (services account for approximately 70% of total personal consumption expenditure).[28] The speed of adjustment remains slightly the same (-0.21), and it takes about three years for an existing disequilibrium to be reduced by 50%. When I remove the rich states, I observe that the income and price elasticities increase to 0.85 and -0.32, respectively (see Table 9). However, the response to stock market volatility remains the same, and the speed of adjustment changes slightly (-0.18). Interestingly, in the short-run, services consumption behaves similarly to nondurables consumption when responding to an income change, as the level and first difference income elasticities are 0.16 and 0.04, respectively. Therefore, services consumption also confirms the existence of the PIH.

Finally, in the state-specific equations for durables consumption, 32 states have no evidence of misspecification, and only one state has evidence of serial correlation (see Table 10). This fact is reassuring in that it indicates no evidence of misspecification and serial correlation in our equations. As expected, the long-run income (0.84) elasticity and inflation

[28] I calculate the weight using the U.S. Bureau of Economic Analysis publications (Gross Domestic Product and its components: Table 13).

coefficient (-0.52) for durables consumption are higher than for nondurables and services consumption (see Table 11). In addition, durables consumption responds more to stock market volatility (-0.25) than do nondurables and services consumption. Moreover, the speed of adjustment (-0.43) is higher for durables consumption, and it takes about 1.3 years for an existing disequilibrium to be reduced by its half-life (50%).[29] When I remove rich states, the income elasticity of durables consumption increases to 0.95, but the inflation, stock market volatility, and speed of adjustment coefficients change slightly (see Table 12). Even removing the rich states did not raise the income elasticity of durables consumption to unity ($\theta_1 \neq 1$). Since the short-run income elasticities (level, 0.36, and first difference, 0.03), are far less than the long-run ones, the short-run dynamics of durables consumption confirm the validity of the PIH in the U.S.

In summary, the model performs well for total consumption, as well as the consumption of nondurables, services, and durables in terms of diagnostic tests.[30] Furthermore, I have significant long-run and short-run coefficients that carry correct signs. The long-run income elasticity is higher for durables than for services and nondurables consumption, which is economically plausible. In addition, the results confirm that durables are more responsive to stock market volatility than services and nondurables. Moreover, the long-run coefficients of the effect of stock market volatility on consumption indicate that the effect of uncertainty is asymmetric "with large increases having a more substantial impact than large decreases,"[31] and is neither temporary nor symmetric.

Although the main purpose of this paper is to validate the uncertainty hypothesis associated with the stock market in the US, the findings confirm the existence of the PIH, as the short-run income elasticities are far less than the long-run ones. As a result, the initial stimulus effect of macroeconomic policy tools that target consumption would be very small and increase gradually as consumers build their confidence in the permanency of their

[29]This result challenges the idea of the slow adjustment of durable goods (Caballero, 1993).

[30]Diagnostic tests reveal that the DFE method suffers from serial correlation, misspecification, and non-normality in almost all models (Results are available upon request).

[31]Foerster (2014).

income.

Unlike previous studies, I distinguish between income uncertainty (PIH) and the uncertainty hypothesis associated with the stock market. Since "most [consumption research] would probably agree that Milton Friedman's original intuitive description of behavior was much closer to the mark, at least for the median consumer,"[32] one would validate the uncertainty hypothesis together with the PIH, as I did in this paper. Although the original uncertainty hypothesis focused on the Great Depression, extending the conjecture to other recessionary periods in the US is reasonable.

While Shulman et al. (1995) found that "as long as asset prices are rising, the risk of a significant drop in consumer spending is small," this paper specifies that ignoring stock market volatility, as a crucial determinant of consumer spending plans could be misleading. Since, at most, only 48% of households with incomes between $100,000 and $200,000 (not included) own stocks, it is reasonable to postulate that most consumers in the U.S. economy consider the stock market to be a signal of uncertainty rather than a source of wealth.[33] Even though an unstable stock market would benefit some stockholders, the economy as a whole would suffer. Therefore, a stable stock market with lower volatility is more desirable.

4 Conclusion and Policy Implications

A broad range of studies exists in the literature regarding the uncertainty hypothesis. Results have been mixed as researchers have employed different models and methodologies. However, conventional methods, such as the ARDL, DOLS, FMOLS, MG, and DFE, provide economically implausible coefficients. In this paper, I include the uncertainty index (VIX) in a standard conventional consumption function to validate the uncertainty hypothesis associated with the stock market. The estimates are more consistent with economic theories than those estimates used in previous studies. In general, all long-run coefficients are significant

[32] Carroll (2001).
[33] Chien and Morris (2017).

and carry the correct sign. In addition, the magnitude of the coefficients is reasonable.

To validate the uncertainty hypothesis and capture the effect of the stock market, I employ the VIX to measure stock market volatility. I find that stock market volatility influences consumers' confidence adversely and reduces their purchasing intensions. Although all categories of consumption suffer from stock market volatility, the findings confirm that durables consumption responds to stock market volatility to a greater degree than services and nondurables. While an unstable stock market might benefit some stockholders in the short-run, it could damage the entire U.S. economy, as consumption accounts for more than 68% of the U.S. GDP. Therefore, a stable stock market is more desirable, as it has been an important determinant of consumers' purchasing plan since the Great Depression.

In contrast to the pervasive idea of no cointegration among consumption and its determinants, I find a strong long-run relationship between the variables in the models. Although I test the existence of the cointegration in the models using a residual-based method, the negative and significant speed of adjustment coefficients obtained from the PMG estimates reconfirms the existence of a long-run relationship among the variables. Since most consumption researchers believe in the PIH, I validate the PIH by considering both the short- and long-run dynamics of the effect of income, together with the uncertainty hypothesis. I find that the short-run income elasticities are far less than the long-run ones. This result reconfirms that the PIH is still valid in the US, as it indicates that the efficacy of macroeconomic policy tools is less pronounced in the short-run than in the long-run. In addition, even though the stock market does not represent the entire economy, an unstable stock market can strongly affects the economy and weaken the efficacy of macroeconomic policy tools in the long run. Therefore, policymakers should calm the stock market to achieve a successful macroeconomic policy through consumers' confidence.

Finally, as turbulence creates the fear of flying, uncertainty associated with an unstable stock market generates the fear of buying. However, "the greatest danger in times of turbulence is not the turbulence; it is to act with yesterday's logic" (Peter Drucker).

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Appendix

List of States in the study

Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Idaho, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming.

Table 1: State-Specific Estimates and Diagnostic Results for Total Consumption.

