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Abstract

This study investigates the predictability of revisions to Euro- area major macroeconomic variables using real-time data from the European Central Bank. The application of nonparametric and semiparametric tests enables robust conclusions about the predictability of revisions. Though there is wide evidence of the nonnormality of the distribution function of revision errors, this is the first application of the nonparametric approach to examine revisions. Moreover, to gain robustness, this study performs tests for parameter instability, and includes structural breaks explicitly in the predictability evaluation. The results underline the predictability of Euro area key macroeconomic revisions. Revisions are inefficient and biased, and revision errors are not optimal forecast errors.

Keywords: revision, revision errors, predictability, real-time data, Euro area, unbiasedness, efficiency, news, noise

JEL classification: C8, D80

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1 Introduction

A recent paper by Manski (2015) underlined the certitude of statistical offices about released data. Preliminary estimates of variables often encompass only incomplete information about the state of economy. Nevertheless, governments, private firms, and consumers have to predicate important decisions on the announcements of statistical offices. Particularly in the short-run, business and government decisions have to be guided by the preliminary data. Here, the users of statistics may be misled, because the possible magnitudes of errors or other uncertainty measures are not communicated to the public (Manski, 2015, p.633). This issue was first raised by Morgenstern (1963), but has unfortunately been systematically ignored, both by statistical offices and by users of the statistics, even though the uncertainty in the data is evident. In the literature, Baetje and Friedrici (2016) and Glass and Fritsche (2015) consider data uncertainty explicitly. A study by Baetje and Friedrici (2016) identifies the relation between the cross-sectional forecast dispersion of the US Survey of Professional Forecasters and the uncertainty originating from revisions of inflation and real output. In our previous work, Glass and Fritsche (2015) investigated revisions to Euro area real-time key macroeconomic data. Both previous papers find evidence of uncertainty about subsequent releases. Hence, to understand the origin of uncertainty, the origin of revisions should be examined. The purpose of this study is to corroborate the predictability of the Euro area revisions using real-time data set from the European Central Bank (ECB), compiled by Giannone et al. (2012). I conclude the need to reconsider the quality of preliminary Eurostat announcements and, following Morgenstern (1963) and Manski (2015), to make uncertainty about the revisions publicly available.

Analysis of real-time data may help statistical agencies to understand the revision process and to oversee their estimation methods of preliminary releases. Croushore and Stark (2003) pointed out that empirical test results of robust economic theory should stay valid for different datasets and vintages. Unfortunately, this requirement does not hold in practice. Studies by Croushore and Stark (2001), Croushore and Stark (2003) and Croushore (2006)[1] have shown he sensitivity to revisions in various fields of empirical economics. Croushore (2011) pointed out that evidence of the predictability of US industrial production already led to the modification of procedures, after which the revisions were no longer predictable (Croushore, 2011, p.74). The intention of this study is to contribute to better revision practices for the Euro area.

The paper applies nonparametric and semiparametric tests, which enable robust conclusions about the predictability of revisions. Two research gaps in the revision literature are covered. The first gap relates to the applied method. There is wide evidence in empirical literature on the nonnormality of the distribution function of

[1] Croushore (2006) focused his literature review on real-time forecasting and the issue of forecast revisions.

revision errors. Nevertheless, to the best of my knowledge, this study is the first to apply the nonparametric approach to examine revisions. In order to make the semiparametric test setting more robust, regressions incorporate dummy variables representing the dates of structural changes. Furthermore, the Euro area is the subject of much research interest, which makes it necessary to mitigate the uncertainty about the quality of available data. In our previous work (Glass and Fritsche, 2015) we have already employed Giannone et al. (2012) data set to measure data uncertainty that originates in uncertainty about future revisions. This study focuses on the predictability of Euro area revisions and, thus, contributes to empirical literature on the quality of Euro area data.

Revisions are replacements of preliminary releases, along with final data. The first release is called a *flash* release, or a flash estimate, and is announced by a statistical agency 45 days after the end of the report quarter.[2] During the revision period, the statistical office publishes monthly updates of the preliminary estimates as new information becomes available. Since the final release should incorporate all relevant information about the variable, this is considered to be its *true* value. A collection of *vintages*, defined as releases of the variable at a particular date, results in a real-time data set.
The revision process is assumed to continue for 24 months after the end of the report period. This definition of the final release corresponds to the practice of statistical offices worldwide. Nevertheless, any assumption made about the timing of the final release presumes that the final value is estimated correctly. For comparison and further computation reasons, this study employs two definitions of the final release. In the first definition, I follow statistical offices and fix the final 24 months after the end of the report quarter. The second definition refers to the last known estimate, under the assumption that progressive revisions should result in the publication of the true values of variables. This definition is closer to that used in research practice.

Traditionally, the magnitude of revisions is measured by the magnitude of revision errors, namely the difference between the preliminary and the final release. In his seminal book on data accuracy, Morgenstern (1963) underlined that the size of a revision is not the most reliable measure to use to analyze revisions. If both the preliminary and the final data are poor, then small revisions simply reflect the non-availability of better data (Morgenstern, 1963, p.270). Hence, descriptive statistics on the magnitude of revision errors gives an incomplete picture about the quality of data. Then, studies based on similar data sets may draw different conclusions. For example, Fixler et al. (2011) found no diminishing revisions for the United States, but they revised this conclusion in their following work Fixler et al. (2014) revised this conclusion. Therefore this study relies on semiparametric and nonparametric predictability tests to identify the quality of Euro area data.

[2]The terms "release" and "estimate" are used synonymously within this paper because any preliminary release is an estimate.

In general, studies on revisions have a long tradition in the literature. Recent examples include the work of Oeller and Hansson (2004) on Sweden; Faust et al. (2005) on the G7 countries; Barklem (2000) and Garratt and Vahey (2006) on the UK; Swanson and Dijk (2006), Aruoba (2008), Croushore (2011), Fixler et al. (2014) on the US; Siliverstovs (2012) on Switzerland. Furthermore, substantial research has been conducted on the real-time forecasting and analysis of forecast revisions, including Keane and Runkle (1990), Croushore and Stark (2001), Koenig et al. (2003), Croushore and Stark (2003) and Croushore (2006), Campbell (2007), Croushore (2011), Kholodilin and Siliverstovs (2009), Oeller and Barot (2000), Clements and Galvao (2013), Arnold (2015), Glass and Fritsche (2015), Garratt et al. (2008), Garratt et al. (2009). Many forecasting studies focus on modeling data revisions in order to announce better forecasts. These include works of Koenig et al. (2003), Döpke and Fritsche (2004), Garratt et al. (2008), Garratt et al. (2009), Jacobs and van Norden (2011), Kishor and Koenig (2012). The aim of this study is to disentangle the predictability of Euro area revisions. Deriving a model of the data is beyond the scope of this work.

The predictability of macroeconomic variable revisions originates from the delayed availability of data. In particular, many studies have examined GDP data revisions and GDP forecast revisions. Traditionally, GDP estimates encompass three components: value-added, expenditure, and income. The timeline of the availability of each component differs. Landefeld et al. (2008) pointed out that in the case of the US Bureau of Economic Analysis, about 25% of GDP information is unavailable when the flash is announced (Landefeld et al., 2008, p.194). Reed (2000), Landefeld et al. (2008), and the German Statistical Office (2014) explained in detail timing of the announcement of preliminary GDP estimates for the UK, the United States, and Germany, respectively. The first component the statistical office releases is derived from the value-added part of the GDP. The contribution of expenditure and income data has to be estimated, either by applying some systematic approach or by constructing an optimal forecast. In the latter case, revision errors cannot be predicted, and with each revision, the statistical office improves its forecast and eliminates forecast errors until the final data are released.

Predictability is traditionally related to the information content of revision errors. Mankiw et al. (1984), Mankiw and Shapiro (1986) discuss about the origin of revisions. If revisions incorporate new information or news, then revision errors reflect optimal forecast errors and are rational forecasts. Otherwise, the corollary of revision errors is noise. This classification of revision errors is rather strong, and numerous studies, including Mork (1987) and Mork (1990), Faust et al. (2005), Swanson and Dijk (2006), Aruoba (2008), Jacobs and van Norden (2011), among others, point out that for evaluated series, neither the news nor the noise hypothesis can be rejected. Formally, news versus noise tests simplify the relationship between the final and preliminary releases. Therefore, the conclusions derived from these tests are more

general and can not answer the question of predictabilty of revisions and revision errors. To evaluate predictability, this paper relies on unbiasedness and efficiency criteria for optimal errors. Following forecasting literature, as for example, Diebold (2001), Clements and Hendry (2002), Stekler (2002), among others, a preliminary estimate should be an unbiased estimator of the final release, and should not be serially correlated with a final release to fulfil efficiency criterion. Unbiasedness and weak efficiency are tested using the Mincer and Zarnowitz (1969) regression. In addition, the strong efficiency regression tests introduced by Nordhaus (1987) are performed. A descriptive analysis of revision errors underlines their nonnormality. Consequently, the application of least absolute deviation estimators upgrades the traditional parametric regression analysis to a semiparametric and the regressions more robust. Another way to avoid the normality and homoscedasticity assumptions of errors is to apply a nonparametric framework. Dufour (1981), Campbell and Dufour (1991), Campbell and Dufour (1995), Campbell and Ghysels (1995) introduced nonparametric tests of unbiasedness and efficiency for forecast errors. This paper utilizes this nonparametric approach to test for unbiasedness and efficiency, and applies it to revision errors. Hence, to identify predictability, three strategies are employed: the test for the origin of revisions, semiparametric regression tests, and nonparametric tests.

The present study builds on a growing body of literature on revisions, which, following Croushore (2011), can be divided into roughly into three main research issues: the magnitude of revisions, the predictability of revisions, and modeling the possibilities of revisions. The latter is especially relevant for real-time forecasting.[3] However, the magnitude of revisions is merely the starting point used by predictability studies to underline the relevance of revision research. This study adds to the body of revision predictability literature, in particular. Therefore, the following literature review focuses on studies that analyze the unbiasedness and efficiency features of revisions.

Mankiw et al. (1984) concluded that money-supply revision errors are noisy. Then, in their study on the gross national product (GNP), Mankiw and Shapiro (1986) verified the efficient forecast characteristics of GNP revisions. However, their results are subject to several caveats. In a longer sample, Mork (1987) applied similar tests and corrected for biases in the estimated standard errors. His results are less encouraging from the perspective of the Bureau of Economic Analysis,[4]: finding that revision errors are neither noise nor news. The revisions exhibited systematic downward bias, as well as an extrapolation of trend tendency, which meant the agency missed turning points (Mork, 1987, p.173). Mork (1990) extended the list of possible explanations of revision errors, assuming that inefficient forecast errors cause revisions. He tested explicitly for conditional bias in revisions of the money supply, and

[3] Croushore gives a comprehensive bibliography of real-time papers on his webpage https://facultystaff.richmond.edu/~dcrousho/docs/realtime_lit.pdf.

[4] Mankiw et al. (1984), Mankiw and Shapiro (1986) and Mork (1987) used Bureau of Economic Analysis GNP data in their calculations.

was able to reject conditional unbiasedness (Mork, 1990, p.598). Moreover systematic behavior was a corollary of about half the revision variation. Hence, traditional test for measurement errors, which examine whether preliminary and final releases are uncorrelated, provide an incorrect picture. Revisions are strongly correlated with available information. Mork (1990) pointed out that it could be that preliminary releases are inefficient forecasts and that observation errors are conditionally biased (Mork, 1990, p.615).

Barklem (2000) performed a revision analysis on UK data for biasedness, and highlighted the different predictability exhibited in short- and longer-term revisions. For most UK indicators, including GDP, she finds no bias in the revisions of initial estimates. Oeller and Hansson (2004) studied revisions of Swedish national accounts, finding that they are positively biased and nonnormally distributed. Faust et al. (2005) analyzed GDP revisions of G7 countries, and found that in the UK, Japan, and Italy, revisions are highly predictable. Moreover, they pointed out that the origins of revisions are probably a mixture of both news and noise. Swanson and Dijk (2006) concentrated on the differences between seasonally adjusted and unadjusted industrial production and the producer price index in US data, accounting for structural breaks and business cycle asymmetry. They concluded that seasonally adjusted data remain irrational for about three months longer than do indices that have not been seasonally adjusted. Garratt and Vahey (2006) analyzed 16 UK macroeconomic indicators and stated bias in the UK variables revisions. Aruoba (2008) evaluated the US real time data, and found evidence of positive unconditional means and high variances of revisions, as well as forecastability of revisions, especially during the times of moderate volatility. Jacobs and van Norden (2011) proposed a state space model for US real output data revisions. They showed the feasibility of the state space framework to model measurement errors and introduced another possible source of revisions,namely spillovers between different vintages and time series.

Using survey data, Jacobs and Sturm (2008)[5] and Siliverstovs (2012) demonstrated that revision errors are predictable. Siliverstovs (2012) found evidence of high predictability in Swiss GDP revisions. Applying a factor model, he showed that information available from the monthly business tendency surveys can be used to predict the direction and the magnitude of revisions. The latter results support the conclusion of Mincer and Zarnowitz with regard to news versus noise tests.

The corollary of the revision literature is the evident irrationality of revision errors for most industrial countries. The Euro area remained unexplored for a long time in terms of revision studies, mainly because of the (non)availability of real-time data. This study investigates the rationality of revision errors for the Euro Area area and, hence, fills this research gap.

[5] Jacobs and Sturm (2008) studied Swiss current account real-time data.

Previous works have a methodological focus on parametric testing, albeit suggesting a nonnormal distribution of revision errors. An alternative approach is nonparametric inference. Dufour (1981) proposed using this method to analyze forecast error unbiasedness and efficiency. His work was then developed further and applied by Campbell and Dufour (1991, 1995); Campbell and Ghysels (1995). Doehrn (2006) applied nonparametric tests to evaluate forecast errors of annual GDP forecasts produced by the Rhine-Westphalia Institute for Economic Research and German "Joint Diagnosis"[6]. McNab et al. (2007) tested for nonparametric rationality in the US budget receipts forecast errors. Moreover, Fritsche and Heilemann (2010) examined German "Joint Diagnosis" GDP and inflation forecasts with the help of nonparametric tests. These successful examples of nonparametric testing in the forecasting literature have encouraged its use in capturing predictability in revisions.

The present work applies the nonparametric tests proposed by Campbell and Dufour (1991, 1995); Campbell and Ghysels (1995) to disentangle the predictability of Euro area revisions. The traditional Mincer and Zarnowitz (1969) and Nordhaus (1987) regression tests include robust errors based on the least absolute deviation estimators and, consequently, can be called semiparametric. Furthermore, the series are tested for structural breaks, following the recommendations of recent literature. To account for parameter instability and to perform robust regression estimations, dummy variables are included in the regression equations to capture the dates of structural breaks for each vintage. As a result, the conclusions drawn here about the predictability of Euro area revision errors are based on robust semiparametric and nonparametric tests.

The results illustrate that Euro area revisions of key macroeconomic variables are not optimal forecasts of the final release. There is no clear evidence on the origin of revisions because neither the news nor the noise hypothesis can be rejected. Jacobs and van Norden (2011) suggested the presence of spillover effects between series, as well as between different vintages. This conclusion adds to the news versus noise discussion that there are probably other sources of revisions. Furthermore, the news versus noise tests are postulated in a way that they are mutually exclusive, but not collectively exhaustive. This study focuses on testing for unbiasedness and efficiency in revisions in order to investigate their predictability, applying both (semi)parametric and nonparametric inferences. The efficiency hypothesis can be rejected in both the parametric and the nonparametric setting. However, the unbiasedness results are more ambiguous, and vary for different variables and within the revision process if the regression tests do not account for structural breaks. For the final release defined as 24 months after the end of the report quarter, the null of parametric unbiasedness is not rejected, although the nonparametric test hypothesis

[6] Joint forecast of leading German economic research institutes, also known as *Gemeinschaftsdiagnose*.

is rejected. Under the assumption that the final release is the last known vintage, parametric and nonparametric unbiasedness could not be rejected for real value-added, nominal GDP, or real consumption. The Andrews (1993) - Quandt (1960) and Andrews and Ploberger (1994) structural break tests pin down the existence of structural changes for most variables and vintages. Therefore, a dummy variable for an estimated structural break is included in the predictability tests regression equations. Within this setting, the unbiasedness hypothesis is rejected, and efficiency is rejected with higher a probability than it was previously. Consequently, there is evidence of predictability in Euro area key macroeconomic revisions. In other words, the revisions are inefficient and biased, and revision errors do not reflect the characteristics of optimal forecast errors.

The remainder of this paper is structured as follows. Section 2 presents the methods used to evaluate predictability, divided into parametric and nonparametric approaches. The empirical settings and results are described in Section 3 and, subsequently, Section 4 concludes the paper.

2 Methods

The importance of data revisions in macroeconomic applications has been the subject of numerous investigations. Croushore and Stark (2003) analyzed the US GNP/GDP and its component revisions, and showed that using certain vintage data can lead to different results, which consequently influences macroeconomic conclusions. They replicated the results of seminal papers by Blanchard and Quah (1989) and Kydland and Prescott (1990) using real-time data and found that business cycle facts are less sensitive to data vintage than are structural identification schemes. Croushore and Stark (2003) concluded that for the robust application of structural vectorautoregressive models, identification should be performed for different vintages (Croushore and Stark, 2003, p.616). Aruoba (2004) incorporated data revisions in a DSGE model and calibrated revisions based on its past history. His results underlined the importance of revisions in economic modeling as well. A further study by Croushore (2006) investigated the role of revisions in forecasting. He pointed out that revisions not only influence the data inputs in forecasting models, but can change the estimated coefficients and the number of estimated lags.

Because revisions influence the outcomes of economic modeling, we need to investigate their quality and, especially, their predictability. Mankiw et al. (1984); Mankiw and Shapiro (1986) and Mork (1987), among others, initiated discussion in the literature on the origin of revisions and revision errors. According to their findings, the aftermath of revision errors are either measurement errors or optimal forecast errors. If the statistical agency announces raw data, then revision errors capture measurement errors. If the statistical agency is able to announce an optimal forecast

of the final estimate, revision errors reflect optimal forecast errors. Furthermore, Mork (1990), Aruoba (2008), Jacobs and van Norden (2011), among others, show that revision errors can be a combination of both news and noise, or neither of the two. Hence, rationality criteria are more reliable and plausible way to judge the quality of revisions.

Traditionally for revisions to be characterized as rational and, consequently, unpredictable, they have to exhibit unbiasedness and efficiency.[7] These definitions rely on the rational expectations literature. Following Lovell (1986), measurement errors fulfill the implicit expectation conditions of Mills (1957), and if revisions are optimal forecasts, then they are rational in the sense of Muth (1961).[8]

The next section presents the parametric and nonparametric regression methods used to evaluate the predictability of revisions, thus identifying the unbiasedness and efficiency characteristics of revisions.

2.1 Parametric Methods to Evaluate Predictability

Parametric tests of predictability were introduced by Mincer and Zarnowitz (1969) as regression tests of forecast accuracy. Mankiw et al. (1984); Mankiw and Shapiro (1986) and Mork (1987) applied the Mincer and Zarnowitz forecast rationality tests to revisions, where instead of forecasts and their realizations, they tested final revisions and preliminary estimates. This regression test is known in the revision literature as the test for news in revision errors, because revision errors in this case origin in an unpredictable error, which is then related to the news. Moreover, Mankiw et al. (1984) suggested that apart from news, a statistical agency may release raw data without any adjustment. If a statistical agency announces noise, then the revision error is a measurement error u_t^{ME}. For example, this would be the case if a preliminary GDP announcement incorporates only the value-added component, $x_t^{output} = x_t^l$.[9] A measurement error is uncorrelated with the final value, the variance of which is smaller than the variance of the revision. To test for measurement errors, the revisions are regressed on a constant and a final release, as shown in equation (1). If the null hypothesis $H_0 : \alpha_0 = 0$ and $\alpha_1 = 1$ is not rejected than $x_t^l = x_t^L$ and

[7] See for example Diebold (2001), Clements and Hendry (2002), Stekler (2002), among many other textbooks on forecasting.

[8] For further discussion of these philosophical issues, refer to Mills (1957), Muth (1961), Lovell (1986), among others.

[9] Traditionally, GDP estimates encompass information from three economic measures: output, income and, expenditure. The preliminary estimate of GDP is derived from the output measure, which is also called production or value-added measure. For details on the usual practice of statistical offices, refer, for example to Reed (2000) for the UK and German Statistical Office (2014) for Germany.

$u_t^{ME} = x_t^l - x_t^L$. Thus statistical agency release x_t^l encompasses noise.

$$x_t^l = \alpha_0 + \alpha_1 x_t^L + u_t^{ME} \tag{1}$$

The optimal forecast error test is the traditional Mincer and Zarnowitz regression (2) test. If the joint hypothesis H_0: $\beta_0 = 0$ and $\beta_1 = 1$ is not rejected than $u_t^{OF} = x_t^L - x_t^l$ and revisions comprehend news.

$$x_t^L = \beta_0 + \beta_1 x_t^l + u_t^{OF} \tag{2}$$

$$e_t^l = x_t^L - x_t^l \tag{3}$$

Aruoba (2008) verified that news and noise tests are mutually exclusive, but are not collectively exhaustive. An earlier study by Mork (1990) suggested a similar conclusion. Although Mankiw et al. (1984) and Mankiw and Shapiro (1986) could reject only one of the hypotheses and, thus, label revisions as either news or noise, for some variables we can reject (or not reject) both. The formal proof of this characteristic is straightforward. If the revision error definition equation in (3) is reorganized so that it can be implied in the noise test (1), then it can be solved for revision error as follows,

$$x_t^L - e_t^l = \alpha_0 + \alpha_1 x_t^L + u_t^{ME} \tag{4}$$

$$e_t^l = x_t^L(1 - \alpha_1) - \alpha_0 - u_t^{ME}. \tag{5}$$

Then, the coefficient α_1 equals

$$\alpha_1 = 1 + \frac{Cov[e_t^l x_t^L]}{Var[x_t^L]}. \tag{6}$$

If the revision error is orthogonal to the final release then the null hypothesis H_0 : $\alpha_0 = 0, \alpha_1 = 1$ is true. This is analogous to the deviation of coefficient β_1 in (7) and the null hypothesis is not rejected under the assumption that the revision error is orthogonal to the preliminary estimate in vintage l.

$$\beta_1 = 1 + \frac{Cov[e_t^l x_t^l]}{Var[x_t^l]} \tag{7}$$

Therefore, the null hypotheses of the noise and news tests are mutually exclusive. If the noise hypothesis is true, then $\beta_1 \neq 1$ and vice versa. However, they are

Table 1: Notation

Notation	Definition
x_t^L	true value of variable x at time t at final vintage L
x_t^{Output}	value of x at time t, raw (mainly output side) data
x_t^l	value of x_t at first vintage l, announced data
x_t^f	an optimal forecast for x_t
e_t^l	revision error of variable x at time (quarter) t and published at vintage l

not collectively exhaustive. When the unconditional mean of the revision errors is nonzero, both hypotheses are rejected (Aruoba, 2008, p.327).

The conclusions from the news versus noise tests may not be sufficiently informative. Formally, they may simplify the relationship between the final and preliminary releases. If the null of the news hypothesis can not be rejected, then residuals of the regression are equal to the revision errors, $e_t^l = u_t^{OF}$, and are unpredictable. Numerioes studies, such as Mork (1987) and Mork (1990), Faust et al. (2005), Swanson and Dijk (2006), Aruoba (2008), Jacobs and van Norden (2011), among others, concluded that news tests do not always deliver straightforward and interpretable results. Hence, we need to analyze the predictability of revisions explicitly. Here, the predictability refers to that of the final estimate x_t^L: if it is predictable, then the preliminary estimates x_t^ls are not optimal forecasts of the final value. In order to define an optimal forecast, the revision literature implement criteria that are successfully established in forecasting: unbiasedness and efficiency. Thus, when the preliminary estimate is a rational estimate of the final value, then it should be both unbiased and efficient. Though parametric unbiasedness and efficiency tests are performed within the same setting as above, within the Mincer and Zarnowitz regression, the news hypothesis is more general and can not answer the question of predictability in detail.
The unbiased preliminary estimate is associated with a zero constant the regression shown in (2) above, $\beta_0 = 0$, and the optimal revision error equals $u_t^{OF} = x_t^L - \beta_1 x_t^l$. An unbiased revision should have a zero expected value of revision error, $E(x_t^L - x_t^l) = 0$. Under the assumption that revision error is orthogonal to the preliminary estimate in vintage l, and knowing (7), the expected error can be derived formally:

$$E(u_t^{OF}) = E(x_t^L - \beta_1 x_t^l) = (1 - \beta_1)E(x_t^L) = (1 - 1 - \frac{Cov[e_t^l x_t^l]}{Var[x_t^l]})E(x_t^L) = 0 \qquad (8)$$

Furthermore, there are two relevant efficiency concepts, namely weak and strong efficiency[10]. Weak efficiency is evident if the correlation between the preliminary and final announcements is perfect: $\beta_1 = 1$. In this case, under the null hypothesis, the residuals of the (2) are as follows, $u_t^{OF} = e_t^l - \beta_0$. Strong efficiency is related

[10]For an example, see an overview by Stekler (2002).

to the rational expectations hypothesis of Muth (1961) and implies that a forecast (and revision) encompasses all relevant information. In practice, this assumption is unrealistic and difficult to test (Nordhaus, 1987, p.668). Nevertheless, the seminal paper by Nordhaus (1987) introduces a test that suggests serial correlation between a forecast and its realization. According to Nordhaus, a forecast is efficient if it minimizes the loss function, subject to available information (Nordhaus, 1987, p.667). An efficient forecast error is independent of all forecast revisions and, consequently, there is no serial correlation between the forecast errors (Nordhaus, 1987, p.668).[11] In this paper, the Nordhaus (1987) test is applied to highlight the strong efficiency of revision errors captured by the serial correlation between the revision errors in vintages l and $l-1$. The following regression is performed:

$$e_t^l = \gamma_1 e_t^{l-1} + u_t \tag{9}$$

The constant is omitted because Nordhaus (1987) assumed there is no systematic bias in the errors. If the null hypothesis $\gamma_1 = 0$ is not rejected then there is no correlation between revision errors and the hypothesis of efficiency can not be rejected.

To recap, this study first investigates the origins of revision errors, and then, following Mankiw et al. (1984), tests whether revision errors are measurement or optimal forecast errors. Secondly, unbiasedness and weak efficiency are tested for explicitly, using the Mincer and Zarnowitz (1969) regression. Then, the parametric Nordhaus (1987) test of strong efficiency is applied. The parametric regression tests presented above have caveats, primarily because of the traditional normality and homoscedasticity assumptions about the residuals in linear regressions. Furthermore, I implement a nonparametric methodology to avoid assumptions about the type of distribution function.

2.2 Structural Break Tests

Evidence of the structural instability of macroeconomic time series parameters has a long history in empirical literature. The classic assumption that there is a single, known structural break was relaxed by Nyblom (1989), Andrews, Andrews and Ploberger, Stock and Watson (1996), Hansen (2000), and Bai and Perron (2003), among others. The objective of this section is to introduce the methods, applied to investigate parameter stability in the Mincer and Zarnowitz and Nordhaus regressions for predictability tests. Stock and Watson (1996) distinguish between three types of parameter stability tests: (1) the tests for random time-varying coefficients by Nyblom (1989); (2) tests based on cumulative forecast errors, known as CUSUM tests, and (3) tests based on sequential Wald tests for a single break for example

[11] This concept is also called "strong efficiency" in the literature.

Andrews (1993) - Quandt (1960) and Andrews and Ploberger (1994) tests. Further development by Bai and Perron (1998), Bai and Perron (2003) allowed for multiple structural breaks. Following the recent literature, this study applies Wald statistics based tests.[12] For completeness, this section briefly summarizes these tests.

The conditional distributions of linear regressions (2) and (9) arises from the coefficients β_t or γ_t, respectively. The structural change is captured by the parameter t_0 which indexes the timing of the structural shift and by the parameter for the magnitude of shift θ_t. Equations (10) and (11) formally define the structural change parameters.

$$\beta_t = \begin{cases} \beta, & t < t_0 \\ \beta + \theta_t, & i \geq t_0 \end{cases} \tag{10}$$

$$\gamma_t = \begin{cases} \gamma, & t < t_0 \\ \gamma + \theta_t, & i \geq t_0 \end{cases} \tag{11}$$

The first strategy to test whether parameters of linear regressions are stable, is to examine the cumulative forecast errors. There are two ways to determine cumulative forecast errors: the traditional method, based on OLS, as in Ploberger and Krämer (1990), or the method of Brown et al. (1975) for recursive residuals. The Kalman filter is applied to perform least squares regressions repeatedly, causing the size of the subsample to keep increasing. To begin with, the smallest set of entries in the sample is defined, and then added in the order indicated. This provides a full rank regression. In the first estimation, the recursive residuals $\hat{u}_t$ are zero. When the new data point is added, the recursive residuals are updated, as follows[13]:

$$\hat{u}_t = \frac{x_t^L - (x_{t-1}^l)'\beta_{t-1}}{\sqrt{1 + (x_t^l)'(\mathbf{X}_{t-1}{}'\mathbf{X}_{t-1})^{-1}x_t^l}} \tag{12}$$

Definition 12 is valid for the Mincer and Zarnowitz regression. The recursive residuals of the Nordhaus regression are defined in equation 13.[14]

$$\hat{u}_t = \frac{e_t^l - (e_{t-1}^{l-1})'\gamma_{t-1}}{\sqrt{1 + (e_{t-1}^{l-1})'(\mathbf{X}_{t-1}{}'\mathbf{X}_{t-1})^{-1}e_{t-1}^{l-1}}} \tag{13}$$

Plots of the recursively defined residuals reflect the changes in the coefficients. If the regression coefficients differ within the samples, then the forecast error mean is nonzero, and there is instability in the model parameters. To derive the test statistics formally, the standard Wald test is chosen, because it is asymptotically equivalent

[12] The Nyblom test focuses on the random walk hypothesis and is similar to the CUSUM test.

