

*Voters, Information Heterogeneity, and the Dynamics of Aggregate Economic Expectations**

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Theory: It is argued here that previous studies analyzing the formation of voters' economic expectations overlook important subtleties found in a differentiated (heterogeneous) electorate. Since different segments of the electorate possess varying information capabilities, it is asserted that they will form their prospective economic evaluations differently from one another.

Hypotheses: The impact of "expectational" electoral cycles, news coverage of the economy reported by voters, retrospective economic evaluations, and personal financial expectations are hypothesized to have a differential impact on their economic expectations based on varying levels of information (education) among subsets of the electorate.

Methods: Time series multiple regression analysis is conducted for the monthly period between January 1978 and December 1990. The empirical analysis involves testing for the properties of the statistical time series (i.e., integration and cointegration) as well as specification of an error correction mechanism (ECM) that captures long-run statistical relationships in appropriate circumstances.

Results: These findings uncover electoral heterogeneity (based on information/education differences) with respect to voters' prospective economic evaluations. Specifically, the information capabilities of voters is inversely related to their reliance on past/retrospective sources of information when forming both egocentric and sociotropic economic expectations. The main implication of this research is that the assumption of electoral homogeneity contained in previous longitudinal analyses of aggregate economic opinion formation provides misleading results that either overlook intra-electoral variations, introduce aggregation bias, or possibly both.

Numerous studies over the years have focused exclusively on how voters form *retrospective* evaluations of the economy (e.g., Conover, Feldman, and Knight 1986, 1987; Haller and Norpoth 1995; Kiewiet 1983; Kinder and Kiewiet 1979; Lewis-Beck 1988; Weatherford 1983). More recently, politi-

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cal scientists have also begun to view the manner in which economic *prospections* are couched within the “rational expectations” versus “adaptive” expectations debate (Clarke and Stewart 1994; Haller and Norpoth 1994; MacKuen, Erikson, and Stimson 1992). Some scholars have discovered that the public’s economic expectations vary according to cyclical swings in a manner consistent with political business cycle theory (Suzuki 1992), and that news coverage of the economy significantly influences voters’ economic perceptions (Goidel and Langley 1995; Haller and Norpoth 1995; Hetherington 1996; MacKuen, Erikson, and Stimson 1992). Though the questions raised and conclusions drawn from these various studies differ, this body of research is important because the formation of economic expectations has been linked to both election outcomes (Kuklinski and West 1981; Miller and Wattenberg 1985) and presidential approval (Clarke and Stewart 1994; Jackman 1993; MacKuen, Erikson, and Stimson 1992).

This study extends the burgeoning body of literature on economic *prospections* by addressing the general research question: what factors significantly shape voters’ egocentric and sociotropic economic expectations? Although this question has been explored elsewhere, this analysis is innovative in two distinct ways from previous studies on this topic. First, the assumption of voter homogeneity (i.e., the treatment of the electorate as a singular entity or aggregate) is relaxed by disaggregating it into three unique informational groups based upon differences in educational attainment. Specific hypotheses relating to these information differences and how they will be related to economic expectations are set forth. This recognizes the empirical fact of voter heterogeneity noted by students of electoral behavior (e.g., Converse 1990; Granato and Krause 1995; Krause and Granato 1996; Lupia 1994; RIVERS 1988), and also allows one to examine the subtleties of this phenomena as it is manifested through the determinants of subjective economic *prospections*. Second, a richer model specification that analyzes the formation of economic expectations is set forth by accounting for objective (actual) economic conditions, subjective economic perceptions, and political variables. Also, unlike previous analyses examining the determinants of aggregate economic expectations, this study takes into account potential long-run relationships between voters’ economic *prospections* and its causal factors.

Using aggregate monthly data from the Institute of Social Research’s (ISR) Survey of Consumer Attitudes (SCA) for the sample period between January 1978 and December 1990, a time series econometric investigation is undertaken to estimate both voters’ personal financial (egocentric) expectations as well as their business (sociotropic) expectations for the macroeconomy for three distinct educational groups. The empirical results support the view that the electorate often forms its economic expectations differently across varying “informational” segments of the electorate. Moreover, the

findings contained in this study shed light on the distinct decision-making calculi employed by different segments of the electorate when expectations are formed about future pocketbook (egocentric) and business (sociotropic) conditions.

The “Informational” Basis for Electoral Heterogeneity

Up until now, research on aggregate economic opinion formation has treated the electorate as a single entity, thereby assuming that economic evaluations are formed in a homogeneous fashion (e.g., Goidel and Langley 1995; Haller and Norpoth 1994, 1995; MacKuen, Erikson, and Stimson 1992; Suzuki 1992). The findings from previous studies assuming a homogeneous electorate suffer from two limitations. First, aggregation of the electorate may produce faulty results since responses by various segments may cancel one another out, thereby providing an inaccurate portrayal of the factors that contribute to the formation of voters' economic expectations. Second, and more importantly, demonstration of electoral heterogeneity has broader implications for further research on voting behavior since incumbent politicians may not be able to apply a “one size fits all” reelection strategy to the entire electorate.

Despite studies of aggregate economic evaluations that have treated the electorate as a single unitary entity, recent research in other areas of political behavior has revealed that the electorate is heterogeneous.¹ Most of these investigations have accentuated the role of information as a means to assess electoral heterogeneity (e.g., Converse 1990; Sniderman, Glazer, and Griffin 1990; Stimson 1990). Recent empirical research in electoral behavior, to varying degrees, has also extended the notion of a heterogeneous electorate. One notable example is MacKuen, Erikson, and Stimson's (1989) analysis of the relationship between economic evaluations and macropartisanship which reveals that the American electorate does not have (or need) high levels of information across the entire population. Many others have also noted the differences regarding the decision-making processes between more informed and less informed voters (Lupia 1994; Sniderman, Brody, and Tetlock 1991).

How does one account for information differences within the electorate? If one is concerned with an individual-level survey regarding a narrowly defined issue (e.g., insurance reform ballot initiatives in the state of California), one could use a battery of survey questions to assess differences in information (Lupia 1994). This is impractical, however, for an aggregate national

¹MacKuen, Erikson, and Stimson (1992, 607) do assert that the electorate is heterogeneous—i.e., elites/better informed lead the less informed. This proposition, however, is not empirically tested (see, however, Granato and Krause 1995).

study of economic expectations. Since this research is concerned with a general issue (economic expectations) in an aggregate fashion, one can view education as a proxy for information. There is a sound empirical basis for such an assumption since better educated individuals tend to be more aware of current events as well as have an easier time acquiring new information. Many studies have shown that levels of educational attainment are closely related to political information levels and sophistication (e.g., Bennett 1995; Campbell et al. 1960; Converse 1964; Granato and Krause 1995; Krause and Granato 1996; MacKuen 1984; Smith 1989; but see Zaller 1992). An examination of information (education) differences within the electorate will enable one to detect the heterogeneous manner in which economic expectations are formed by voters. The next section discusses behavioral relationships and specific hypotheses regarding information differences.