State	ϕ	θ_1	θ_2	θ_3	χ^2_{SC}	χ^2_{FE}	χ^2_{NO}	χ^2_{HE}	$\bar{R}^2$
AL	-0.249	0.674	-0.104	-0.058	2.53	0.08	2.26	0.00	0.77
	(0.139)	(0.483)	(0.314)	(0.046)					
AK	-0.121	0.373	-0.495	-0.179	1.37	0.56	0.36	0.00	0.73
	(0.097)	(2.005)	(1.149)	(0.117)					
AZ	-0.291	0.912	-0.310	0.008	3.51	0.45	0.98	0.00	0.93
	(0.106)	(0.204)	(0.144)	(0.045)					
AR	-0.296	1.351	-0.518	-0.054	0.07	3.89	2.14	0.00	0.80
	(0.074)	(0.288)	(0.253)	(0.029)					
CA	-0.261	0.787	-0.103	-0.059	1.49	3.59	0.44	0.00	0.87
	(0.143)	(0.246)	(0.163)	(0.033)					
CO	-0.209	1.193	-0.584	-0.087	1.14	5.36	0.43	0.00	0.82
	(0.066)	(0.522)	(0.260)	(0.055)					
CT	-0.379	0.110	0.108	-0.132	0.30	0.61	0.61	0.00	0.81
	(0.129)	(0.219)	(0.135)	(0.047)					
DE	-0.436	0.405	0.316	-0.041	0.02	0.46	0.81	0.00	0.53
	(0.135)	(0.136)	(0.063)	(0.022)					
FL	-0.470	0.535	0.013	-0.042	2.73	0.00	0.38	0.00	0.91
	(0.212)	(0.163)	(0.048)	(0.024)					
GA	-0.189	0.179	-0.052	-0.124	0.79	0.51	3.66	0.00	0.80
	(0.114)	(0.453)	(0.303)	(0.075)					
ID	-0.220	0.798	-0.120	-0.128	0.52	0.42	1.19	0.00	0.81
	(0.101)	(0.463)	(0.192)	(0.077)					
IL	-0.150	1.823	-0.559	-0.129	0.00	1.11	1.66	0.00	0.81
	(0.100)	(0.933)	(0.600)	(0.092)					
IA	-0.136	2.163	-1.279	-0.178	0.02	2.05	0.84	0.00	0.54
	(0.117)	(1.703)	(1.517)	(0.165)					
KS	-0.142	0.901	-0.996	-0.237	0.44	0.40	0.85	0.00	0.76
	(0.070)	(0.744)	(0.909)	(0.134)					
KY	-0.396	1.521	-0.276	-0.010	0.03	1.16	1.50	0.00	0.78
	(0.075)	(0.284)	(0.121)	(0.018)					
LA	-0.591	0.974	-0.285	-0.077	0.00	6.22	0.83	0.00	0.59
	(0.197)	(0.266)	(0.324)	(0.038)					
ME	-0.265	0.459	0.049	-0.080	0.04	4.56	1.03	0.00	0.59
	(0.226)	(0.464)	(0.440)	(0.079)					
MD	-0.096	1.023	-0.852	-0.319	2.54	0.02	1.33	0.00	0.94
	(0.082)	(0.471)	(0.827)	(0.287)					
MA	-0.188	0.317	-0.003	-0.133	1.47	0.27	0.49	0.00	0.82
	(0.097)	(0.242)	(0.234)	(0.075)					
MI	-0.041	1.412	-1.626	-0.270	0.97	0.07	1.18	0.00	0.81
	(0.130)	(3.369)	(6.674)	(0.855)					
MN	-0.361	1.460	-0.496	-0.010	3.30	0.01	3.05	0.00	0.76
	(0.090)	(0.402)	(0.222)	(0.025)					
MS	-0.181	1.864	-1.312	-0.129	1.23	0.28	0.44	0.00	1.00
	(0.192)	(1.292)	(1.865)	(0.150)					
MT	-0.272	0.205	0.250	-0.143	1.38	2.28	1.18	0.00	0.82
	(0.099)	(0.363)	(0.279)	(0.058)					

[a] ***Standard errors*** *are in parentheses.*

Table 1: (continued) State-Specific Estimates and Diagnostic Results.

State	ϕ	θ_1	θ_2	θ_3	χ^2_{SC}	χ^2_{FE}	χ^2_{NO}	χ^2_{HE}	$\bar{R}^2$
NE	0.002	-138.300	143.400	14.300	1.18	0.14	0.44	0.00	0.76
	(0.076)	(4923.000)	(5082.000)	(509.700)					
NV	-0.476	-0.014	0.147	-0.078	0.01	1.27	4.54	0.00	0.87
	(0.161)	(0.186)	(0.101)	(0.036)					
NH	-0.252	-0.276	0.355	-0.090	0.07	3.54	1.67	0.00	0.63
	(0.189)	(0.376)	(0.210)	(0.079)					
NJ	-0.251	0.907	-0.154	-0.111	2.46	7.65	1.06	0.00	0.80
	(0.058)	(0.278)	(0.131)	(0.033)					
NM	-0.408	1.176	-0.293	-0.084	0.07	3.11	0.28	0.00	0.73
	(0.135)	(0.303)	(0.262)	(0.032)					
NY	-0.300	0.799	0.005	-0.121	0.71	1.10	1.04	0.00	0.69
	(0.098)	(0.230)	(0.141)	(0.043)					
NC	-0.604	0.196	0.068	-0.074	0.78	1.03	1.22	0.00	0.84
	(0.126)	(0.156)	(0.039)	(0.016)					
ND	-0.744	0.443	0.554	-0.067	0.41	0.17	0.76	0.00	0.87
	(0.078)	(0.049)	(0.083)	(0.010)					
OH	-0.184	0.911	-0.264	-0.077	6.05	1.75	0.17	0.00	0.82
	(0.078)	(0.385)	(0.361)	(0.036)					
OK	-0.220	0.750	-0.305	-0.118	0.03	0.65	0.21	0.00	0.56
	(0.163)	(0.580)	(0.852)	(0.100)					
OR	-0.180	0.383	-0.243	-0.190	1.44	1.44	1.30	0.00	0.77
	(0.086)	(0.620)	(0.273)	(0.104)					
PA	-0.162	1.428	-0.598	-0.082	2.28	0.11	0.36	0.00	0.83
	(0.075)	(0.583)	(0.331)	(0.055)					
RI	-0.213	0.854	-0.086	-0.104	1.10	0.67	1.12	0.00	0.49
	(0.166)	(1.029)	(0.680)	(0.093)					
SC	-0.099	-0.645	-0.008	-0.242	0.82	2.54	0.59	0.00	0.62
	(0.138)	(1.596)	(1.525)	(0.335)					
SD	-0.115	-0.141	0.530	-0.214	1.71	0.15	0.94	0.00	0.73
	(0.135)	(1.179)	(0.691)	(0.226)					
TX	-0.172	1.121	-0.731	-0.161	0.06	1.67	0.57	0.00	0.69
	(0.150)	(0.874)	(1.005)	(0.124)					
UT	-0.190	0.733	-0.368	-0.147	0.77	2.07	1.02	0.00	0.90
	(0.083)	(0.321)	(0.199)	(0.082)					
VT	-0.480	0.573	0.246	-0.048	0.44	0.42	0.87	0.00	0.49
	(0.176)	(0.117)	(0.090)	(0.016)					
VA	-0.455	1.437	-0.230	-0.031	0.25	5.11	1.90	0.00	0.88
	(0.088)	(0.177)	(0.104)	(0.019)					
WA	-0.151	0.869	-0.538	-0.137	3.62	0.06	0.82	0.00	0.84
	(0.112)	(0.770)	(0.708)	(0.096)					
WV	-0.173	1.259	-0.278	-0.081	0.20	1.58	0.36	0.00	0.52
	(0.179)	(1.123)	(0.695)	(0.065)					
WI	-0.312	1.200	-0.201	-0.072	0.35	0.93	0.88	0.00	0.79
	(0.062)	(0.246)	(0.131)	(0.028)					
WY	-0.097	0.778	-1.147	-0.368	0.94	0.33	0.76	0.00	0.82
	(0.174)	(0.586)	(2.005)	(0.701)					

[a] ***Standard errors*** *are in parentheses.*

Table 2: Alternative Pooled Estimates for Total Consumption (46 states).