[13] $(\mathbf{X}_{t-1}{}'\mathbf{X}_{t-1})^{-1}$ defined as the covariance matrix.

[14] For further details on recursive estimations, refer to Dufour (1982) and Harvey (1989) among others.

to the likelihood ratio (LR) test.
The *CUSUM* statistics applied in this study follow the definition of Brown et al. (1975) and, hence, are based on the recursive residuals in (12) and (13):[15]

$$CUSUM = \sum_{i=k+1}^{T} \hat{u}_t / \hat{\sigma} \tag{14}$$

$$\hat{\sigma} = \sqrt{\frac{1}{T-k} \sum_{i=k+1}^{T} \hat{u}_t^2} \tag{15}$$

The limit distribution of the *CUSUM* test can expressed as a maximum weighted Wiener process $W(r)$ [16]:

$$CUSUM \Rightarrow \sup_{0 \leq r \leq 1} \mid \frac{W(r)}{1+2r} \mid \tag{16}$$

CUSUMSQ is complementary to the *CUSUM* test. While the latter can detect instability only in the intercept or in the model itself, the *CUSUMSQ* (17) tests for a break in the residual variance. Ploberger and Krämer (1990) compared the asymptotic power of both tests, and concluded that the *CUSUM* test is preferred if the regressor is orthogonal to all structural changes.

$$CUSUMSQ = \frac{\sum_{i=k+1}^{t_0} \hat{u}_i^2}{\sum_{i=k+1}^{T} \hat{u}_i^2} \tag{17}$$

The aforementioned tests are only valid if the date of a structural break is known. Thus, if the null hypothesis is postulated to answer the question of whether there is a structural break, the information gain from such tests would be higher. The Andrews - Quandt test $\sup LR$ statistics considers the maximum of the Wald statistics and is the maximum of the Chow statistics. Therefore, it is also called the $\sup F$ statistics. The supremum is taken over all break dates λ within the trimmed period.

$$\sup LR = \sup F = \frac{SSR(1,T) - SSR(1,\lambda) - SSR(\lambda+1,T)}{\left[SSR(1,\lambda) + SSR(\lambda+1,T)\right]/T} \tag{18}$$

where $t = 1, ..., T$ and SSR stands for the sum of the squared residuals of a regression. Andrews (1993) shows that the $\sup LR$ test statistics has a nonstandard

[15] To recap, $t = k+1, \ldots, T$ and k is the number of regressors.
[16] For more details refer to Brown et al. (1975) or Perron (2006) among others.

limiting distribution.
Perron (2006) argues that the optimal power of the Andrews - Quandt test is limited because of its characterics in finite samples. Furthermore, Andrews and Ploberger (1994) consider a test that maximizes the weighted average power and limit distributions, as follows:

$$ExpF = log\left(T^{-1}\sum_{\lambda=0.15T+1}^{T-0.85T} exp(\frac{1}{2}F(\frac{\lambda}{T}))\right) \tag{19}$$

$$MeanF = ExpF(0) = T^{-1}\sum_{\lambda=0.15T+1}^{T-0.85T} exp(\frac{1}{2}F(\frac{\lambda}{T})) \tag{20}$$

These tests are asymptotically equivalent and simulations reported by Andrews et al. (1996); Perron (2006), among others, show that they perform well in practice.

The analysis of parameter instability in the empirical Section 3.2 begins by estimating the recursive residuals, followed by the *CUSUM* and the *CUSUMSQ* test based on recursive residuals. Then, the Andrews - Quandt and Andrews and Ploberger tests identify structural breaks with higher asymptotic power.

2.3 Nonparametric Methods to Evaluate Predictability

The available literature on the characteristics of revision errors concentrates on parametric testing methods, under the assumption of normally distributed errors. In practice, this assumption does not hold, as descriptive analyses of Euro area revision errors have shown. The nonparametric approach to analyzing revisions allows flexibility in terms of the distribution function. Its application in the context of evaluating revision errors is new, and relies heavily on the literature on forecast errors evaluations.

In general, the main difference between parametric and nonparametric methods is the inference. Inferences based on parametric estimates assume that the postulated parametric model is exact. In contrast, nonparametric estimations treat the model as an approximation, where an approximation error is included in the confidence intervals and hypothesis tests.(Horowitz, 2009, p.6)
To the best of my knowledge, there are no studies on revisions that use the nonparametric concept. However, in the forecast evaluation literature, forecast errors have been used for nonparametric analyses of unbiasedness and efficiency characteristics, which are taken here as the starting point for nonparametric tests of revision errors.

Campbell and Dufour (1995) extended the earlier work of Dufour (1981) and Campbell and Dufour (1991) by introducing nonparametric analogs of unbiasedness and efficiency regression tests, namely Wilcoxon (1945) signed rank tests. Because nonparametric tests are distribution free, per definition, they are preferred to the traditional parametric test statistics in the case of suggested nonnormality.

Considering the loss of efficiency under uncertainty over the true distribution function of residuals, the Wilcoxon test is asymptotically relatively more efficient than the t-test. Efficiency in this context refers to using the sample size differences of two tests to obtain the same power under the same level of significance. Relative efficiency is a measure of efficiency that captures the simple relation between two sample sizes, under the assumption that the critical regions are of the same size, and the probability of committing an error is equal. The test that requires the smaller sample is more efficient, and its relative efficiency is greater than one (Conover, 1980, p.88). Moreover, Conover (1980) underlined that the asymptotic relative efficiency is a suitable approximation of the relative efficiency because it is independent of both significance level and the probability of committing an error (Conover, 1980, p.89). This concept is also referred to in the literature as the Pitman efficiency or power-efficiency. Marascuilo and McSweeney (1977) compared the asymptotic relative efficiencies of a number of nonparametric and parametric tests to demonstrate the power of the Wilcoxon signed rank test. Lehmann (2006) formally proved the superiority of the Wilcoxon statistics, particularly to the t-statistics. However, in the case of a large sample and a true normal distribution function, the test procedures deliver similar accuracy. ((Sheskin, 2004, p.198-199), (Lehmann, 2006, p.78-81))

In the applications by Campbell and Dufour (1991, 1995); Campbell and Ghysels (1995), the Wilcoxon-type statistics have good power, under a minimal assumption of a zero median and are independent of disturbances such as heteroscedasticity and nonnormality. Moreover, the strong statistical assumptions required for parametric analyses contradict the rational expectation hypothesis, because nonsystematic errors can neither be normally distributed nor have constant and fixed variance (Campbell and Ghysels, 1995, p.22). Hence, nonparametric testing is closer to the spirit of rational expectation theory.

The Wilcoxon signed rank test enables us to test whether a sample is derived from a population with a specific median value, which in our case is a median value of zero. The test statistics is defined as the sum of the ranks of the positive sample items among absolute values.
Formally, the two times series, vintage x_t^l and the final vintage x_t^L are reduced to a single observation by considering the difference, namely the revision error. Furthermore, the revision errors are assumed to be symmetric[17] and mutually independent

[17]The symmetry assumption is necessary for an unambiguous interpretation of large test statistic values (Hettmansperger, 1984, p.32).

with the same median Θ.[18]
The absolute values of the revision errors are ranked, zero revision errors are omitted and the rank 1 is assigned to the lowest value of the series. If the revision error is positive then the rank corresponds to R_+, otherwise the rank is labeled R_-. The two-tailed version of the Wilcoxon test postulates the null hypothesis that the sample is derived from a population with a median value equal to the hypothesized value of the population median (Sheskin, 2004, p.192). Consequently, the values of the positive and negative ranks are equal if the null hypothesis is true. In the last step of the Wilcoxon test statistic calculation, W is computed as the sum over the products of the positive ranks and the corresponding absolute values. Index i in equation (21) denotes the number of positive errors.
The normal approximation of the Wilcoxon test statistics W holds if the sample is sufficiently large, which is the case here. The expected value of test statistics and the standard deviation are given in (22) and (23), respectively, following Hettmansperger (1984, p.36-37) and Sheskin (2004, p.194-195)

$$W = \sum_{i=1}^{n} R_{+,i} \mid e_i^l \mid \tag{21}$$

$$\mu = R_+ + R_- = \frac{n(n+1)}{4} \tag{22}$$

$$\sigma = \sqrt{\frac{n(n+1)(2n+1)}{24}}. \tag{23}$$

Summing up, the normal approximation of Wilcoxon (1945) test statistics Z is as follows:

$$Z = \frac{W - \frac{n(n+1)}{4}}{\sqrt{\frac{n(n+1)(2n+1)}{24}}}. \tag{24}$$

The nonparametric exercise used here was introduced by Campbell and Ghysels (1995) to investigate the unbiasedness and efficiency of forecasts.[19] Here, the revisions are unbiased if the median of the revision error series is equal to zero, $H_0 : \Theta[e_t^l] = 0$. Following the concept proposed by Dufour (1981), the null hypothesis $H_0 : \Theta[e_t^l * e_t^{l-1}] = 0$ has to be rejected when revision errors are efficient. This definition of efficiency is similar to that of Nordhaus (1987), because both tests identify the serial correlation between the errors in vintages l and $l-1$.

The next section sets up the empirical framework, based on the above parametric

[18] Hettmansperger (1984, p.31-36) and Conover (1980, p.280-281) showed formally the relevance of these assumptions.

[19] Campbell and Ghysels (1995) evaluated the predictive ability of budget figures submitted to the US Congress.

and nonparametric methods. Then, further predictability tests are performed. To increase robustness, especially within the parametric context, the regression parameters are analyzed for structural changes. Note that the tests are performed on the full sample, but on spilled samples in order to ensure the parameter stability of the predictability regression tests.

3 Empirical Setting and Results

The objective of this paper is to corroborate the quality of Euro area data and to test the predictability of major macroeconomic indicator revisions. Nonparametric and robust regression based tests are conducted to fill the research gap on the methodologies applied in the revision studies.

This study uses the real-time data set of the European Central Bank, constructed by Giannone et al. (2012). The data include monthly[20] revisions of the following quarterly variables: real and nominal GDP, real and nominal value-added, real consumption, real government consumption, real investment, real net exports[21]. Detailed description of the data is available in Appendix A. This study analyzes 174 monthly vintages in the Giannone et al. (2012) data set, from January 2001 to December 2015, of quarterly variables from the third quarter of 2000 to the first quarter of 2015. The data are in levels and the annualized quarterly growth rates are computed.

In the following, two definitions of final release x_t^L are considered. To be in line with the customary statistical office definition of final release, I assume first that the final estimate is announced 24 months after the end of the report quarter. Therefore all releases before the 24^{th} month are preliminary estimates, and further vintages are cut. Secondly, the last known vintage for each quarterly estimate is defined as the date of the final release, namely December 2015. This definition corresponds to the usual research practice, where last known data are applied to model estimation and simulation. The additional tests focus on the first 24 vintages, because major revisions occur during this period.

Section 2 described the methods used to analyze the revisions. The predictability analysis starts by investigating the origin of revision using the Mankiw et al. (1984) tests for the measurement errors and the optimal forecast errors. Furthermore, the Mincer and Zarnowitz (1969) regression is applied to test for unbiasedness and weak

[20] The revisions in the beginning of the sample are occasionally not monthly, because some months are skipped. However, this is not a problem here because the predictability tests are applied to the revision release explicitly. Thus, the specific release date is irrelevant.

[21] Real net exports (real NX) are calculated according to the standard definition in the literature, as the difference between exports and imports.

efficiency, followed by the Nordhaus (1987) strong efficiency test. To order to test for nonparametric unbiasedness and efficiency, the normal approximation of Wilcoxon signed rank tests is performed, as derived in (24).

The previous descriptive analysis of revisions indicated the nonnormal distribution of the series.[22] Therefore, standard parametric linear estimators may not be robust. The traditional way to solve this problem is to use the least absolute deviations (LAD) estimator for the linear regression coefficients. Instead of estimating the coefficients that minimize the sum of the squared residuals, as the ordinary least squares method does, the LAD estimates the coefficients that minimize the sum of the absolute residuals. LAD estimators are a special case of quantile regression models, and belong to the class of M-estimators, such as maximum likelihood estimators. For a formal presentation and discussion of LAD estimators refer to Horowitz (2009) and Pagan and Ullah (1999). All regression tests performed here use robust LAD estimators. Hence, the linear parametric regressions are upgraded to the class of semiparametric regressions.

Table 2 gives an overview of the null hypotheses for the semiparametric and nonparametric tests.

Table 2: Overview of Test Hypotheses

Test	Parametric	Nonparametric
ME	$H_0 : \alpha_0 = 0, \alpha_1 = 1$	
OFE	$H_0 : \beta_0 = 0, \beta_1 = 1$	
Unbiasedness	H_0: $\beta_0 = 0$	$H_0 : \Theta[e_t^l] = 0$
Weak efficiency	H_0: $\beta_1 = 1$	
Strong efficiency	H_0: $\gamma_1 = 0$	$H_0 : \Theta[e_t^l * e_t^{l-1}] = 0$

Note: ME is the measurement error; OFE is the optimal forecast error. Further notation is consistent with already established notation in Section 2.

The available revision data cover both Great Moderation and Great Recession periods. Many studies pointed out the presence of structural breaks and regime switches during last two decades for most macroeconomic variables. As Ng and Wright (2013) note, even our knowledge of business cycle facts may have changed owing to the crisis. Therefore it is plausible to assume that there are structural breaks in the revision sample as well. The recent studies of Glass and Fritsche (2015) and Baetje and Friedrici (2016) link the breaks to uncertainty in the data. To account for structural breaks, this paper follows several strategies. To begin with, rationality tests are performed for the full sample. Then the sample is divided into two subsamples: (1) a precrisis sample, from third quarter of 2000 to the fourth quarter of 2006 and (2) a crisis sample, from the first quarter of 2007 to the first quarter of 2015. The

[22] To test for normal distribution I applied Jarque and Bera (1987) test. The detailed results are presented on the Appendix Tables 58 - 73.

tests within these two subsamples are the first robustness checks performed. Then, recursive estimation and the Andrews (1993) - Quandt (1960) and Andrews and Ploberger (1994) structural break tests underline the presence of structural breaks in the Mincer and Zarnowitz and Nordhaus regression equations. Therefore, for the last robustness check all tests are repeated with dummy variables that account for estimated structural breaks.

3.1 Rationality Tests for Full Sample

To conserve space this section gives an overview of results. A detailed presentation for each variable and each vintage is presented in Appendix B.

The empirical study first conducts a revision rationality test for the full sample. The results are given in Table 3 for final release, announced 24 months after the end of the report quarter, and in Table 4 for the final estimate being the last known release.

For the first group of tests, we observe that, in most cases, neither the measurement error nor the optimal forecast error hypotheses can be rejected. This result corresponds to previous findings based on US data by Mork (1987), Mork (1990), Aruoba (2008) and underlines the collective nonexhaustiveness of the Mankiw et al. and Mankiw and Shapiro hypotheses. Hence, additional insights can be obtained from explicit unbiasedness and efficiency testing. The null hypothesis of parametric unbiasedness is not rejected, except for several vintages of real investment. Accordingly, the first six vintages of investment are biased, which confirm the result of the nonparametric unbiasedness test. A similar conclusion is drawn for nominal value-added. The first estimates of nominal GDP and real consumption are not biased, and in the fifth and seventh vintages, the null of nonparametric unbiasedness can be rejected. Real GDP and real value-added nonparametric unbiasedness is rejected for all vintages. For the parametric efficiency, weak efficiency is not rejected, but Nordhaus efficiency is rejected for all variables and vintages. Nonparametric efficiency is rejected as well. Only during the revision process of nominal GDP, nominal value-added, and real consumption are there vintages for which the null of nonparametric efficiency cannot be rejected.

The results of the second group of tests, where the last known release is defined as being final, are similar and show even stronger efficiency. For the origin of revision errors, the outcome is the opposite: for most variables, both the noise and the news hypotheses can be rejected. For real GDP, the null of measurement errors is rejected, but the optimal forecast error is not rejected. For real net exports, the errors of it exhibit the characteristics of measurement errors. However, if unbiasedness and efficiency are tested separately, then for real exports, unbiasedness is not rejected and weak efficiency is rejected. The latter test hypothesis for real GDP is rejected for

the first half of the revision process, until the 13^th vintage. For nominal GDP, real value-added, and nominal value-added, the hypotheses of parametric unbiasedness are not rejected. For real government consumption, unbiasedness is not rejected in the first four vintages only. The real consumption results are even more mixed and vintage dependent. Weak efficiency is rejected for most variables, except for real government consumption and the latter half of the vintages of real GDP. Nonparametric unbiasedness is not rejected for real value-added, real consumption, or the second half of revision process of real and nominal GDP, real investment, and nominal value-added. The null of nonparametric unbiasedness is rejected for real net exports and real government consumption. The strong efficiency and nonparametric efficiency hypotheses are rejected for all variables and vintages.

Table 3: Overview of Predictability Test Results with Final Release Announced 24 Months After the End of Report Quarter

Variable	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
Real GDP	not reject	not reject	not reject	not reject	reject	reject	reject
Nominal GDP	not reject	not reject	not reject	not reject	reject	reject from L7	reject not reject L7-L13
Real Consumption	not reject from L13	not reject	not reject	not reject	reject	reject from L5	reject; not reject L4-L15
Real Investment	reject	not reject from L5	not reject; reject L1-L6,L15-L17	not reject from L13	reject	not reject from L7	reject
Real Government Consumption	not reject from L4	not reject	not reject	not reject	reject	reject; not reject L18-L22	reject
Real Net Exports	not reject; reject L4,L6-L8	not reject	not reject	not reject	reject	reject; not reject L10-L18	reject
Real Value Added	not reject from L13	not reject; reject L4-L6	not reject	not reject; reject L4-L7,L9	reject	reject	reject
Nominal Value Added	not reject	not reject	not reject	not reject from L4	reject	reject from L13	reject; not reject L11-L15

Note: ME is the measurement error test; OFE is the optimal forecast error test.

Table 4: Overview of Predictability Test Results with Final Release Equals Last Known Release

Variable	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
Real GDP	reject	not reject	not reject	not reject from L13	reject	reject L1-L16	reject
Nominal GDP	reject	reject	not reject	reject from L3	reject	not reject from L9	reject
Real Consumption	reject	reject L4-L6, from L11	reject L4-L6, from L13	reject from L13	reject	not reject	reject
Real Investment	reject	reject	reject	reject	reject	reject; not reject from L20	reject
Real Government Consumption	reject	reject from L6	reject from L4	not reject	reject	reject	reject
Real Net Exports	not reject	reject	not reject	reject	reject;	reject	reject
Real Value Added	reject	reject	not reject	reject	reject	not reject	reject
Nominal Value Added	reject	reject from L4	not reject	reject from L7	reject	reject L1-L7,L9-L10	reject

Note: ME is the measurement error test; OFE is the optimal forecast error test.

3.2 Allowing for Structural Breaks

Major macroeconomic variables exhibit structural changes. To account for the structural breaks, this section employs different methods. The classic approach in Section 3.2.1 assumes that the date of suggested structural break is the same for all vintages and that it occurred at the beginning of Great Recession. Hence, the full sample is divided into two subsamples: (1) a precrisis sample, from third quarter of 2000 to the fourth quarter of 2006 and (2) a crisis sample, from the first quarter of 2007 to the first quarter of 2015. Furthermore, the standard in empirical literature methods, as presented in Section 2.2 enables deeper insights about the occurrence of the break, and shows the robustness of previous findings. Subsection 3.2.2 describes the recursive estimation. Then, Subsection 3.2.4 describes structural break tests, followed by the Mincer and Zarnowitz and Nordhaus predictability regression tests, which incorporate dummy variables for the Andrews and Ploberger estimated date of structural change.

3.2.1 Split Samples

An overview of the results is presented in Tables 5 and 6 for the different final release definitions.

Splitting the sample has no apparent influence on the outcomes of the rationality test for real GDP: both subsamples agree in terms of rejecting and not rejecting the investigated null hypotheses. For the final release defined as 24 month after the end of report quarter, the results of the subsamples and the full sample are identical. When the final date is the last- known release date, then both subsamples reject the optimal forecast error and parametric unbiasedness hypotheses, whereas in the full sample, these null hypotheses are not rejected. The weak efficiency hypothesis is rejected until the 13^{th} vintage in both subsamples.

The outcomes for nominal GDP for in the subsamples and in the full sample tests are the same, except in the case of the weak efficiency tests when the final date is the last- known release date. In the full sample, the null of weak efficiency is rejected, whereas within both subsamples, the null hypothesis cannot be rejected. Furthermore, there are differences in the results of the nonparametric analysis for the real consumption. Within the full sample, the hypothesis of nonparametric unbiasedness cannot be rejected, while within the subsamples, the null is rejected for all final definitions and vintages. Moreover, in the second subsample, when the final date is the last- known release date, the null hypothesis of efficiency cannot be rejected from the seventh vintage onwards. In the middle of the first pre-crisis subsample (from the eighths until the 17^{th} vintages), when the release date is defined as 24 months after the end of report quarter, the null of nonparametric efficiency cannot be rejected either.

The findings for real investment throughout the three analyzed samples differ only for the 24- months definition: for the full sample, the rejection of the unbiasedness hypothesis in the parametric and nonparametric settings differed for different vintages. The analysis of the two subsamples underlines that that there is no consensus about the results of the unbiasedness hypothesis for real investment.
The test results for government consumption, real net exports, real value-added and nominal value-added are similar in the subsamples and in the full sample.

Table 5: Overview of Predictability Test Results for two Subsamples 2000:3-2006:4 and 2007:1-2015:1 with Final Release Announced 24 Months After the End of Report Quarter

	Real GDP		Nom GDP		Real C		Real I		Real G		Real NX		Real VA		Real G	
	smp1	smpl2	smp1	smpl2	smp1	smpl2	smp1	smpl2	smp1	smpl2	smp1	smpl2	smp1	smpl2	smp1	smpl2
ME	not	not	not	not	rej. until L16	rej. until L13	rej.	rej. until L14	rej.	not	not for L9-15,18-23	not from L7	not	not	not	not
OFE	not	not	rej. until L17	not	not	rej L13-15,17,18	not	not from L6	not	not	not	not	not	not from L10	not from L11	not
UN	not	not	rej. until L15	not	not	not	rej.	not	not	not	not	not	not	not	not from L11	not
WEF	not	not	not	not	not	not	rej L7-13,16	not from L70	not	not	not	not	not	not	not	not
NH	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.
NONUN	rej.	rej.	rej.	rej.	rej. for L7,8,16-23	rej.	rej.; not L12-14	not L4-16	rej. until L15	rej.	rej.	rej.	rej.	rej.	rej.	rej.
NONEF	rej.	rej.	rej.	rej.	rej.; not for L8-17	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.

Note: Subsamples *smpl1* and *smpl2* cover time periods 2000:3-2006:4 and 2007:1-2015:1 respectively. ME is the measurement error test; OFE is the optimal forecast error test; UN is parametric unbiasedness test; WEF is weak efficiency test; NH is Nordhaus efficiency test; NONUN is nonparametric unbiasedness test; NONEF is nonparametric efficiency test.

Table 6: Overview of Predictability Test Results for two Subsamples 2000:3-2006:4 and 2007:1-2015:1 with with Final Release Equals Last Known Release

	Real GDP		Nom GDP		Real C		Real I		Real G		Real NX		Real VA		Real G	
	smp1	smpl2	smp1	smpl2	smp1	smpl2	smp1	smpl2	smp1	smpl2	smp1	smpl2	smp1	smpl2	smp1	smpl2
ME	rej.	rej.	rej.	rej.	rej.	not	rej. until L19	rej.	rej.	not	not	not	rej.	rej.	rej.	rej.
OFE	rej.	rej.	rej.	not	rej.	rej. from L13	rej.	rej.	rej.	not	not	rej.	not	rej. until L13	rej. from L11	rej. L11-13,16-23
UN	rej.	rej. from L19	not	not	rej.	not	rej.	rej.	rej.	not	not	not from L8	not	not	rej. from L11	rej. L11-13,16-23
WEF	not	rej. until L12	not	not	rej.	rej.	rej.	rej.	rej.	not	rej.	rej.	not	rej.	rej. L11-13,16-23	rej. L11-13,16-23
NH	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.
NONUN	rej.; until L17	rej.	rej.	rej.	rej.	rej.	rej. until L19	not L7-12,17,18	rej.	rej.	rej.	rej.	rej. until L12	rej.	rej.	rej.
NONEF	rej.	rej.	rej.	rej.	rej.	not from L7	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.	rej.

Note: Subsamples *smpl1* and *smpl2* cover time periods 2000:3-2006:4 and 2007:1-2015:1 respectively. ME is the measurement error test; OFE is the optimal forecast error test; UN is parametric unbiasedness test; WEF is weak efficiency test; NH is Nordhaus efficiency test; NONUN is nonparametric unbiasedness test; NONEF is nonparametric efficiency test.

3.2.2 Recursive Estimation and Cumulative Forecast Errors Based Tests

The analysis in the previous subsection was performed under the restrictive assumption that we know the date of structural breaks. The following test refines these findings by determining explicitly whether and where structural breaks in the series of vintages occurred.

The recursive estimations of the Mincer and Zarnowitz (1969) and Nordhaus (1987) regressions derived in (12) and (13), respectively, allow us to test the stability of parameters and, thus, suggest possible structural breaks. The output of the recursive estimation for each variable, vintage, and regression are presented in Appendix B. Figures (1) - (32) plot the recursive residuals. The confidence bands are defined as two standard errors for the estimated coefficients. If the residuals are outside the bands than the parameters are unstable. As before, the results underline unbiasedness in the Mincer and Zarnowitz regression: the instability hypothesis can be rejected for all the vintages of the investigated variables. The recursive residuals of the Nordhaus regression lie outside the confidence bands and, therefore, indicate the presence of structural breaks.

The cumulative forecast error tests, *CUSUM* and *CUSUMSQ*, rely on the previous recursive estimation of residuals, and test for the presence of a structural break. The null hypothesis of a constant regression coefficient is rejected for the settings of the Mincer and Zarnowitz regression for the final released dated 24 months after the end of the report quarter. The null hypothesis for the tests within other settings can not be rejected.[23] To ensure that the conclusions are drawn on parameter instability are robust, this study applies a further test with better power than *CUSUM* and *CUSUMSQ*, following Hansen (2000), among others.

3.2.3 Andrews - Quandt and Andrews and Ploberger Structural Break Tests

The Andrews (1993) - Quandt (1960) and Andrews and Ploberger (1994) tests allow us to test for structural breaks at the unknown change point, and are standard in the literature. This investigation adds important knowledge to the previous findings because these tests have higher power and, hence, the conclusions based on these are more robust. The break point is estimated explicitly, and is incorporated into the regression based predictability tests as a dummy variable.

The null hypothesis of the structural breaks tests is that no structural change occurs in the parameters, and the likelihood function does not depend on the parameter of change. The Andrews - Quandt test considers likelihood ratio statistic, which is dependent on the number of parameters and on the trimming parameter. Andrews (1993) recommends to set the trimming parameter to 0.15, so that the test cuts

[23] Detailed results are presented in Table 7.

Table 7: Results of *CUSUM* and *CUSUMSQ* Tests

		Mincer and Zarnowitz		Nordhaus	
Variable	Final	CUSUM	CUSUMSQ	CUSUM	CUSUMSQ
Real GDP	L24	2.32	0.49	0.93	0.69
		(0.00)	(0.24)	(0.05)	(0.24)
	Last known	0.37	0.45	0.48	0.38
		(0.89)	(0.23)	(0.65)	(0.22)
Nom GDP	L24	2.29	0.67	0.33	0.16
		(0.00)	(0.24)	(0.94)	(0.24)
	Last known	0.58	0.45	0.68	0.38
		(0.44)	(0.23)	(0.26)	(0.22)
Real C	L24	2.42	0.66	0.35	0.23
		(0.00)	(0.24)	(0.91)	(0.24)
	Last known	0.63	0.19	0.98	0.22
		(0.34)	(0.23)	(0.03)	(0.22)
Real G	L24	1.54	0.79	0.61	0.10
		(0.00)	(0.24)	(0.39)	(0.24)
	Last known	0.68	0.29	0.49	0.32
		(0.27)	(0.23)	(0.64)	(0.22)
Real I	L24	2.40	0.32	0.94	0.16
		(0.00)	(0.24)	(0.04)	(0.24)
	Last known	0.82	0.24	0.82	0.12
		(0.11)	(0.24)	(0.11)	(0.23)
Real NX	L24	0.93	0.92	0.33	0.25
		(0.05)	(0.24)	(0.94)	(0.24)
	Last known	0.44	0.13	0.51	0.14
		(0.74)	(0.23)	(0.60)	(0.22)
Real VA	L24	2.00	0.54	0.43	0.25
		(0.00)	(0.23)	(0.76)	(0.23)
	Last known	0.43	0.41	0.52	0.37
		(0.77)	(0.23)	(0.58)	(0.22)
Nominal VA	L24	1.57	0.77	0.39	0.20
		(0.00)	(0.24)	(0.85)	(0.24)
	Last known	0.63	0.41	0.81	0.36
		(0.34)	(0.24)	(0.12)	(0.22)

Note: P-values are in parentheses.