Information Heterogeneity and the Formation of Economic Expectations

According to Suzuki (1992), the public conceptualizes political business cycles (PBC's) in their mind when forming expectations about future personal financial and business conditions.² Considering both PBC theory and Suzuki's findings, this would lead one to hypothesize that as presidential elections draw near, voters become more optimistic about their egocentric and sociotropic economic prospects. In essence, this cyclical pattern of behavior is explained by politicians' attempts to manipulate the economy for their own electoral benefit. The impact of the election cycle on economic prospects, however, may be more complicated than the notion of an "expectational" PBC espoused by Suzuki (1992). Electoral heterogeneity implies that more informed segments of the electorate may be affected by the election cycle differently than less informed voters. The following hypothesis addresses this issue:

H1: The economic expectations of the less informed segments of the electorate are more likely to follow an electoral cycle pattern relative to more informed groups.

In other words, less informed voters are more inclined to exhibit an "expectational" cycle that is independent of actual economic conditions regarding both their personal financial situations and business expectations vis-à-vis more informed counterparts. This implies that less informed voters exhibit

²Political business cycle (PBC) theory asserts that incumbent politicians seeking reelection are able to create economic expansions prior to upcoming elections while pursuing anti-inflationary macroeconomic policies in the period following an election. Research on this topic is too numerous to describe here. Please consult Suzuki (1992, 994, fnt. #1) or Nordhaus (1989) for nice summaries of the mixed empirical findings this theory has received.

greater naivete and thus are more likely to be fooled into an expectational cycle in a “nonrational” sense (Nordhaus 1975; Suzuki 1992) relative to more informed counterparts.

News coverage of the economy should also affect voters’ economic expectations. Numerous studies have explored the role of the media in affecting the way the electorate perceives economic conditions (Goidel and Langley 1995; Haller and Norpoth 1995; Hetherington 1996; MacKuen, Erikson, and Stimson 1992; Tims, Fan, and Freeman 1989). From a substantive perspective, this measure taps into the tone of economic news coverage that voters receive from various media sources. Tims, Fan, and Freeman (1989) provide strong empirical evidence that this aggregate measure closely relates to the economic news coverage reported in the media. One would expect that the more positive the news coverage on the economy received by voters is, the more inclined they are to have an optimistic outlook towards future personal and general economic conditions. However, this may also vary according to different information capabilities. The following hypothesis addresses the manner in which information-based differences may lead us to a clearer understanding of how the media shapes economic opinions:

H2: The media coverage of the economy reported by voters will have a greater effect on the egocentric expectations of the less informed segments relative to more informed counterparts. Alternatively, the media coverage of the economy reported by voters will have a greater effect on the sociotropic expectations of the more informed segments relative to less informed groups.

Simply, this hypothesis states that less informed segments of the electorate are more likely to deduce that news on the economy affects their future personal financial situation; whereas, more informed segments are more apt to allow economic news coverage to shape their expectations for the general economy. Why should this be the case? Less informed voters should be more likely to “personalize” news coverage of the general economy by making the connection between “bad news” and their own personal financial outlook relative to more informed voters. More informed (sophisticated) voters will be more apt to realize that news coverage of the economy as a whole may not necessarily affect their personal circumstances.

Subjective retrospective economic evaluations may shape voters’ perceptions of their future economic outlook (Haller and Norpoth 1994). This means that voters will use their subjective judgments regarding retrospective egocentric and sociotropic evaluations to form economic expectations. Therefore, for each model of economic expectations, the associated retrospective measure is included as an independent variable for each respective

group of voters. This variable should be positively related to economic expectations since voters will parlay rosier retrospective economic evaluations into a brighter view of the economic future. It must be said, however, that information heterogeneity may produce varying results as given by the following hypothesis:

H3: Retrospective economic evaluations will have a greater impact on the economic expectations of the less informed groups relative to more informed segments.

Less informed voters should place a greater reliance upon an adaptive decision rule than more informed segments by tying their retrospective economic evaluations to their economic expectations. On the other hand, more informed segments of the electorate will exhibit greater sophistication by not having their retrospective economic judgments greatly influence their prospective view of economic matters. The reason for such behavior is straightforward—more informed voters generally exhibit greater sophistication than less informed counterparts, hence (1) they may use other available information that is more relevant in the formulation of economic expectations compared to less informed voters; and (2) the latter segment of the electorate is more inclined to use retrospective judgments as a ‘heuristic’ shortcut to mitigate low information levels (Lupia 1994; Sniderman, Brody, and Tetlock 1991).

Many studies have examined the relationship between subjective egocentric and sociotropic economic evaluations (Hetherington 1996; Kiewiet 1983; Kinder and Kiewiet 1979; Popkin 1994). As a result, one can hypothesize that voters’ business expectations may be influenced by their personal financial expectations. This is an important relationship to examine since subjective economic expectations are useful in predicting variations associated with voting behavior and presidential approval. The empirical evidence to date is mixed with some finding that egocentric (personal) economic perceptions significantly influence sociotropic (business) economic evaluations (e.g., Hetherington 1996; Popkin 1994), while others detect only a modest relationship (Kiewiet 1983; Kinder and Kiewiet 1979). It is possible that personal financial expectations may positively influence voters’ general business expectations over the same annual time horizon for some segment of the electorate but not for others. The cross-sectional individual-level evidence indicates that less informed voters are more apt to use their personal economic conditions and perceptions as a heuristic device in assessing the state of the economy (Conover, Feldman, and Knight 1986; Weatherford 1983).³

³ For varying perspectives on this subject, please see Mutz (1992) and Haller and Norpoth (1995).

This study serves as a novel test of the relationship between egocentric and sociotropic economic expectations by allowing for electoral heterogeneity in a time series design. The following hypothesis can be stated with respect to the differential impact of information on sociotropic (business) expectations:

H4: Less informed segments of the electorate will be more inclined than their more informed counterparts to extrapolate their egocentric (personal) economic expectations to their sociotropic (business) economic expectations.

The above statement implies that less informed voters will have a more difficult time separating personal financial (egocentric) and sociotropic (business) expectations relative to more informed counterparts. The latter segment's greater sophistication implies that they may not necessarily believe that a more optimistic personal economic outlook will translate into a rosier outlook for the economy as a whole.

Data, Research Design, and Methodology

Dependent Variables

The aim of this study is to explain variations involving egocentric and sociotropic economic expectations held by the American electorate. The following survey questions and responses come from the Survey of Consumer Attitudes (SCA) conducted by the Institute of Social Research (ISR) at the University of Michigan (Institute for Social Research 1978–90):

“Now looking ahead—do you think that *a year from now* you (and your family living there) will be *better off* financially or *worse off*, or just about the same as now?”

and

“And how about a year from now, do you expect that in the country as a whole, business conditions will be *better* or *worse* than they are at the present, or just about the same?”

where the former deals with voters' *egocentric* economic projections for next year, while the latter pertains to voters' *sociotropic* economic projections for the same time horizon. These survey questions were selected since they are mirror images of one another that represent a stark contrast between egocentric and sociotropic prospective economic evaluations. Both questions are analyzed separately by three distinct educational categories that reflect information heterogeneity within the electorate. GROUP 1 involves survey respondents with less than a high school diploma or its equivalent; GROUP 2 consists of individuals with a high school diploma (or its equivalent) and those with some post-secondary education but without a baccalau-

reate (four year) college degree; and GROUP 3 comprises of respondents who have obtained at least a baccalaureate (four year) college degree. These measures are constructed from the original survey question posed by SCA and have the advantage of making a clear demarcation between high school dropouts (generally made up of unskilled “blue-collar” workers), individuals possessing high school diplomas and some limited post-secondary education (mostly consisting of skilled “blue-collar” workers), and those who have earned at least a four-year college degree (generally composed of “white collar” professional workers).