Variable	PMG	MG	DFE
A: Long-run Coefficients			
Panel A: ARDL (1, 0, 0, 0)			
Income Elasticity	0.844*	-2.142	1.274*
	(0.032)	(3.026)	(0.270)
Inflation Effect	-0.193*	2.926	-0.380*
	(0.028)	(3.123)	(0.135)
VIX Effect	-0.105*	0.221	-0.089*
	(0.007)	(0.313)	(0.020)
Speed of Adjustment	-0.269*	-0.360*	-0.320*
	(0.019)	(0.024)	(0.064)
Panel B: ARDL (1, 1, 1, 1)			
Income Elasticity	0.714*	1.200*	0.656*
	(0.057)	(0.335)	(0.073)
Inflation Effect	-0.404*	-0.919*	-0.458*
	(0.056)	(0.401)	(0.057)
VIX Effect	-0.171*	-0.217*	-0.202*
	(0.013)	(0.059)	(0.019)
Speed of Adjustment	-0.148*	-0.248*	-0.134*
	(0.006)	(0.025)	(0.010)
Panel C: ARDL (SBC)			
Income Elasticity	0.838*	-2.220	
	(0.044)	(3.025)	
Inflation Effect	-0.360*	2.840	
	(0.045)	(3.125)	
VIX Effect	-0.140*	0.196	
	(0.010)	(0.314)	
Speed of Adjustment	-0.179*	-0.265	
	(0.008)	(0.023)	
B: Sort-run Coefficients			
Income Elasticity			
Level	0.150*		
	(0.007)		
First Difference	0.155*		
	(0.022)		
Inflation Effect			
Level	-0.064*		
	(0.003)		
First Difference	-0.288*		
	(0.035)		
VIX Effect			
Level	-0.025*		
	(0.001)		
First Difference	0.000		
	(0.000)		

[a] ***Standard errors*** *are in parentheses.*

[b] ***The asterisk*** *indicates that the coefficient is significant at the 5% level .*

Table 3: Alternative Pooled Estimates for Total Consumption (37 states).

Variable	PMG	MG	DFE
A: Long-run Coefficients			
Panel A: ARDL (1, 0, 0, 0)			
Income Elasticity	0.902*	-2.828	1.279*
	(0.036)	(3.764)	(0.247)
Inflation Effect	-0.237*	3.657	-0.377*
	(0.035)	(3.883)	(0.134)
VIX Effect	-0.103*	0.300	-0.083*
	(0.008)	(0.389)	(0.020)
Speed of Adjustment	-0.261*	-0.364*	-0.339*
	(0.022)	(0.028)	(0.076)
Panel B: ARDL (1, 1, 1, 1)			
Income Elasticity	0.827*	1.324*	1.279*
	(0.063)	(0.413)	(0.247)
Inflation Effect	-0.445*	-1.083*	-0.377*
	(0.064)	(0.495)	(0.134)
VIX Effect	-0.144*	-0.238*	-0.083*
	(0.013)	(0.074)	(0.020)
Speed of Adjustment	-0.151*	-0.250*	-0.339*
	(0.008)	(0.030)	(0.076)
Panel C: ARDL (SBC)			
Income Elasticity	0.908*	-2.910	
	(0.046)	(3.762)	
Inflation Effect	-0.392*	3.583	
	(0.050)	(3.885)	
VIX Effect	-0.124*	0.275	
	(0.010)	(0.390)	
Speed of Adjustment	-0.183*	-0.271*	
	(0.011)	(0.027)	
B: Sort-run Coefficients			
Income Elasticity			
Level	0.167*		
	(0.010)		
First Difference	0.149*		
	(0.025)		
Inflation Effect			
Level	-0.072*		
	(0.004)		
First Difference	-0.273*		
	(0.039)		
VIX Effect			
Level	-0.023*		
	(0.001)		
First Difference	0.000		
	(0.001)		

[a] ***Standard errors*** *are in parentheses.*

[b] ***The asterisk*** *indicates that the coefficient is significant at the 5% level .*

Table 4: State-Specific Estimates and Diagnostic Results for Nondurables.

State	ϕ	θ_1	θ_2	θ_3	χ^2_{SC}	χ^2_{FE}	χ^2_{NO}	χ^2_{HE}	$\bar{R}^2$
AL	-0.127	0.409	-0.591	-0.161	3.05	1.55	0.38	0.00	0.88
	(0.099)	(0.953)	(0.459)	(0.151)					
AK	-0.252	0.864	-0.829	-0.109	0.02	0.08	1.37	0.00	0.45
	(0.112)	(0.812)	(0.528)	(0.066)					
AZ	-0.054	0.294	-2.456	-1.332	0.00	1.07	1.07	0.00	0.79
	(0.121)	(2.029)	(5.675)	(3.254)					
AR	-0.459	1.136	-0.284	0.022	0.11	0.76	0.52	0.00	0.30
	(0.197)	(0.306)	(0.187)	(0.042)					
CA	-0.181	0.588	-0.351	-0.175	4.52	2.93	1.23	0.00	0.82
	(0.097)	(0.301)	(0.322)	(0.093)					
CO	-0.411	1.423	-0.474	0.022	1.62	2.86	0.87	0.00	0.65
	(0.114)	(0.563)	(0.155)	(0.052)					
CT	-0.254	0.107	-0.309	-0.303	0.20	0.68	0.77	0.00	0.84
	(0.072)	(0.373)	(0.181)	(0.077)					
DE	-0.377	-0.122	-0.281	-0.105	0.55	1.63	0.56	0.00	0.67
	(0.109)	(0.262)	(0.139)	(0.048)					
FL	-0.610	0.577	-0.061	-0.035	1.77	1.32	19.43	0.00	0.68
	(0.193)	(0.236)	(0.061)	(0.040)					
GA	-0.568	0.415	-0.116	-0.053	1.62	0.80	1.00	0.00	0.77
	(0.140)	(0.179)	(0.048)	(0.028)					
ID	-0.422	1.216	-0.178	-0.100	2.71	0.59	0.77	0.00	0.76
	(0.105)	(0.315)	(0.113)	(0.054)					
IL	-0.068	3.898	-1.879	0.133	1.24	0.88	3.54	0.00	0.72
	(0.143)	(7.727)	(4.336)	(0.552)					
IA	-0.189	1.645	-0.873	-0.185	0.08	4.28	1.38	0.00	0.47
	(0.115)	(0.913)	(0.712)	(0.124)					
KS	-0.472	0.859	-0.594	-0.074	0.16	0.69	0.17	0.00	0.78
	(0.095)	(0.193)	(0.140)	(0.024)					
KY	-0.245	0.908	-0.414	-0.042	1.89	1.05	0.62	0.00	0.64
	(0.093)	(0.560)	(0.255)	(0.051)					
LA	-1.000	1.089	-0.337	-0.006	1.48	5.29	1.02	0.00	0.63
	(NA)	(0.143)	(0.127)	(0.014)					
ME	-0.119	1.389	-0.823	-0.278	0.48	0.70	2.19	0.00	0.42
	(0.110)	(1.749)	(1.115)	(0.281)					
MD	-0.320	0.594	-0.435	-0.144	1.64	0.01	0.38	0.00	0.81
	(0.092)	(0.262)	(0.133)	(0.050)					
MA	-0.291	0.749	-0.546	-0.147	0.30	3.43	2.04	0.00	0.71
	(0.089)	(0.310)	(0.187)	(0.048)					
MI	-0.115	1.179	-0.510	-0.111	0.99	0.24	0.41	0.00	0.70
	(0.112)	(0.829)	(0.679)	(0.114)					
MN	-0.376	1.751	-0.723	0.023	2.22	0.14	0.64	0.00	0.87
	(0.060)	(0.300)	(0.121)	(0.028)					
MS	-0.442	1.364	-0.573	-0.075	0.11	0.85	0.60	0.00	0.40
	(0.198)	(0.636)	(0.463)	(0.040)					
MT	-0.266	2.057	-1.212	-0.085	0.09	0.42	0.33	0.00	0.66
	(0.115)	(0.603)	(0.535)	(0.111)					