15% of data points in the beginning and at the end of the sample. Andrews and Ploberger (1994) apply likelihood ratio statistics with the same trimming parameter, but instead of the maximum values, they suggested to use the weighted average exponential likelihood function to calculate the test statistics.
Both tests have highly non-standard distributions. Therefore, for the asymptotic inference, the bootstrap distribution of Hansen (2000) is applied, which is now standard in the literature. Moreover, the critical values of the test statistic were recently corrected by Andrews (2003), and are implemented in the test procedures.

Empirical tests of the structural breaks are performed for the full and the spit samples. The full sample is divided into two subsamples, before and after the crisis. Table 8 gives an overview of the results. A detailed presentation of these tests can be found in Appendix B.
The null hypothesis of parameter stability cannot be rejected for almost all series when the final release date is defined as being 24 months after the end of the report quarter, and in the full sample. For real investment and the first eight vintages of real net exports, no structural change hypothesis is rejected. The null hypothesis is rejected for all vintages if the final release is defined as the last known release date. The structural break test results underline that the revision error regression for the 24-month final date has stable parameters, and that in the case of the last- known release date, structural breaks must be considered.

3.2.4 Parametric Regression Tests with Structural Break Dates Dummy Variables

Further robustness of the predictability tests is gained when the Mincer and Zarnowitz and Nordhaus regression tests include dummy variables for the date of the structural change, as determined by the Andrews and Ploberger test. After the dummy variable is defined, the subsamples are retested for parameter instability. The null hypothesis of parameter stability can not be rejected for these subsamples. Therefore I proceed with the parametric regression tests within this robust structural change setting.

The predictability test results are presented in Tables (74) - (81) of Appendix B. With regard to predictability, the outcomes of the tests underline the irrationality of the Euro area revision errors because the null hypotheses of unbiasedness and efficiency are rejected in the case of the tests without the dummy variables. These findings are in line with the results described earlier.

In summary, the findings confirm the previous evidence on the revision origin by Mork (1990), Faust et al. (2005), Aruoba (2008), Jacobs and van Norden (2011) for the Euro area key macroeconomic variables. Euro area revision errors can not be

Table 8: Overview of Structural Breaks Tests Results

		Full sample		Smpl1		Smpl2	
Variable	Final	A-P Test	A-Q Test	A-P Test	A-Q Test	A-P Test	A-Q Test
Real GDP	L24	not reject	not reject	not reject	not reject	not reject	not reject
	Last known	reject	reject	not reject	not reject	reject	reject
Nom GDP	L24	not reject	not reject	not reject	not reject	not reject	not reject
	Last known	not reject	not reject	not reject	not reject	not reject	not reject
		from L14	from L14				
Real C	L24	not reject	not reject	not reject	not reject	not reject	not reject
	Last known	reject	reject	not reject	not reject	not reject	not reject
Real I	L24	reject	reject	not reject	not reject	not reject	not reject
						L7-21	L7-L21
	Last known	reject	reject	not reject	not reject	not reject	not reject
Real G	L24	not reject	not reject	not reject	not reject	not reject	not reject
	Last known	reject	not reject	not reject	not reject	not reject	not reject
Real NX	L24	not reject	not reject	not reject	not reject	not reject	not reject
		from L7	from L8			from L7	from L8
	Last known	not reject	not reject	not reject	not reject	not reject	not reject
Real VA	L24	not reject	not reject	not reject	not reject	not reject	not reject
	Last known	not reject	not reject	not reject	not reject	not reject	not reject
Nominal VA	L24	not reject	not reject	not reject	not reject	not reject	not reject
	Last known	not reject	not reject	not reject	not reject	not reject	not reject
		from L11					

Note: A-P reports results of the Andrews and Ploberger and A-Q of Andrews - Quandt structural break tests. P-values for the null hypothesis of no structural break are put in parentheses. Three samples are considered: full sample, smpl1 covers the period 2000:3-2006:4 and smpl2 covers 2007:1-2015:1. The results for both applied definitions of final estimate are to find in this table: final which equals (1) l_{24} and (2) last known release.

classified as noise or news errors. Moreover, the revisions of Euro area are definitely inefficient, although the results for unbiasedness in the parametric regression tests are ambiguous because the null hypothesis cannot be rejected in several settings. However, in the more robust parametric specification, with dummy variables representing the dates of estimated structural changes, both hypotheses of interest are rejected. The nonparametric tests conclude biased and inefficient revisions as well. Therefore, the revisions are not rational and are not optimal forecasts of the final estimate.

4 Conclusion

Analyses of economic data have a long tradition in economics. Decision-makers from the government and private sectors have to base their economic policy and decisions on preliminary estimates. Therefore, the accuracy of early estimates in particular remains an issue. Recent studies, most of which are based on real-time US data, underline the importance and relevance of revisions. The magnitude of the revision errors does not diminish during the revision process, even though new or better information is expected to be available for the upcoming revisions. Croushore (2011) pointed out that the prevalent opinion that revisions are small and insignificant is misleading. Fixler et al. (2014) underlined this finding for the US GDP estimates announced by the Bureau of Economic Analysis, and Glass and Fritsche (2015) showed that revision errors for the Euro area macroeconomic variables have not decreased during the last two decades. Private and government economic actors base their strategic and operational decisions and predictions on the announcements of statistical offices. In particular, short-run business and government decisions have to be guided by these preliminary data. Therefore, if uncertainties about the data are not communicated to the public, the data could mislead decisions and result in incomplete forecasting and planning. Morgenstern (1963) identified the need to announce measurement errors in order to reduce the uncertainty of revisions data. More recently, Manski (2015) renewed this important discussion.

This study evaluates the predictability of key macroeconomic Euro area variables using a real-time ECB dataset, compiled by Giannone et al. (2012) in order to to investigate the nature of Euro area revisions, focusing on their predictability. The main criteria used to judge the predictability of revisions are unbiasedness and efficiency. These definitions are borrowed from the forecast error evaluation literature, and rely on the rational expectations hypothesis. The novelty of this approach is in the application of nonparametric and semiparametric tests to capture the unbiasedness and efficiency characteristics of revisions. Moreover, structural changes are tested for explicitly, and the predictability tests incorporate dummy variables for the estimated dates of these structural changes in order to make the results more robust.

The analysis begins with the Mankiw et al. (1984) and Mankiw and Shapiro (1986) tests on the origin of revision errors. In line with previous literature, the results are mixed. In two cases, namely for real GDP and real net exports, when the last known vintage is taken as the final release, a decision on the origin of the errors could be made. The null of measurement errors for real GDP is rejected, although the null of optimal forecast errors is not rejected. The results are reversed for real net exports, where the null of measurement errors could not be rejected. However further tests indicated that these results may be misleading, because the efficiency and unbiasedness hypotheses could be rejected. Therefore, this study adds to the evidence of Mork (1990), Faust et al. (2005), Aruoba (2008), and Jacobs and van Norden (2011), among others, that revisions are probably more than simply news or noise, and are, and as Jacobs and van Norden (2011) suggest, a mixture of different spillover effects.

The test results, notwithstanding those of the final definition, show that strong Nordhaus efficiency and nonparametric efficiency are rejected for all variables and vintages. For the 24-month final release date, weak efficiency is not rejected, but in the other setting, it could not be rejected only for real government consumption and the second half of the revision process. The parametric unbiasedness hypothesis is not rejected for the group of tests with the 24-month final date, but is rejected in the nonparametric inference. Neither parametric nor nonparametric unbiasedness could not rejected for real value-added, nominal GDP, and real consumption in the case of the last known release date. Consequently, there is evidence of predictability in Euro area key macroeconomic revisions, which means the revisions are inefficient and biased.

This study showed that revision errors are non-normally distributed and, therefore, are subject to structural changes. To improve the robustness of the parametric regression tests, parameter instability is tested explicitly by applying the standard recursive estimation, *CUSUM*, *CUSUMSQ*, Andrews - Quandt and Andrews and Ploberger (1994) tests. The null hypothesis of parameter stability is rejected for the revision errors when the final release date is the last known release date. For the 24-month definition, the above-mentioned tests indicated no structural breaks. Hence, to capture structural changes, dummy variables were incorporated into the parametric regression tests. These additional analyses point to stronger results for unbiasedness and efficiency, because the test statistics exhibit higher significance.
The analysis results show that Euro area revisions are biased and inefficient. The revision errors are not optimal forecasts of the final estimate, irrespective of how the final estimate is defined, and the results are consistent and robust for different specifications.

Revision studies share a general caveat, pointed out, for example by Faust et al. (2005): revision studies make conclusions about past rationality and, hence, the

past predictability of revisions. Computational methodologies may change or, as is the case for the Euro area, regional coverage may change. Therefore past predictability may not deliver a full picture. Nevertheless, revision studies need to evaluate the quality of data. Croushore (2011) claimed that problems detected in revisions (i.e. the predictability of revisions) lead to the development of computational methods. Swanson and Dijk (2006) and Siliverstovs (2012) underlined that modeling can also reduce the predictability of revisions. The intention of this study is to provide further insights into the Euro area data revision problems, especially concerning unbiasedness and efficiency. Nevertheless, I do not criticize the quality of Eurostat announcements, but rather conclude that we need to reconsider the quality of preliminary statistics.

Alternatively, the statistical office could follow the idea of Morgenstern (1963), and revived by Manski (2015), release uncertainty confidence intervals or revision errors, based on a study of previous vintages, in order to improve the data for many applications. Manski (2015) sharply criticized the fact that since Morgenstern's book was published, very little effort has been made by statistical agencies to publish either sampling or non-sampling errors. One possible reason for this could be political pressure to publish the most accurate estimate. Another possible reason is a communication issue, because it is not trivial to announce uncertainty, and the influence it might have on decision-making processes is not straight forward (Manski, 2015, p.651).

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A Data Description

Table 9: Eurostat Download Information

Eurostat name	Short name
Euro area (moving concept in the Real Time database context) Gross domestic product at market price Chain linked volumes - Euro	Real Gross Domestic Product (real Y)
Euro area (moving concept in the Real Time database context) Gross domestic product at market price Current prices - Euro	Nominal Gross Domestic Product (nom Y)
Euro area (moving concept in the Real Time database context) Final Consumption of Households and NPISH's (private consumption)[24] Chain linked volumes - Euro	Real Consumption (real C)
Euro area (moving concept in the Real Time database context) Gross Fixed Capital Formation Chain linked volumes - Euro	Rea Investment (real I)
Euro area (moving concept in the Real Time database context) Final Consumption of General Government Chain linked volumes - Euro	Real Government Consumption (real G)
Euro area (moving concept in the Real Time database context) Exports of Goods and Services Chain linked volumes - Euro	Real Exports
Euro area (moving concept in the Real Time database context) Imports of Goods and Services Chain linked volumes - Euro	Real Imports
Euro area (moving concept in the Real Time database context) Gross value added at basic prices Constant prices - Euro	Real Value Added (real VA)
Euro area (moving concept in the Real Time database context) Gross value added at basic prices Current prices - Euro	Nominal Value Added (nom VA)

In the recent version of the paper the Eurostat data was updated March 2016.
http://sdw.ecb.europa.eu/browseExplanation.do?node=4843526.
Further information concerning the variables can be found in EUROSTAT (2013).