As in previous research examining voters’ economic judgments from the SCA dataset, each dependent measure is operationalized as the net percentage⁴ balance of “better” to “worse” responses to these survey questions, plus 100 (e.g., Clarke and Stewart 1994; Goidel and Langley 1995; Haller and Norpoth 1994, 1995; MacKuen, Erikson, and Stimson 1992; Suzuki 1992). This means that values for the dependent series can range from 0 (most pessimistic) to 200 (most optimistic), with 100 being the center of the index scale. Descriptive statistics for each of the independent variables are listed in Table 1. The mean values for each dependent series reveals that those strata with less than a high school diploma (or its equivalent) appear to have less optimistic egocentric and sociotropic economic projections compared to their more informed counterparts. Moreover, there is a general positive pattern between information (education) and personal financial expectations. Simply put, more informed (educated) voters seem to have a more optimistic view of their future pocketbook conditions than their less informed (educated) counterparts. Over the sample period it appears that voters are more optimistic about personal pocketbook finances than they are regarding general business conditions. What explains variations in these dependent series? The following subsection discusses the independent variables used in this study to explain how voters’ economic projections are formed.

Independent Variables

The election cycle variable is operationalized as a trend term that rises linearly for 24 months after a presidential election (indicating greater pessimism—reaching an apex during the “off-year” elections), and then declining in value over the subsequent 24 months leading up to the next election (signifying greater optimism).⁵ The economic news coverage variables are

⁴ These measures are constructed in percentage terms (as opposed to raw counts) since the sample size for each educational strata varies to some extent. This will provide a more accurate portrait of the relative optimism displayed in voters’ subjective economic projections.

⁵ This measure is a monthly analog to the traditional inverted-U election cycle variable employed with quarterly data by Allen (1986), Belton and Cebula (1994), and McCallum (1978). Furthermore, this operationalization is consistent with the aggregate electorate pattern found by Suzuki (1992).

**Table 1. Descriptive Statistics for Dependent Series (in Levels):
Economic Projections by Education Level (1978.1–1990.12)**

Dependent Variable	(GROUP 1)		(GROUP 2)		(GROUP 3)		AGGREGATE (All Respondents)
	No HS Diploma	HS Diploma	HS Diploma/Some College	Baccalaureate/Graduate Degrees			
Personal Financial Expectations:							
Mean	102.94		122.41		131.67		121.70
Standard Deviation	11.64		10.59		12.97		11.00
Minimum	75.68		89.09		96.28		91.46
Maximum	137.04		139.89		153.61		141.37
Business Expectations:							
Mean	100.19		108.14		107.41		106.55
Standard Deviation	14.73		17.17		22.05		17.11
Minimum	63.39		65.09		55.82		64.88
Maximum	147.22		150.67		161.11		149.34

Note: These figures are computed with the interpolated “forecasted” values that were used to replace the missing observations (see next section for a more detailed discussion). The theoretical range of values are 0 (most pessimistic) to 200 (most optimistic), with 100 serving as the center of the index scale.

measured as the net balance (in percentage terms) of aggregate favorable economic news mentions to aggregate unfavorable economic news mentions from the SCA survey for the sample period in question.⁶ This variable is quite similar to the operationalization of the dependent variables described above with a range of zero (most negative) to 200 (most positive). Like the economic news coverage, personal financial expectations, and business expectations variables, the retrospective economic evaluation variables are from the SCA survey and measured from a survey instrument very similar to the prospective economic judgment indicators.

Besides the independent variables discussed earlier, several control measures were incorporated into it to make sure the model was appropriately specified. Actual economic conditions from the recent past are generally thought to be related to economic expectations (e.g., Goidel and Langley 1995; MacKuen, Erikson, and Stimson 1992; Suzuki 1992). This study incorporates the price level, unemployment, and industrial production variables each lagged one month. Both the rate of inflation (based on the annualized Consumer Price Index) and the seasonally adjusted civilian unemployment rate from the previous month are hypothesized to be negatively related to both personal financial and business expectations. Put simply, as inflation and unemployment conditions worsen, voters' expectations concerning future economic conditions should become less optimistic (or more pessimistic). The Fed's Industrial Production Index is a monthly measure that accounts for economic robustness. As this index rises in value, one should observe an electorate with a more optimistic outlook for economic conditions a year from now whether it be in the pocketbook or at the sociotropic level. Suzuki (1992) has also found that presidential partisanship accounts for differences in economic projections that can be attributed to the party controlling the White House. This variable is measured as zero for the lone Democratic administration during this sample period (Carter), and a value of one is assigned for the Republican administrations of Reagan and Bush.

Research Design and Methodology

The purpose of the time series research design employed here is to examine how economic expectations vary across time by educational group (which serves as a proxy for information heterogeneity) for the period

⁶ Although Haller and Norpoth (1995) note that low response rates to the SCA news coverage questions may be problematic for aggregate analyses of any sort, this measure is used, nonetheless, as in previous studies (e.g., MacKuen, Erikson, and Stimson 1992). In the same study, Haller and Norpoth (1995, 10) find that the correlation between those hearing news versus those who did not was highly correlated ($r = .91$). Moreover, this issue is less of a concern because the response rate for the sample period of this study (1978–90) is significantly better than in preceding years of this survey.

between January 1978 and December 1990 in which monthly data are available. Though this sample period covers 13 years, there were a number of reasons it was chosen over a longer version of this historical series. First, it was thought to be preferable to use monthly rather than quarterly data since Freeman (1990) demonstrates that systematic sampling and temporal aggregation are known to generally induce Type II errors (falsely rejecting the null hypothesis of no statistical relationship), render OLS estimates as not being the best linear unbiased estimator (BLUE), and providing models that contain goodness-of-fit statistics which are artificially high in the presence of serial correlation (Freeman 1990, 67). In terms of detecting statistical relationships, the analysis undertaken here will produce more rigorous findings that are not overly optimistic. For instance, the use of monthly data will be a more robust test of Suzuki's (1992) notion of a PBC in the "public's mind" than if quarterly data were being employed. Moreover, the natural time unit for analyzing economic projections would appear to be more closely aligned with monthly observations than quarterly observations since many macroeconomic statistics are released to the public in monthly time intervals. Second, the quality of information contained in the surveys was significantly enhanced at the end of 1977 when Richard Curtin assumed the position as the director of the SCA project. This is an essential issue since it is necessary that these data can be broken down by these three distinct levels of educational attainment without problems of paucity.