[a] ***Standard errors*** *are in parentheses.*

Table 4: (continued) State-Specific Estimates and Diagnostic Results.

State	ϕ	θ_1	θ_2	θ_3	χ^2_{SC}	χ^2_{FE}	χ^2_{NO}	χ^2_{HE}	$\bar{R}^2$
NE	-0.178	1.274	-0.824	-0.259	0.35	2.41	1.18	0.00	0.42
	(0.126)	(1.255)	(1.028)	(0.203)					
NV	-0.358	0.393	-0.041	-0.110	0.03	2.19	0.37	0.00	0.72
	(0.117)	(0.290)	(0.172)	(0.074)					
NH	-0.361	-0.158	-0.201	-0.114	0.22	1.62	0.46	0.00	0.84
	(0.055)	(0.173)	(0.066)	(0.021)					
NJ	-0.227	0.735	-0.448	-0.185	0.09	0.00	1.41	0.00	0.78
	(0.064)	(0.377)	(0.182)	(0.063)					
NM	-0.507	0.928	-0.273	-0.080	0.69	2.56	0.81	0.00	0.57
	(0.154)	(0.233)	(0.148)	(0.033)					
NY	-0.238	0.702	-0.249	-0.195	0.01	0.89	0.66	0.00	0.70
	(0.082)	(0.284)	(0.170)	(0.070)					
NC	-0.525	0.318	-0.096	-0.095	1.52	0.23	1.10	0.00	0.65
	(0.122)	(0.217)	(0.068)	(0.028)					
ND	-0.510	0.158	0.711	-0.088	2.57	3.55	0.72	0.00	0.57
	(0.101)	(0.229)	(0.304)	(0.031)					
OH	-0.405	0.202	-0.212	-0.035	0.36	4.68	2.87	0.00	0.71
	(0.143)	(0.244)	(0.091)	(0.022)					
OK	-0.289	0.693	-0.129	-0.078	1.46	0.15	0.23	0.00	0.50
	(0.085)	(0.398)	(0.376)	(0.039)					
OR	-0.171	0.469	-0.417	-0.244	6.96	0.16	0.76	0.00	0.78
	(0.087)	(0.538)	(0.280)	(0.146)					
PA	-0.347	0.574	-0.345	-0.043	0.89	0.25	0.81	0.00	0.50
	(0.114)	(0.456)	(0.142)	(0.044)					
RI	-0.314	2.215	-0.993	-0.104	1.25	0.25	1.08	0.00	0.78
	(0.059)	(0.613)	(0.273)	(0.042)					
SC	-0.261	-0.216	0.071	-0.125	3.30	5.15	0.68	0.00	0.41
	(0.196)	(0.627)	(0.245)	(0.111)					
SD	-0.092	-0.82	0.128	-0.351	1.22	0.26	0.48	0.00	0.51
	(0.119)	(2.752)	(1.177)	(0.432)					
TX	-0.431	0.530	-0.010	-0.106	2.51	0.10	0.76	0.00	0.45
	(0.153)	(0.256)	(0.168)	(0.040)					
UT	-0.596	1.034	-0.470	-0.021	1.42	3.03	1.01	0.00	0.63
	(0.148)	(0.219)	(0.135)	(0.029)					
VT	-0.353	0.502	-0.013	-0.114	1.74	0.36	0.34	0.00	0.44
	(0.116)	(0.296)	(0.171)	(0.039)					
VA	-0.588	0.849	-0.287	-0.024	0.00	4.30	0.41	0.00	0.80
	(0.111)	(0.191)	(0.073)	(0.020)					
WA	-0.403	0.228	-0.092	-0.107	0.48	0.45	1.81	0.00	0.62
	(0.141)	(0.199)	(0.092)	(0.052)					
WV	-0.006	-41.646	4.844	-2.630	0.78	4.23	0.33	0.00	0.18
	(0.237)	(1747.79)	(190.80)	(107.76)					
WI	-0.400	0.814	-0.253	-0.071	0.11	7.02	1.51	0.00	0.61
	(0.115)	(0.271)	(0.102)	(0.039)					
WY	-0.223	2.481	-2.306	-0.128	0.09	1.61	1.00	0.00	0.78
	(0.120)	(1.043)	(1.337)	(0.143)					

[a] ***Standard errors*** *are in parentheses.*

Table 5: Alternative Pooled Estimates for Nondurables (46 states).

Variable	PMG	MG	DFE
A: Long-run Coefficients			
Panel A: ARDL (1, 0, 0, 0)			
Income Elasticity	0.830*	0.848*	0.606*
	(0.054)	(0.091)	(0.149)
Inflation Effect	-0.425*	-0.436*	-0.376*
	(0.033)	(0.090)	(0.043)
VIX Effect	-0.136*	-0.129*	-0.173*
	(0.010)	(0.029)	(0.028)
Speed of Adjustment	0.234*	-0.363*	-0.200*
	(0.010)	(0.023)	(0.026)
Panel B: ARDL (1, 1, 1, 1)			
Income Elasticity	0.560*	0.992*	0.444*
	(0.075)	(0.236)	(0.119)
Inflation Effect	-0.472*	-0.572*	-0.418*
	(0.045)	(0.129)	(0.055)
VIX Effect	-0.168*	-0.121*	-0.213*
	(0.014)	(0.025)	(0.027)
Speed of Adjustment	-0.170*	-0.328 *	-0.168*
	(0.009)	(0.035)	(0.017)
Panel C: ARDL (SBC)			
Income Elasticity	0.724*	-0.073	
	(0.056)	(0.931)	
Inflation Effect	-0.452*	-0.364*	
	(0.036)	(0.143)	
VIX Effect	-0.159*	-0.188*	
	(0.011)	(0.062)	
Speed of Adjustment	-0.228*	-0.335*	
	(0.019)	(0.027)	
B: Sort-run Coefficients			
Income Elasticity			
Level	0.165*		
	(0.014)		
First Difference	0.046*		
	(0.021)		
Inflation Effect			
Level	-0.103*		
	(0.009)		
First Difference	-0.062*		
	(0.024)		
VIX Effect			
Level	-0.036*		
	(0.003)		
First Difference	0.003		
	(0.002)		

[a] ***Standard errors*** *are in parentheses.*

[b] ***The asterisk*** *indicates that the coefficient is significant at the 5% level .*

Table 6: Alternative Pooled Estimates for Nondurables (37 states).