B Detailed Results

Table 10: Rationality Tests for Real GDP Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (full sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	3.32	0.78	0.06	0.62	1.71	-2.64	6.33
	(0.19)	(0.68)	(0.81)	(0.43)	(0.09)	(0.01)	(0.00)
L2	3.29	0.77	0.04	0.56	28.93	-2.68	-0.72
	(0.19)	(0.68)	(0.84)	(0.45)	(0.00)	(0.01)	(0.47)
L3	2.97	0.53	0.01	0.22	21.15	-2.76	-1.06
	(0.23)	(0.77)	(0.91)	(0.64)	(0.00)	(0.01)	(0.29)
L4	5.40	1.57	0.09	0.89	12.82	-3.22	-2.59
	(0.07)	(0.46)	(0.77)	(0.35)	(0.00)	(0.00)	(0.01)
L5	3.11	0.53	0.06	0.22	47.10	-3.38	-3.12
	(0.21)	(0.77)	(0.80)	(0.64)	(0.00)	(0.00)	(0.00)
L6	2.26	0.15	0.12	0.00	47.50	-3.29	-3.14
	(0.32)	(0.93)	(0.73)	(0.99)	(0.00)	(0.00)	(0.00)
L7	1.93	0.19	0.18	0.08	16.98	-3.48	-3.54
	(0.38)	(0.91)	(0.67)	(0.77)	(0.00)	(0.00)	(0.00)
L8	1.40	0.16	0.12	0.10	29.99	-3.73	-3.90
	(0.50)	(0.92)	(0.73)	(0.75)	(0.00)	(0.00)	(0.00)
L9	2.39	0.46	0.33	0.02	20.99	-3.83	-4.23
	(0.30)	(0.79)	(0.56)	(0.90)	(0.00)	(0.00)	(0.00)
L10	1.61	1.65	1.61	0.56	27.11	-3.78	-4.51
	(0.45)	(0.44)	(0.20)	(0.45)	(0.00)	(0.00)	(0.00)
L11	3.20	2.16	1.69	0.03	24.50	-3.65	-4.61
	(0.20)	(0.34)	(0.19)	(0.86)	(0.00)	(0.00)	(0.00)
L12	2.36	1.50	1.26	0.03	31.85	-3.69	-4.64
	(0.31)	(0.47)	(0.26)	(0.85)	(0.00)	(0.00)	(0.00)
L13	1.70	3.02	2.66	1.28	11.31	-3.70	-4.81
	(0.43)	(0.22)	(0.10)	(0.26)	(0.00)	(0.00)	(0.00)
L14	2.02	6.60	2.65	5.69	23.95	-3.99	-4.74
	(0.36)	(0.04)	(0.10)	(0.02)	(0.00)	(0.00)	(0.00)
L15	2.95	7.95	2.05	7.36	19.06	-4.17	-4.80
	(0.23)	(0.02)	(0.15)	(0.01)	(0.00)	(0.00)	(0.00)
L16	0.34	1.62	0.68	1.56	12.16	-4.45	-5.03
	(0.84)	(0.44)	(0.41)	(0.21)	(0.00)	(0.00)	(0.00)
L17	0.35	1.33	0.69	1.22	9.53	-4.69	-5.41
	(0.84)	(0.51)	(0.41)	(0.27)	(0.00)	(0.00)	(0.00)
L18	0.37	1.49	0.47	1.49	39.97	-4.72	-5.50
	(0.83)	(0.47)	(0.49)	(0.22)	(0.00)	(0.00)	(0.00)
L19	2.14	1.03	1.01	0.01	6.69	-5.31	-5.78
	(0.34)	(0.60)	(0.31)	(0.90)	(0.00)	(0.00)	(0.00)
L20	2.41	1.25	1.01	0.46	24.45	-5.30	-5.83
	(0.30)	(0.53)	(0.31)	(0.50)	(0.00)	(0.00)	(0.00)
L21	2.43	1.93	1.86	0.01	11.31	-5.52	-5.91
	(0.30)	(0.38)	(0.17)	(0.92)	(0.00)	(0.00)	(0.00)
L22	1.60	0.86	0.86	0.00	6.09	-5.72	-6.04
	(0.45)	(0.65)	(0.35)	(0.99)	(0.00)	(0.00)	(0.00)
L23	0.98	0.45	0.35	0.01	1.99	-6.21	-6.26
	(0.61)	(0.80)	(0.55)	(0.92)	(0.05)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 11: Rationality Tests for Real GDP Revision Errors with Final Release Equals Last Known Release (full sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	27.80	3.66	2.44	3.65	3.55	10.55	38.18
	(0.00)	(0.16)	(0.12)	(0.06)	(0.00)	(0.00)	(0.00)
L2	27.51	3.68	2.42	3.66	375.71	10.54	131.74
	(0.00)	(0.16)	(0.12)	(0.06)	(0.00)	(0.00)	(0.00)
L3	26.34	3.76	2.53	3.76	176.82	10.69	131.05
	(0.00)	(0.15)	(0.11)	(0.05)	(0.00)	(0.00)	(0.00)
L4	28.23	3.80	2.60	3.80	151.77	10.55	129.90
	(0.00)	(0.15)	(0.11)	(0.05)	(0.00)	(0.00)	(0.00)
L5	26.15	3.92	2.59	3.90	180.22	10.50	130.57
	(0.00)	(0.14)	(0.11)	(0.05)	(0.00)	(0.00)	(0.00)
L6	25.44	4.22	2.65	4.18	121.39	10.81	134.62
	(0.00)	(0.12)	(0.10)	(0.04)	(0.00)	(0.00)	(0.00)
L7	26.10	4.28	2.66	4.24	190.79	10.57	136.92
	(0.00)	(0.12)	(0.10)	(0.04)	(0.00)	(0.00)	(0.00)
L8	25.29	4.33	2.57	4.26	526.98	10.62	138.28
	(0.00)	(0.11)	(0.11)	(0.04)	(0.00)	(0.00)	(0.00)
L9	25.89	4.17	2.61	4.14	321.11	10.60	137.75
	(0.00)	(0.12)	(0.11)	(0.04)	(0.00)	(0.00)	(0.00)
L10	22.17	4.18	2.48	4.12	530.26	10.26	137.15
	(0.00)	(0.12)	(0.12)	(0.04)	(0.00)	(0.00)	(0.00)
L11	22.82	4.16	2.55	4.13	213.61	10.45	138.22
	(0.00)	(0.12)	(0.11)	(0.04)	(0.00)	(0.00)	(0.00)
L12	22.52	4.18	2.48	4.12	716.09	10.38	139.36
	(0.00)	(0.12)	(0.12)	(0.04)	(0.00)	(0.00)	(0.00)
L13	14.25	1.58	0.72	1.53	179.39	4.99	71.35
	(0.00)	(0.45)	(0.40)	(0.22)	(0.00)	(0.00)	(0.00)
L14	12.97	1.74	0.69	1.63	246.52	4.83	71.08
	(0.00)	(0.42)	(0.41)	(0.20)	(0.00)	(0.00)	(0.00)
L15	12.51	1.88	0.65	1.70	277.49	4.73	70.90
	(0.00)	(0.39)	(0.42)	(0.19)	(0.00)	(0.00)	(0.00)
L16	10.71	0.78	0.00	0.52	138.85	1.09	41.88
	(0.00)	(0.68)	(0.96)	(0.47)	(0.00)	(0.28)	(0.00)
L17	11.21	0.74	0.00	0.48	58.93	1.05	41.75
	(0.00)	(0.69)	(0.94)	(0.49)	(0.00)	(0.29)	(0.00)
L18	11.07	0.79	0.01	0.50	472.41	1.00	41.68
	(0.00)	(0.67)	(0.94)	(0.48)	(0.00)	(0.32)	(0.00)
L19	10.60	1.09	0.53	0.14	76.68	-0.42	37.91
	(0.00)	(0.58)	(0.47)	(0.71)	(0.00)	(0.67)	(0.00)
L20	10.68	1.11	0.66	0.09	93.19	-0.57	37.55
	(0.00)	(0.57)	(0.42)	(0.76)	(0.00)	(0.57)	(0.00)
L21	10.38	1.21	0.69	0.12	224.42	-0.60	37.44
	(0.01)	(0.55)	(0.41)	(0.73)	(0.00)	(0.55)	(0.00)
L22	10.37	1.69	1.34	0.04	298.70	-1.22	36.14
	(0.01)	(0.43)	(0.25)	(0.85)	(0.00)	(0.22)	(0.00)
L23	10.08	1.64	1.39	0.03	121.51	-1.32	35.67
	(0.01)	(0.44)	(0.24)	(0.87)	(0.00)	(0.19)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 12: Rationality Tests for Nominal GDP Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (full sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	1.36	3.03	2.49	2.76	0.85	0.90	16.14
	(0.51)	(0.22)	(0.11)	(0.10)	(0.40)	(0.37)	(0.00)
L2	0.62	2.81	1.85	2.81	8.71	-0.12	5.73
	(0.73)	(0.25)	(0.17)	(0.09)	(0.00)	(0.90)	(0.00)
L3	1.26	1.94	1.59	1.81	20.30	-0.66	4.62
	(0.53)	(0.38)	(0.21)	(0.18)	(0.00)	(0.51)	(0.00)
L4	5.36	0.91	0.57	0.01	17.01	-0.96	2.79
	(0.07)	(0.63)	(0.45)	(0.91)	(0.00)	(0.34)	(0.01)
L5	3.45	0.55	0.53	0.18	24.46	-1.33	2.21
	(0.18)	(0.76)	(0.47)	(0.67)	(0.00)	(0.18)	(0.03)
L6	2.55	0.66	0.65	0.36	24.64	-1.36	2.02
	(0.28)	(0.72)	(0.42)	(0.55)	(0.00)	(0.17)	(0.04)
L7	1.84	1.14	1.07	0.59	17.00	-1.77	1.15
	(0.40)	(0.57)	(0.30)	(0.44)	(0.00)	(0.08)	(0.25)
L8	1.84	1.43	1.32	0.78	36.07	-1.68	0.62
	(0.40)	(0.49)	(0.25)	(0.38)	(0.00)	(0.09)	(0.53)
L9	2.05	1.02	0.98	0.51	31.10	-1.70	0.60
	(0.36)	(0.60)	(0.32)	(0.47)	(0.00)	(0.09)	(0.55)
L10	2.74	2.83	2.82	0.91	23.25	-1.55	0.40
	(0.25)	(0.24)	(0.09)	(0.34)	(0.00)	(0.12)	(0.69)
L11	3.19	0.74	0.67	0.09	21.36	-2.06	0.05
	(0.20)	(0.69)	(0.41)	(0.76)	(0.00)	(0.04)	(0.96)
L12	3.09	1.13	1.06	0.18	30.46	-1.83	-0.04
	(0.21)	(0.57)	(0.30)	(0.67)	(0.00)	(0.07)	(0.97)
L13	2.37	1.63	1.63	0.58	14.53	-2.30	-1.04
	(0.31)	(0.44)	(0.20)	(0.45)	(0.00)	(0.02)	(0.30)
L14	1.79	5.37	4.48	3.60	13.97	-2.48	-2.04
	(0.41)	(0.07)	(0.03)	(0.06)	(0.00)	(0.01)	(0.04)
L15	0.63	6.95	3.96	6.19	28.39	-2.82	-2.16
	(0.73)	(0.03)	(0.05)	(0.01)	(0.00)	(0.00)	(0.03)
L16	2.28	0.43	0.41	0.09	11.99	-3.32	-2.57
	(0.32)	(0.81)	(0.52)	(0.76)	(0.00)	(0.00)	(0.01)
L17	3.31	0.51	0.35	0.01	31.73	-3.30	-2.75
	(0.19)	(0.77)	(0.55)	(0.94)	(0.00)	(0.00)	(0.01)
L18	3.60	3.22	2.42	0.04	3.03	-3.05	-4.10
	(0.17)	(0.20)	(0.12)	(0.84)	(0.00)	(0.00)	(0.00)
L19	2.52	1.12	0.67	0.00	9.70	-3.68	-4.50
	(0.28)	(0.57)	(0.41)	(0.95)	(0.00)	(0.00)	(0.00)
L20	2.93	1.50	0.39	0.07	11.74	-4.13	-4.83
	(0.23)	(0.47)	(0.53)	(0.79)	(0.00)	(0.00)	(0.00)
L21	1.68	0.33	0.03	0.30	5.19	-4.76	-5.32
	(0.43)	(0.85)	(0.86)	(0.58)	(0.00)	(0.00)	(0.00)
L22	1.52	2.31	2.21	0.11	5.48	-4.75	-5.60
	(0.47)	(0.32)	(0.14)	(0.74)	(0.00)	(0.00)	(0.00)
L23	0.58	1.11	0.88	0.92	5.09	-5.88	-6.01
	(0.75)	(0.57)	(0.35)	(0.34)	(0.00)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 13: Rationality Tests for Nominal GDP Revision Errors with Final Release Equals Last Known Release (full sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	12.49	3.22	1.69	0.03	3.33	4.34	35.09
	(0.00)	(0.20)	(0.19)	(0.86)	(0.00)	(0.00)	(0.00)
L2	12.16	2.89	1.25	0.02	13.81	3.20	15.84
	(0.00)	(0.24)	(0.26)	(0.88)	(0.00)	(0.00)	(0.00)
L3	15.74	3.80	0.67	0.66	33.22	2.55	14.21
	(0.00)	(0.15)	(0.41)	(0.42)	(0.00)	(0.01)	(0.00)
L4	30.74	7.12	0.05	3.01	27.55	2.49	12.47
	(0.00)	(0.03)	(0.82)	(0.08)	(0.00)	(0.01)	(0.00)
L5	25.82	6.38	0.00	3.29	39.35	2.16	12.21
	(0.00)	(0.04)	(0.95)	(0.07)	(0.00)	(0.03)	(0.00)
L6	26.60	6.61	0.00	3.32	43.95	1.85	11.35
	(0.00)	(0.04)	(0.95)	(0.07)	(0.00)	(0.06)	(0.00)
L7	26.37	8.02	0.00	4.38	36.86	1.63	10.05
	(0.00)	(0.02)	(0.99)	(0.04)	(0.00)	(0.10)	(0.00)
L8	27.03	8.03	0.01	4.27	56.12	1.79	8.90
	(0.00)	(0.02)	(0.90)	(0.04)	(0.00)	(0.07)	(0.00)
L9	25.21	8.18	0.00	4.96	43.98	1.46	8.56
	(0.00)	(0.02)	(0.94)	(0.03)	(0.00)	(0.15)	(0.00)
L10	26.68	8.06	0.10	3.95	45.26	1.58	8.14
	(0.00)	(0.02)	(0.75)	(0.05)	(0.00)	(0.11)	(0.00)
L11	33.23	7.75	0.04	4.65	30.42	1.32	7.92
	(0.00)	(0.02)	(0.83)	(0.03)	(0.00)	(0.19)	(0.00)
L12	33.61	9.64	0.04	5.59	42.85	1.17	7.03
	(0.00)	(0.01)	(0.85)	(0.02)	(0.00)	(0.24)	(0.00)
L13	33.19	10.94	0.02	7.10	29.24	0.75	5.71
	(0.00)	(0.00)	(0.88)	(0.01)	(0.00)	(0.45)	(0.00)
L14	24.15	10.61	0.11	6.41	35.59	0.96	4.96
	(0.00)	(0.00)	(0.74)	(0.01)	(0.00)	(0.34)	(0.00)
L15	21.36	7.27	0.03	4.57	24.80	0.36	4.10
	(0.00)	(0.03)	(0.87)	(0.03)	(0.00)	(0.72)	(0.00)
L16	34.97	8.20	0.38	7.07	25.49	0.16	3.91
	(0.00)	(0.02)	(0.53)	(0.01)	(0.00)	(0.87)	(0.00)
L17	42.43	9.22	0.37	7.84	60.58	0.30	4.69
	(0.00)	(0.01)	(0.54)	(0.01)	(0.00)	(0.77)	(0.00)
L18	43.03	8.41	0.00	5.54	17.27	1.04	5.03
	(0.00)	(0.01)	(0.98)	(0.02)	(0.00)	(0.30)	(0.00)
L19	35.98	8.13	0.17	6.43	30.22	0.34	4.86
	(0.00)	(0.02)	(0.68)	(0.01)	(0.00)	(0.73)	(0.00)
L20	39.10	7.75	0.18	5.50	40.99	0.27	4.56
	(0.00)	(0.02)	(0.67)	(0.02)	(0.00)	(0.78)	(0.00)
L21	36.09	7.30	0.49	6.09	45.61	0.19	4.86
	(0.00)	(0.03)	(0.48)	(0.01)	(0.00)	(0.85)	(0.00)
L22	32.55	7.58	0.23	6.50	28.53	0.06	4.28
	(0.00)	(0.02)	(0.63)	(0.01)	(0.00)	(0.95)	(0.00)
L23	34.21	5.79	0.35	5.13	39.98	-0.29	3.89
	(0.00)	(0.06)	(0.55)	(0.02)	(0.00)	(0.77)	(0.00)
L24	34.75	7.01	0.67	6.63	57.98	-0.07	3.95
	(0.00)	(0.03)	(0.41)	(0.01)	(0.00)	(0.94)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 14: Rationality Tests for Real Consumption Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (full sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	19.93	0.27	0.09	0.27	3.96	0.72	12.73
	(0.00)	(0.87)	(0.76)	(0.60)	(0.00)	(0.47)	(0.00)
L2	51.25	2.33	0.18	2.27	9.79	0.03	8.20
	(0.00)	(0.31)	(0.67)	(0.13)	(0.00)	(0.97)	(0.00)
L3	59.65	3.51	0.51	3.46	10.26	-1.17	4.69
	(0.00)	(0.17)	(0.48)	(0.06)	(0.00)	(0.24)	(0.00)
L4	30.55	3.21	0.01	2.81	10.14	-1.50	1.09
	(0.00)	(0.20)	(0.94)	(0.09)	(0.00)	(0.13)	(0.28)
L5	14.61	0.37	0.00	0.32	16.43	-1.97	0.78
	(0.00)	(0.83)	(1.00)	(0.57)	(0.00)	(0.05)	(0.44)
L6	11.91	0.53	0.46	0.00	16.60	-1.36	1.29
	(0.00)	(0.77)	(0.50)	(0.96)	(0.00)	(0.17)	(0.20)
L7	13.72	0.52	0.40	0.32	12.13	-2.78	0.28
	(0.00)	(0.77)	(0.53)	(0.57)	(0.00)	(0.01)	(0.78)
L8	15.90	0.69	0.49	0.42	15.64	-2.89	-0.18
	(0.00)	(0.71)	(0.48)	(0.52)	(0.00)	(0.00)	(0.86)
L9	14.41	0.39	0.22	0.28	28.20	-2.72	-0.11
	(0.00)	(0.82)	(0.64)	(0.60)	(0.00)	(0.01)	(0.91)
L10	11.78	1.96	0.67	1.75	9.74	-3.15	-1.24
	(0.00)	(0.38)	(0.41)	(0.19)	(0.00)	(0.00)	(0.21)
L11	7.44	0.49	0.02	0.49	34.08	-2.77	-1.41
	(0.02)	(0.78)	(0.88)	(0.48)	(0.00)	(0.01)	(0.16)
L12	7.68	0.45	0.02	0.44	26.99	-2.82	-1.42
	(0.02)	(0.80)	(0.88)	(0.51)	(0.00)	(0.00)	(0.16)
L13	4.06	1.75	1.33	0.56	11.97	-2.42	-1.83
	(0.13)	(0.42)	(0.25)	(0.45)	(0.00)	(0.02)	(0.07)
L14	4.93	0.78	0.67	0.25	24.79	-2.60	-1.50
	(0.09)	(0.68)	(0.41)	(0.61)	(0.00)	(0.01)	(0.13)
L15	3.29	1.15	0.79	0.73	24.50	-2.66	-1.61
	(0.19)	(0.56)	(0.37)	(0.39)	(0.00)	(0.01)	(0.11)
L16	1.12	1.07	0.02	0.93	9.29	-3.61	-2.65
	(0.57)	(0.59)	(0.89)	(0.33)	(0.00)	(0.00)	(0.01)
L17	0.47	2.36	0.60	2.33	16.37	-3.26	-2.98
	(0.79)	(0.31)	(0.44)	(0.13)	(0.00)	(0.00)	(0.00)
L18	0.96	2.19	1.19	1.86	29.32	-3.29	-3.19
	(0.62)	(0.33)	(0.28)	(0.17)	(0.00)	(0.00)	(0.00)
L19	2.03	3.62	2.95	2.35	8.66	-3.69	-4.47
	(0.36)	(0.16)	(0.09)	(0.13)	(0.00)	(0.00)	(0.00)
L20	3.23	2.61	2.61	0.42	13.97	-3.84	-4.90
	(0.20)	(0.27)	(0.11)	(0.52)	(0.00)	(0.00)	(0.00)
L21	3.54	3.54	3.54	0.40	13.24	-3.69	-5.05
	(0.17)	(0.17)	(0.06)	(0.53)	(0.00)	(0.00)	(0.00)
L22	1.94	1.04	0.94	0.01	5.14	-4.59	-5.37
	(0.38)	(0.59)	(0.33)	(0.92)	(0.00)	(0.00)	(0.00)
L23	1.89	0.51	0.01	0.36	3.69	-5.81	-6.03
	(0.39)	(0.77)	(0.91)	(0.55)	(0.00)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 15: Rationality Tests for Real Consumption Revision Errors with Final Release Equals Last Known Release (full sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	27.75	3.48	2.66	2.88	4.27	3.42	15.40
	(0.00)	(0.18)	(0.10)	(0.09)	(0.00)	(0.00)	(0.00)
L2	46.49	1.65	1.52	0.04	11.43	2.60	15.59
	(0.00)	(0.44)	(0.22)	(0.84)	(0.00)	(0.01)	(0.00)
L3	39.70	1.49	1.11	0.05	13.47	1.08	11.22
	(0.00)	(0.47)	(0.29)	(0.83)	(0.00)	(0.28)	(0.00)
L4	25.02	4.53	4.44	0.08	13.33	0.83	8.30
	(0.00)	(0.10)	(0.04)	(0.78)	(0.00)	(0.41)	(0.00)
L5	15.35	5.75	3.98	1.62	36.83	0.59	8.58
	(0.00)	(0.06)	(0.05)	(0.20)	(0.00)	(0.56)	(0.00)
L6	14.80	8.97	6.45	2.28	26.55	1.11	9.24
	(0.00)	(0.01)	(0.01)	(0.13)	(0.00)	(0.27)	(0.00)
L7	12.27	3.45	2.24	1.46	20.85	-0.30	7.97
	(0.00)	(0.18)	(0.13)	(0.23)	(0.00)	(0.76)	(0.00)
L8	13.13	3.30	2.18	1.26	30.95	-0.31	6.71
	(0.00)	(0.19)	(0.14)	(0.26)	(0.00)	(0.76)	(0.00)
L9	12.52	4.07	2.94	1.32	35.76	0.18	6.91
	(0.00)	(0.13)	(0.09)	(0.25)	(0.00)	(0.86)	(0.00)
L10	11.68	2.37	2.13	0.61	20.70	-0.09	5.23
	(0.00)	(0.31)	(0.14)	(0.44)	(0.00)	(0.93)	(0.00)
L11	10.19	3.82	2.96	1.38	35.48	0.12	4.65
	(0.01)	(0.15)	(0.09)	(0.24)	(0.00)	(0.90)	(0.00)
L12	10.02	3.92	2.77	1.50	45.85	0.16	5.32
	(0.01)	(0.14)	(0.10)	(0.22)	(0.00)	(0.87)	(0.00)
L13	8.32	10.94	6.13	5.30	25.85	0.79	5.13
	(0.02)	(0.00)	(0.01)	(0.02)	(0.00)	(0.43)	(0.00)
L14	10.14	9.95	6.33	3.70	55.18	0.57	5.27
	(0.01)	(0.01)	(0.01)	(0.05)	(0.00)	(0.57)	(0.00)
L15	8.49	12.18	7.06	5.62	36.58	0.56	5.01
	(0.01)	(0.00)	(0.01)	(0.02)	(0.00)	(0.57)	(0.00)
L16	5.06	10.42	4.74	6.78	32.00	0.37	4.66
	(0.08)	(0.01)	(0.03)	(0.01)	(0.00)	(0.71)	(0.00)
L17	5.10	12.61	5.65	8.97	33.24	0.60	4.87
	(0.08)	(0.00)	(0.02)	(0.00)	(0.00)	(0.55)	(0.00)
L18	5.62	12.17	6.21	8.21	57.63	0.64	5.33
	(0.06)	(0.00)	(0.01)	(0.00)	(0.00)	(0.53)	(0.00)
L19	7.01	10.37	6.69	7.15	19.87	0.80	4.73
	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)	(0.43)	(0.00)
L20	8.70	8.19	6.18	4.81	39.63	0.48	4.01
	(0.01)	(0.02)	(0.01)	(0.03)	(0.00)	(0.63)	(0.00)
L21	8.81	8.59	6.50	5.01	54.34	0.81	3.92
	(0.01)	(0.01)	(0.01)	(0.03)	(0.00)	(0.42)	(0.00)
L22	7.80	6.82	4.83	4.35	33.44	0.49	4.16
	(0.02)	(0.03)	(0.03)	(0.04)	(0.00)	(0.62)	(0.00)
L23	7.54	5.23	3.78	3.63	30.81	-0.16	3.61
	(0.02)	(0.07)	(0.05)	(0.06)	(0.00)	(0.87)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 16: Rationality Tests for Real Investment Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (full sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	47.84	18.61	15.23	16.21	6.83	8.39	36.85
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L2	89.61	11.24	9.14	9.45	11.26	6.95	43.19
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L3	98.84	6.81	6.25	4.86	21.19	5.72	32.62
	(0.00)	(0.03)	(0.01)	(0.03)	(0.00)	(0.00)	(0.00)
L4	40.47	5.30	4.20	4.32	11.74	3.37	25.72
	(0.00)	(0.07)	(0.04)	(0.04)	(0.00)	(0.00)	(0.00)
L5	36.94	3.23	2.67	2.86	16.62	2.67	23.18
	(0.00)	(0.20)	(0.10)	(0.09)	(0.00)	(0.01)	(0.00)
L6	32.73	3.93	2.70	3.78	23.22	2.50	22.86
	(0.00)	(0.14)	(0.10)	(0.05)	(0.00)	(0.01)	(0.00)
L7	20.38	3.58	1.89	3.57	12.12	1.63	19.41
	(0.00)	(0.17)	(0.17)	(0.06)	(0.00)	(0.10)	(0.00)
L8	19.07	7.28	1.62	6.46	38.95	1.47	19.27
	(0.00)	(0.03)	(0.20)	(0.01)	(0.00)	(0.14)	(0.00)
L9	20.09	3.44	0.56	2.77	23.63	0.67	18.14
	(0.00)	(0.18)	(0.46)	(0.10)	(0.00)	(0.50)	(0.00)
L10	11.57	3.50	1.15	3.38	20.98	0.57	15.50
	(0.00)	(0.17)	(0.28)	(0.07)	(0.00)	(0.57)	(0.00)
L11	12.81	2.68	1.51	2.68	39.28	1.10	15.15
	(0.00)	(0.26)	(0.22)	(0.10)	(0.00)	(0.27)	(0.00)
L12	9.06	3.09	1.71	3.06	12.61	0.30	12.66
	(0.01)	(0.21)	(0.19)	(0.08)	(0.00)	(0.76)	(0.00)
L13	14.07	1.92	1.66	1.52	23.47	0.71	11.47
	(0.00)	(0.38)	(0.20)	(0.22)	(0.00)	(0.48)	(0.00)
L14	9.37	2.76	2.60	1.71	18.87	0.53	9.61
	(0.01)	(0.25)	(0.11)	(0.19)	(0.00)	(0.59)	(0.00)
L15	9.21	3.47	3.36	2.28	13.05	0.92	7.86
	(0.01)	(0.18)	(0.07)	(0.13)	(0.00)	(0.36)	(0.00)
L16	9.09	5.06	4.84	3.28	15.79	0.87	9.31
	(0.01)	(0.08)	(0.03)	(0.07)	(0.00)	(0.38)	(0.00)
L17	11.59	3.37	3.01	0.55	6.68	-0.23	7.84
	(0.00)	(0.19)	(0.08)	(0.46)	(0.00)	(0.82)	(0.00)
L18	12.58	1.41	1.29	0.22	11.96	-1.53	4.13
	(0.00)	(0.50)	(0.26)	(0.64)	(0.00)	(0.13)	(0.00)
L19	5.78	2.84	2.38	0.30	2.03	-2.09	-1.57
	(0.06)	(0.24)	(0.12)	(0.58)	(0.05)	(0.04)	(0.12)
L20	5.76	1.18	0.49	0.02	2.56	-3.21	-3.89
	(0.06)	(0.56)	(0.49)	(0.89)	(0.01)	(0.00)	(0.00)
L21	5.05	0.00	0.00	0.00	8.57	-3.63	-3.76
	(0.08)	(1.00)	(0.96)	(0.98)	(0.00)	(0.00)	(0.00)
L22	0.88	1.55	0.27	1.39	4.62	-4.55	-4.02
	(0.64)	(0.46)	(0.60)	(0.24)	(0.00)	(0.00)	(0.00)
L23	0.55	1.22	0.44	1.15	2.76	-5.68	-5.37
	(0.76)	(0.54)	(0.51)	(0.28)	(0.01)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 17: Rationality Tests for Real Inventment Revision Errors with Final Release Equals Last Known Release (full sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	38.94	24.51	19.81	22.62	6.24	7.98	31.68
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L2	63.62	26.26	19.75	23.14	11.26	7.01	44.71
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L3	86.79	26.80	22.15	20.62	27.38	6.03	37.33
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L4	37.28	17.23	15.08	13.16	11.71	3.96	31.84
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L5	33.07	14.81	12.85	11.45	25.08	3.24	30.37
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L6	25.71	18.43	13.27	15.80	21.48	3.10	28.56
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L7	17.25	16.52	11.88	14.51	13.33	2.69	26.13
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
L8	13.10	21.26	10.85	20.67	27.44	2.46	26.18
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
L9	14.40	14.71	8.05	14.13	28.50	2.10	24.88
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)
L10	11.39	20.84	11.48	18.91	30.51	1.95	22.55
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)
L11	14.92	17.63	10.36	16.17	27.54	2.20	22.80
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)
L12	11.42	16.45	11.91	13.74	16.61	2.19	23.52
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)
L13	16.33	13.08	11.36	9.97	26.35	2.96	24.98
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L14	13.95	12.52	11.29	9.23	29.33	2.52	25.28
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
L15	14.50	15.63	13.63	11.41	29.42	3.00	24.82
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L16	15.74	15.49	13.09	12.41	25.11	3.49	27.19
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L17	18.81	13.36	11.14	10.93	20.04	2.84	26.96
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L18	16.90	12.69	9.83	11.17	37.84	2.48	26.04
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
L19	10.52	11.90	9.48	10.55	8.24	2.54	23.28
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
L20	8.87	10.38	7.63	9.71	17.96	1.35	21.12
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.18)	(0.00)
L21	7.62	9.12	6.05	8.91	37.38	0.52	19.57
	(0.02)	(0.01)	(0.01)	(0.00)	(0.00)	(0.60)	(0.00)
L22	5.46	13.18	7.83	13.00	30.42	0.99	21.58
	(0.07)	(0.00)	(0.01)	(0.00)	(0.00)	(0.32)	(0.00)
L23	5.25	12.92	8.21	12.58	32.18	0.75	23.36
	(0.07)	(0.00)	(0.00)	(0.00)	(0.00)	(0.45)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 18: Rationality Tests for Real Government Consumption Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (full sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	42.88	0.50	0.02	0.44	6.63	9.41	188.96
	(0.00)	(0.78)	(0.90)	(0.51)	(0.00)	(0.00)	(0.00)
L2	19.96	0.15	0.00	0.12	13.72	9.07	93.72
	(0.00)	(0.93)	(0.94)	(0.73)	(0.00)	(0.00)	(0.00)
L3	12.61	0.38	0.33	0.03	20.09	7.36	86.11
	(0.00)	(0.83)	(0.56)	(0.87)	(0.00)	(0.00)	(0.00)
L4	2.03	1.03	0.01	0.90	8.13	7.11	64.46
	(0.36)	(0.60)	(0.93)	(0.34)	(0.00)	(0.00)	(0.00)
L5	1.79	1.59	0.17	1.09	29.56	7.63	59.44
	(0.41)	(0.45)	(0.68)	(0.30)	(0.00)	(0.00)	(0.00)
L6	2.54	1.25	0.53	0.29	20.29	6.52	53.25
	(0.28)	(0.53)	(0.47)	(0.59)	(0.00)	(0.00)	(0.00)
L7	9.78	0.53	0.35	0.41	17.32	5.54	42.59
	(0.01)	(0.77)	(0.55)	(0.52)	(0.00)	(0.00)	(0.00)
L8	2.97	0.67	0.47	0.02	36.59	6.15	40.74
	(0.23)	(0.72)	(0.49)	(0.89)	(0.00)	(0.00)	(0.00)
L9	2.60	0.59	0.37	0.04	57.76	6.04	42.67
	(0.27)	(0.74)	(0.54)	(0.83)	(0.00)	(0.00)	(0.00)
L10	2.20	0.20	0.19	0.00	13.73	5.02	35.18
	(0.33)	(0.90)	(0.66)	(0.96)	(0.00)	(0.00)	(0.00)
L11	2.73	0.38	0.37	0.01	17.11	4.96	32.75
	(0.26)	(0.83)	(0.54)	(0.91)	(0.00)	(0.00)	(0.00)
L12	2.88	0.65	0.60	0.03	10.96	4.06	28.75
	(0.24)	(0.72)	(0.44)	(0.87)	(0.00)	(0.00)	(0.00)
L13	2.72	2.13	1.33	0.61	6.16	5.02	23.93
	(0.26)	(0.34)	(0.25)	(0.43)	(0.00)	(0.00)	(0.00)
L14	1.81	2.11	0.90	1.09	24.92	4.64	27.55
	(0.40)	(0.35)	(0.34)	(0.30)	(0.00)	(0.00)	(0.00)
L15	0.63	1.51	0.26	1.16	11.41	2.88	22.78
	(0.73)	(0.47)	(0.61)	(0.28)	(0.00)	(0.00)	(0.00)
L16	1.18	0.84	0.41	0.43	9.39	1.96	17.26
	(0.55)	(0.66)	(0.52)	(0.51)	(0.00)	(0.05)	(0.00)
L17	1.89	0.70	0.56	0.17	26.88	2.11	17.53
	(0.39)	(0.70)	(0.46)	(0.68)	(0.00)	(0.03)	(0.00)
L18	0.73	0.79	0.22	0.54	9.51	1.55	14.80
	(0.69)	(0.67)	(0.64)	(0.46)	(0.00)	(0.12)	(0.00)
L19	3.74	0.62	0.56	0.05	15.90	1.01	13.40
	(0.15)	(0.73)	(0.46)	(0.82)	(0.00)	(0.31)	(0.00)
L20	3.25	1.40	1.40	0.00	13.91	0.72	11.73
	(0.20)	(0.50)	(0.24)	(0.98)	(0.00)	(0.47)	(0.00)
L21	3.11	1.28	1.05	0.62	5.46	-1.61	3.36
	(0.21)	(0.53)	(0.31)	(0.43)	(0.00)	(0.11)	(0.00)
L22	0.23	0.25	0.11	0.04	6.87	-2.82	-1.40
	(0.89)	(0.88)	(0.75)	(0.83)	(0.00)	(0.00)	(0.16)
L23	2.40	2.01	0.27	0.46	2.58	-5.80	-5.50
	(0.30)	(0.37)	(0.60)	(0.50)	(0.01)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error tes. P-values are in parentheses.