Missing data for the dependent variables occurred in each series ranging from three to five observations (out of 156 cases) for each variable. In time series statistical designs, missing observations of the dependent variables must be filled in with some type of data interpolation technique since these types of models have unique properties that rely upon contiguous observations. To remedy this solution in the single-equation context presented here, a "rolling"⁷ regression procedure was used to generate one-step (month) ahead out-of-sample forecast values of the dependent series using three simple model specifications.⁸ The forecasted value selected as the appropri-

⁷ By "rolling" regressions, I mean that a regression model is run for the sample period that begins at the beginning of the sample period until the month prior to the missing value. This missing value is replaced by the best one-month ahead forecast, then the procedure is repeated to fill in the next missing value in a given series (based on its temporal sequence). This procedure is repeated for each missing value.

⁸ These competing "rolling" specifications take the following general form:

$$Y_t = b_0 + b_1 * Y_{t-1} + b_2 * \text{Trend} + \varepsilon_t$$

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I wish to thank David DeJong for this suggestion in dealing with the interpolation of time series data.

ate replacement for the missing value in question was based on the regression model with the lowest standard error of estimate.

For the time series analysis, three separate regression equations for each information stratum are estimated for both personal financial and business expectations for the monthly period between January 1978 and December 1990. These dynamic specifications appear in the following general form:

$$Y_t = \alpha + \gamma Y_{t-1} + \beta_1 X_{t,1} + \eta_m Z_{t,m} + \varepsilon_t \quad [1]$$

where Y_t represents the current expectations (dependent) variable of interest, α is a constant term, γ is the coefficient of the lagged endogenous term (Y_{t-1}) that will capture the inertial or gradual aspects of economic expectations formation, β_1 is a vector of coefficients connected with the independent variables ($X_{t,1}$) that relate to the main theoretical hypotheses discussed earlier, while η_m is a vector of coefficients related to (independent) control variables ($Z_{t,m}$) including objective economic conditions and presidential partisanship, and ε_t is a normally distributed error term with a mean of zero and a constant variance (σ^2).

Before these models are estimated, time series issues of integration and possible cointegration must be considered. An integrated (or nonstationary) time series is one in which its sample statistics are a function of time. Cointegration refers to the condition in which a (dependent) variable is nonstationary but forms a linear combination with at least one other nonstationary variable that is jointly stationary. Table 2 reveals Augmented Dickey-Fuller (ADF) unit root test (Dickey and Fuller 1979) results for each model as well as cointegration tests among nonstationary dependent and independent variables. These results indicate that the personal financial expectations variable for both the GROUP 2 (high school diploma/some college) and the aggregate models are integrated time series of order one—i.e., $I(1)$. Moreover, the unit root tests indicate that each of the dependent variables analyzed in the business expectations models are nonstationary time series that exhibit an $I(1)$ process.

Many have noted that time series models that have cointegrating parameters are known to suffer from an omitted variables problem if simply analyzed in differenced-form (e.g., Beck 1992; Engle and Granger 1987; Harvey 1990; Ostrom and Smith 1993). Therefore, cointegration tests for these integrated dependent variables in levels were performed to determine whether a long-run relationship held between these series and independent variables adhering to an $I(1)$ process. Instead of using the commonly prescribed ADF cointegration test on the residuals (Engle and Granger 1987; Engle and Yoo 1991), a more powerful alternative test set forth by Banarjee et al. (1993) is employed. This test specifically is centered on solving for a

Table 2. Augmented Dickey-Fuller (ADF) Unit Root Test Statistics for Dependent Variables, Economic Projections and Long-Run Coefficient Restrictions Test Statistics for Cointegration by Education Level (1978.1–1990.12)

	(GROUP 1) No HS Diploma	(GROUP 2) HS Diploma/Some College	(GROUP 3) Baccalaureate/Graduate Degrees	AGGREGATE (All Respondents)
Personal Financial Expectations				
(Levels):				
ADF coefficient	-41** (-4.82)	-41 (-2.96)	-23* (-3.47)	-13 (-2.43)
t-statistic				
Personal Financial Expectations				
(1st Difference):				
ADF coefficient	—	-1.80** (-14.15)	—	-1.53** (-11.87)
t-statistic				
Business Expectations				
(Levels):				
ADF Coefficient	-21 (-3.22)	-06 (-1.74)	-07 (-1.93)	-05 (-1.69)
t-statistic				
Business Expectations				
(1st Difference):				
ADF Coefficient	-1.66** (-12.10)	-1.39** (-10.94)	-1.51** (-11.40)	-1.28** (-10.23)
t-statistic				

Personal Financial Expectations

(Cointegration Test): — 130.00 — 383.01**
 Wald Test χ^2 statistic (.00) (.00)
 Probability level

Business Expectations

(Cointegration Test): 37.70** 580.94** 411.95** 467.15**
 Wald Test χ^2 statistic (.00) (.00) (.00) (.00)
 Probability level

Notes: These figures are computed with the interpolated “forecasted” values (used to replace missing observations) that are discussed in the next section. The ADF tests were selected based upon serial correlation that these series exhibited. The critical values for the ADF test are derived from MacKinnon (1991). The unit root critical values were -3.44 and -4.02 respectively for $p < .05$ and $p < .01$ (one-tailed tests). The cointegration tests were based simply on a long-run static regression model in levels. The specification of these cointegrating vectors is discussed in Appendix A. The null hypothesis of no cointegration was rejected in each instance. Therefore, an error correction mechanism (ECM) term produced from this cointegrating regression in levels was specified as a separate independent variable in these final model specifications to capture long-run relationships with the dependent series.
 * $p < .05$; ** $p < .01$.

static long-run equation generated from a dynamic regression among these nonstationary variables in levels to see whether the long-run coefficients are jointly zero. If the Wald joint-test statistic for the long-run coefficients is significantly different from zero (according to the chi-square distribution with degrees of freedom equal to the number of independent variables in this regression⁹), then it can be stated that a cointegrating vector exists and an appropriate error correction mechanism (ECM) that takes into account long-run relationships should be incorporated into each of the model specifications. The results of these cointegration tests (reported in Table 2 and discussed in Appendix A) indicate that an ECM term is appropriate in each instance where the dependent variable contains a unit root.

Regression diagnostics are utilized in order to ensure that these models serve as valid instruments of statistical inference. In instances where these diagnostics provide evidence that the heteroskedasticity and/or nonnormally distributed residuals exist, the bias contained in OLS standard errors are "corrected" for by employing Jackknife¹⁰ heteroskedastic-consistent robust standard errors (JHCRSE) as proposed by MacKinnon and White (1985).¹¹ Those models exhibiting a residual serial correlation problem, autocorrelation-consistent standard errors are computed by the method proposed by Newey and West (1987).¹² In models that do not suffer from these problems,

⁹The cointegrating regressions only consisted of those independent variables that were nonstationary series yet formed a linear, stationary combination as reflected by a significant unit root *t*-statistic for a given variable.

¹⁰The jackknife is a robust estimation technique that involves resampling of the data. To derive a jackknife estimator, consider an estimator (*T*) that is functional and compute $T_n(x_1, x_2, \dots, x_n) = T(F_n)$ for a sample size of *n*. Generally, a functional *T* and a sample will yield a pseudosample ($T_{n1}^*, T_{n2}^*, \dots, T_{nm}^*$) that is used to compute a bias-corrected estimator that takes the general form:

$$T_{n1}^* = (1/n) \sum_{i=1}^n T_{ni}^*$$

with a mean of $T_{n1}^* = x_1$ and a variance of *n* pseudovalues (V_n) equal to $(1/n-1) \sum_{i=1}^n (T_{ni}^* - T_{n1}^*)^2$.