Variable	PMG	MG	DFE
A: Long-run Coefficients			
Panel A: ARDL (1, 0, 0, 0)			
Income Elasticity	0.896*	0.904*	0.600*
	(0.054)	(0.109)	(0.160)
Inflation Effect	-0.391*	-0.453*	-0.330*
	(0.037)	(0.111)	(0.042)
VIX Effect	-0.119*	-0.129*	-0.164*
	(0.011)	(0.035)	(0.032)
Speed of Adjustment	-0.248*	-0.364*	-0.203*
	(0.012)	(0.027)	(0.032)
Panel B: ARDL (1, 1, 1, 1)			
Income Elasticity	0.857*	1.164*	0.481*
	(0.094)	(0.285)	(0.111)
Inflation Effect	-0.575*	-0.625*	-0.362*
	(0.065)	(0.158)	(0.054)
VIX Effect	-0.141*	-0.109*	-0.195*
	(0.015)	(0.030)	(0.028)
Speed of Adjustment	-0.167*	-0.333*	-0.179*
	(0.011)	(0.041)	(0.019)
Panel C: ARDL (SBC)			
Income Elasticity	0.871*	-0.214	
	(0.055)	(1.159)	
Inflation Effect	-0.416*	-0.358*	
	(0.038)	(0.178)	
VIX Effect	-0.127*	-0.198*	
	(0.011)	(0.077)	
Speed of Adjustment	-0.255*	-0.338*	
	(0.023)	(0.032)	
B: Sort-run Coefficients			
Income Elasticity			
Level	0.222*		
	(0.020)		
First Difference	0.044*		
	(0.025)		
Inflation Effect			
Level	-0.106*		
	(0.010)		
First Difference	-0.047*		
	(0.028)		
VIX Effect			
Level	-0.032*		
	(0.003)		
First Difference	0.002		
	(0.002)		

[a] ***Standard errors*** *are in parentheses.*
[b] ***The asterisk*** *indicates that the coefficient is significant at the 5% level .*

Table 7: State-Specific Estimates and Diagnostic Results for Services.

State	ϕ	θ_1	θ_2	θ_3	χ^2_{SC}	χ^2_{FE}	χ^2_{NO}	χ^2_{HE}	$\bar{R}^2$
AL	-0.385	1.044	-0.101	-0.027	5.00	1.04	1.43	0.00	0.76
	(0.114)	(0.260)	(0.158)	(0.025)					
AK	-0.162	1.065	-0.633	-0.181	0.09	1.16	0.96	0.00	0.73
	(0.109)	(0.872)	(0.668)	(0.127)					
AZ	-0.303	0.624	-0.189	-0.008	0.91	1.60	0.72	0.00	0.93
	(0.074)	(0.121)	(0.077)	(0.025)					
AR	-0.292	0.577	0.003	-0.095	1.26	1.44	0.19	0.00	0.74
	(0.098)	(0.353)	(0.274)	(0.046)					
CA	-1.00	0.563	0.010	0.003	0.05	13.72	0.55	0.00	0.87
	(NA)	(0.032)	(0.014)	(0.006)					
CO	-0.249	1.712	-0.481	-0.030	0.96	0.50	1.23	0.00	0.90
	(0.047)	(0.331)	(0.127)	(0.035)					
CT	-0.135	-0.429	-0.187	-0.346	0.26	7.82	1.37	0.00	0.84
	(0.124)	(0.892)	(0.470)	(0.313)					
DE	-0.167	0.104	0.034	-0.190	1.80	1.61	1.40	0.00	0.65
	(0.081)	(0.719)	(0.325)	(0.116)					
FL	-0.479	0.067	0.057	0.008	3.53	0.00	25.62	0.00	0.79
	(0.155)	(0.136)	(0.022)	(0.018)					
GA	-0.051	5.198	-2.513	-0.177	5.54	0.18	0.17	0.00	0.52
	(0.123)	(14.120)	(8.045)	(0.376)					
ID	-0.318	1.073	-0.062	-0.031	1.20	1.57	1.77	0.00	0.80
	(0.080)	(0.247)	(0.095)	(0.024)					
IL	-0.481	0.455	0.246	-0.049	0.17	3.76	0.56	0.00	0.51
	(0.188)	(0.187)	(0.109)	(0.024)					
IA	-0.181	1.248	-0.581	-0.115	0.04	3.72	0.59	0.00	0.53
	(0.150)	(0.944)	(0.855)	(0.107)					
KS	-0.208	-0.052	0.107	-0.199	0.14	0.47	3.13	0.00	0.72
	(0.096)	(0.364)	(0.364)	(0.102)					
KY	-0.357	1.425	-0.237	-0.024	5.37	0.26	0.72	0.00	0.78
	(0.091)	(0.362)	(0.147)	(0.019)					
LA	-0.708	0.762	0.099	-0.057	6.75	8.29	0.79	0.00	0.76
	(0.130)	(0.081)	(0.098)	(0.015)					
ME	-0.265	0.982	-0.131	-0.070	3.08	0.87	1.26	0.00	0.85
	(0.051)	(0.235)	(0.122)	(0.022)					
MD	0.000	254.973	-254.193	-89.487	3.51	3.21	1.91	0.00	0.83
	(0.133)	(75415)	(75391)	(26538)					
MA	-0.265	0.055	0.244	-0.088	3.16	2.92	1.46	0.00	0.85
	(0.153)	(0.417)	(0.171)	(0.058)					
MI	-0.120	0.469	-0.468	-0.222	5.99	0.13	0.38	0.00	0.90
	(0.055)	(0.892)	(0.477)	(0.100)					
MN	-1.000	0.528	0.055	0.004	0.05	4.34	0.69	0.00	0.76
	(NA)	(0.086)	(0.040)	(0.006)					
MS	-0.164	-0.046	0.333	-0.161	1.58	1.35	5.11	0.00	0.73
	(0.066)	(0.115)	(0.398)	(0.081)					
MT	-0.307	0.670	-0.087	-0.010	1.90	0.03	0.73	0.00	0.79
	(0.123)	(0.167)	(0.136)	(0.023)					

[a] ***Standard errors*** *are in parentheses.*

Table 7: (continued) State-Specific Estimates and Diagnostic Results.