Table 19: Rationality Tests for Real Government Consumption Revision Errors with Final Release Equals Last Known Release (full sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	38.42	1.79	1.75	0.01	6.00	19.86	219.30
	(0.00)	(0.41)	(0.19)	(0.93)	(0.00)	(0.00)	(0.00)
L2	16.88	2.69	2.69	0.02	24.94	19.36	166.96
	(0.00)	(0.26)	(0.10)	(0.90)	(0.00)	(0.00)	(0.00)
L3	11.06	1.23	1.23	0.08	24.98	16.57	151.76
	(0.00)	(0.54)	(0.27)	(0.77)	(0.00)	(0.00)	(0.00)
L4	9.21	3.66	3.42	0.75	11.12	17.32	127.77
	(0.01)	(0.16)	(0.06)	(0.39)	(0.00)	(0.00)	(0.00)
L5	9.16	4.48	4.04	0.90	59.88	17.78	120.56
	(0.01)	(0.11)	(0.04)	(0.34)	(0.00)	(0.00)	(0.00)
L6	11.13	5.00	4.68	0.66	40.80	17.97	117.31
	(0.00)	(0.08)	(0.03)	(0.42)	(0.00)	(0.00)	(0.00)
L7	15.34	4.39	4.37	0.03	20.69	16.37	107.24
	(0.00)	(0.11)	(0.04)	(0.87)	(0.00)	(0.00)	(0.00)
L8	11.92	4.91	4.76	0.34	34.31	16.80	103.38
	(0.00)	(0.09)	(0.03)	(0.56)	(0.00)	(0.00)	(0.00)
L9	12.37	5.23	5.12	0.27	73.10	17.13	104.34
	(0.00)	(0.07)	(0.02)	(0.60)	(0.00)	(0.00)	(0.00)
L10	12.90	4.70	4.69	0.15	18.85	14.92	90.68
	(0.00)	(0.10)	(0.03)	(0.70)	(0.00)	(0.00)	(0.00)
L11	14.92	5.40	5.28	0.12	27.82	15.25	91.30
	(0.00)	(0.07)	(0.02)	(0.73)	(0.00)	(0.00)	(0.00)
L12	11.51	5.21	5.20	0.32	71.37	16.56	97.67
	(0.00)	(0.07)	(0.02)	(0.57)	(0.00)	(0.00)	(0.00)
L13	10.64	7.42	7.40	0.41	13.74	17.52	92.36
	(0.00)	(0.02)	(0.01)	(0.52)	(0.00)	(0.00)	(0.00)
L14	9.33	6.56	6.46	0.59	59.42	17.01	91.49
	(0.01)	(0.04)	(0.01)	(0.44)	(0.00)	(0.00)	(0.00)
L15	7.91	5.39	5.30	0.64	27.78	15.61	87.63
	(0.02)	(0.07)	(0.02)	(0.42)	(0.00)	(0.00)	(0.00)
L16	9.24	5.63	5.62	0.41	37.67	15.68	85.60
	(0.01)	(0.06)	(0.02)	(0.52)	(0.00)	(0.00)	(0.00)
L17	10.10	5.94	5.93	0.30	56.39	15.19	82.23
	(0.01)	(0.05)	(0.01)	(0.58)	(0.00)	(0.00)	(0.00)
L18	8.59	5.64	5.61	0.37	35.90	13.68	77.51
	(0.01)	(0.06)	(0.02)	(0.54)	(0.00)	(0.00)	(0.00)
L19	9.76	5.64	5.62	0.16	28.76	15.07	78.59
	(0.01)	(0.06)	(0.02)	(0.69)	(0.00)	(0.00)	(0.00)
L20	9.67	5.85	5.76	0.32	51.04	15.50	82.75
	(0.01)	(0.05)	(0.02)	(0.57)	(0.00)	(0.00)	(0.00)
L21	8.42	4.73	4.62	0.30	47.90	14.84	85.24
	(0.01)	(0.09)	(0.03)	(0.59)	(0.00)	(0.00)	(0.00)
L22	6.47	4.05	3.73	0.52	75.91	15.07	87.56
	(0.04)	(0.13)	(0.05)	(0.47)	(0.00)	(0.00)	(0.00)
L23	6.42	3.11	2.84	0.51	53.41	14.73	87.94
	(0.04)	(0.21)	(0.09)	(0.48)	(0.00)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 20: Rationality Tests for Real Net Exports Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (full sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	0.51	8.60	0.00	6.22	0.62	6.23	58.37
	(0.77)	(0.01)	(0.97)	(0.01)	(0.54)	(0.00)	(0.00)
L2	1.71	3.14	0.20	2.79	11.36	7.52	59.93
	(0.43)	(0.21)	(0.65)	(0.09)	(0.00)	(0.00)	(0.00)
L3	2.13	1.18	0.08	1.06	12.54	4.96	46.92
	(0.34)	(0.55)	(0.78)	(0.30)	(0.00)	(0.00)	(0.00)
L4	5.08	0.65	0.04	0.21	9.78	3.76	35.18
	(0.08)	(0.72)	(0.84)	(0.65)	(0.00)	(0.00)	(0.00)
L5	3.82	1.14	0.00	0.73	17.15	4.34	35.31
	(0.15)	(0.57)	(0.95)	(0.39)	(0.00)	(0.00)	(0.00)
L6	6.08	0.61	0.03	0.50	26.68	5.08	36.65
	(0.05)	(0.74)	(0.87)	(0.48)	(0.00)	(0.00)	(0.00)
L7	4.98	0.51	0.06	0.50	10.75	4.67	34.24
	(0.08)	(0.77)	(0.80)	(0.48)	(0.00)	(0.00)	(0.00)
L8	4.71	0.72	0.00	0.50	39.26	4.32	37.10
	(0.09)	(0.70)	(0.99)	(0.48)	(0.00)	(0.00)	(0.00)
L9	3.03	1.43	0.01	1.09	20.58	3.84	36.21
	(0.22)	(0.49)	(0.92)	(0.30)	(0.00)	(0.00)	(0.00)
L10	3.10	2.37	0.64	0.70	5.61	1.16	30.32
	(0.21)	(0.31)	(0.42)	(0.40)	(0.00)	(0.25)	(0.00)
L11	3.65	2.02	0.94	0.28	17.58	0.59	38.15
	(0.16)	(0.36)	(0.33)	(0.60)	(0.00)	(0.55)	(0.00)
L12	3.18	3.99	1.06	1.26	52.94	0.90	41.27
	(0.20)	(0.14)	(0.30)	(0.26)	(0.00)	(0.37)	(0.00)
L13	3.70	2.43	0.78	0.77	17.93	1.13	46.02
	(0.16)	(0.30)	(0.38)	(0.38)	(0.00)	(0.26)	(0.00)
L14	2.79	2.86	0.67	1.32	24.84	1.12	47.88
	(0.25)	(0.24)	(0.41)	(0.25)	(0.00)	(0.26)	(0.00)
L15	3.38	0.67	0.18	0.26	9.20	1.44	39.01
	(0.18)	(0.71)	(0.67)	(0.61)	(0.00)	(0.15)	(0.00)
L16	3.92	1.21	1.07	0.04	10.42	-0.23	30.55
	(0.14)	(0.54)	(0.30)	(0.84)	(0.00)	(0.82)	(0.00)
L17	4.73	0.13	0.09	0.00	20.28	1.30	29.12
	(0.09)	(0.93)	(0.76)	(1.00)	(0.00)	(0.19)	(0.00)
L18	3.28	0.33	0.19	0.01	14.63	0.60	29.56
	(0.19)	(0.85)	(0.66)	(0.93)	(0.00)	(0.55)	(0.00)
L19	2.73	1.78	1.40	0.10	5.78	-1.67	24.26
	(0.26)	(0.41)	(0.24)	(0.75)	(0.00)	(0.09)	(0.00)
L20	2.59	1.78	1.69	0.32	15.46	-2.27	25.03
	(0.27)	(0.41)	(0.19)	(0.57)	(0.00)	(0.02)	(0.00)
L21	1.57	1.52	1.00	0.01	7.87	-1.84	22.09
	(0.46)	(0.47)	(0.32)	(0.92)	(0.00)	(0.07)	(0.00)
L22	0.98	0.66	0.35	0.23	1.56	-3.24	-1.94
	(0.61)	(0.72)	(0.56)	(0.63)	(0.13)	(0.00)	(0.05)
L23	0.51	1.15	0.62	0.41	4.14	-4.79	-4.51
	(0.78)	(0.56)	(0.43)	(0.52)	(0.00)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 21: Rationality Tests for Real Net Exports Revision Errors with Final Release Equals Last Known Release (full sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	0.19	19.91	0.62	19.50	0.41	10.27	48.15
	(0.91)	(0.00)	(0.43)	(0.00)	(0.69)	(0.00)	(0.00)
L2	1.98	13.82	1.40	13.82	17.21	12.21	119.80
	(0.37)	(0.00)	(0.24)	(0.00)	(0.00)	(0.00)	(0.00)
L3	1.64	11.36	1.60	10.94	16.72	9.85	98.49
	(0.44)	(0.00)	(0.21)	(0.00)	(0.00)	(0.00)	(0.00)
L4	2.00	8.35	1.04	8.32	15.40	7.76	77.81
	(0.37)	(0.02)	(0.31)	(0.00)	(0.00)	(0.00)	(0.00)
L5	1.51	10.69	1.49	10.59	41.55	8.39	75.88
	(0.47)	(0.00)	(0.22)	(0.00)	(0.00)	(0.00)	(0.00)
L6	2.44	10.03	1.45	9.99	30.61	9.15	78.82
	(0.30)	(0.01)	(0.23)	(0.00)	(0.00)	(0.00)	(0.00)
L7	2.86	13.51	1.47	13.49	20.17	9.81	84.90
	(0.24)	(0.00)	(0.23)	(0.00)	(0.00)	(0.00)	(0.00)
L8	2.49	11.95	0.91	11.59	32.91	9.37	92.95
	(0.29)	(0.00)	(0.34)	(0.00)	(0.00)	(0.00)	(0.00)
L9	1.62	14.34	0.90	13.38	30.16	10.04	100.07
	(0.44)	(0.00)	(0.34)	(0.00)	(0.00)	(0.00)	(0.00)
L10	1.17	13.65	0.33	11.30	15.25	7.97	91.47
	(0.56)	(0.00)	(0.57)	(0.00)	(0.00)	(0.00)	(0.00)
L11	1.75	11.86	0.24	9.70	44.13	7.54	89.82
	(0.42)	(0.00)	(0.62)	(0.00)	(0.00)	(0.00)	(0.00)
L12	1.30	16.64	0.17	12.52	45.18	8.39	93.98
	(0.52)	(0.00)	(0.68)	(0.00)	(0.00)	(0.00)	(0.00)
L13	2.76	12.72	0.23	10.57	37.72	9.43	98.32
	(0.25)	(0.00)	(0.63)	(0.00)	(0.00)	(0.00)	(0.00)
L14	1.45	12.96	0.33	11.43	34.87	8.64	96.49
	(0.48)	(0.00)	(0.57)	(0.00)	(0.00)	(0.00)	(0.00)
L15	2.73	9.66	0.70	9.45	24.71	9.08	91.39
	(0.26)	(0.01)	(0.40)	(0.00)	(0.00)	(0.00)	(0.00)
L16	2.24	9.37	0.37	8.35	25.48	8.42	86.25
	(0.33)	(0.01)	(0.54)	(0.00)	(0.00)	(0.00)	(0.00)
L17	3.35	8.62	0.86	8.34	29.24	9.32	85.57
	(0.19)	(0.01)	(0.36)	(0.00)	(0.00)	(0.00)	(0.00)
L18	2.14	9.09	0.91	8.97	27.06	8.16	83.38
	(0.34)	(0.01)	(0.34)	(0.00)	(0.00)	(0.00)	(0.00)
L19	1.21	8.73	0.33	8.40	14.55	6.80	76.53
	(0.55)	(0.01)	(0.57)	(0.00)	(0.00)	(0.00)	(0.00)
L20	1.42	8.08	0.23	7.59	68.17	6.19	75.42
	(0.49)	(0.02)	(0.63)	(0.01)	(0.00)	(0.00)	(0.00)
L21	1.20	9.49	0.42	9.17	46.40	6.78	76.65
	(0.55)	(0.01)	(0.52)	(0.00)	(0.00)	(0.00)	(0.00)
L22	0.56	12.22	1.45	12.12	6.69	7.93	72.55
	(0.76)	(0.00)	(0.23)	(0.00)	(0.00)	(0.00)	(0.00)
L23	1.09	12.75	2.09	12.35	38.94	8.38	74.83
	(0.58)	(0.00)	(0.15)	(0.00)	(0.00)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 22: Rationality Tests for Real Value Added Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (full sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	6.12	1.95	0.10	1.82	2.32	-2.61	8.50
	(0.05)	(0.38)	(0.75)	(0.18)	(0.02)	(0.01)	(0.00)
L2	6.94	2.50	0.01	2.00	39.35	-2.50	-0.20
	(0.03)	(0.29)	(0.91)	(0.16)	(0.00)	(0.01)	(0.84)
L3	6.25	1.96	0.02	1.48	21.71	-2.62	-0.59
	(0.04)	(0.38)	(0.89)	(0.22)	(0.00)	(0.01)	(0.55)
L4	25.30	12.77	0.04	12.60	14.39	-2.89	-2.07
	(0.00)	(0.00)	(0.85)	(0.00)	(0.00)	(0.00)	(0.04)
L5	12.97	7.96	0.06	7.82	21.89	-3.13	-2.58
	(0.00)	(0.02)	(0.81)	(0.01)	(0.00)	(0.00)	(0.01)
L6	11.20	4.77	0.02	4.70	27.56	-3.13	-2.67
	(0.00)	(0.09)	(0.90)	(0.03)	(0.00)	(0.00)	(0.01)
L7	15.57	4.05	0.29	3.09	17.10	-2.63	-2.78
	(0.00)	(0.13)	(0.59)	(0.08)	(0.00)	(0.01)	(0.01)
L8	10.97	2.86	0.13	2.35	28.24	-2.93	-2.72
	(0.00)	(0.24)	(0.72)	(0.13)	(0.00)	(0.00)	(0.01)
L9	11.51	4.55	0.05	4.37	15.00	-3.30	-3.31
	(0.00)	(0.10)	(0.82)	(0.04)	(0.00)	(0.00)	(0.00)
L10	5.12	1.98	0.71	1.01	19.30	-3.48	-3.75
	(0.08)	(0.37)	(0.40)	(0.31)	(0.00)	(0.00)	(0.00)
L11	5.63	3.45	2.47	0.60	20.18	-3.18	-4.01
	(0.06)	(0.18)	(0.12)	(0.44)	(0.00)	(0.00)	(0.00)
L12	4.56	2.49	1.34	0.72	19.23	-3.39	-4.06
	(0.10)	(0.29)	(0.25)	(0.40)	(0.00)	(0.00)	(0.00)
L13	2.23	2.18	2.18	0.08	6.97	-3.80	-4.64
	(0.33)	(0.34)	(0.14)	(0.77)	(0.00)	(0.00)	(0.00)
L14	1.06	1.77	1.47	0.48	20.38	-3.95	-4.58
	(0.59)	(0.41)	(0.23)	(0.49)	(0.00)	(0.00)	(0.00)
L15	0.98	3.88	1.79	2.22	27.87	-3.79	-4.56
	(0.61)	(0.14)	(0.18)	(0.14)	(0.00)	(0.00)	(0.00)
L16	1.63	1.38	1.38	0.01	9.73	-4.14	-4.94
	(0.44)	(0.50)	(0.24)	(0.93)	(0.00)	(0.00)	(0.00)
L17	2.39	2.33	2.33	0.01	15.72	-4.01	-5.09
	(0.30)	(0.31)	(0.13)	(0.91)	(0.00)	(0.00)	(0.00)
L18	2.21	2.90	2.80	0.27	25.32	-4.08	-5.14
	(0.33)	(0.23)	(0.09)	(0.60)	(0.00)	(0.00)	(0.00)
L19	1.07	0.01	0.00	0.01	5.99	-4.90	-5.51
	(0.58)	(0.99)	(0.99)	(0.92)	(0.00)	(0.00)	(0.00)
L20	2.04	0.81	0.31	0.54	14.39	-5.19	-5.70
	(0.36)	(0.67)	(0.58)	(0.46)	(0.00)	(0.00)	(0.00)
L21	2.62	1.52	1.21	0.37	31.98	-5.34	-5.79
	(0.27)	(0.47)	(0.27)	(0.54)	(0.00)	(0.00)	(0.00)
L22	3.51	1.72	0.59	1.11	5.95	-5.48	-6.02
	(0.17)	(0.42)	(0.44)	(0.29)	(0.00)	(0.00)	(0.00)
L23	1.27	0.86	0.00	0.86	3.59	-6.03	-6.24
	(0.53)	(0.65)	(0.99)	(0.35)	(0.00)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 23: RationalityTests for Real Value Added Revision Errors with Final Release Equals Last Known Release (full sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	85.40	17.15	0.04	15.97	7.88	0.31	26.96
	(0.00)	(0.00)	(0.84)	(0.00)	(0.00)	(0.76)	(0.00)
L2	81.77	17.50	0.12	15.85	81.84	0.64	6.95
	(0.00)	(0.00)	(0.73)	(0.00)	(0.00)	(0.52)	(0.00)
L3	70.40	14.35	0.34	11.32	32.80	0.84	7.20
	(0.00)	(0.00)	(0.56)	(0.00)	(0.00)	(0.40)	(0.00)
L4	45.83	11.09	0.06	6.66	17.04	0.61	6.90
	(0.00)	(0.00)	(0.80)	(0.01)	(0.00)	(0.54)	(0.00)
L5	45.86	9.66	0.05	6.61	37.84	0.34	7.02
	(0.00)	(0.01)	(0.83)	(0.01)	(0.00)	(0.74)	(0.00)
L6	42.47	8.71	0.03	5.72	67.65	0.07	6.37
	(0.00)	(0.01)	(0.86)	(0.02)	(0.00)	(0.94)	(0.00)
L7	36.28	11.10	0.25	5.10	23.89	0.25	5.78
	(0.00)	(0.00)	(0.62)	(0.02)	(0.00)	(0.80)	(0.00)
L8	33.37	10.08	0.12	5.04	61.53	-0.18	5.18
	(0.00)	(0.01)	(0.73)	(0.02)	(0.00)	(0.86)	(0.00)
L9	33.89	10.37	0.13	5.87	29.62	-0.09	4.59
	(0.00)	(0.01)	(0.72)	(0.02)	(0.00)	(0.93)	(0.00)
L10	26.79	9.17	0.42	4.47	42.24	-0.23	4.22
	(0.00)	(0.01)	(0.52)	(0.03)	(0.00)	(0.82)	(0.00)
L11	28.14	10.73	1.04	4.38	61.84	0.09	3.78
	(0.00)	(0.00)	(0.31)	(0.04)	(0.00)	(0.93)	(0.00)
L12	26.48	8.61	0.71	4.13	46.19	0.01	4.04
	(0.00)	(0.01)	(0.40)	(0.04)	(0.00)	(0.99)	(0.00)
L13	23.05	7.31	0.87	2.70	25.73	-0.21	3.92
	(0.00)	(0.03)	(0.35)	(0.10)	(0.00)	(0.83)	(0.00)
L14	23.20	7.03	0.70	3.09	36.91	-0.54	3.47
	(0.00)	(0.03)	(0.40)	(0.08)	(0.00)	(0.59)	(0.00)
L15	20.37	5.53	0.79	2.05	60.71	-0.48	3.20
	(0.00)	(0.06)	(0.37)	(0.15)	(0.00)	(0.63)	(0.00)
L16	22.79	6.49	0.55	2.58	30.46	-0.32	3.67
	(0.00)	(0.04)	(0.46)	(0.11)	(0.00)	(0.75)	(0.00)
L17	24.01	7.35	0.82	2.70	58.40	-0.39	3.74
	(0.00)	(0.03)	(0.36)	(0.10)	(0.00)	(0.69)	(0.00)
L18	22.43	6.35	0.85	2.09	80.40	-0.30	3.95
	(0.00)	(0.04)	(0.36)	(0.15)	(0.00)	(0.76)	(0.00)
L19	23.81	4.97	0.16	2.69	36.46	-0.83	3.93
	(0.00)	(0.08)	(0.69)	(0.10)	(0.00)	(0.41)	(0.00)
L20	23.36	5.64	0.09	3.19	54.34	-1.04	3.75
	(0.00)	(0.06)	(0.76)	(0.07)	(0.00)	(0.30)	(0.00)
L21	22.84	5.28	0.03	3.31	75.90	-1.22	3.31
	(0.00)	(0.07)	(0.85)	(0.07)	(0.00)	(0.22)	(0.00)
L22	23.80	5.50	0.10	3.17	37.55	-0.88	3.14
	(0.00)	(0.06)	(0.75)	(0.07)	(0.00)	(0.38)	(0.00)
L23	26.73	7.27	0.23	4.19	55.41	-0.88	2.81
	(0.00)	(0.03)	(0.63)	(0.04)	(0.00)	(0.38)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 24: Rationality Tests for Nominal Value Added Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (full sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	1.19	3.86	3.01	3.45	0.87	1.95	21.66
	(0.55)	(0.15)	(0.08)	(0.06)	(0.39)	(0.05)	(0.00)
L2	0.66	3.46	2.39	3.39	9.31	0.98	9.32
	(0.72)	(0.18)	(0.12)	(0.07)	(0.00)	(0.33)	(0.00)
L3	0.79	3.25	2.21	3.06	29.99	0.57	9.33
	(0.67)	(0.20)	(0.14)	(0.08)	(0.00)	(0.57)	(0.00)
L4	3.67	0.98	0.96	0.54	14.67	0.22	7.34
	(0.16)	(0.61)	(0.33)	(0.46)	(0.00)	(0.83)	(0.00)
L5	2.06	0.80	0.68	0.59	13.50	-0.62	5.96
	(0.36)	(0.67)	(0.41)	(0.44)	(0.00)	(0.54)	(0.00)
L6	1.89	1.16	0.97	0.82	33.74	-0.48	5.68
	(0.39)	(0.56)	(0.33)	(0.37)	(0.00)	(0.63)	(0.00)
L7	2.15	1.47	1.42	0.54	14.46	-0.88	4.15
	(0.34)	(0.48)	(0.23)	(0.46)	(0.00)	(0.38)	(0.00)
L8	1.62	1.03	0.99	0.46	32.78	-1.20	3.23
	(0.45)	(0.60)	(0.32)	(0.50)	(0.00)	(0.23)	(0.00)
L9	1.66	0.89	0.88	0.30	38.67	-1.16	2.88
	(0.44)	(0.64)	(0.35)	(0.59)	(0.00)	(0.25)	(0.00)
L10	1.63	3.45	3.36	1.14	28.26	-0.99	2.41
	(0.44)	(0.18)	(0.07)	(0.29)	(0.00)	(0.32)	(0.02)
L11	1.86	0.39	0.38	0.16	21.59	-1.83	1.49
	(0.39)	(0.82)	(0.54)	(0.69)	(0.00)	(0.07)	(0.14)
L12	1.90	0.52	0.51	0.18	26.69	-1.58	1.21
	(0.39)	(0.77)	(0.48)	(0.67)	(0.00)	(0.11)	(0.23)
L13	1.61	0.09	0.07	0.06	14.59	-2.25	-0.47
	(0.45)	(0.96)	(0.79)	(0.81)	(0.00)	(0.02)	(0.64)
L14	0.64	0.45	0.44	0.26	20.11	-2.12	-0.99
	(0.73)	(0.80)	(0.51)	(0.61)	(0.00)	(0.03)	(0.32)
L15	0.15	0.92	0.47	0.91	23.10	-2.54	-1.28
	(0.93)	(0.63)	(0.49)	(0.34)	(0.00)	(0.01)	(0.20)
L16	3.79	0.56	0.06	0.49	7.32	-3.10	-2.52
	(0.15)	(0.76)	(0.81)	(0.48)	(0.00)	(0.00)	(0.01)
L17	4.07	0.65	0.02	0.50	28.42	-3.09	-2.66
	(0.13)	(0.72)	(0.89)	(0.48)	(0.00)	(0.00)	(0.01)
L18	1.72	0.57	0.33	0.00	4.69	-2.93	-3.35
	(0.42)	(0.75)	(0.57)	(0.96)	(0.00)	(0.00)	(0.00)
L19	0.73	0.26	0.13	0.24	8.34	-3.76	-3.65
	(0.70)	(0.88)	(0.72)	(0.63)	(0.00)	(0.00)	(0.00)
L20	1.02	0.30	0.22	0.01	14.25	-3.88	-3.95
	(0.60)	(0.86)	(0.64)	(0.94)	(0.00)	(0.00)	(0.00)
L21	1.25	0.00	0.00	0.00	8.99	-4.38	-4.44
	(0.54)	(1.00)	(0.96)	(0.96)	(0.00)	(0.00)	(0.00)
L22	3.05	2.79	1.30	0.34	2.75	-4.49	-5.49
	(0.22)	(0.25)	(0.25)	(0.56)	(0.01)	(0.00)	(0.00)
L23	0.46	0.87	0.86	0.14	6.55	-5.77	-5.98
	(0.79)	(0.65)	(0.35)	(0.71)	(0.00)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 25: Rationality Tests for Nominal Value Added Revision Errors with Final Release Equals Last Known Release (full sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	11.06	3.55	1.67	0.01	2.62	5.12	42.20
	(0.00)	(0.17)	(0.20)	(0.92)	(0.01)	(0.00)	(0.00)
L2	10.51	3.37	1.35	0.00	14.37	4.13	18.41
	(0.01)	(0.19)	(0.25)	(0.95)	(0.00)	(0.00)	(0.00)
L3	10.14	2.80	0.82	0.05	37.14	3.25	16.81
	(0.01)	(0.25)	(0.37)	(0.82)	(0.00)	(0.00)	(0.00)
L4	18.41	5.60	0.16	1.80	22.99	3.28	15.08
	(0.00)	(0.06)	(0.69)	(0.18)	(0.00)	(0.00)	(0.00)
L5	14.92	4.71	0.03	2.10	18.58	2.52	13.86
	(0.00)	(0.09)	(0.86)	(0.15)	(0.00)	(0.01)	(0.00)
L6	15.51	5.04	0.02	2.40	48.15	2.25	12.54
	(0.00)	(0.08)	(0.88)	(0.12)	(0.00)	(0.02)	(0.00)
L7	19.06	8.24	0.01	4.17	20.41	2.07	10.60
	(0.00)	(0.02)	(0.91)	(0.04)	(0.00)	(0.04)	(0.00)
L8	17.45	7.14	0.00	3.71	41.62	1.47	9.38
	(0.00)	(0.03)	(0.96)	(0.05)	(0.00)	(0.14)	(0.00)
L9	17.02	7.50	0.01	4.00	41.37	1.84	9.20
	(0.00)	(0.02)	(0.93)	(0.05)	(0.00)	(0.07)	(0.00)
L10	17.05	7.87	0.20	3.47	33.95	1.89	8.23
	(0.00)	(0.02)	(0.66)	(0.06)	(0.00)	(0.06)	(0.00)
L11	19.57	8.96	0.13	6.55	37.51	1.08	7.48
	(0.00)	(0.01)	(0.72)	(0.01)	(0.00)	(0.28)	(0.00)
L12	19.23	9.78	0.14	6.89	66.25	1.36	7.63
	(0.00)	(0.01)	(0.71)	(0.01)	(0.00)	(0.17)	(0.00)
L13	17.64	10.35	0.53	7.44	20.72	0.73	5.98
	(0.00)	(0.01)	(0.47)	(0.01)	(0.00)	(0.46)	(0.00)
L14	16.33	9.06	0.11	4.20	40.53	0.51	4.74
	(0.00)	(0.01)	(0.74)	(0.04)	(0.00)	(0.61)	(0.00)
L15	13.87	7.28	0.08	3.63	36.84	0.11	3.77
	(0.00)	(0.03)	(0.78)	(0.06)	(0.00)	(0.92)	(0.00)
L16	20.50	9.03	0.47	6.98	18.71	1.29	4.55
	(0.00)	(0.01)	(0.49)	(0.01)	(0.00)	(0.20)	(0.00)
L17	21.54	9.16	0.39	6.90	61.20	1.13	6.29
	(0.00)	(0.01)	(0.53)	(0.01)	(0.00)	(0.26)	(0.00)
L18	21.54	8.13	0.01	4.29	24.75	1.37	5.96
	(0.00)	(0.02)	(0.92)	(0.04)	(0.00)	(0.17)	(0.00)
L19	24.66	8.17	0.15	6.83	22.61	0.83	5.49
	(0.00)	(0.02)	(0.70)	(0.01)	(0.00)	(0.41)	(0.00)
L20	30.31	9.83	0.16	8.22	36.18	0.84	4.22
	(0.00)	(0.01)	(0.69)	(0.00)	(0.00)	(0.40)	(0.00)
L21	27.15	9.56	0.40	8.48	76.49	0.76	4.21
	(0.00)	(0.01)	(0.53)	(0.00)	(0.00)	(0.45)	(0.00)
L22	24.19	11.59	0.13	9.15	21.75	1.09	3.65
	(0.00)	(0.00)	(0.72)	(0.00)	(0.00)	(0.27)	(0.00)
L23	21.21	8.75	0.21	7.45	48.68	0.43	2.96
	(0.00)	(0.01)	(0.65)	(0.01)	(0.00)	(0.67)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 26: Rationality Tests for Real GDP Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (2000:3-2006:4 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	6.69	1.08	0.88	0.11	2.43	-1.51	0.08
	(0.04)	(0.58)	(0.35)	(0.74)	(0.02)	(0.13)	(0.94)
L2	7.65	0.75	0.40	0.00	18.95	-1.72	-1.65
	(0.02)	(0.69)	(0.53)	(0.99)	(0.00)	(0.08)	(0.10)
L3	3.92	1.17	0.80	0.12	18.53	-1.84	-2.10
	(0.14)	(0.56)	(0.37)	(0.72)	(0.00)	(0.07)	(0.04)
L4	3.99	1.36	0.98	0.18	7.48	-2.26	-2.83
	(0.14)	(0.51)	(0.32)	(0.67)	(0.00)	(0.02)	(0.00)
L5	1.93	1.21	1.20	0.67	19.36	-2.46	-2.94
	(0.38)	(0.55)	(0.27)	(0.41)	(0.00)	(0.01)	(0.00)
L6	1.19	2.35	2.29	1.89	17.78	-2.37	-2.96
	(0.55)	(0.31)	(0.13)	(0.17)	(0.00)	(0.02)	(0.00)
L7	0.17	2.76	1.93	2.76	11.92	-2.62	-3.01
	(0.92)	(0.25)	(0.16)	(0.10)	(0.00)	(0.01)	(0.00)
L8	0.27	1.28	0.97	1.27	18.33	-2.84	-3.07
	(0.87)	(0.53)	(0.32)	(0.26)	(0.00)	(0.00)	(0.00)
L9	2.29	0.85	0.46	0.09	11.34	-2.93	-3.44
	(0.32)	(0.65)	(0.50)	(0.76)	(0.00)	(0.00)	(0.00)
L10	2.20	1.88	1.49	0.46	14.39	-2.89	-3.71
	(0.33)	(0.39)	(0.22)	(0.50)	(0.00)	(0.00)	(0.00)
L11	4.88	3.31	1.34	0.07	9.96	-2.72	-3.76
	(0.09)	(0.19)	(0.25)	(0.79)	(0.00)	(0.01)	(0.00)
L12	2.37	1.55	0.99	0.13	15.49	-3.00	-3.79
	(0.31)	(0.46)	(0.32)	(0.72)	(0.00)	(0.00)	(0.00)
L13	2.70	2.77	1.61	0.11	6.61	-2.92	-3.89
	(0.26)	(0.25)	(0.20)	(0.74)	(0.00)	(0.00)	(0.00)
L14	1.34	3.71	3.63	2.37	7.93	-3.22	-3.87
	(0.51)	(0.16)	(0.06)	(0.12)	(0.00)	(0.00)	(0.00)
L15	4.38	8.50	8.48	3.79	6.88	-3.27	-3.96
	(0.11)	(0.01)	(0.00)	(0.05)	(0.00)	(0.00)	(0.00)
L16	0.72	2.23	2.15	1.79	8.18	-3.39	-4.04
	(0.70)	(0.33)	(0.14)	(0.18)	(0.00)	(0.00)	(0.00)
L17	0.99	2.93	2.80	2.23	14.69	-3.46	-4.06
	(0.61)	(0.23)	(0.09)	(0.14)	(0.00)	(0.00)	(0.00)
L18	1.03	2.96	2.35	2.85	16.06	-3.49	-4.09
	(0.60)	(0.23)	(0.13)	(0.09)	(0.00)	(0.00)	(0.00)
L19	0.01	0.70	0.52	0.68	6.98	-3.52	-4.13
	(1.00)	(0.71)	(0.47)	(0.41)	(0.00)	(0.00)	(0.00)
L20	0.42	0.38	0.34	0.11	18.00	-3.45	-4.11
	(0.81)	(0.83)	(0.56)	(0.74)	(0.00)	(0.00)	(0.00)
L21	0.28	1.22	0.56	1.14	6.30	-3.78	-4.22
	(0.87)	(0.54)	(0.45)	(0.29)	(0.00)	(0.00)	(0.00)
L22	0.54	1.40	1.14	1.29	6.27	-3.89	-4.29
	(0.76)	(0.50)	(0.29)	(0.26)	(0.00)	(0.00)	(0.00)
L23	0.12	0.11	0.07	0.07	2.03	-4.33	-4.43
	(0.94)	(0.95)	(0.80)	(0.79)	(0.05)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 27: Rationality Tests for Real GDP Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (2007:1-2015:1 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	1.81	0.66	0.37	0.65	1.35	-2.22	8.72
	(0.40)	(0.72)	(0.54)	(0.42)	(0.19)	(0.03)	(0.00)
L2	1.77	0.51	0.22	0.50	29.66	-2.08	0.50
	(0.41)	(0.78)	(0.64)	(0.48)	(0.00)	(0.04)	(0.62)
L3	1.44	0.25	0.11	0.24	15.14	-2.08	0.44
	(0.49)	(0.88)	(0.74)	(0.63)	(0.00)	(0.04)	(0.66)
L4	3.15	1.22	0.04	1.22	10.54	-2.34	-0.94
	(0.21)	(0.54)	(0.84)	(0.27)	(0.00)	(0.02)	(0.34)
L5	1.87	0.48	0.03	0.48	65.50	-2.35	-1.56
	(0.39)	(0.79)	(0.87)	(0.49)	(0.00)	(0.02)	(0.12)
L6	1.47	0.19	0.08	0.15	70.06	-2.34	-1.57
	(0.48)	(0.91)	(0.78)	(0.69)	(0.00)	(0.02)	(0.12)
L7	2.01	0.19	0.01	0.18	13.94	-2.33	-2.09
	(0.37)	(0.91)	(0.94)	(0.67)	(0.00)	(0.02)	(0.04)
L8	1.14	0.02	0.00	0.02	23.10	-2.52	-2.52
	(0.56)	(0.99)	(0.95)	(0.89)	(0.00)	(0.01)	(0.01)
L9	1.22	0.05	0.02	0.03	62.87	-2.54	-2.63
	(0.54)	(0.97)	(0.87)	(0.86)	(0.00)	(0.01)	(0.01)
L10	0.33	0.69	0.36	0.42	24.59	-2.52	-2.76
	(0.85)	(0.71)	(0.55)	(0.51)	(0.00)	(0.01)	(0.01)
L11	0.56	0.32	0.31	0.05	25.40	-2.48	-2.85
	(0.75)	(0.85)	(0.57)	(0.83)	(0.00)	(0.01)	(0.00)
L12	0.86	0.47	0.46	0.01	35.14	-2.28	-2.87
	(0.65)	(0.79)	(0.50)	(0.91)	(0.00)	(0.02)	(0.00)
L13	0.50	1.82	0.54	1.41	9.25	-2.34	-3.00
	(0.78)	(0.40)	(0.46)	(0.23)	(0.00)	(0.02)	(0.00)
L14	1.40	5.00	0.54	4.46	28.61	-2.49	-2.95
	(0.50)	(0.08)	(0.46)	(0.03)	(0.00)	(0.01)	(0.00)
L15	1.97	6.46	0.09	6.27	32.29	-2.67	-2.94
	(0.37)	(0.04)	(0.76)	(0.01)	(0.00)	(0.01)	(0.00)
L16	0.16	0.99	0.06	0.98	9.91	-2.95	-3.18
	(0.92)	(0.61)	(0.80)	(0.32)	(0.00)	(0.00)	(0.00)
L17	0.11	0.65	0.05	0.65	7.21	-3.24	-3.66
	(0.95)	(0.72)	(0.83)	(0.42)	(0.00)	(0.00)	(0.00)
L18	0.14	0.70	0.05	0.70	75.93	-3.25	-3.75
	(0.93)	(0.70)	(0.83)	(0.40)	(0.00)	(0.00)	(0.00)
L19	3.62	3.32	2.77	0.12	4.41	-4.05	-4.09
	(0.16)	(0.19)	(0.10)	(0.73)	(0.00)	(0.00)	(0.00)
L20	4.57	4.28	4.04	0.26	16.49	-4.10	-4.18
	(0.10)	(0.12)	(0.04)	(0.61)	(0.00)	(0.00)	(0.00)
L21	4.18	3.91	3.76	0.08	48.29	-4.07	-4.18
	(0.12)	(0.14)	(0.05)	(0.78)	(0.00)	(0.00)	(0.00)
L22	5.21	4.11	2.87	0.13	3.20	-4.24	-4.29
	(0.07)	(0.13)	(0.09)	(0.72)	(0.00)	(0.00)	(0.00)
L23	2.45	2.43	2.27	0.01	0.98	-4.46	-4.46
	(0.29)	(0.30)	(0.13)	(0.92)	(0.34)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 28: Rationality Tests for Real GDP Revision Errors with Final Release Equals Last Known Release (2000:3-2006:4 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	33.08	7.44	2.58	0.05	5.67	2.50	10.62
	(0.00)	(0.02)	(0.11)	(0.82)	(0.00)	(0.01)	(0.00)
L2	35.91	7.50	2.00	0.08	42.46	2.55	6.13
	(0.00)	(0.02)	(0.16)	(0.78)	(0.00)	(0.01)	(0.00)
L3	29.37	8.19	2.10	0.00	21.07	2.80	6.02
	(0.00)	(0.02)	(0.15)	(0.99)	(0.00)	(0.01)	(0.00)
L4	33.63	9.31	2.28	0.01	19.60	2.45	5.33
	(0.00)	(0.01)	(0.13)	(0.92)	(0.00)	(0.01)	(0.00)
L5	25.56	7.87	2.49	0.01	61.81	2.33	4.84
	(0.00)	(0.02)	(0.11)	(0.94)	(0.00)	(0.02)	(0.00)
L6	24.53	8.50	2.99	0.05	44.86	2.24	4.65
	(0.00)	(0.01)	(0.08)	(0.82)	(0.00)	(0.03)	(0.00)
L7	23.18	7.77	2.62	0.05	33.61	1.81	3.98
	(0.00)	(0.02)	(0.11)	(0.82)	(0.00)	(0.07)	(0.00)
L8	26.83	7.62	2.00	0.00	99.94	1.70	3.49
	(0.00)	(0.02)	(0.16)	(0.96)	(0.00)	(0.09)	(0.00)
L9	29.78	9.00	1.79	0.05	37.69	1.88	3.48
	(0.00)	(0.01)	(0.18)	(0.83)	(0.00)	(0.06)	(0.00)
L10	26.66	8.56	2.76	0.00	38.25	1.96	3.79
	(0.00)	(0.01)	(0.10)	(0.97)	(0.00)	(0.05)	(0.00)
L11	32.42	9.84	2.63	0.03	60.23	2.13	4.05
	(0.00)	(0.01)	(0.10)	(0.86)	(0.00)	(0.03)	(0.00)
L12	30.53	8.04	2.53	0.00	67.67	1.98	4.10
	(0.00)	(0.02)	(0.11)	(0.94)	(0.00)	(0.05)	(0.00)
L13	27.01	8.68	2.94	0.00	26.63	2.14	4.22
	(0.00)	(0.01)	(0.09)	(0.96)	(0.00)	(0.03)	(0.00)
L14	20.63	7.80	3.42	0.04	36.40	1.96	4.28
	(0.00)	(0.02)	(0.06)	(0.84)	(0.00)	(0.05)	(0.00)
L15	20.09	7.93	4.17	0.15	28.88	1.96	4.02
	(0.00)	(0.02)	(0.04)	(0.70)	(0.00)	(0.05)	(0.00)
L16	24.30	7.01	3.20	0.04	30.01	1.66	3.72
	(0.00)	(0.03)	(0.07)	(0.84)	(0.00)	(0.10)	(0.00)
L17	23.14	7.13	3.36	0.03	66.23	1.70	3.63
	(0.00)	(0.03)	(0.07)	(0.85)	(0.00)	(0.09)	(0.00)
L18	22.27	6.37	3.44	0.10	73.87	1.61	3.73
	(0.00)	(0.04)	(0.06)	(0.75)	(0.00)	(0.11)	(0.00)
L19	22.30	6.27	2.68	0.00	42.35	1.42	3.61
	(0.00)	(0.04)	(0.10)	(0.97)	(0.00)	(0.16)	(0.00)
L20	25.22	6.90	2.56	0.01	126.33	1.50	3.49
	(0.00)	(0.03)	(0.11)	(0.91)	(0.00)	(0.13)	(0.00)
L21	21.66	6.16	2.65	0.00	57.58	1.46	3.38
	(0.00)	(0.05)	(0.10)	(0.94)	(0.00)	(0.14)	(0.00)
L22	21.33	6.49	2.98	0.00	58.32	1.41	3.23
	(0.00)	(0.04)	(0.08)	(0.98)	(0.00)	(0.16)	(0.00)
L23	27.64	7.07	2.13	0.09	41.55	1.16	2.83
	(0.00)	(0.03)	(0.14)	(0.77)	(0.00)	(0.24)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 29: Rationality Tests for Real GDP Revision Errors with Final Release Equals Last Known Release (2007:1-2015:1 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	14.43	6.30	0.23	4.41	3.02	11.90	40.69
	(0.00)	(0.04)	(0.63)	(0.04)	(0.00)	(0.00)	(0.00)
L2	14.28	6.32	0.23	4.43	415.06	11.87	165.90
	(0.00)	(0.04)	(0.63)	(0.04)	(0.00)	(0.00)	(0.00)
L3	13.57	6.32	0.24	4.49	191.17	11.88	165.08
	(0.00)	(0.04)	(0.62)	(0.03)	(0.00)	(0.00)	(0.00)
L4	14.16	6.31	0.27	4.56	226.41	11.86	164.13
	(0.00)	(0.04)	(0.61)	(0.03)	(0.00)	(0.00)	(0.00)
L5	13.35	6.41	0.27	4.64	183.80	11.92	165.40
	(0.00)	(0.04)	(0.60)	(0.03)	(0.00)	(0.00)	(0.00)
L6	12.55	7.04	0.21	5.00	118.82	12.42	171.77
	(0.00)	(0.03)	(0.65)	(0.03)	(0.00)	(0.00)	(0.00)
L7	13.19	6.92	0.25	5.05	261.94	12.43	175.34
	(0.00)	(0.03)	(0.62)	(0.02)	(0.00)	(0.00)	(0.00)
L8	12.52	7.14	0.18	5.14	533.85	12.68	178.49
	(0.00)	(0.03)	(0.67)	(0.02)	(0.00)	(0.00)	(0.00)
L9	12.58	7.02	0.18	5.05	328.41	12.54	177.86
	(0.00)	(0.03)	(0.67)	(0.02)	(0.00)	(0.00)	(0.00)
L10	10.63	7.34	0.11	5.02	592.99	12.16	178.08
	(0.00)	(0.03)	(0.74)	(0.03)	(0.00)	(0.00)	(0.00)
L11	10.75	7.44	0.12	5.08	214.53	12.28	179.34
	(0.00)	(0.02)	(0.73)	(0.02)	(0.00)	(0.00)	(0.00)
L12	10.88	7.28	0.12	5.04	796.24	12.23	180.82
	(0.00)	(0.03)	(0.73)	(0.02)	(0.00)	(0.00)	(0.00)
L13	7.23	4.21	0.07	2.01	199.52	4.93	90.78
	(0.03)	(0.12)	(0.79)	(0.16)	(0.00)	(0.00)	(0.00)
L14	6.73	4.37	0.08	2.08	355.99	4.85	90.43
	(0.03)	(0.11)	(0.78)	(0.15)	(0.00)	(0.00)	(0.00)
L15	6.54	4.81	0.10	2.15	491.09	4.83	90.40
	(0.04)	(0.09)	(0.75)	(0.14)	(0.00)	(0.00)	(0.00)
L16	6.42	3.59	1.68	1.01	159.51	0.07	52.21
	(0.04)	(0.17)	(0.20)	(0.31)	(0.00)	(0.94)	(0.00)
L17	6.84	3.58	1.72	0.97	51.50	-0.05	52.03
	(0.03)	(0.17)	(0.19)	(0.32)	(0.00)	(0.96)	(0.00)
L18	6.85	3.59	1.71	0.98	767.13	-0.10	51.80
	(0.03)	(0.17)	(0.19)	(0.32)	(0.00)	(0.92)	(0.00)
L19	8.60	5.16	4.12	0.57	67.49	-1.87	47.45
	(0.01)	(0.08)	(0.04)	(0.45)	(0.00)	(0.06)	(0.00)
L20	8.80	5.45	4.67	0.50	79.19	-2.15	47.08
	(0.01)	(0.07)	(0.03)	(0.48)	(0.00)	(0.03)	(0.00)
L21	8.67	5.43	4.63	0.52	265.63	-2.15	47.06
	(0.01)	(0.07)	(0.03)	(0.47)	(0.00)	(0.03)	(0.00)
L22	9.80	6.99	6.73	0.37	376.32	-2.92	45.88
	(0.01)	(0.03)	(0.01)	(0.54)	(0.00)	(0.00)	(0.00)
L23	9.31	6.71	6.52	0.39	133.72	-2.89	45.60
	(0.01)	(0.03)	(0.01)	(0.53)	(0.00)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 30: Rationality Tests for Nominal GDP Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (2000:3-2006:1 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	7.90	9.70	7.90	4.15	2.62	2.15	18.24
	(0.02)	(0.01)	(0.00)	(0.04)	(0.01)	(0.03)	(0.00)
L2	5.76	7.70	5.92	3.24	5.11	0.68	1.89
	(0.06)	(0.02)	(0.01)	(0.07)	(0.00)	(0.50)	(0.06)
L3	7.09	7.78	4.45	1.70	12.37	0.37	0.80
	(0.03)	(0.02)	(0.03)	(0.19)	(0.00)	(0.71)	(0.43)
L4	7.12	8.69	4.53	1.54	12.41	0.08	0.04
	(0.03)	(0.01)	(0.03)	(0.21)	(0.00)	(0.94)	(0.97)
L5	4.56	5.87	3.50	1.74	9.24	-0.27	-0.37
	(0.10)	(0.05)	(0.06)	(0.19)	(0.00)	(0.79)	(0.71)
L6	3.56	6.54	4.33	2.09	9.34	-0.25	-0.24
	(0.17)	(0.04)	(0.04)	(0.15)	(0.00)	(0.80)	(0.81)
L7	2.97	7.65	5.60	2.80	23.77	-0.18	0.23
	(0.23)	(0.02)	(0.02)	(0.09)	(0.00)	(0.85)	(0.82)
L8	4.05	9.71	7.00	3.61	20.54	0.05	0.33
	(0.13)	(0.01)	(0.01)	(0.06)	(0.00)	(0.96)	(0.74)
L9	4.16	8.87	5.30	2.44	20.03	0.04	0.18
	(0.13)	(0.01)	(0.02)	(0.12)	(0.00)	(0.97)	(0.86)
L10	4.50	9.38	4.47	1.69	12.56	-0.20	-0.09
	(0.11)	(0.01)	(0.03)	(0.19)	(0.00)	(0.84)	(0.93)
L11	3.46	8.39	5.03	2.18	13.45	-0.70	-0.50
	(0.18)	(0.02)	(0.02)	(0.14)	(0.00)	(0.48)	(0.61)
L12	3.69	13.58	11.37	5.94	14.28	-0.64	-0.74
	(0.16)	(0.00)	(0.00)	(0.01)	(0.00)	(0.52)	(0.46)
L13	3.97	8.91	6.06	3.03	11.38	-1.16	-1.53
	(0.14)	(0.01)	(0.01)	(0.08)	(0.00)	(0.24)	(0.13)
L14	3.18	7.01	3.17	1.24	10.68	-1.46	-2.23
	(0.20)	(0.03)	(0.07)	(0.26)	(0.00)	(0.15)	(0.03)
L15	2.18	4.63	2.53	1.24	16.29	-1.64	-2.36
	(0.34)	(0.10)	(0.11)	(0.26)	(0.00)	(0.10)	(0.02)
L16	4.45	4.72	1.57	0.61	9.93	-1.73	-2.61
	(0.11)	(0.09)	(0.21)	(0.44)	(0.00)	(0.08)	(0.01)
L17	3.51	3.48	1.30	0.58	26.86	-1.85	-2.71
	(0.17)	(0.18)	(0.25)	(0.45)	(0.00)	(0.06)	(0.01)
L18	5.24	5.38	1.86	0.72	12.63	-1.54	-2.71
	(0.07)	(0.07)	(0.17)	(0.40)	(0.00)	(0.12)	(0.01)
L19	6.18	2.68	0.40	0.09	7.82	-2.10	-2.90
	(0.05)	(0.26)	(0.53)	(0.76)	(0.00)	(0.04)	(0.00)
L20	4.97	3.04	0.48	0.15	8.17	-2.55	-3.22
	(0.08)	(0.22)	(0.49)	(0.70)	(0.00)	(0.01)	(0.00)
L21	2.97	1.29	0.06	0.30	3.43	-3.19	-3.77
	(0.23)	(0.53)	(0.81)	(0.58)	(0.00)	(0.00)	(0.00)
L22	9.13	3.99	2.84	3.64	4.52	-3.36	-3.99
	(0.01)	(0.14)	(0.09)	(0.06)	(0.00)	(0.00)	(0.00)
L23	2.07	0.85	0.82	0.85	3.28	-4.05	-4.24
	(0.36)	(0.65)	(0.36)	(0.36)	(0.00)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 31: Rationality Tests for Nominal GDP Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (2007:1-2015:1 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	1.46	9.20	0.03	5.84	-0.73	-0.94	4.35
	(0.48)	(0.01)	(0.86)	(0.02)	(0.47)	(0.35)	(0.00)