More information on details surrounding this technique are discussed in Efron (1982) and Hampel et al. (1986).

¹¹"Robust" statistics are termed as such because they perform well when the assumptions of the statistical model are not true. MacKinnon and White's Monte Carlo investigation demonstrates that the JHCRSE significantly outperforms both OLS and White heteroskedastic-consistent standard errors (White 1980) in the presence of heteroskedasticity. An additional advantage of the JHCRSE over the conventional White method of obtaining heteroskedastic-consistent standard errors is that the former produces standard errors based on a nonparametric technique that does not require that the residuals be normally distributed.

¹²Newey-West variance-covariance matrix estimation is analogous to White's (1980) heteroskedastic-consistent standard errors, except that the former technique requires the selection of a lag length (*l*) in order to generate standard errors that are corrected for residual autocorrelation. Since theory does not serve as a strong guide to choosing the appropriate lag length, the Lagrange Multiplier serial correlation test is used as a guide to select *l*. More information on this method of dealing with serial correlated errors can be found in Greene (1993, 423).

the OLS standard errors are presented since heteroskedastic-consistent estimators are less reliable than those generated by OLS in the absence of these violations to traditional Gauss-Markov assumptions (MacKinnon and White 1985, 318).¹³

5. Empirical Findings

Personal Financial Expectations

The regression results for the personal financial expectations models (broken down by levels of educational attainment) are reported in Table 3. The significant coefficient on the lagged dependent variables contain different meanings. In the models where the dependent variables are treated as levels (GROUP 1 and GROUP 3), these positive coefficients uncover persistence—i.e., personal financial expectation for the current month are positively related to its value in the previous month. In the models that are in first-difference error correction form (GROUP 2 and AGGREGATE), this negative relationship implies that voters' personal pocketbook outlook has a mean-reverting tendency where the rate of optimism (pessimism) expressed in the prior month leads voters back towards a more balanced expectation in the subsequent month.

Only those voters holding at least a four year college degree (GROUP 3), exhibit a personal financial “expectational” cycle independent of actual economic conditions. This runs counter to the first hypothesis (*H1*) that those segments of the electorate with lesser information capabilities are more inclined to exhibit an “expectational” cycle regarding their economic expectations relative to more informed groups. There are two potential explanations to describe this unexpected source of electoral heterogeneity. First, the low and moderately informed strata of voters (i.e., those with less than a baccalaureate college degree) may be unaware of politicians' attempts at manipulating the economy in an electorally beneficial (cyclical) manner. Second, these segments of voters are sufficiently disenfranchised; thus they do not believe that politicians' attempts to expand the economy leading up to the election (and contract it following an election) has an impact on their future personal economic fortunes. Unlike aggregate analysis on this topic (Suzuki 1992, 994), these findings indicate that not all (information) segments of the

¹³OLS estimators are biased (yet consistent) in the presence of a lagged endogenous variable because one of the regressors is no longer independent of the disturbance term. This bias is given by $-(1+3\beta)/n$, where n is the number of observations. As n becomes large, the size of this bias becomes smaller. The use of OLS estimation is not problematic here for two reasons. First, this bias is extremely small because there are an ample number of observations (n ranges from 154 to 156), and correction for this bias does not result in substantive changes in statistical significance. Second, the inclusion of additional independent variables in a given model (such as the case in this analysis) results in a further decrease of this bias (Kennedy 1985, 122).

Table 3. The Determinants of Personal Financial Expectations by Education Level (1978.01-1990.12)

Coefficient	(GROUP 1)		(GROUP 2)		(GROUP 3)		AGGREGATE (All Respondents)
	No HS Diploma	HS Diploma/Some College	Baccalaureate/Graduate Degrees				
Constant	46.54*** (10.28) ^b	-44 (2.77) ^c	60.60*** (12.02) ^c			.94 (2.12) ^c	
Personal Financial Expectations _{t-1}	.24*** (.08) ^b	-.16** (.07) ^c	.40*** (.08) ^c			-.15*** (.05) ^c	
Election Cycle _t	-.08 (.11) ^b	-.12 (.10) ^c	-.19*** (.05) ^c			-.07 (.08) ^c	
Economic News _t	.01 (.07) ^b	.03 (.07) ^c	.13*** (.05) ^c			.10*** (.03) ^c	
Personal Financial Retrospections _t	.30*** (.07) ^b	.27*** (.06) ^c	.15*** (.05) ^c			.35*** (.05) ^c	
<i>Control Variables:</i> Inflation _{t-1}	-.27 (.22) ^b	-.11 (.14) ^c	-.58** (.12) ^c			-.10 (.11) ^c	
Δ Unemployment _{t-1}	.15 (2.42) ^{b,d}	.18 (.24) ^{c,d}	.41 (.37) ^{c,d}			.65*** (.04) ^{c,d}	
Δ Industrial Production _{t-1}	1.61** (.70) ^b	-.23 (.61) ^{c,d}	1.43** (.65) ^c			-.10 (.48) ^{c,d}	

Partisan Dummy _t	7.91*** (2.13) ^b	3.35* (1.77) ^c	10.70*** (2.51) ^c	.72 (1.18) ^c
ECM _{t-1}	—	-.35*** (.11) ^c	—	-.28*** (.09) ^c
<i>Goodness-of-Fit Measures:</i>				
R ²	.55	.33	.76	.32
F-statistic	21.91***	7.97***	58.03***	2719.1***
σ	8.10	4.92	6.55	4.15
<i>Model Diagnostic Test Statistics:</i>				
LM F-test (lags 1-12)	2.17**	1.88**	2.26**	2.16**
LM F-test (lags 1-24)	1.42	1.43	1.80**	1.25
Jarque-Bera $\chi^2(2)$	7.85**	2.75	2.50	5.31*
White F-Test	.74	1.43	1.26	.86
Ramsey RESET F-Test (1 power)	2.32	.04	.50	3.15*

* $p < .10$; ** $p < .05$; *** $p < .01$.

^a OLS standard errors are inside parentheses.

^b Jackknife heteroskedastic-consistent robust standard errors are inside parentheses.

^c Newey-West autocorrelation-consistent robust standard errors are inside parentheses.

^d Coefficient with incorrect (hypothesized) sign.

Notes: The Personal Financial Expectations models for GROUP 2 and AGGREGATE are in error correction form where the dependent variable as well as all independent variables are in first-differenced error correction (EC) form with the exception of the electoral cycle trend, partisan dummy, and ECM variables. The personal financial retrospective variable is in levels in the GROUP 1 model, and in first-difference form in the GROUP 3 model since the former follows an I(0) process while the latter is integrated of order one I(1). In the GROUP 1 model, JHCRSE standard errors were chosen. The JHCRSE and Newey-West standard errors in both the GROUP 1 and AGGREGATE models lead to the same substantive inferences for all variables (except the unemployment variable in the AGGREGATE model is not statistically significant at $p < .10$ level when JHCRSE is employed).

electorate will exhibit an expectational cycle that is independent of cyclical economic outcomes. The lack of complete congruency between the disaggregate and aggregate findings reveal that an analysis of a homogeneous electorate can lead us to overlook important differences among voters with varying levels of information capabilities.