State	ϕ	θ_1	θ_2	θ_3	χ^2_{SC}	χ^2_{FE}	χ^2_{NO}	χ^2_{HE}	$\bar{R}^2$
NE	-0.108	1.290	-0.841	-0.193	0.02	0.16	0.83	0.00	0.39
	(0.177)	(2.735)	(2.801)	(0.339)					
NV	-0.522	-0.108	0.111	-0.053	1.16	0.04	0.33	0.00	0.69
	(0.164)	(0.179)	(0.068)	(0.038)					
NH	-0.293	-0.025	0.420	-0.048	3.84	0.72	0.68	0.00	0.83
	(0.077)	(0.468)	(0.168)	(0.029)					
NJ	-0.337	0.623	0.188	-0.047	4.03	0.04	0.46	0.00	0.63
	(0.133)	(0.269)	(0.115)	(0.024)					
NM	-0.209	1.583	-0.528	-0.090	0.10	0.58	0.84	0.00	0.77
	(0.080)	(0.600)	(0.411)	(0.049)					
NY	-0.668	0.581	0.138	-0.041	0.00	0.04	1.07	0.00	0.69
	(0.160)	(0.089)	(0.041)	(0.015)					
NC	0.116	-0.060	0.804	0.273	0.84	0.78	0.73	0.00	0.69
	(0.189)	(1.104)	(1.249)	(0.443)					
ND	-0.431	0.658	0.141	-0.030	0.88	0.03	0.59	0.00	0.74
	(0.088)	(0.087)	(0.130)	(0.019)					
OH	-0.681	0.275	0.661	-0.013	0.76	1.57	0.52	0.00	0.66
	(0.209)	(0.097)	(0.075)	(0.009)					
OK	-0.257	-0.166	0.545	-0.107	5.71	0.60	0.67	0.00	0.64
	(0.182)	(0.486)	(0.307)	(0.090)					
OR	-0.368	0.721	-0.100	-0.095	0.41	2.15	1.68	0.00	0.84
	(0.075)	(0.298)	(0.104)	(0.027)					
PA	-0.120	2.810	-1.033	-0.082	5.39	0.19	0.96	0.00	0.83
	(0.067)	(1.489)	(0.751)	(0.076)					
RI	-0.374	0.467	0.272	-0.026	4.88	0.44	0.25	0.00	0.25
	(0.306)	(0.772)	(0.374)	(0.034)					
SC	-0.204	0.755	-0.078	-0.143	2.96	0.83	1.74	0.00	0.70
	(0.079)	(0.540)	(0.384)	(0.064)					
SD	-0.258	0.351	0.487	-0.083	0.00	0.54	0.70	0.00	0.59
	(0.110)	(0.211)	(0.201)	(0.037)					
TX	-0.658	0.513	-0.003	-0.018	0.04	0.31	1.82	0.00	0.70
	(0.229)	(0.116)	(0.090)	(0.013)					
UT	-0.209	0.785	-0.171	-0.034	2.17	3.83	1.36	0.00	0.75
	(0.118)	(0.381)	(0.198)	(0.067)					
VT	-0.150	1.164	-0.342	-0.104	3.16	0.40	1.18	0.00	0.40
	(0.155)	(0.754)	(0.676)	(0.090)					
VA	-0.317	1.405	-0.312	-0.055	0.13	0.08	1.45	0.00	0.72
	(0.122)	(0.524)	(0.264)	(0.049)					
WA	-0.038	10.686	-4.868	0.151	2.40	1.13	1.81	0.00	0.92
	(0.058)	(17.084	(8.106)	(0.349)					
WV	-0.351	1.034	-0.074	-0.041	1.03	0.20	0.44	0.00	0.54
	(0.220)	(0.554)	(0.231)	(0.021)					
WI	-0.143	1.700	-0.657	-0.107	0.83	2.81	0.64	0.00	0.83
	(0.053)	(0.656)	(0.444)	(0.063)					
WY	-0.633	0.513	0.068	-0.058	2.86	2.36	0.69	0.00	0.92
	(0.100)	(0.056)	(0.058)	(0.018)					

[a] ***Standard errors*** *are in parentheses.*

Table 8: Alternative Pooled Estimates for Services (46 states).

Variable	PMG	MG	DFE
A: Long-run Coefficients			
Panel A: ARDL (1, 0, 0, 0)			
Income Elasticity	0.789*	0.064	0.485
	(0.044)	(0.594)	(0.243)
Inflation Effect	-0.171*	0.411	-0.311*
	(0.035)	(0.351)	(0.114)
VIX Effect	-0.088*	-0.138*	-0.201*
	(0.010)	(0.043)	(0.059)
Speed of Adjustment	-0.174*	-0.339*	-0.089*
	(0.013)	(0.039)	(0.023)
Panel B: ARDL (1, 1, 1, 1)			
Income Elasticity	0.538*	7.316	0.432*
	(0.058)	(5.604)	(0.127)
Inflation Effect	-0.251*	-6.085	-0.370*
	(0.040)	(5.536)	(0.055)
VIX Effect	-0.161*	-1.982	-0.256*
	(0.014)	(1.945)	(0.033)
Speed of Adjustment	-0.139*	-0.289*	-0.121*
	(0.006)	(0.031)	(0.010)
Panel C: ARDL (SBC)			
Income Elasticity	0.753*	6.535	
	(0.038)	(5.527)	
Inflation Effect	-0.238*	-5.736	
	(0.030)	(5.523)	
VIX Effect	-0.120*	(-2.013)	
	(0.009)	(1.944)	
Speed of Adjustment	-0.211*	-0.322*	
	(0.027)	(0.035)	
B: Sort-run Coefficients			
Income Elasticity			
Level	0.159*		
	(0.020)		
First Difference	0.043*		
	(0.013)		
Inflation Effect			
Level	-0.050*		
	(0.006)		
First Difference	-0.715*		
	(0.062)		
VIX Effect			
Level	-0.025*		
	(0.003)		
First Difference	0.007*		
	(0.001)		

[a] ***Standard errors*** *are in parentheses.*
[b] ***The asterisk*** *indicates that the coefficient is significant at the 5% level .*

Table 9: Alternative Pooled Estimates for Services (37 states).

Variable	PMG	MG	DFE
A: Long-run Coefficients			
Panel A: ARDL (1, 0, 0, 0)			
Income Elasticity	0.845*	0.646*	0.499
	(0.054)	(0.157)	(0.292)
Inflation Effect	-0.247*	0.356	-0.432*
	(0.051)	(0.409)	(0.172)
VIX Effect	-0.089*	-0.108*	-0.227*
	(0.013)	(0.031)	(0.081)
Speed of Adjustment	-0.154*	-0.335*	-0.075*
	(0.014)	(0.043)	(0.023)
Panel B: ARDL (1, 1, 1, 1)			
Income Elasticity	0.614*	0.812*	0.436*
	(0.064)	(0.232)	(0.131)
Inflation Effect	-0.301*	-0.071	-0.365*
	(0.047)	(0.089)	(0.059)
VIX Effect	-0.148*	-0.055*	-0.250*
	(0.015)	(0.022)	(0.035)
Speed of Adjustment	-0.133*	-0.304*	-0.118*
	(0.006)	(0.032)	(0.011)
Panel C: ARDL (SBC)			
Income Elasticity	0.845*	0.857*	
	(0.046)	(0.157)	
Inflation Effect	-0.315*	-0.122	
	(0.041)	(0.092)	
VIX Effect	-0.116*	-0.068*	
	(0.010)	(0.014)	
Speed of Adjustment	-0.182*	-0.331*	
	(0.025)	(0.036)	
B: Sort-run Coefficients			
Income Elasticity			
Level	0.153*		
	(0.021)		
First Difference	0.039*		
	(0.015)		
Inflation Effect			
Level	-0.057*		
	(0.008)		
First Difference	-0.672*		
	(0.060)		
VIX Effect			
Level	-0.021*		
	(0.003)		
First Difference	0.005*		
	(0.001)		

[a] ***Standard errors*** *are in parentheses.*
[b] ***The asterisk*** *indicates that the coefficient is significant at the 5% level .*

Table 10: State-Specific Estimates and Diagnostic Results for Durables.