L2	1.30	9.40	0.04	5.73	17.53	-0.82	6.01
	(0.52)	(0.01)	(0.84)	(0.02)	(0.00)	(0.41)	(0.00)
L3	0.95	8.01	0.00	5.73	16.39	-1.29	5.51
	(0.62)	(0.02)	(0.96)	(0.02)	(0.00)	(0.20)	(0.00)
L4	1.12	1.18	0.07	0.75	12.56	-1.43	3.74
	(0.57)	(0.56)	(0.79)	(0.39)	(0.00)	(0.15)	(0.00)
L5	0.73	1.33	0.05	0.94	49.58	-1.59	3.31
	(0.69)	(0.52)	(0.83)	(0.33)	(0.00)	(0.11)	(0.00)
L6	0.53	2.12	0.05	1.51	47.31	-1.71	2.95
	(0.77)	(0.35)	(0.83)	(0.22)	(0.00)	(0.09)	(0.00)
L7	0.35	2.40	0.05	2.06	10.80	-2.36	1.29
	(0.84)	(0.30)	(0.82)	(0.15)	(0.00)	(0.02)	(0.20)
L8	0.59	3.29	0.14	2.77	36.35	-2.50	0.46
	(0.74)	(0.19)	(0.71)	(0.10)	(0.00)	(0.01)	(0.64)
L9	0.69	3.60	0.19	2.84	37.71	-2.48	0.56
	(0.71)	(0.17)	(0.66)	(0.09)	(0.00)	(0.01)	(0.58)
L10	0.01	2.74	0.12	2.74	25.31	-2.06	0.57
	(1.00)	(0.25)	(0.73)	(0.10)	(0.00)	(0.04)	(0.57)
L11	0.71	0.74	0.05	0.49	19.35	-2.26	0.49
	(0.70)	(0.69)	(0.82)	(0.48)	(0.00)	(0.02)	(0.63)
L12	1.04	0.20	0.00	0.18	46.03	-1.98	0.60
	(0.60)	(0.90)	(0.95)	(0.67)	(0.00)	(0.05)	(0.55)
L13	0.14	1.28	0.02	1.28	10.83	-2.14	-0.05
	(0.93)	(0.53)	(0.89)	(0.26)	(0.00)	(0.03)	(0.96)
L14	0.45	9.50	0.80	8.73	10.77	-2.09	-0.73
	(0.80)	(0.01)	(0.37)	(0.00)	(0.00)	(0.04)	(0.47)
L15	2.26	15.44	0.44	15.01	24.01	-2.41	-0.77
	(0.32)	(0.00)	(0.51)	(0.00)	(0.00)	(0.02)	(0.44)
L16	0.45	2.90	0.14	2.49	8.83	-3.01	-1.10
	(0.80)	(0.23)	(0.71)	(0.11)	(0.00)	(0.00)	(0.27)
L17	0.63	0.59	0.04	0.49	22.38	-2.84	-1.26
	(0.73)	(0.75)	(0.83)	(0.48)	(0.00)	(0.00)	(0.21)
L18	0.08	0.49	0.23	0.39	2.03	-2.86	-3.15
	(0.96)	(0.78)	(0.63)	(0.53)	(0.05)	(0.00)	(0.00)
L19	0.07	0.51	0.00	0.45	5.76	-3.21	-3.53
	(0.96)	(0.78)	(0.98)	(0.50)	(0.00)	(0.00)	(0.00)
L20	0.10	0.07	0.01	0.03	8.83	-3.35	-3.66
	(0.95)	(0.97)	(0.92)	(0.87)	(0.00)	(0.00)	(0.00)
L21	0.55	0.39	0.28	0.03	6.08	-3.58	-3.81
	(0.76)	(0.82)	(0.60)	(0.85)	(0.00)	(0.00)	(0.00)
L22	2.34	2.41	1.83	0.92	3.50	-3.41	-3.97
	(0.31)	(0.30)	(0.18)	(0.34)	(0.00)	(0.00)	(0.00)
L23	1.67	1.78	0.57	1.70	4.32	-4.28	-4.32
	(0.43)	(0.41)	(0.45)	(0.19)	(0.00)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 32: Rationality Tests for Nominal GDP Revision Errors with Final Release Equals Last Known Release (2000:3-2006:4 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	47.78	16.46	5.79	1.35	6.15	5.76	36.21
	(0.00)	(0.00)	(0.02)	(0.25)	(0.00)	(0.00)	(0.00)
L2	56.07	15.14	4.44	0.86	7.86	4.01	10.66
	(0.00)	(0.00)	(0.04)	(0.35)	(0.00)	(0.00)	(0.00)
L3	55.71	17.97	2.91	0.12	20.16	3.91	8.48
	(0.00)	(0.00)	(0.09)	(0.73)	(0.00)	(0.00)	(0.00)
L4	51.95	25.11	2.27	0.00	15.89	3.64	6.44
	(0.00)	(0.00)	(0.13)	(0.97)	(0.00)	(0.00)	(0.00)
L5	56.26	19.08	2.40	0.07	18.61	3.41	5.38
	(0.00)	(0.00)	(0.12)	(0.79)	(0.00)	(0.00)	(0.00)
L6	56.61	21.64	2.08	0.01	17.81	3.23	4.79
	(0.00)	(0.00)	(0.15)	(0.91)	(0.00)	(0.00)	(0.00)
L7	47.28	24.00	2.47	0.00	25.69	3.04	4.34
	(0.00)	(0.00)	(0.12)	(0.97)	(0.00)	(0.00)	(0.00)
L8	43.21	24.03	4.20	0.21	33.24	3.46	4.28
	(0.00)	(0.00)	(0.04)	(0.65)	(0.00)	(0.00)	(0.00)
L9	38.39	24.63	3.90	0.05	18.72	3.37	4.45
	(0.00)	(0.00)	(0.05)	(0.82)	(0.00)	(0.00)	(0.00)
L10	43.28	30.12	3.22	0.07	24.84	2.99	3.97
	(0.00)	(0.00)	(0.07)	(0.79)	(0.00)	(0.00)	(0.00)
L11	49.63	28.75	3.47	0.03	20.71	2.51	3.00
	(0.00)	(0.00)	(0.06)	(0.86)	(0.00)	(0.01)	(0.00)
L12	31.33	35.90	7.53	0.14	26.20	2.64	2.60
	(0.00)	(0.00)	(0.01)	(0.71)	(0.00)	(0.01)	(0.01)
L13	31.08	28.44	5.10	0.01	20.86	2.54	2.48
	(0.00)	(0.00)	(0.02)	(0.90)	(0.00)	(0.01)	(0.01)
L14	39.77	23.54	2.49	0.09	22.88	2.37	2.31
	(0.00)	(0.00)	(0.11)	(0.76)	(0.00)	(0.02)	(0.02)
L15	36.58	19.74	2.45	0.02	30.14	2.27	2.15
	(0.00)	(0.00)	(0.12)	(0.89)	(0.00)	(0.02)	(0.03)
L16	35.46	19.71	2.05	0.02	23.24	2.59	2.31
	(0.00)	(0.00)	(0.15)	(0.88)	(0.00)	(0.01)	(0.02)
L17	32.60	16.13	2.13	0.00	51.05	2.58	3.09
	(0.00)	(0.00)	(0.14)	(0.98)	(0.00)	(0.01)	(0.00)
L18	34.86	16.48	2.64	0.04	26.87	2.97	3.65
	(0.00)	(0.00)	(0.10)	(0.85)	(0.00)	(0.00)	(0.00)
L19	33.93	13.97	1.12	0.07	25.45	2.46	3.76
	(0.00)	(0.00)	(0.29)	(0.79)	(0.00)	(0.01)	(0.00)
L20	37.11	14.92	1.27	0.06	31.06	2.09	2.89
	(0.00)	(0.00)	(0.26)	(0.81)	(0.00)	(0.04)	(0.00)
L21	33.17	11.90	0.30	0.38	23.43	1.77	2.35
	(0.00)	(0.00)	(0.58)	(0.54)	(0.00)	(0.08)	(0.02)
L22	28.29	10.94	0.00	0.89	15.80	1.44	2.26
	(0.00)	(0.00)	(0.95)	(0.35)	(0.00)	(0.15)	(0.02)
L23	27.48	10.51	0.18	0.32	23.73	1.11	2.20
	(0.00)	(0.01)	(0.68)	(0.57)	(0.00)	(0.26)	(0.03)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 33: Rationality Tests for Nominal GDP Revision Errors with Final Release Equals Last Known Release (2007:1-2015:1 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	2.26	1.04	0.03	0.62	1.47	0.23	12.81
	(0.32)	(0.59)	(0.87)	(0.43)	(0.15)	(0.82)	(0.00)
L2	2.23	1.02	0.01	0.63	23.08	0.58	11.48
	(0.33)	(0.60)	(0.93)	(0.43)	(0.00)	(0.56)	(0.00)
L3	4.44	0.58	0.12	0.18	31.04	-0.06	11.24
	(0.11)	(0.75)	(0.73)	(0.67)	(0.00)	(0.95)	(0.00)
L4	13.15	0.43	0.38	0.25	21.93	0.24	10.75
	(0.00)	(0.81)	(0.54)	(0.62)	(0.00)	(0.81)	(0.00)
L5	11.34	0.73	0.66	0.33	38.83	-0.06	11.27
	(0.00)	(0.69)	(0.42)	(0.56)	(0.00)	(0.95)	(0.00)
L6	11.72	0.68	0.66	0.24	58.20	-0.28	10.64
	(0.00)	(0.71)	(0.42)	(0.62)	(0.00)	(0.78)	(0.00)
L7	10.45	0.94	0.85	0.44	27.56	-0.56	9.43
	(0.01)	(0.62)	(0.36)	(0.51)	(0.00)	(0.58)	(0.00)
L8	11.70	1.06	0.99	0.44	47.17	-0.76	7.98
	(0.00)	(0.59)	(0.32)	(0.51)	(0.00)	(0.45)	(0.00)
L9	12.06	1.38	1.34	0.46	88.43	-0.99	7.34
	(0.00)	(0.50)	(0.25)	(0.50)	(0.00)	(0.32)	(0.00)
L10	9.30	0.54	0.49	0.24	44.84	-0.49	7.19
	(0.01)	(0.76)	(0.48)	(0.62)	(0.00)	(0.62)	(0.00)
L11	13.58	1.25	1.12	0.64	23.47	-0.43	7.81
	(0.00)	(0.53)	(0.29)	(0.42)	(0.00)	(0.67)	(0.00)
L12	14.59	1.78	1.22	1.34	33.59	-0.71	6.90
	(0.00)	(0.41)	(0.27)	(0.25)	(0.00)	(0.48)	(0.00)
L13	17.18	1.96	1.28	1.44	21.84	-1.33	5.30
	(0.00)	(0.38)	(0.26)	(0.23)	(0.00)	(0.18)	(0.00)
L14	8.89	1.03	0.51	0.75	27.35	-0.96	4.50
	(0.01)	(0.60)	(0.48)	(0.39)	(0.00)	(0.34)	(0.00)
L15	8.60	0.99	0.94	0.28	15.25	-1.68	3.48
	(0.01)	(0.61)	(0.33)	(0.60)	(0.00)	(0.09)	(0.00)
L16	21.75	3.22	2.69	1.38	15.96	-2.18	3.03
	(0.00)	(0.20)	(0.10)	(0.24)	(0.00)	(0.03)	(0.00)
L17	27.62	3.58	2.41	2.16	41.23	-1.99	3.36
	(0.00)	(0.17)	(0.12)	(0.14)	(0.00)	(0.05)	(0.00)
L18	20.47	2.00	1.17	1.47	8.76	-1.54	3.28
	(0.00)	(0.37)	(0.28)	(0.23)	(0.00)	(0.12)	(0.00)
L19	17.11	2.36	1.58	1.48	18.61	-1.91	2.99
	(0.00)	(0.31)	(0.21)	(0.22)	(0.00)	(0.06)	(0.00)
L20	16.01	2.02	1.37	1.41	33.30	-1.63	3.38
	(0.00)	(0.36)	(0.24)	(0.23)	(0.00)	(0.10)	(0.00)
L21	17.94	2.32	1.61	1.45	52.63	-1.42	4.31
	(0.00)	(0.31)	(0.20)	(0.23)	(0.00)	(0.15)	(0.00)
L22	19.34	1.84	0.92	1.33	29.09	-1.49	3.57
	(0.00)	(0.40)	(0.34)	(0.25)	(0.00)	(0.14)	(0.00)
L23	18.98	1.92	1.27	1.14	37.03	-1.54	3.11
	(0.00)	(0.38)	(0.26)	(0.29)	(0.00)	(0.12)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 34: Rationality Tests for Real Consumption Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (2000:3-2006:4 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	26.28	1.40	1.35	0.79	5.08	2.10	8.93
	(0.00)	(0.50)	(0.24)	(0.37)	(0.00)	(0.04)	(0.00)
L2	42.04	0.81	0.19	0.00	11.82	1.42	7.77
	(0.00)	(0.67)	(0.67)	(0.99)	(0.00)	(0.16)	(0.00)
L3	51.17	1.11	0.01	0.38	6.60	-0.14	3.65
	(0.00)	(0.58)	(0.93)	(0.54)	(0.00)	(0.89)	(0.00)
L4	54.48	2.13	0.01	0.86	13.55	-0.28	1.95
	(0.00)	(0.34)	(0.94)	(0.35)	(0.00)	(0.78)	(0.05)
L5	21.97	0.30	0.01	0.14	10.61	-0.88	1.65
	(0.00)	(0.86)	(0.93)	(0.71)	(0.00)	(0.38)	(0.10)
L6	18.88	0.47	0.35	0.08	11.34	-0.44	2.34
	(0.00)	(0.79)	(0.56)	(0.78)	(0.00)	(0.66)	(0.02)
L7	9.65	0.13	0.01	0.06	12.22	-1.72	1.42
	(0.01)	(0.94)	(0.94)	(0.81)	(0.00)	(0.09)	(0.15)
L8	10.14	0.04	0.00	0.01	17.41	-1.76	1.00
	(0.01)	(0.98)	(0.98)	(0.94)	(0.00)	(0.08)	(0.32)
L9	8.99	0.04	0.03	0.04	19.58	-1.46	1.33
	(0.01)	(0.98)	(0.86)	(0.84)	(0.00)	(0.14)	(0.18)
L10	4.63	0.25	0.14	0.03	9.12	-1.11	0.75
	(0.10)	(0.88)	(0.71)	(0.87)	(0.00)	(0.27)	(0.45)
L11	4.37	0.32	0.22	0.06	57.25	-0.95	0.71
	(0.11)	(0.85)	(0.64)	(0.81)	(0.00)	(0.34)	(0.48)
L12	4.93	0.16	0.05	0.00	23.58	-1.38	0.52
	(0.08)	(0.92)	(0.82)	(0.96)	(0.00)	(0.17)	(0.60)
L13	5.42	0.97	0.05	0.10	15.79	-1.22	0.02
	(0.07)	(0.61)	(0.82)	(0.76)	(0.00)	(0.22)	(0.99)
L14	11.06	1.67	0.08	0.76	16.78	-1.48	-0.30
	(0.00)	(0.43)	(0.78)	(0.38)	(0.00)	(0.14)	(0.76)
L15	5.69	1.02	0.00	0.16	15.88	-1.54	-0.47
	(0.06)	(0.60)	(0.95)	(0.69)	(0.00)	(0.12)	(0.64)
L16	3.06	0.07	0.02	0.00	9.17	-2.41	-0.89
	(0.22)	(0.97)	(0.88)	(0.96)	(0.00)	(0.02)	(0.37)
L17	3.02	0.04	0.00	0.00	13.38	-2.31	-1.33
	(0.22)	(0.98)	(0.96)	(0.96)	(0.00)	(0.02)	(0.18)
L18	2.30	0.33	0.08	0.00	18.19	-2.34	-1.88
	(0.32)	(0.85)	(0.78)	(0.99)	(0.00)	(0.02)	(0.06)
L19	1.08	1.27	1.25	0.80	5.69	-2.66	-3.17
	(0.58)	(0.53)	(0.26)	(0.37)	(0.00)	(0.01)	(0.00)
L20	2.04	1.71	1.52	0.68	10.82	-2.65	-3.44
	(0.36)	(0.43)	(0.22)	(0.41)	(0.00)	(0.01)	(0.00)
L21	3.77	4.77	4.44	1.63	8.57	-2.44	-3.59
	(0.15)	(0.09)	(0.04)	(0.20)	(0.00)	(0.01)	(0.00)
L22	2.14	2.36	1.99	0.61	4.96	-2.88	-3.65
	(0.34)	(0.31)	(0.16)	(0.43)	(0.00)	(0.00)	(0.00)
L23	1.99	0.98	0.01	0.19	2.56	-3.80	-4.17
	(0.37)	(0.61)	(0.93)	(0.66)	(0.02)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 35: Rationality Tests for Real Consumption Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (2007:1-2015:1 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	6.73	2.49	0.93	0.92	2.32	-1.14	8.85
	(0.03)	(0.29)	(0.33)	(0.34)	(0.03)	(0.25)	(0.00)
L2	30.20	5.21	0.50	5.21	4.66	-1.52	3.63
	(0.00)	(0.07)	(0.48)	(0.02)	(0.00)	(0.13)	(0.00)
L3	31.19	4.00	0.53	3.97	17.09	-1.50	2.88
	(0.00)	(0.14)	(0.47)	(0.05)	(0.00)	(0.13)	(0.00)
L4	11.37	1.22	0.03	1.22	5.48	-1.99	-0.56
	(0.00)	(0.54)	(0.85)	(0.27)	(0.00)	(0.05)	(0.57)
L5	5.67	0.07	0.01	0.07	23.66	-2.04	-0.70
	(0.06)	(0.97)	(0.93)	(0.79)	(0.00)	(0.04)	(0.48)
L6	5.52	0.19	0.13	0.02	24.93	-1.67	-0.71
	(0.06)	(0.91)	(0.71)	(0.88)	(0.00)	(0.10)	(0.48)
L7	10.91	2.63	0.24	2.47	5.54	-2.34	-1.23
	(0.00)	(0.27)	(0.62)	(0.12)	(0.00)	(0.02)	(0.22)
L8	14.24	1.90	0.34	1.28	8.76	-2.40	-1.44
	(0.00)	(0.39)	(0.56)	(0.26)	(0.00)	(0.02)	(0.15)
L9	12.64	1.63	0.34	0.96	30.17	-2.51	-1.71
	(0.00)	(0.44)	(0.56)	(0.33)	(0.00)	(0.01)	(0.09)
L10	12.89	6.58	2.65	3.02	4.96	-3.62	-2.75
	(0.00)	(0.04)	(0.10)	(0.08)	(0.00)	(0.00)	(0.01)
L11	4.59	1.26	0.59	0.61	9.32	-3.22	-2.94
	(0.10)	(0.53)	(0.44)	(0.43)	(0.00)	(0.00)	(0.00)
L12	4.93	0.73	0.16	0.51	15.91	-2.85	-2.75
	(0.08)	(0.69)	(0.69)	(0.48)	(0.00)	(0.00)	(0.01)
L13	0.31	8.42	0.09	4.29	3.67	-2.28	-2.81
	(0.85)	(0.01)	(0.77)	(0.04)	(0.00)	(0.02)	(0.00)
L14	0.21	6.91	0.00	5.63	22.15	-2.27	-1.93
	(0.90)	(0.03)	(0.96)	(0.02)	(0.00)	(0.02)	(0.05)
L15	0.36	6.49	0.00	5.74	23.63	-2.32	-1.89
	(0.84)	(0.04)	(0.95)	(0.02)	(0.00)	(0.02)	(0.06)
L16	0.05	2.37	0.00	2.35	6.55	-2.75	-2.97
	(0.98)	(0.31)	(0.95)	(0.13)	(0.00)	(0.01)	(0.00)
L17	1.16	6.45	0.01	6.37	13.79	-2.34	-3.00
	(0.56)	(0.04)	(0.91)	(0.01)	(0.00)	(0.02)	(0.00)
L18	0.90	5.38	0.07	5.05	43.85	-2.37	-2.72
	(0.64)	(0.07)	(0.79)	(0.02)	(0.00)	(0.02)	(0.01)
L19	1.04	2.80	0.77	1.81	8.59	-2.62	-3.20
	(0.59)	(0.25)	(0.38)	(0.18)	(0.00)	(0.01)	(0.00)
L20	1.31	1.01	0.79	0.09	9.48	-2.85	-3.55
	(0.52)	(0.60)	(0.37)	(0.76)	(0.00)	(0.00)	(0.00)
L21	0.65	0.61	0.32	0.16	12.96	-2.81	-3.60
	(0.72)	(0.74)	(0.57)	(0.69)	(0.00)	(0.00)	(0.00)
L22	0.22	0.24	0.06	0.11	2.91	-3.68	-3.99
	(0.90)	(0.89)	(0.81)	(0.74)	(0.01)	(0.00)	(0.00)
L23	0.14	1.94	0.17	1.17	3.35	-4.34	-4.37
	(0.93)	(0.38)	(0.68)	(0.28)	(0.00)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 36: Rationality Tests for Real Consumption Revision Errors with Final Release Equals Last Known Release (2000:3-2006:4 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	46.74	23.72	23.16	13.75	6.68	5.43	13.15
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L2	67.11	19.55	19.55	9.30	11.23	4.68	16.10
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L3	28.88	16.02	13.96	2.72	9.23	2.92	11.02
	(0.00)	(0.00)	(0.00)	(0.10)	(0.00)	(0.00)	(0.00)
L4	27.00	21.87	19.70	3.10	23.49	3.03	9.06
	(0.00)	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)
L5	18.71	18.76	18.40	5.48	24.73	2.53	9.32
	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.01)	(0.00)
L6	15.51	27.47	26.63	6.61	22.03	2.98	10.58
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
L7	8.47	21.01	20.96	8.71	24.13	2.00	10.26
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)
L8	9.64	19.36	19.36	7.29	24.44	1.99	8.80
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.05)	(0.00)
L9	9.27	22.97	22.97	7.65	36.42	2.03	8.65
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.04)	(0.00)
L10	8.63	24.22	22.26	12.18	18.20	2.38	7.32
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)
L11	8.65	25.77	23.65	12.61	64.98	2.51	6.59
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
L12	8.60	25.40	24.04	10.82	33.51	2.31	6.77
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)
L13	10.14	24.70	23.00	11.21	23.76	2.71	6.75
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
L14	14.49	18.55	18.54	5.96	81.48	2.60	6.70
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
L15	10.15	19.53	18.77	9.60	25.36	2.49	6.18
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
L16	5.53	17.57	15.84	11.91	25.82	1.94	5.54
	(0.06)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)
L17	6.70	17.40	16.50	11.04	26.51	2.31	5.47
	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)
L18	7.22	17.88	17.44	10.42	39.20	2.41	5.54
	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)
L19	8.25	21.44	21.16	12.08	13.69	2.23	5.00
	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)
L20	10.26	22.13	22.04	11.06	34.36	2.26	5.05
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)
L21	10.35	28.64	28.15	13.71	37.75	2.69	5.13
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
L22	9.71	23.98	23.76	11.79	32.43	2.33	5.19
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)
L23	9.81	17.09	17.09	8.59	22.64	1.66	4.46
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.10)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 37: Rationality Tests for Real Consumption Revision Errors with Final Release Equals Last Known Release (2007:1-2015:1 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	7.12	3.62	0.21	1.95	2.38	-0.67	8.76
	(0.03)	(0.16)	(0.65)	(0.16)	(0.02)	(0.50)	(0.00)
L2	18.31	0.36	0.33	0.15	5.41	-1.25	5.83
	(0.00)	(0.83)	(0.57)	(0.70)	(0.00)	(0.21)	(0.00)
L3	14.46	0.35	0.35	0.04	24.48	-1.60	4.86
	(0.00)	(0.84)	(0.55)	(0.85)	(0.00)	(0.11)	(0.00)
L4	4.58	0.75	0.02	0.73	4.96	-2.27	2.50
	(0.10)	(0.69)	(0.89)	(0.39)	(0.00)	(0.02)	(0.01)
L5	2.32	5.04	0.01	4.44	48.77	-2.08	2.53
	(0.31)	(0.08)	(0.91)	(0.04)	(0.00)	(0.04)	(0.01)
L6	2.30	5.90	0.04	5.34	25.05	-1.84	2.30
	(0.32)	(0.05)	(0.84)	(0.02)	(0.00)	(0.07)	(0.02)
L7	3.98	0.65	0.32	0.51	7.92	-2.67	0.92
	(0.14)	(0.72)	(0.57)	(0.47)	(0.00)	(0.01)	(0.36)
L8	3.31	1.01	0.36	0.94	19.96	-2.67	0.63
	(0.19)	(0.60)	(0.55)	(0.33)	(0.00)	(0.01)	(0.53)
L9	2.98	1.36	0.21	1.33	16.47	-2.23	0.87
	(0.23)	(0.51)	(0.65)	(0.25)	(0.00)	(0.03)	(0.38)
L10	3.07	1.58	0.83	0.86	9.26	-2.73	-0.05
	(0.22)	(0.45)	(0.36)	(0.35)	(0.00)	(0.01)	(0.96)
L11	1.43	2.38	0.60	1.97	10.77	-2.66	-0.24
	(0.49)	(0.30)	(0.44)	(0.16)	(0.00)	(0.01)	(0.81)
L12	1.27	2.67	0.64	2.36	47.29	-2.54	0.36
	(0.53)	(0.26)	(0.42)	(0.12)	(0.00)	(0.01)	(0.72)
L13	0.11	11.62	0.10	11.51	11.04	-1.91	0.09
	(0.94)	(0.00)	(0.75)	(0.00)	(0.00)	(0.06)	(0.93)
L14	0.01	11.97	0.02	11.44	19.41	-1.95	0.59
	(0.99)	(0.00)	(0.89)	(0.00)	(0.00)	(0.05)	(0.55)
L15	0.04	13.16	0.00	12.23	56.82	-1.75	0.71
	(0.98)	(0.00)	(0.99)	(0.00)	(0.00)	(0.08)	(0.48)
L16	0.09	9.61	0.02	9.18	18.58	-1.54	0.72
	(0.95)	(0.01)	(0.89)	(0.00)	(0.00)	(0.12)	(0.47)
L17	0.01	14.49	0.04	13.56	25.29	-1.46	1.25
	(1.00)	(0.00)	(0.85)	(0.00)	(0.00)	(0.14)	(0.21)
L18	0.02	13.82	0.04	13.10	46.25	-1.59	1.81
	(0.99)	(0.00)	(0.85)	(0.00)	(0.00)	(0.11)	(0.07)
L19	0.12	10.16	0.00	9.41	18.80	-1.32	1.37
	(0.94)	(0.01)	(0.97)	(0.00)	(0.00)	(0.19)	(0.17)
L20	0.24	8.03	0.01	7.26	22.43	-1.72	0.39
	(0.89)	(0.02)	(0.92)	(0.01)	(0.00)	(0.09)	(0.69)
L21	0.15	8.39	0.04	7.87	51.85	-1.80	0.13
	(0.93)	(0.02)	(0.84)	(0.01)	(0.00)	(0.07)	(0.89)
L22	0.19	7.07	0.32	6.99	14.44	-1.98	0.17
	(0.91)	(0.03)	(0.57)	(0.01)	(0.00)	(0.05)	(0.86)
L23	0.20	6.50	0.33	6.50	36.75	-2.09	0.38
	(0.91)	(0.04)	(0.57)	(0.01)	(0.00)	(0.04)	(0.70)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 38: Rationality Tests for Real Investment Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (2000:3-2006:4 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	101.70	12.75	12.75	6.47	9.57	6.22	22.60
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
L2	154.96	10.69	10.00	3.49	20.63	6.36	21.93
	(0.00)	(0.00)	(0.00)	(0.06)	(0.00)	(0.00)	(0.00)
L3	150.07	11.45	9.44	1.82	11.30	5.78	19.45
	(0.00)	(0.00)	(0.00)	(0.18)	(0.00)	(0.00)	(0.00)
L4	51.03	8.10	8.04	2.98	8.21	4.29	17.62
	(0.00)	(0.02)	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)
L5	47.44	1.98	1.45	0.44	9.41	2.42	14.45
	(0.00)	(0.37)	(0.23)	(0.50)	(0.00)	(0.02)	(0.00)
L6	30.52	3.54	3.53	2.58	11.98	2.48	14.23
	(0.00)	(0.17)	(0.06)	(0.11)	(0.00)	(0.01)	(0.00)
L7	12.12	11.78	8.77	10.79	10.83	2.89	16.40
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L8	7.17	17.17	9.26	17.03	29.76	2.81	18.26
	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L9	9.74	7.65	4.12	7.64	17.18	1.83	16.47
	(0.01)	(0.02)	(0.04)	(0.01)	(0.00)	(0.07)	(0.00)
L10	7.93	8.12	4.74	8.03	19.08	1.51	14.53
	(0.02)	(0.02)	(0.03)	(0.00)	(0.00)	(0.13)	(0.00)
L11	8.41	8.13	5.47	7.90	36.09	2.08	14.80
	(0.01)	(0.02)	(0.02)	(0.00)	(0.00)	(0.04)	(0.00)
L12	6.60	8.51	5.15	8.15	9.74	0.72	12.86
	(0.04)	(0.01)	(0.02)	(0.00)	(0.00)	(0.47)	(0.00)
L13	11.64	4.02	3.48	3.65	20.47	1.35	12.72
	(0.00)	(0.13)	(0.06)	(0.06)	(0.00)	(0.18)	(0.00)
L14	13.39	1.05	0.97	0.97	16.10	0.66	11.17
	(0.00)	(0.59)	(0.33)	(0.33)	(0.00)	(0.51)	(0.00)
L15	10.76	2.80	2.80	2.02	9.30	1.77	9.02
	(0.00)	(0.25)	(0.09)	(0.16)	(0.00)	(0.08)	(0.00)
L16	12.61	6.69	6.66	3.84	12.72	1.90	11.19
	(0.00)	(0.04)	(0.01)	(0.05)	(0.00)	(0.06)	(0.00)
L17	16.70	6.04	4.41	1.30	6.83	1.65	11.61
	(0.00)	(0.05)	(0.04)	(0.25)	(0.00)	(0.10)	(0.00)
L18	9.50	3.77	3.11	1.06	9.76	0.04	7.56
	(0.01)	(0.15)	(0.08)	(0.30)	(0.00)	(0.97)	(0.00)
L19	4.82	3.27	2.96	1.43	1.50	-0.62	0.18
	(0.09)	(0.19)	(0.09)	(0.23)	(0.15)	(0.54)	(0.85)
L20	8.57	0.59	0.00	0.16	1.74	-2.29	-2.73
	(0.01)	(0.74)	(0.95)	(0.69)	(0.09)	(0.02)	(0.01)
L21	21.19	1.84	1.84	1.30	4.30	-3.05	-2.73
	(0.00)	(0.40)	(0.18)	(0.25)	(0.00)	(0.00)	(0.01)
L22	1.37	0.92	0.01	0.10	6.53	-2.89	-2.37
	(0.50)	(0.63)	(0.91)	(0.76)	(0.00)	(0.00)	(0.02)
L23	0.06	0.57	0.56	0.52	1.83	-3.37	-3.71
	(0.97)	(0.75)	(0.46)	(0.47)	(0.08)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 39: Rationality Tests for Real Investment Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (2007:1-2015:1 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	18.52	14.75	6.24	14.43	4.27	5.69	29.16
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
L2	24.26	8.84	2.21	8.76	8.92	3.53	38.42
	(0.00)	(0.01)	(0.14)	(0.00)	(0.00)	(0.00)	(0.00)
L3	25.77	5.30	1.07	5.11	20.53	2.30	26.35
	(0.00)	(0.07)	(0.30)	(0.02)	(0.00)	(0.02)	(0.00)
L4	10.88	4.95	0.53	4.69	8.40	0.43	18.53
	(0.00)	(0.08)	(0.47)	(0.03)	(0.00)	(0.67)	(0.00)
L5	10.05	5.26	0.99	5.10	30.41	1.34	18.06
	(0.01)	(0.07)	(0.32)	(0.02)	(0.00)	(0.18)	(0.00)
L6	10.54	3.51	0.69	3.38	25.63	1.08	17.81
	(0.01)	(0.17)	(0.41)	(0.07)	(0.00)	(0.28)	(0.00)
L7	10.78	0.46	0.00	0.18	8.33	-0.79	10.71
	(0.00)	(0.79)	(0.97)	(0.67)	(0.00)	(0.43)	(0.00)
L8	14.35	1.98	0.05	0.42	26.13	-0.91	8.36
	(0.00)	(0.37)	(0.83)	(0.52)	(0.00)	(0.36)	(0.00)
L9	11.31	1.28	0.04	0.18	17.95	-0.89	8.72
	(0.00)	(0.53)	(0.84)	(0.67)	(0.00)	(0.37)	(0.00)
L10	5.10	1.87	0.03	0.81	10.48	-0.90	6.88
	(0.08)	(0.39)	(0.87)	(0.37)	(0.00)	(0.37)	(0.00)
L11	6.53	0.13	0.04	0.11	17.39	-0.69	6.05
	(0.04)	(0.94)	(0.84)	(0.74)	(0.00)	(0.49)	(0.00)
L12	4.96	0.28	0.25	0.11	8.54	-0.45	4.47
	(0.08)	(0.87)	(0.62)	(0.74)	(0.00)	(0.66)	(0.00)
L13	6.26	0.82	0.20	0.02	14.70	-0.53	2.74
	(0.04)	(0.66)	(0.66)	(0.88)	(0.00)	(0.59)	(0.01)
L14	2.79	1.97	1.94	0.73	10.12	0.03	1.79
	(0.25)	(0.37)	(0.16)	(0.39)	(0.00)	(0.98)	(0.07)
L15	1.24	1.52	1.26	1.26	18.90	-0.62	1.65
	(0.54)	(0.47)	(0.26)	(0.26)	(0.00)	(0.54)	(0.10)
L16	0.90	1.70	0.93	1.70	5.87	-1.14	1.25
	(0.64)	(0.43)	(0.33)	(0.19)	(0.00)	(0.25)	(0.21)
L17	1.83	0.03	0.00	0.02	3.30	-2.42	-1.23
	(0.40)	(0.99)	(1.00)	(0.88)	(0.00)	(0.02)	(0.22)
L18	3.97	0.30	0.17	0.26	13.94	-2.44	-2.11
	(0.14)	(0.86)	(0.68)	(0.61)	(0.00)	(0.01)	(0.03)
L19	1.30	0.26	0.22	0.00	6.48	-2.47	-2.51
	(0.52)	(0.88)	(0.64)	(0.98)	(0.00)	(0.01)	(0.01)
L20	1.82	0.86	0.62	0.00	4.36	-2.25	-2.83
	(0.40)	(0.65)	(0.43)	(1.00)	(0.00)	(0.02)	(0.00)
L21	2.00	1.05	0.83	0.02	28.76	-2.13	-2.65
	(0.37)	(0.59)	(0.36)	(0.90)	(0.00)	(0.03)	(0.01)
L22	0.41	1.30	0.95	1.04	2.07	-3.54	-3.40
	(0.81)	(0.52)	(0.33)	(0.31)	(0.05)	(0.00)	(0.00)
L23	2.31	2.25	0.02	1.24	4.95	-4.44	-3.99
	(0.32)	(0.32)	(0.90)	(0.27)	(0.00)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 40: Rationality Tests for Real Inventment Revision Errors with Final Release Equals Last Known Release (2000:3-2006:4 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	45.49	12.62	12.54	8.44	6.52	4.88	16.82
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L2	66.29	9.64	9.32	4.54	20.74	5.23	18.29
	(0.00)	(0.01)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)
L3	96.59	13.49	12.18	5.24	13.34	5.21	18.29
	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)
L4	37.19	9.39	9.08	5.55	8.07	4.07	20.64
	(0.00)	(0.01)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)
L5	29.59	6.24	5.84	3.67	11.77	2.34	19.99
	(0.00)	(0.04)	(0.02)	(0.06)	(0.00)	(0.02)	(0.00)
L6	24.11	9.02	8.41	8.56	14.36	2.47	20.94
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
L7	11.01	13.63	12.20	12.71	12.08	2.84	24.63
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L8	6.93	19.29	13.08	19.20	40.36	2.98	26.68
	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L9	9.03	12.56	8.66	12.56	20.63	2.24	24.21
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)
L10	9.16	17.71	11.25	17.68	31.90	1.78	22.20
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.08)	(0.00)
L11	9.89	18.62	12.81	18.42	45.37	2.48	21.82
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
L12	7.62	13.38	11.11	12.86	10.27	1.58	21.69
	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.11)	(0.00)
L13	11.06	11.52	11.14	9.98	25.60	2.21	23.57
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)
L14	12.02	7.35	7.33	6.17	23.13	1.60	23.23
	(0.00)	(0.03)	(0.01)	(0.01)	(0.00)	(0.11)	(0.00)
L15	11.04	15.12	15.11	10.08	21.80	2.99	21.58
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L16	11.70	19.58	19.47	13.02	20.53	2.81	22.95
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L17	11.69	16.53	16.49	9.90	13.76	2.51	22.15
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
L18	8.77	17.21	16.61	12.20	21.06	2.02	19.19
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)
L19	3.36	12.41	12.06	8.72	4.18	1.19	13.32
	(0.19)	(0.00)	(0.00)	(0.00)	(0.00)	(0.23)	(0.00)
L20	3.15	6.20	5.34	5.85	7.19	-0.07	11.05
	(0.21)	(0.05)	(0.02)	(0.02)	(0.00)	(0.94)	(0.00)
L21	3.56	4.29	2.81	4.28	16.77	-1.16	10.20
	(0.17)	(0.12)	(0.09)	(0.04)	(0.00)	(0.25)	(0.00)
L22	2.24	7.28	5.24	7.25	25.79	-0.52	10.95
	(0.33)	(0.03)	(0.02)	(0.01)	(0.00)	(0.60)	(0.00)
L23	1.16	8.73	7.96	7.57	12.22	-0.55	11.43
	(0.56)	(0.01)	(0.00)	(0.01)	(0.00)	(0.58)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 41: Rationality Tests for Real Inventment Revision Errors with Final Release Equals Last Known Release (2007:1-2015:1 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	20.88	22.59	11.23	22.39	4.54	6.19	27.12
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L2	27.67	23.95	9.25	23.72	8.64	4.86	42.73
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L3	28.21	20.65	8.54	19.63	26.26	3.45	32.99
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L4	11.39	10.50	5.62	9.44	8.80	1.60	24.01
	(0.00)	(0.01)	(0.02)	(0.00)	(0.00)	(0.11)	(0.00)
L5	10.29	12.09	6.14	10.23	44.15	2.20	22.56
	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.03)	(0.00)
L6	11.12	12.17	5.92	9.21	23.80	1.80	19.31
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.07)	(0.00)
L7	12.97	5.88	3.14	4.77	10.52	0.89	12.60
	(0.00)	(0.05)	(0.08)	(0.03)	(0.00)	(0.37)	(0.00)
L8	11.96	4.64	2.33	4.09	10.72	0.58	10.87
	(0.00)	(0.10)	(0.13)	(0.04)	(0.00)	(0.56)	(0.00)
L9	12.00	3.26	1.78	2.62	19.78	0.75	11.04
	(0.00)	(0.20)	(0.18)	(0.11)	(0.00)	(0.46)	(0.00)
L10	8.90	5.87	3.76	4.01	15.47	0.90	9.96
	(0.01)	(0.05)	(0.05)	(0.05)	(0.00)	(0.37)	(0.00)
L11	13.52	3.56	2.50	2.49	11.55	0.68	10.61
	(0.00)	(0.17)	(0.11)	(0.11)	(0.00)	(0.50)	(0.00)
L12	11.07	5.27	4.11	2.65	22.14	1.52	11.44
	(0.00)	(0.07)	(0.04)	(0.10)	(0.00)	(0.13)	(0.00)
L13	10.62	4.52	3.87	2.42	13.19	2.05	11.48
	(0.00)	(0.10)	(0.05)	(0.12)	(0.00)	(0.04)	(0.00)
L14	6.41	6.60	5.37	4.10	18.68	2.02	12.53
	(0.04)	(0.04)	(0.02)	(0.04)	(0.00)	(0.04)	(0.00)
L15	5.39	6.15	4.87	4.04	20.98	1.40	13.43
	(0.07)	(0.05)	(0.03)	(0.04)	(0.00)	(0.16)	(0.00)
L16	5.52	4.47	3.29	3.85	14.62	1.86	14.86
	(0.06)	(0.11)	(0.07)	(0.05)	(0.00)	(0.06)	(0.00)
L17	8.08	4.68	2.70	4.40	30.18	1.42	15.72
	(0.02)	(0.10)	(0.10)	(0.04)	(0.00)	(0.16)	(0.00)
L18	9.47	3.65	2.19	3.49	48.97	1.36	17.30
	(0.01)	(0.16)	(0.14)	(0.06)	(0.00)	(0.17)	(0.00)
L19	8.94	5.04	3.21	4.53	41.97	2.32	19.17
	(0.01)	(0.08)	(0.07)	(0.03)	(0.00)	(0.02)	(0.00)
L20	8.08	5.41	3.70	4.41	38.95	1.83	18.26
	(0.02)	(0.07)	(0.05)	(0.04)	(0.00)	(0.07)	(0.00)
L21	7.58	5.30	3.77	4.18	51.16	1.62	16.95
	(0.02)	(0.07)	(0.05)	(0.04)	(0.00)	(0.10)	(0.00)
L22	4.74	7.33	3.87	6.55	20.85	1.78	19.21
	(0.09)	(0.03)	(0.05)	(0.01)	(0.00)	(0.07)	(0.00)
L23	4.93	7.33	3.40	6.93	49.85	1.35	20.88
	(0.08)	(0.03)	(0.07)	(0.01)	(0.00)	(0.18)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 42: Rationality Tests for Real Government Consumption Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (2000:3-2006:4 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	14.82	4.64	4.64	0.10	3.15	12.34	63.63
	(0.00)	(0.10)	(0.03)	(0.75)	(0.00)	(0.00)	(0.00)
L2	19.34	1.57	1.29	0.09	12.98	9.47	49.97
	(0.00)	(0.46)	(0.26)	(0.76)	(0.00)	(0.00)	(0.00)
L3	23.98	0.31	0.01	0.26	13.46	6.09	43.33
	(0.00)	(0.86)	(0.93)	(0.61)	(0.00)	(0.00)	(0.00)
L4	24.90	1.33	0.37	0.44	10.91	6.73	37.44
	(0.00)	(0.51)	(0.55)	(0.51)	(0.00)	(0.00)	(0.00)
L5	22.16	2.39	1.36	0.37	16.17	7.52	32.69
	(0.00)	(0.30)	(0.24)	(0.54)	(0.00)	(0.00)	(0.00)
L6	17.34	4.86	3.72	1.16	8.19	6.85	27.50
	(0.00)	(0.09)	(0.05)	(0.28)	(0.00)	(0.00)	(0.00)
L7	7.89	5.48	5.47	0.13	13.38	6.51	23.53
	(0.02)	(0.06)	(0.02)	(0.72)	(0.00)	(0.00)	(0.00)
L8	8.38	3.38	3.29	0.14	30.86	6.18	23.80
	(0.02)	(0.18)	(0.07)	(0.71)	(0.00)	(0.00)	(0.00)
L9	6.13	2.22	2.14	0.06	30.29	5.71	25.00
	(0.05)	(0.33)	(0.14)	(0.80)	(0.00)	(0.00)	(0.00)
L10	15.07	2.24	0.27	1.98	6.09	4.45	19.72
	(0.00)	(0.33)	(0.60)	(0.16)	(0.00)	(0.00)	(0.00)
L11	10.28	0.85	0.17	0.73	16.88	3.95	20.60
	(0.01)	(0.66)	(0.68)	(0.39)	(0.00)	(0.00)	(0.00)
L12	6.65	0.91	0.86	0.02	5.82	2.89	15.81
	(0.04)	(0.64)	(0.35)	(0.89)	(0.00)	(0.00)	(0.00)
L13	9.45	1.30	1.22	0.00	12.04	3.96	14.93
	(0.01)	(0.52)	(0.27)	(0.96)	(0.00)	(0.00)	(0.00)
L14	12.24	0.94	0.69	0.10	18.88	3.03	15.78
	(0.00)	(0.63)	(0.41)	(0.75)	(0.00)	(0.00)	(0.00)
L15	10.43	0.46	0.15	0.33	6.42	1.57	10.75
	(0.01)	(0.80)	(0.69)	(0.57)	(0.00)	(0.12)	(0.00)
L16	4.77	0.07	0.00	0.07	4.86	0.82	7.72
	(0.09)	(0.97)	(0.98)	(0.79)	(0.00)	(0.41)	(0.00)
L17	6.38	0.41	0.00	0.40	15.91	1.17	8.96
	(0.04)	(0.82)	(0.97)	(0.53)	(0.00)	(0.24)	(0.00)
L18	9.67	1.25	0.90	0.62	5.93	0.11	7.61
	(0.01)	(0.54)	(0.34)	(0.43)	(0.00)	(0.91)	(0.00)
L19	7.91	1.29	0.03	1.24	12.15	0.49	7.47
	(0.02)	(0.52)	(0.87)	(0.26)	(0.00)	(0.62)	(0.00)
L20	2.68	0.62	0.34	0.14	10.27	0.29	5.95
	(0.26)	(0.73)	(0.56)	(0.71)	(0.00)	(0.77)	(0.00)
L21	3.30	0.95	0.19	0.46	5.99	-1.10	1.90
	(0.19)	(0.62)	(0.67)	(0.50)	(0.00)	(0.27)	(0.06)
L22	3.96	1.07	0.32	0.97	15.89	-1.78	0.21
	(0.14)	(0.58)	(0.57)	(0.32)	(0.00)	(0.07)	(0.83)
L23	2.65	1.60	0.88	1.24	2.56	-3.77	-3.29
	(0.27)	(0.45)	(0.35)	(0.26)	(0.02)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error tes. P-values are in parentheses.