Although the aggregate results for the economic news coverage variable is statistically significant, the disaggregated results show that news coverage of the economy reported by voters is only helpful in predicting the personal financial expectations of those voters who have obtained at least a four year college degree (GROUP 3). On the surface this analysis provides indirect empirical evidence for MacKuen, Erikson, and Stimson's (1992, 607) casual observation that the mass (uniaggregate) public will be driven by the most informed/sophisticated (or elite) portions of the electorate. A more closer inspection of the data reveals that rather than having a greater immediate impact on those less informed as suggested by (H2), these results demonstrate that only the most informed are sophisticated enough to make the connection between media coverage of the economy and their own personal financial outlook. In sum, these disaggregated results broken down by level of educational attainment and embodying a richer model specification are not consistent with the findings of homogeneous (aggregate) electorate studies that claim economic news coverage is a strong predictor of voters' economic evaluations (Goidel and Langley 1995; Hetherington 1996; MacKuen, Erikson, and Stimson 1992). This implies that previous aggregate studies of voters' economic perceptions mask the true nature of this relationship.

Each of the coefficients associated with the personal financial retrospection variables is statistically significant in each of the disaggregated models. There is indirect evidence supporting the hypothesis that retrospective economic evaluations of one's pocketbook finances will have a relatively greater impact on the personal financial expectations of the less informed strata vis-à-vis more informed groups (i.e., H3).¹⁴ Specifically the coefficients for the two models in levels form (GROUP 1 and GROUP 3) reveal that the actual impact of personal financial retrospections on personal financial expectations is 26.37 for the least informed stratum versus 18.65 for the most informed group.¹⁵ Each stratum of voters behave to some extent in an adaptive manner by updating their current personal financial expectations of

¹⁴One can examine the equality of coefficients for independent variables across independently estimated equations by "stacking" their data set in a panel design fashion and treating it as a group-wise heteroskedastic model where cross-equation model restrictions can be imposed. This, however, was not feasible given the unique aspects of integration and cointegration for each set of equations.

¹⁵These values were computed by the "levels of importance" approach set forth by Achen (1982) where each coefficient (.30 and .15, respectively) is multiplied by its respective series' mean value (87.91 and 124.31, respectively).

the future based upon their current retrospective economic evaluations of their personal economic well-being over the previous year, but the actual influence is greater for the least informed set of voters.

The results pertaining to the control variables are diverse. The inflation rate has a strong and statistically significant negative impact on voters' personal financial expectations for only the most informed segment of the electorate (GROUP 3) yet fails to obtain significance in the aggregate model. On the other hand, the unemployment rate variable is the incorrect sign, and fails to play a legitimate role in shaping any stratum of voters' personal financial expectations for each of the disaggregated models. Moreover, positive movements in industrial production (i.e., economic growth) are significantly and positively related to voters' personal financial outlook in the least and most educated strata (GROUP 1 and GROUP 3). Regardless, the impact of objective economic conditions on personal financial expectations of voters is not uniform across both disaggregated and uni-aggregate treatments of the electorate. The partisan dummy variables in the three disaggregate models indicate that these informational stratum held a significantly rosier personal financial outlook during the Reagan-Bush years vis-à-vis the Carter administration, even controlling for actual economic conditions.¹⁶ Finally, the error correction terms indicate that the rate of adjustment in the month following a shock is faster in the disaggregated model containing only respondents with a high school degree/some post-secondary training (35%) than it is in the aggregate model (28%). Thus, the aggregate electorate's sophistication, in terms of the ability to re-equilibrate following an innovation, is less than those with moderate information capabilities.

Business Expectations

Turning our attention towards sociotropic economic projections involving future business conditions a year from now, the regression results for these (Business Expectations) models are reported in Table 4. Although the aggregate findings reveal that voters do not exhibit an expectational PBC, the two most informed segments of voters (found in the GROUP 2 and GROUP 3 models) clearly exhibit an "expectational" political business cycle regarding the general economy, independent of actual economic conditions. Thus, only those voters who have obtained at least a high school diploma or its equivalent respond to the timing of presidential elections in a manner that is beneficial to the incumbent administration by becoming more

¹⁶ A great deal of caution is warranted in interpreting this result because it is based on two administrations, and more importantly one shift/discrete change (i.e., from the Carter administration to the Reagan/Bush administrations). Other variables such as the election cycle variable do only cover three presidential elections cycles; however, this behavior involves many gradual shifts/changes in values across the entire range of a given election cycle.

Table 4. The Determinants of Business Expectations by Education Level (1978.01-1990.12)

Coefficient	(GROUP 1)		(GROUP 2)		(GROUP 3)		AGGREGATE (All Respondents)
	No HS Diploma	HS Diploma/Some College	Baccalaureate/Graduate Degrees				
Constant	-19 (3.89) ^b	2.57 (2.09) ^a	5.79*** (1.68) ^c	1.47 (1.53) ^c			
Business Expectations _{t-1}	-.25*** (.07) ^b	-.10 (.07) ^a	-.21*** (.03) ^c	-.18*** (.02) ^c			
Election Cycle _t	-.09 (.11) ^b	-.31*** (.07) ^a	-.33** (.13) ^c	-.17 (.11) ^c			
Economic News _t	-.02 (.05) ^{b,d}	-.11 (.07) ^{a,d}	.17** (.08) ^c	-.02 (.07) ^{c,d}			
Business Retrospections _t	.28*** (.06) ^b	.29*** (.05) ^a	.31*** (.06) ^c	.26*** (.05) ^c			
Personal Financial Expectations _t	.28*** (.08) ^b	.37*** (.08) ^a	.14*** (.05) ^c	.56*** (.07) ^c			
<i>Control Variables:</i>							
Inflation _{t-1}	-.14 (.26) ^b	.16 (.14) ^{a,d}	-.04 (.14) ^c	.05 (.11) ^{c,d}			
Δ Unemployment _{t-1}	2.09 (2.51) ^{b,d}	.68 (.76) ^{a,d}	2.62** (1.07) ^{c,d}	1.50*** (.54) ^{c,d}			
Δ Industrial Production _{t-1}	1.00 (.84) ^b	-.128** (.49) ^{a,d}	-.83 (.60) ^{c,d}	-.89*** (.32) ^{c,d}			

Partisan Dummy _t	2.23 (2.76) ^b	.83 (1.44) ^a	-1.56* (.81) ^c	.65 (1.29) ^c
ECM _{t-1}	-.29*** (.09) ^b	-.46*** (.08) ^a	-.34*** (.06) ^c	-.27*** (.07) ^c
<i>Goodness-of-Fit Measures:</i>				
R ²	.45	.47	.46	.47
F-statistic	11.71***	12.58***	12.02***	1638.9***
σ	8.91	5.31	7.76	4.96
<i>Model Diagnostic Test Statistics:</i>				
LM F-test (lags 1-12)	1.75**	1.29	2.10**	2.12**
LM F-test (lags 1-24)	1.98**	1.43	2.07***	1.69**
Jarque-Bera $\chi^2(2)$.41	1.87	.26	.65
White F-Test	1.97**	.90	1.32	1.32
Ramsey RESET F-Test (1 power)	.92	1.12	2.08	.02

* $p < .10$; ** $p < .05$; *** $p < .01$.