State	ϕ	θ_1	θ_2	θ_3	χ^2_{SC}	χ^2_{FE}	χ^2_{NO}	χ^2_{HE}	$\bar{R}^2$
AL	-0.478	1.073	-0.386	-0.243	0.15	9.35	1.13	0.00	0.61
	(0.131)	(0.908)	(1.116)	(0.075)					
AK	-0.552	0.068	-3.189	-0.144	0.54	0.64	1.67	0.00	0.72
	(0.104)	(0.192)	(0.477)	(0.033)					
AZ	-0.211	-0.347	1.740	-0.329	0.23	6.16	0.74	0.00	0.92
	(0.067)	(0.942)	(1.583)	(0.186)					
AR	-0.492	0.822	-1.102	-0.115	0.04	0.52	0.18	0.00	0.78
	(0.120)	(0.253)	(0.379)	(0.042)					
CA	-0.275	1.438	0.605	-0.348	0.06	7.45	0.67	0.00	0.88
	(0.075)	(0.583)	(0.695)	(0.092)					
CO	-0.235	0.789	2.871	-0.493	0.21	2.42	1.63	0.00	0.78
	(0.105)	(0.707)	(2.645)	(0.253)					
CT	-0.611	-0.815	-2.126	-0.218	0.11	6.54	0.63	0.00	0.74
	(0.120)	(0.296)	(0.246)	(0.038)					
DE	-1.000	0.570	-1.465	-0.166	0.77	8.64	0.82	0.00	0.85
	(NA)	(0.119)	(0.099)	(0.019)					
FL	-0.522	1.064	-1.613	-0.272	1.73	10.74	1.30	0.00	0.88
	(0.096)	(0.390)	(0.595)	(0.069)					
GA	-1.000	2.405	0.141	-0.087	0.24	5.96	3.31	0.00	0.91
	(NA)	(0.196)	(0.111)	(0.018)					
ID	-0.452	1.899	-0.139	-0.294	0.06	3.23	0.63	0.00	0.89
	(0.072)	(0.423)	(0.337)	(0.074)					
IL	-0.651	1.170	-0.780	-0.148	0.14	5.57	1.31	0.00	0.76
	(0.111)	(0.261)	(0.183)	(0.035)					
IA	-1.000	0.772	-1.457	-0.104	6.42	3.71	1.26	0.00	0.72
	(NA)	(0.123)	(0.186)	(0.011)					
KS	-0.513	0.895	-0.874	-0.156	0.02	0.15	0.47	0.00	0.69
	(0.180)	(0.185)	(0.361)	(0.058)					
KY	-1.000	1.852	-0.259	-0.116	0.25	1.50	0.29	0.00	0.69
	(NA)	(0.245)	(0.250)	(0.021)					
LA	-0.533	0.830	-1.028	-0.182	1.84	0.85	1.46	0.00	0.68
	(0.167)	(0.196)	(0.590)	(0.086)					
ME	-0.397	1.163	-1.283	-0.152	1.12	0.10	0.45	0.00	0.81
	(0.113)	(0.312)	(0.866)	(0.051)					
MD	-0.144	2.317	3.361	-0.432	0.12	3.64	0.08	0.00	0.80
	(0.139)	(3.459)	(6.207)	(0.306)					
MA	-0.517	0.414	-1.295	-0.203	1.30	1.45	0.91	0.00	0.69
	(0.130)	(0.193)	(0.467)	(0.044)					
MI	-0.656	1.146	-0.409	-0.093	0.38	0.60	3.79	0.00	0.82
	(0.120)	(0.136)	(0.296)	(0.026)					
MN	-0.338	2.329	0.581	-0.013	1.48	1.33	0.71	0.00	0.77
	(0.122)	(0.766)	(0.890)	(0.071)					
MS	-0.598	-0.082	-2.134	-0.303	0.52	3.58	0.84	0.00	0.75
	(0.126)	(0.089)	(0.296)	(0.052)					
MT	-0.252	1.818	1.159	-0.362	1.88	6.13	0.89	0.00	0.71
	(0.098)	(0.888)	(2.225)	(0.166)					

[a] ***Standard errors*** *are in parentheses.*

Table 10: (continued) State-Specific Estimates and Diagnostic Results.

State	ϕ	θ_1	θ_2	θ_3	χ^2_{SC}	χ^2_{FE}	χ^2_{NO}	χ^2_{HE}	$\bar{R}^2$
NE	-0.566	1.048	-1.178	-0.160	1.48	2.40	1.76	0.00	0.76
	(0.133)	(0.104)	(0.413)	(0.034)					
NV	-0.442	0.977	-0.873	-0.341	0.31	1.93	0.63	0.00	0.81
	(0.111)	(0.378)	(1.155)	(0.117)					
NH	-0.416	0.688	-1.206	-0.220	0.02	0.06	1.15	0.00	0.74
	(0.152)	(0.308)	(1.068)	(0.075)					
NJ	-0.365	0.584	-0.833	-0.272	1.40	9.70	0.30	0.00	0.69
	(0.086)	(0.642)	(0.418)	(0.073)					
NM	-0.530	0.404	-0.774	-0.238	0.88	6.77	1.11	0.00	0.88
	(0.092)	(0.192)	(0.317)	(0.042)					
NY	-0.477	0.066	-1.598	-0.247	0.19	10.63	0.19	0.00	0.75
	(0.140)	(0.350)	(0.395)	(0.052)					
NC	-0.338	-2.310	-1.902	-0.467	0.84	7.04	1.39	0.00	0.65
	(0.144)	(1.709)	(0.644)	(0.172)					
ND	-0.430	1.100	-1.065	-0.172	0.20	1.82	0.08	0.00	0.51
	(0.124)	(0.101)	(0.867)	(0.053)					
OH	-0.573	1.041	-0.241	-0.172	1.45	3.10	0.08	0.00	0.70
	(0.115)	(0.273)	(0.375)	(0.040)					
OK	-0.594	0.525	-1.065	-0.120	0.53	3.30	3.93	0.00	0.78
	(0.157)	(0.086)	(0.263)	(0.043)					
OR	-0.554	1.245	-0.145	-0.262	0.72	10.00	1.50	0.00	0.80
	(0.117)	(0.517)	(0.438)	(0.074)					
PA	-0.622	1.982	-0.651	-0.052	1.65	3.39	0.25	0.00	0.72
	(0.142)	(0.730)	(0.416)	(0.043)					
RI	-0.121	4.024	6.749	-0.186	0.18	0.55	0.29	0.00	0.80
	(0.140)	(5.066)	(12.232)	(0.208)					
SC	-0.562	1.351	0.280	-0.230	0.09	7.26	1.48	0.00	0.85
	(0.080)	(0.401)	(0.495)	(0.042)					
SD	-0.370	1.386	-0.050	-0.208	1.01	1.81	0.76	0.00	0.77
	(0.097)	(0.159)	(0.773)	(0.058)					
TX	-0.705	0.368	-1.208	-0.200	1.61	16.75	1.11	0.00	0.80
	(0.125)	(0.147)	(0.290)	(0.036)					
UT	-0.618	0.697	-1.488	-0.316	0.07	8.76	0.25	0.00	0.84
	(0.164)	(0.249)	(0.695)	(0.091)					
VT	-0.324	1.070	-0.352	-0.213	0.00	1.28	0.86	0.00	0.72
	(0.161)	(0.364)	(1.988)	(0.093)					
VA	-0.350	0.010	-0.914	-0.241	0.01	1.85	0.15	0.00	0.84
	(0.113)	(0.894)	(0.417)	(0.082)					
WA	-0.638	1.417	-0.493	-0.135	3.73	3.64	1.90	0.00	0.82
	(0.109)	(0.342)	(0.402)	(0.046)					
WV	-0.654	1.364	-1.174	-0.120	0.00	0.26	1.71	0.00	0.39
	(0.166)	(0.587)	(0.379)	(0.025)					
WI	-0.590	1.559	-0.568	-0.119	0.08	0.06	1.74	0.00	0.73
	(0.197)	(0.437)	(0.419)	(0.046)					
WY	-1.000	0.517	-2.618	-0.098	0.55	5.36	0.36	0.00	0.80
	(NA)	(0.055)	(0.236)	(0.020)					