Table 43: Rationality Tests for Real Government Consumption Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (2007:1-2015:1 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	40.67	4.41	2.76	0.21	6.00	1.41	197.18
	(0.00)	(0.11)	(0.10)	(0.64)	(0.00)	(0.16)	(0.00)
L2	10.25	1.34	1.15	0.01	9.23	3.52	81.25
	(0.01)	(0.51)	(0.28)	(0.91)	(0.00)	(0.00)	(0.00)
L3	4.96	0.81	0.78	0.04	15.57	4.37	77.11
	(0.08)	(0.67)	(0.38)	(0.83)	(0.00)	(0.00)	(0.00)
L4	0.25	3.51	0.96	3.48	5.03	3.58	53.04
	(0.88)	(0.17)	(0.33)	(0.06)	(0.00)	(0.00)	(0.00)
L5	0.25	4.56	0.95	4.54	29.32	3.52	50.56
	(0.88)	(0.10)	(0.33)	(0.03)	(0.00)	(0.00)	(0.00)
L6	0.26	4.02	0.96	3.98	35.71	2.55	46.96
	(0.88)	(0.13)	(0.33)	(0.05)	(0.00)	(0.01)	(0.00)
L7	9.60	1.17	1.01	0.01	12.24	1.38	36.12
	(0.01)	(0.56)	(0.31)	(0.90)	(0.00)	(0.17)	(0.00)
L8	0.64	1.20	0.58	1.09	22.98	2.48	33.23
	(0.72)	(0.55)	(0.45)	(0.30)	(0.00)	(0.01)	(0.00)
L9	0.54	0.92	0.36	0.89	57.47	2.72	34.66
	(0.76)	(0.63)	(0.55)	(0.34)	(0.00)	(0.01)	(0.00)
L10	0.18	1.54	0.32	1.54	17.41	2.65	29.27
	(0.91)	(0.46)	(0.57)	(0.21)	(0.00)	(0.01)	(0.00)
L11	0.50	0.60	0.00	0.57	10.50	2.95	25.19
	(0.78)	(0.74)	(0.97)	(0.45)	(0.00)	(0.00)	(0.00)
L12	0.73	0.35	0.01	0.30	28.00	2.77	24.41
	(0.69)	(0.84)	(0.91)	(0.58)	(0.00)	(0.01)	(0.00)
L13	0.44	1.69	0.09	1.34	3.49	3.05	18.60
	(0.80)	(0.43)	(0.76)	(0.25)	(0.00)	(0.00)	(0.00)
L14	0.41	3.40	0.02	3.23	25.81	3.47	22.83
	(0.82)	(0.18)	(0.88)	(0.07)	(0.00)	(0.00)	(0.00)
L15	0.50	4.42	0.03	4.37	10.09	2.30	21.11
	(0.78)	(0.11)	(0.86)	(0.04)	(0.00)	(0.02)	(0.00)
L16	1.16	1.25	0.51	1.06	8.59	1.96	16.37
	(0.56)	(0.54)	(0.48)	(0.30)	(0.00)	(0.05)	(0.00)
L17	1.17	1.08	0.49	0.77	25.11	1.91	15.27
	(0.56)	(0.58)	(0.49)	(0.38)	(0.00)	(0.06)	(0.00)
L18	1.79	2.25	1.25	1.11	7.85	2.12	12.97
	(0.41)	(0.32)	(0.26)	(0.29)	(0.00)	(0.03)	(0.00)
L19	1.58	0.53	0.44	0.13	12.56	0.82	11.05
	(0.45)	(0.77)	(0.51)	(0.72)	(0.00)	(0.41)	(0.00)
L20	2.04	0.83	0.80	0.04	10.71	0.67	10.30
	(0.36)	(0.66)	(0.37)	(0.83)	(0.00)	(0.51)	(0.00)
L21	1.23	0.51	0.51	0.24	3.83	-1.21	2.69
	(0.54)	(0.77)	(0.48)	(0.63)	(0.00)	(0.23)	(0.01)
L22	2.61	3.77	0.23	1.91	2.50	-2.28	-2.32
	(0.27)	(0.15)	(0.63)	(0.17)	(0.02)	(0.02)	(0.02)
L23	3.05	2.73	0.61	0.06	1.24	-4.37	-4.36
	(0.22)	(0.26)	(0.43)	(0.81)	(0.22)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error tes. P-values are in parentheses.