^a OLS standard errors are inside parentheses.

^b Jackknife heteroskedastic-consistent robust standard errors are inside parentheses.

^c Newey-West autocorrelation-consistent robust standard errors are inside parentheses.

^d Coefficient with incorrect (hypothesized) sign.

Notes: Each of the Business Expectations models (GROUP 1, GROUP 2, GROUP 3, and AGGREGATE) are in error correction form where both the dependent variable as well as all independent variables are in first-differenced form with the exception of the electoral cycle trend, partisan dummy, and ECM variables. In the GROUP 1 model, JHCRSE standard errors were chosen. The JHCRSE and Newey-West standard errors in this model lead to the same substantive inferences for all variables except the unemployment variable which is statistically significant at $p < .01$ level.

optimistic about the future state of the United States economy (Suzuki 1992, 993). These results, in tandem with those from the previous set of egocentric models, reveal that the least educated segment of the electorate do not perceive that politicians can successfully manipulate the economy. The results from those with a moderate level of education (GROUP 2) indicate that they do view that politicians can manipulate the economy; however, it does not benefit them on a personal level. Although it cannot be determined from this analysis whether the least informed segment of the electorate (GROUP 1) is “disenfranchised” (i.e., they do not believe that elected officials can manipulate the economy) or “ignorant” (i.e., unaware of incumbent politicians attempts to shape economic conditions), the GROUP 2 results lend credence to the “disenfranchised” proposition since they perceive a sociotropic, but not an egocentric-based expectational PBC.

The economic news coverage variables are the incorrect (negative) sign, yet statistically insignificant in all models save the most informed group (GROUP 3) whose economic news consumption does have a positive effect on their sociotropic economic expectations. This finding not only displays obvious heterogeneity but also is consistent with the latter portion of the second hypothesis (*H2*) which asserts that media coverage of the economy will have a relatively greater effect for more informed voters vis-à-vis less informed counterparts. These results, in tandem with the previous models, cast doubt on previous studies that claim a strong link between media coverage of the economy and economic perceptions across the entire electorate (Goidel and Langley 1995; Hetherington 1996; MacKuen, Erikson, and Stimson 1992; but see Haller and Norpoth 1995).

Once again, each of the subjective economic retrospection variables exert a statistically significant effect on voters’ economic projections. These results indicate that voters’ current business expectations are closely tied to their current subjective evaluations of the United States economy’s past performance over the previous year. The uniformity associated with this result across varying informational segments of the electorate reveals a lack of support for the third hypothesis (*H3*) that less informed voters are more likely to use the adaptive decision rule of retrospective evaluations to assist them in forming macroeconomic expectations as a heuristic device to overcome relatively low information levels. Moreover, these findings clearly indicate that voters from different segments of the electorate behave similarly when it comes to extrapolating their retrospective evaluations of the economy to their future outlook regarding business conditions.

The aggregate relationship between personal pocketbook expectations and business expectations does not provide much explicit support for the fourth hypothesis (*H4*) that less informed voters are more likely to extrapolate their expectations concerning their personal financial outlook to their

sociotropic (business) projections. This does not only appear to be true for the least informed portions of the electorate, but for all segments. Using the "level of importance" interpretation to gauge actual influence, however, reveals that these findings suggest that egocentric projections have the most sizable effect for the least informed ($.28 * -.176 = -.049$), and approximately the same impact on the moderately and highly informed strata ($.37 * -.036 = -.013$; $.14 * -.11 = -.015$), thereby, implying that this egocentric-sociotropic linkage is relatively more important for those with the weakest information capabilities (Conover, Feldman, and Knight 1986; Weatherford 1983). Moreover, these results are somewhat contradictory to the individual-level cross section "homogeneous" analyses of Kinder and Kiewiet (1979) and Kiewiet (1983) that claim a strong relationship does not exist. Instead, these uniform significant findings for these variables clearly demonstrate that voters' expectations of the economy a year from now are influenced by their own personal pocketbook outlook over the same time period. This implies that economic-based models of voting and presidential approval are not simply explained as arising from either egocentric or sociotropic evaluations separately, but in fact, are an *interrelated* combination of both since the impact of sociotropic effects on voting and approval behavior may be partly attributed to (or contingent) upon variations in personal financial expectations. For instance, although recent studies of presidential approval have considered both egocentric and sociotropic economic evaluations as separate phenomena within a given model specification (Clarke and Stewart 1994; MacKuen, Erikson, and Stimson 1992), this evidence suggests that egocentric expectations and sociotropic economic expectations exert an interdependent effect. Thus, on the macro/aggregate level, some portion of the explanatory force associated with sociotropic models of voting behavior and presidential approval may be overstated since egocentric perceptions appear to have a conditional impact on them.

As in the personal financial expectations models, objective economic variables have a varying impact on business expectations. Unlike the previous set of egocentric projection models, inflation is an insignificant factor in explaining variations in all but GROUP 2's expectations about the future status of the general economy. The unemployment rate variable again, however, generally proves to be a modest predictor of economic expectations as was found in the previous set of models. Changes involving industrial production are significantly related to variations in voters' business expectations for both the aggregate and high school and some college stratum (GROUP 2) models. The significant findings that run contrary to hypothetical relations may, in fact, provide additional evidence of Haller and Norpeth's (1994, 647) argument that United States voters exhibit stubborn optimism during adverse economic times. Conversely, this may also imply that

voters exhibit cautious pessimism during periods of low unemployment and high economic growth. These counterintuitive findings appear to indicate that voters' economic prospections may contain a mean-reverting component with respect to fluctuations in the unemployment rate and industrial production index.¹⁷ Only the sociotropic model of the most informed segment reveals that voters are more optimistic (or pessimistic) regarding the party of the presidential administration in power. Finally, the error correction mechanism terms (ECM_{t-1}) specified in each model containing cointegrated parameters reveal that the rate at which business expectations approach equilibrium in the current month following a perturbation from the previous month ranges from a high of 46% for the moderately informed group (GROUP 2) to a low of 27% for the aggregate model. Though one may surmise that the more informed segments of the electorate should readjust to an equilibrium state following a shock in business expectations faster than those with less education, the results are mixed. Although the least informed group of voters (GROUP 1) adjusts more slowly to an innovation compared to the most educated stratum (GROUP 3)—29% versus 34%, surprisingly the middle segment (GROUP 2) re-equilibrates at a faster rate (46%). The quick response of GROUP 2 may reflect their superiority in coping with unexpected changes possibly attributable to better heuristic devices (e.g., adaptive decision rules) compared to the most informed group of voters, and also a greater ability to exploit them than the least informed group.¹⁸

Conclusion

Although the topic of information heterogeneity within the electorate has been analyzed extensively (e.g., Converse 1990; Lupia 1994; MacKuen 1984; Sniderman, Brody, and Tetlock 1991; Stimson 1990; Zaller 1992), this phenomenon in relation to aggregate economic perceptions has been essentially ignored. This is an important line of research since economic expectations play a sizable role in shaping both electoral behavior (Kuklinski and West 1981; Miller and Wattenberg 1985) and presidential approval (Clarke and Stewart 1994; Jackman 1993; MacKuen, Erikson, and Stimson 1992). The varying levels of educational attainment examined in this study serve as a proxy for information differences, thus relaxing the assumption found in many aggregate time series studies on this subject that views the electorate as a single (unitary) entity (e.g., Goidel and Langley 1995; Haller and Norpoth 1994; MacKuen, Erikson, and Stimson 1992; Suzuki 1992; but see

¹⁷ These findings held across a variety of preliminary model specifications.