[a] ***Standard errors*** *are in parentheses.*

Table 11: Alternative Pooled Estimates for Durables (46 states).

Variable	PMG	MG	DFE
A: Long-run Coefficients			
Panel A: ARDL (1, 0, 0, 0)			
Income Elasticity	0.802*	0.791*	0.697*
	(0.049)	(0.104)	(0.142)
Inflation Effect	-0.750*	-1.018*	-0.819*
	(0.063)	(0.154)	(0.106)
VIX Effect	-0.240*	-0.224*	-0.267*
	(0.011)	(0.021)	(0.025)
Speed of Adjustment	-0.397*	-0.520*	-0.371*
	(0.014)	(0.025)	(0.030)
Panel B: ARDL (1, 1, 1, 1)			
Income Elasticity	0.663*	1.000*	0.741*
	(0.048)	(0.157)	(0.111)
Inflation Effect	-0.601*	-0.301	-0.561*
	(0.072)	(0.322)	(0.120)
VIX Effect	-0.248*	-0.210*	-0.282*
	(0.010)	(0.015)	(0.021)
Speed of Adjustment	-0.332*	-0.502*	-0.341*
	(0.020)	(0.030)	(0.023)
Panel C: ARDL (SBC)			
Income Elasticity	0.839*	0.972*	
	(0.043)	(0.141)	
Inflation Effect	-0.518*	-0.488*	
	(0.062)	(0.241)	
VIX Effect	-0.251*	-0.212*	
	(0.010)	(0.016)	
Speed of Adjustment	-0.425*	-0.527*	
	(0.034)	(0.032)	
B: Sort-run Coefficients			
Income Elasticity			
Level	0.356*		
	(0.028)		
First Difference	0.030*		
	(0.051)		
Inflation Effect			
Level	-0.220*		
	(0.017)		
First Difference	-0.895*		
	(0.084)		
VIX Effect			
Level	-0.1071*		
	(0.008)		
First Difference	0.004		
	(0.005)		

[a] ***Standard errors*** *are in parentheses.*
[b] ***The asterisk*** *indicates that the coefficient is significant at the 5% level .*

Table 12: Alternative Pooled Estimates for Durables (37 states).

Variable	PMG	MG	DFE
A: Long-run Coefficients			
Panel A: ARDL (1, 0, 0, 0)			
Income Elasticity	0.868*	0.842*	0.713*
	(0.051)	(0.115)	(0.160)
Inflation Effect	-0.777*	-0.955*	-0.820*
	(0.072)	(0.173)	(0.113)
VIX Effect	-0.234*	-0.228*	-0.276*
	(0.013)	(0.025)	(0.033)
Speed of Adjustment	-0.402*	-0.529*	-0.360*
	(0.017)	(0.029)	(0.037)
Panel B: ARDL (1, 1, 1, 1)			
Income Elasticity	0.710*	1.064*	0.767*
	(0.052)	(0.182)	(0.117)
Inflation Effect	-0.567*	-0.215	-0.544*
	(0.085)	(0.373)	(0.132)
VIX Effect	-0.241*	-0.200*	-0.287*
	(0.012)	(0.017)	(0.026)
Speed of Adjustment	-0.331*	-0.514*	-0.335*
	(0.024)	(0.034)	(0.025)
Panel C: ARDL (SBC)			
Income Elasticity	0.945*	1.043*	
	(0.044)	(0.158)	
Inflation Effect	-0.482*	-0.442	
	(0.069)	(0.264)	
VIX Effect	-0.244*	-0.204*	
	(0.010)	(0.018)	
Speed of Adjustment	-0.446*	-0.551*	
	(0.041)	(0.037)	
B: Sort-run Coefficients			
Income Elasticity			
Level	0.421*		
	(0.039)		
First Difference	-0.008		
	(0.060)		
Inflation Effect			
Level	-0.215*		
	(0.020)		
First Difference	-0.936*		
	(0.092)		
VIX Effect			
Level	-0.109*		
	(0.010)		
First Difference	0.005		
	(0.075)		

[a] ***Standard errors*** *are in parentheses.*

[b] ***The asterisk*** *indicates that the coefficient is significant at the 5% level .*

Table 13: Panel Dynamic Least Square (DOLS) Estimates.

Variable	Total Consumption	Nondurables	Services	Durables
Income Elasticity	0.582*	0.632*	0.614*	0.872*
	(0.038)	(0.053)	(0.038)	(0.048)
Inflation Effect	0.100*	-0.088*	0.080*	-1.078*
	(0.023)	(0.025)	(0.024)	(0.070)
VIX Effect	-0.061*	-0.080*	-0.049*	-0.195*
	(0.007)	(0.011)	(0.009)	(0.014)

[a] ***Standard errors*** *are in parentheses.*
[b] ***The asterisk*** *indicates that the coefficient is significant at the 5% level .*

Table 14: Panel Fully Modified Least Square (FMOLS) Estimates.

Variable	Total Consumption	Nondurables	Services	Durables
Income Elasticity	0.700*	0.578*	0.497*	0.735*
	(0.023)	(0.032)	(0.034)	(0.026)
Inflation Effect	0.113*	-0.039*	0.211*	-1.300*
	(0.015)	(0.019)	(0.020)	(0.038)
VIX Effect	-0.030*	-0.045*	-0.003	-0.143*
	(0.005)	(0.006)	(0.006)	(0.006)

[a] ***Standard errors*** *are in parentheses.*
[b] ***The asterisk*** *indicates that the coefficient is significant at the 5% level .*