¹⁸ The actual heuristic (i.e., means) cannot be gleaned from an ECM analysis, only the effectiveness in response to uncertainty (i.e., the end results). This is a (theoretical) limitation of error correction models.

Granato and Krause 1995; Krause and Granato 1996 for exceptions). By analyzing egocentric and sociotropic economic projections broken down by informational strata, one can acquire insights into the heterogeneity that may be present when voters form economic expectations.

The empirical results contained in this study clearly show that the electorate consists of different groups with varying information capabilities. For instance, the least informed segment of the educated electorate (i.e., those with less than a high school diploma or its equivalent) largely bases their economic expectations on the previous month's economic expectations, current retrospective economic evaluations, and egocentric economic expectations (the latter in only the business/sociotropic model) to form economic expectations. Contrary to previous aggregate-level time series studies on this topic, neither the timing of the election cycle (Suzuki 1992) nor economic news coverage reported by voters (MacKuen, Erikson, and Stimson 1992) shapes the formation of economic expectations of the least informed stratum of the electorate. Those voters with moderate information capabilities (i.e., a high school diploma or its equivalent and possibly limited post-secondary education) are quite similar to the least informed segment with respect to the main causal factors that help explain economic projections. One noteworthy difference is that the moderately informed stratum has an expectational PBC on a sociotropic level, but does not possess an egocentric one. This suggests that these voters believe that politicians are able to manipulate business (macroeconomic) conditions in an electorally beneficial manner; however, this does not translate into a rosier personal economic future. The most informed group of voters (i.e., those with at least a four year college degree) essentially utilize the previous month's economic expectations, economic news coverage, the timing of the election cycle, current retrospective economic evaluations, and egocentric economic expectations (the latter in only the business/sociotropic model) to generate their economic expectations. The aggregate models understate the true importance of the timing of election cycles and economic news coverage (business expectations model) on prospective economic evaluations, and overstate the effect of the latter when it comes to forming personal financial expectations. In sum, these findings indicate that as electoral sophistication declines (rises), voters will rely more (less) heavily on past/retrospective perceptual information when forming economic evaluations regarding future conditions. This implies that these more sophisticated (educated) segments of the electorate who utilize a broader array of information may be more capable of holding elected officials accountable for economic conditions than less sophisticated (educated) counterparts who place a greater reliance on their past perceptions when forming current economic expectations.

This study has demonstrated that previous studies of economic opinion formation can draw misleading conclusions when treating the electorate as a singular entity by missing the subtleties of an electorate with varying levels of sophistication. Most of the findings contained in this study lend further credence to the claim that voters possess heterogeneous preferences and utilize different decision rules (Rivers 1988). Future research on this topic needs to take into account other sources of electoral heterogeneity when examining political-economic behavior. This line of inquiry has meaningful implications for the study of election outcomes since these empirical findings imply that a single electoral strategy may not work for all segments of the electorate because of information-based differences. Because the electorate does not form subjective perceptions about the economy in a homogeneous manner, it is not wise to assume that its behavior can be analyzed as such in all instances. Aggregate studies of the electorate do have their rightful place in the study of political behavior; however, failure to consider the possibility of electoral heterogeneity can lead us to both an oversimplified and inaccurate portrait of how voters form their opinions.

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APPENDIX

Integration, Cointegration, and Model Specification

The tests of integration revealed that besides the $I(1)$ dependent variables listed in Table 2, that the following variables followed an $I(1)$ process as well: consumer price index at month $t-1$ (CPI_{t-1}), unemployment rate at month $t-1$ (UE_{t-1}), Federal Reserve's industrial production index at month $t-1$ (IP_{t-1}), personal financial retrospections at month t (PFR_t) for GROUP 2, GROUP 3, and AGGREGATE models, business retrospections at month t (BR_t) for GROUP 1, GROUP 2, GROUP 3, and AGGREGATE models, and personal financial expectations at month t (PFE_t) for GROUP 2 and AGGREGATE models. Each of the nonstationary time series were transformed into stationary time series by first-differencing with the exception of the inflation measure which was calculated as the log percentage change in the CPI from month $t-1$ to month t (these transformations yielded series that became stationary at the $p < .05$). This data transformation served as the means to obtain stationarity, thereby, avoiding a spurious regression problem (Granger and Newbold 1974). The other variables were treated as levels since they exhibited a stationary $I(0)$ process.

The tests for cointegration involved the long-run static equation generated from the dynamic regression test proposed by Banerjee et al. (1993). In these tests, each of the nonstationary time series are treated in levels, and a Wald test determines the joint significance of the independent variables. The unit root t -statistic for each variable

determines whether a given independent variable forms a stationary linear combination—I(0)—with the dependent series. Those variables that have a unit root statistic that exceeds |3.44| (critical value of $p = .10$ for a two-tailed test) are incorporated into the final cointegrating regression (vector) used to construct the error correction mechanism (ECM) term, while all other independent variables are deleted from this intermediate specification. The ECM among these variables takes the following form for each of the following models analyzed in this study:

Personal Financial Expectations (PFE) Model (GROUP 2):

$$ECM_t = PFE_t - \alpha_0 - \alpha_1 PFR_t \quad [A-1]$$

Personal Financial Expectations (PFE) Model (AGGREGATE):

$$ECM_t = PFE_t - \alpha_0 - \alpha_1 CPI_{t-1} - \alpha_2 PFR_t \quad [A-2]$$

Business Expectations (BE) Model (GROUP 1):

$$ECM_t = BE_t - \alpha_0 - \alpha_1 BR_t \quad [A-3]$$

Business Expectations (BE) Model (GROUP 2):

$$ECM_t = BE_t - \alpha_0 - \alpha_1 CPI_{t-1} - \alpha_2 IPI_{t-1} - \alpha_3 BR_t - \alpha_4 PFE_t \quad [A-4]$$

Business Expectations (BE) Model (GROUP 3):

$$ECM_t = BE_t - \alpha_0 - \alpha_1 CPI_{t-1} - \alpha_2 IPI_{t-1} - \alpha_3 BR_t \quad [A-5]$$

Business Expectations (BE) Model (AGGREGATE):

$$ECM_t = BE_t - \alpha_0 - \alpha_1 IPI_{t-1} - \alpha_2 PFE_t \quad [A-6]$$

where α_0 , α_1 , α_2 , α_3 , and α_4 in the various models represent the cointegrating parameters of interest. The residuals from these aforementioned regression equations (in levels form) reflect a linear combination of these variables that are stationary. The lagged ECM term used in the final model specifications capture the long-run relationship between the dependent variables (personal financial expectations and business expectations) and changes in the relevant independent variables noted above.

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