Table 44: Rationality Tests for Real Government Consumption Revision Errors with Final Release Equals Last Known Release (2000:3-2006:4 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	15.90	23.95	20.64	6.75	2.78	24.18	94.10
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)
L2	14.10	16.77	15.67	3.78	16.99	20.48	126.94
	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)	(0.00)	(0.00)
L3	9.72	8.86	8.83	2.37	13.98	16.32	100.19
	(0.01)	(0.01)	(0.00)	(0.12)	(0.00)	(0.00)	(0.00)
L4	15.01	15.64	15.54	2.39	23.15	17.49	87.54
	(0.00)	(0.00)	(0.00)	(0.12)	(0.00)	(0.00)	(0.00)
L5	17.20	21.01	20.50	2.96	40.88	18.66	84.81
	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)
L6	21.19	24.10	23.24	2.87	23.43	19.55	86.85
	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)
L7	21.19	31.86	29.27	5.15	21.67	18.98	86.86
	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)
L8	18.87	25.77	24.61	4.49	64.40	18.71	84.95
	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)
L9	17.10	23.80	22.82	4.59	51.53	18.07	83.00
	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)
L10	20.68	22.27	22.25	1.38	12.62	15.21	66.41
	(0.00)	(0.00)	(0.00)	(0.24)	(0.00)	(0.00)	(0.00)
L11	17.91	20.72	20.68	2.23	29.16	14.60	58.43
	(0.00)	(0.00)	(0.00)	(0.14)	(0.00)	(0.00)	(0.00)
L12	16.88	32.97	28.04	6.24	30.90	15.45	58.23
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
L13	16.43	31.92	26.58	6.76	22.08	16.45	65.22
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
L14	15.58	29.88	25.05	5.75	40.12	15.73	69.08
	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)
L15	12.59	32.45	24.59	6.20	17.52	14.72	63.58
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
L16	10.13	29.09	22.24	6.88	28.07	13.96	59.85
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
L17	9.90	30.33	22.13	6.60	32.94	14.22	59.82
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
L18	7.77	23.76	18.55	5.71	21.02	12.21	56.58
	(0.02)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)
L19	10.13	24.95	20.26	5.40	25.88	14.25	58.22
	(0.01)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)
L20	9.80	29.71	21.49	8.28	35.80	15.66	67.81
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L21	9.63	32.22	22.30	8.49	35.73	14.94	71.71
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L22	7.68	27.99	19.23	8.32	59.61	14.21	70.99
	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
L23	6.76	31.99	18.92	10.70	39.92	14.92	72.09
	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 45: Rationality Tests for Real Government Consumption Revision Errors with Final Release Equals Last Known Release (2007:1-2015:1 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	31.79	2.29	1.42	0.30	5.50	4.57	206.81
	(0.00)	(0.32)	(0.23)	(0.58)	(0.00)	(0.00)	(0.00)
L2	5.82	0.20	0.20	0.00	21.15	7.32	108.92
	(0.05)	(0.91)	(0.66)	(0.95)	(0.00)	(0.00)	(0.00)
L3	3.52	0.44	0.34	0.09	27.11	7.51	112.45
	(0.17)	(0.80)	(0.56)	(0.76)	(0.00)	(0.00)	(0.00)
L4	0.67	1.37	0.28	0.98	7.03	7.61	91.88
	(0.72)	(0.50)	(0.60)	(0.32)	(0.00)	(0.00)	(0.00)
L5	0.36	1.82	0.47	1.27	45.43	7.05	85.10
	(0.83)	(0.40)	(0.49)	(0.26)	(0.00)	(0.00)	(0.00)
L6	0.58	1.69	0.51	1.08	41.67	6.40	78.87
	(0.75)	(0.43)	(0.47)	(0.30)	(0.00)	(0.00)	(0.00)
L7	4.45	0.75	0.71	0.04	11.79	4.53	65.25
	(0.11)	(0.69)	(0.40)	(0.85)	(0.00)	(0.00)	(0.00)
L8	1.90	0.91	0.42	0.53	16.91	5.27	61.77
	(0.39)	(0.63)	(0.52)	(0.47)	(0.00)	(0.00)	(0.00)
L9	2.00	0.49	0.16	0.37	52.01	5.93	64.21
	(0.37)	(0.78)	(0.69)	(0.54)	(0.00)	(0.00)	(0.00)
L10	1.59	0.83	0.20	0.61	18.23	6.39	61.63
	(0.45)	(0.66)	(0.66)	(0.43)	(0.00)	(0.00)	(0.00)
L11	2.34	0.35	0.02	0.31	17.62	7.56	69.60
	(0.31)	(0.84)	(0.89)	(0.58)	(0.00)	(0.00)	(0.00)
L12	2.64	0.26	0.00	0.24	121.43	8.11	78.68
	(0.27)	(0.88)	(0.95)	(0.62)	(0.00)	(0.00)	(0.00)
L13	1.49	0.31	0.06	0.27	7.91	8.12	64.66
	(0.47)	(0.86)	(0.80)	(0.60)	(0.00)	(0.00)	(0.00)
L14	1.19	0.51	0.02	0.51	43.36	8.38	60.06
	(0.55)	(0.77)	(0.89)	(0.48)	(0.00)	(0.00)	(0.00)
L15	0.74	0.63	0.01	0.58	23.52	7.23	59.94
	(0.69)	(0.73)	(0.94)	(0.45)	(0.00)	(0.00)	(0.00)
L16	2.28	0.30	0.14	0.20	25.54	7.88	60.38
	(0.32)	(0.86)	(0.71)	(0.65)	(0.00)	(0.00)	(0.00)
L17	2.40	0.29	0.17	0.16	51.34	7.04	55.73
	(0.30)	(0.86)	(0.68)	(0.69)	(0.00)	(0.00)	(0.00)
L18	2.18	0.52	0.37	0.18	36.06	7.00	52.37
	(0.34)	(0.77)	(0.54)	(0.67)	(0.00)	(0.00)	(0.00)
L19	2.43	0.17	0.10	0.07	19.72	6.73	52.18
	(0.30)	(0.92)	(0.75)	(0.79)	(0.00)	(0.00)	(0.00)
L20	2.53	0.19	0.11	0.08	66.93	6.22	48.84
	(0.28)	(0.91)	(0.74)	(0.77)	(0.00)	(0.00)	(0.00)
L21	2.58	0.07	0.01	0.07	31.92	5.84	48.47
	(0.28)	(0.96)	(0.94)	(0.79)	(0.00)	(0.00)	(0.00)
L22	1.50	0.27	0.01	0.26	47.60	6.68	51.77
	(0.47)	(0.87)	(0.94)	(0.61)	(0.00)	(0.00)	(0.00)
L23	1.92	0.30	0.09	0.20	35.67	5.81	51.76
	(0.38)	(0.86)	(0.77)	(0.65)	(0.00)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 46: Rationality Tests for Real Net Exports Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (2000:3-2006:4 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	7.82	33.91	3.62	27.03	-1.20	0.88	14.67
	(0.02)	(0.00)	(0.06)	(0.00)	(0.24)	(0.38)	(0.00)
L2	1.60	16.06	1.00	15.59	7.90	1.79	33.63
	(0.45)	(0.00)	(0.32)	(0.00)	(0.00)	(0.07)	(0.00)
L3	2.11	8.76	1.71	7.64	6.38	0.20	22.66
	(0.35)	(0.01)	(0.19)	(0.01)	(0.00)	(0.84)	(0.00)
L4	2.93	1.98	1.64	0.34	7.70	-0.08	14.70
	(0.23)	(0.37)	(0.20)	(0.56)	(0.00)	(0.94)	(0.00)
L5	3.48	3.00	2.36	0.92	19.49	-0.35	12.74
	(0.18)	(0.22)	(0.12)	(0.34)	(0.00)	(0.73)	(0.00)
L6	4.95	1.46	1.46	0.26	10.74	0.81	11.53
	(0.08)	(0.48)	(0.23)	(0.61)	(0.00)	(0.42)	(0.00)
L7	7.21	0.60	0.37	0.08	9.17	1.85	14.71
	(0.03)	(0.74)	(0.55)	(0.78)	(0.00)	(0.06)	(0.00)
L8	4.52	0.37	0.37	0.01	34.12	2.08	19.07
	(0.10)	(0.83)	(0.54)	(0.93)	(0.00)	(0.04)	(0.00)
L9	1.27	1.18	0.40	0.72	9.80	1.19	17.61
	(0.53)	(0.55)	(0.53)	(0.40)	(0.00)	(0.23)	(0.00)
L10	0.88	1.70	0.31	1.47	17.00	1.37	18.69
	(0.64)	(0.43)	(0.58)	(0.23)	(0.00)	(0.17)	(0.00)
L11	1.60	0.87	0.34	0.61	17.01	0.79	19.39
	(0.45)	(0.65)	(0.56)	(0.44)	(0.00)	(0.43)	(0.00)
L12	1.11	2.82	0.55	2.42	24.99	1.18	19.62
	(0.58)	(0.24)	(0.46)	(0.12)	(0.00)	(0.24)	(0.00)
L13	2.12	2.49	0.95	1.57	15.54	0.50	23.65
	(0.35)	(0.29)	(0.33)	(0.21)	(0.00)	(0.61)	(0.00)
L14	2.13	2.74	1.16	1.84	14.22	0.23	25.41
	(0.35)	(0.25)	(0.28)	(0.18)	(0.00)	(0.82)	(0.00)
L15	1.97	0.82	0.35	0.65	4.76	0.33	18.10
	(0.37)	(0.66)	(0.56)	(0.42)	(0.00)	(0.74)	(0.00)
L16	5.85	0.61	0.55	0.03	10.85	-0.10	14.07
	(0.05)	(0.74)	(0.46)	(0.86)	(0.00)	(0.92)	(0.00)
L17	6.83	0.05	0.02	0.01	9.27	1.63	13.24
	(0.03)	(0.98)	(0.88)	(0.90)	(0.00)	(0.10)	(0.00)
L18	3.47	0.04	0.04	0.00	6.10	0.26	11.75
	(0.18)	(0.98)	(0.85)	(0.97)	(0.00)	(0.79)	(0.00)
L19	3.36	1.35	1.28	0.16	3.11	-2.16	4.55
	(0.19)	(0.51)	(0.26)	(0.69)	(0.00)	(0.03)	(0.00)
L20	5.30	2.84	2.04	0.76	18.67	-2.64	2.58
	(0.07)	(0.24)	(0.15)	(0.38)	(0.00)	(0.01)	(0.01)
L21	1.39	0.55	0.54	0.01	2.33	-2.10	-1.55
	(0.50)	(0.76)	(0.46)	(0.93)	(0.03)	(0.04)	(0.12)
L22	3.47	6.43	0.66	3.50	1.89	-2.65	-2.77
	(0.18)	(0.04)	(0.42)	(0.06)	(0.07)	(0.01)	(0.01)
L23	0.31	1.14	0.03	1.14	3.57	-3.00	-2.83
	(0.86)	(0.56)	(0.87)	(0.29)	(0.00)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 47: Rationality Tests for Real Net Exports Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (2007:1-2015:1 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	11.48	2.91	1.50	0.02	2.44	8.19	66.64
	(0.00)	(0.23)	(0.22)	(0.90)	(0.02)	(0.00)	(0.00)
L2	15.22	2.76	1.30	0.04	16.18	8.46	50.14
	(0.00)	(0.25)	(0.25)	(0.84)	(0.00)	(0.00)	(0.00)
L3	13.96	2.89	1.33	0.01	12.33	6.49	42.97
	(0.00)	(0.24)	(0.25)	(0.92)	(0.00)	(0.00)	(0.00)
L4	7.58	0.19	0.18	0.08	8.39	5.04	34.45
	(0.02)	(0.91)	(0.67)	(0.78)	(0.00)	(0.00)	(0.00)
L5	6.94	1.01	0.84	0.28	12.08	6.18	36.47
	(0.03)	(0.60)	(0.36)	(0.59)	(0.00)	(0.00)	(0.00)
L6	6.89	0.83	0.76	0.33	77.31	6.35	39.23
	(0.03)	(0.66)	(0.38)	(0.57)	(0.00)	(0.00)	(0.00)
L7	2.18	0.83	0.59	0.82	7.40	4.78	32.99
	(0.34)	(0.66)	(0.44)	(0.37)	(0.00)	(0.00)	(0.00)
L8	2.31	0.60	0.22	0.56	27.13	4.08	32.77
	(0.32)	(0.74)	(0.64)	(0.46)	(0.00)	(0.00)	(0.00)
L9	2.92	0.50	0.33	0.50	48.46	4.20	32.70
	(0.23)	(0.78)	(0.57)	(0.48)	(0.00)	(0.00)	(0.00)
L10	2.57	0.90	0.46	0.00	3.20	0.25	23.74
	(0.28)	(0.64)	(0.50)	(0.98)	(0.00)	(0.81)	(0.00)
L11	2.52	1.24	0.68	0.01	16.20	0.03	34.08
	(0.28)	(0.54)	(0.41)	(0.90)	(0.00)	(0.98)	(0.00)
L12	2.46	1.54	0.73	0.00	61.86	-0.02	38.15
	(0.29)	(0.46)	(0.39)	(0.98)	(0.00)	(0.99)	(0.00)
L13	3.03	0.34	0.22	0.00	14.08	1.20	40.53
	(0.22)	(0.84)	(0.64)	(0.95)	(0.00)	(0.23)	(0.00)
L14	2.10	0.48	0.08	0.07	27.59	1.35	41.38
	(0.35)	(0.79)	(0.78)	(0.80)	(0.00)	(0.18)	(0.00)
L15	2.84	0.03	0.02	0.00	20.18	1.80	36.51
	(0.24)	(0.99)	(0.88)	(0.94)	(0.00)	(0.07)	(0.00)
L16	1.51	1.03	0.47	0.02	6.78	-0.31	28.63
	(0.47)	(0.60)	(0.49)	(0.89)	(0.00)	(0.76)	(0.00)
L17	1.63	0.61	0.21	0.00	28.30	0.23	27.48
	(0.44)	(0.74)	(0.65)	(0.99)	(0.00)	(0.81)	(0.00)
L18	1.76	0.46	0.14	0.00	218.61	0.45	29.60
	(0.41)	(0.79)	(0.71)	(0.98)	(0.00)	(0.65)	(0.00)
L19	1.64	1.15	0.54	0.03	9.16	-0.38	29.23
	(0.44)	(0.56)	(0.46)	(0.85)	(0.00)	(0.71)	(0.00)
L20	1.50	1.16	0.63	0.05	19.07	-0.78	32.18
	(0.47)	(0.56)	(0.43)	(0.82)	(0.00)	(0.44)	(0.00)
L21	1.31	1.43	0.61	0.03	12.29	-0.71	32.01
	(0.52)	(0.49)	(0.44)	(0.86)	(0.00)	(0.48)	(0.00)
L22	10.25	4.31	0.12	2.49	1.42	-2.01	-0.09
	(0.01)	(0.12)	(0.72)	(0.11)	(0.17)	(0.04)	(0.93)
L23	1.87	1.86	1.86	0.56	2.41	-3.79	-3.63
	(0.39)	(0.39)	(0.17)	(0.46)	(0.02)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 48: Rationality Tests for Real Net Exports Revision Errors with Final Release Equals Last Known Release (2000:3-2006:4 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	1.00	34.09	0.16	18.44	0.27	6.18	50.16
	(0.61)	(0.00)	(0.69)	(0.00)	(0.79)	(0.00)	(0.00)
L2	0.90	16.69	0.00	11.45	13.20	8.70	129.38
	(0.64)	(0.00)	(0.99)	(0.00)	(0.00)	(0.00)	(0.00)
L3	0.98	9.32	0.01	7.35	13.10	6.64	105.61
	(0.61)	(0.01)	(0.92)	(0.01)	(0.00)	(0.00)	(0.00)
L4	2.55	4.63	0.00	4.01	14.10	5.68	83.87
	(0.28)	(0.10)	(0.97)	(0.05)	(0.00)	(0.00)	(0.00)
L5	2.38	5.50	0.02	4.52	44.23	4.99	78.72
	(0.30)	(0.06)	(0.88)	(0.03)	(0.00)	(0.00)	(0.00)
L6	5.12	5.00	0.00	4.16	22.58	6.67	79.82
	(0.08)	(0.08)	(0.98)	(0.04)	(0.00)	(0.00)	(0.00)
L7	7.95	4.55	0.03	4.06	18.20	7.44	86.61
	(0.02)	(0.10)	(0.87)	(0.04)	(0.00)	(0.00)	(0.00)
L8	8.20	4.52	0.02	3.77	23.18	7.58	92.94
	(0.02)	(0.10)	(0.89)	(0.05)	(0.00)	(0.00)	(0.00)
L9	4.50	7.77	0.02	5.61	22.17	8.21	99.34
	(0.11)	(0.02)	(0.88)	(0.02)	(0.00)	(0.00)	(0.00)
L10	3.00	10.06	0.03	6.91	56.85	8.86	102.77
	(0.22)	(0.01)	(0.87)	(0.01)	(0.00)	(0.00)	(0.00)
L11	3.82	7.68	0.03	5.55	39.30	8.77	98.11
	(0.15)	(0.02)	(0.87)	(0.02)	(0.00)	(0.00)	(0.00)
L12	2.69	14.07	0.01	8.38	32.98	9.09	97.70
	(0.26)	(0.00)	(0.94)	(0.00)	(0.00)	(0.00)	(0.00)
L13	5.52	11.20	0.00	6.46	33.30	9.04	101.35
	(0.06)	(0.00)	(0.99)	(0.01)	(0.00)	(0.00)	(0.00)
L14	3.81	10.49	0.00	6.37	31.24	7.86	99.30
	(0.15)	(0.01)	(0.95)	(0.01)	(0.00)	(0.00)	(0.00)
L15	5.51	6.08	0.03	5.07	17.70	8.25	93.57
	(0.06)	(0.05)	(0.87)	(0.02)	(0.00)	(0.00)	(0.00)
L16	6.37	4.44	0.02	3.12	22.54	7.36	83.32
	(0.04)	(0.11)	(0.90)	(0.08)	(0.00)	(0.00)	(0.00)
L17	11.76	3.20	0.20	2.88	18.64	9.16	78.01
	(0.00)	(0.20)	(0.66)	(0.09)	(0.00)	(0.00)	(0.00)
L18	5.19	3.15	0.12	2.84	16.92	7.05	73.89
	(0.07)	(0.21)	(0.73)	(0.09)	(0.00)	(0.00)	(0.00)
L19	3.41	2.91	0.02	2.72	9.11	5.26	64.30
	(0.18)	(0.23)	(0.90)	(0.10)	(0.00)	(0.00)	(0.00)
L20	3.57	2.93	0.02	2.72	91.55	5.25	65.75
	(0.17)	(0.23)	(0.90)	(0.10)	(0.00)	(0.00)	(0.00)
L21	2.52	3.60	0.09	3.49	31.86	6.22	66.51
	(0.28)	(0.17)	(0.76)	(0.06)	(0.00)	(0.00)	(0.00)
L22	1.78	4.91	0.10	4.73	24.05	6.48	69.72
	(0.41)	(0.09)	(0.75)	(0.03)	(0.00)	(0.00)	(0.00)
L23	2.17	4.31	0.16	4.27	35.14	6.62	70.82
	(0.34)	(0.12)	(0.69)	(0.04)	(0.00)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 49: Rationality Tests for Real Net Exports Revision Errors with Final Release Equals Last Known Release (2007:1-2015:1 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	6.35	8.15	4.74	5.28	0.40	8.56	18.65
	(0.04)	(0.02)	(0.03)	(0.02)	(0.69)	(0.00)	(0.00)
L2	6.92	7.41	5.07	4.49	15.24	8.69	40.59
	(0.03)	(0.02)	(0.02)	(0.03)	(0.00)	(0.00)	(0.00)
L3	5.43	11.12	6.81	5.82	11.34	7.42	35.64
	(0.07)	(0.00)	(0.01)	(0.02)	(0.00)	(0.00)	(0.00)
L4	2.53	7.05	4.01	6.17	6.39	4.94	27.05
	(0.28)	(0.03)	(0.05)	(0.01)	(0.00)	(0.00)	(0.00)
L5	4.26	11.79	7.32	9.48	14.77	6.41	28.78
	(0.12)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
L6	3.46	10.49	6.22	8.57	25.37	5.90	31.57
	(0.18)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
L7	2.40	14.75	4.87	13.86	9.06	5.72	32.64
	(0.30)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)
L8	0.92	11.76	2.60	11.65	44.69	5.39	38.40
	(0.63)	(0.00)	(0.11)	(0.00)	(0.00)	(0.00)	(0.00)
L9	0.76	12.66	2.54	12.44	32.42	5.81	41.22
	(0.69)	(0.00)	(0.11)	(0.00)	(0.00)	(0.00)	(0.00)
L10	0.04	6.49	0.46	6.30	4.87	2.42	26.52
	(0.98)	(0.04)	(0.50)	(0.01)	(0.00)	(0.02)	(0.00)
L11	0.02	6.17	0.27	5.67	22.03	1.98	28.79
	(0.99)	(0.05)	(0.61)	(0.02)	(0.00)	(0.05)	(0.00)
L12	0.07	6.33	0.18	5.64	77.37	2.52	32.89
	(0.97)	(0.04)	(0.67)	(0.02)	(0.00)	(0.01)	(0.00)
L13	0.59	6.09	0.59	6.07	20.44	4.25	34.89
	(0.74)	(0.05)	(0.44)	(0.01)	(0.00)	(0.00)	(0.00)
L14	0.40	6.76	1.13	6.76	16.54	4.31	36.62
	(0.82)	(0.03)	(0.29)	(0.01)	(0.00)	(0.00)	(0.00)
L15	0.87	5.40	1.36	5.34	26.87	4.46	35.52
	(0.65)	(0.07)	(0.24)	(0.02)	(0.00)	(0.00)	(0.00)
L16	0.07	7.40	0.80	7.39	13.68	4.63	37.06
	(0.96)	(0.02)	(0.37)	(0.01)	(0.00)	(0.00)	(0.00)
L17	0.17	8.38	1.03	8.21	49.63	4.27	42.79
	(0.92)	(0.02)	(0.31)	(0.00)	(0.00)	(0.00)	(0.00)
L18	0.28	10.78	1.48	10.10	190.81	4.64	44.01
	(0.87)	(0.00)	(0.22)	(0.00)	(0.00)	(0.00)	(0.00)
L19	0.02	9.44	0.63	9.37	16.94	3.97	43.01
	(0.99)	(0.01)	(0.43)	(0.00)	(0.00)	(0.00)	(0.00)
L20	0.03	7.13	0.38	6.88	28.23	3.13	40.31
	(0.99)	(0.03)	(0.54)	(0.01)	(0.00)	(0.00)	(0.00)
L21	0.01	7.95	0.41	7.70	38.54	3.16	41.10
	(0.99)	(0.02)	(0.52)	(0.01)	(0.00)	(0.00)	(0.00)
L22	0.86	24.76	3.89	16.61	2.00	4.13	30.27
	(0.65)	(0.00)	(0.05)	(0.00)	(0.06)	(0.00)	(0.00)
L23	1.42	28.69	5.35	18.91	18.26	4.87	33.02
	(0.49)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 50: Rationality Tests for Real Value Added Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (2000:3-2006:4 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	7.87	0.54	0.30	0.03	2.22	-1.54	1.71
	(0.02)	(0.76)	(0.59)	(0.86)	(0.04)	(0.12)	(0.09)
L2	8.38	0.91	0.25	0.00	30.13	-1.38	-0.47
	(0.02)	(0.64)	(0.62)	(0.96)	(0.00)	(0.17)	(0.64)
L3	5.37	1.28	0.72	0.05	15.18	-1.71	-1.04
	(0.07)	(0.53)	(0.40)	(0.83)	(0.00)	(0.09)	(0.30)
L4	6.80	2.30	0.51	0.08	8.95	-1.86	-2.10
	(0.03)	(0.32)	(0.48)	(0.78)	(0.00)	(0.06)	(0.04)
L5	3.82	0.69	0.24	0.00	11.68	-2.36	-2.62
	(0.15)	(0.71)	(0.63)	(0.98)	(0.00)	(0.02)	(0.01)
L6	2.75	0.74	0.35	0.03	14.57	-2.36	-2.81
	(0.25)	(0.69)	(0.55)	(0.86)	(0.00)	(0.02)	(0.00)
L7	2.53	1.63	1.38	0.65	9.81	-1.91	-2.76
	(0.28)	(0.44)	(0.24)	(0.42)	(0.00)	(0.06)	(0.01)
L8	1.71	0.75	0.72	0.47	45.05	-2.08	-2.24
	(0.42)	(0.69)	(0.40)	(0.49)	(0.00)	(0.04)	(0.03)
L9	2.68	0.43	0.05	0.01	7.61	-2.56	-2.81
	(0.26)	(0.80)	(0.83)	(0.90)	(0.00)	(0.01)	(0.00)
L10	2.77	0.41	0.00	0.09	10.74	-2.69	-3.00
	(0.25)	(0.81)	(0.97)	(0.77)	(0.00)	(0.01)	(0.00)
L11	6.02	3.20	0.18	0.35	9.16	-2.28	-3.18
	(0.05)	(0.20)	(0.67)	(0.55)	(0.00)	(0.02)	(0.00)
L12	8.56	2.97	0.23	1.61	8.91	-2.77	-3.38
	(0.01)	(0.23)	(0.63)	(0.20)	(0.00)	(0.01)	(0.00)
L13	6.80	1.92	0.59	1.77	4.23	-3.14	-3.75
	(0.03)	(0.38)	(0.44)	(0.18)	(0.00)	(0.00)	(0.00)
L14	6.15	1.77	0.91	1.74	7.39	-3.19	-3.60
	(0.05)	(0.41)	(0.34)	(0.19)	(0.00)	(0.00)	(0.00)
L15	2.54	0.43	0.26	0.43	19.26	-3.19	-3.60
	(0.28)	(0.81)	(0.61)	(0.51)	(0.00)	(0.00)	(0.00)
L16	2.20	0.24	0.00	0.10	17.08	-3.02	-3.56
	(0.33)	(0.89)	(1.00)	(0.75)	(0.00)	(0.00)	(0.00)
L17	2.79	0.94	0.00	0.36	9.46	-2.90	-3.57
	(0.25)	(0.62)	(0.99)	(0.55)	(0.00)	(0.00)	(0.00)
L18	1.72	0.79	0.06	0.10	18.16	-3.01	-3.68
	(0.42)	(0.68)	(0.81)	(0.75)	(0.00)	(0.00)	(0.00)
L19	1.23	0.24	0.02	0.02	12.52	-3.19	-3.74
	(0.54)	(0.89)	(0.89)	(0.88)	(0.00)	(0.00)	(0.00)
L20	4.46	1.88	1.27	1.87	9.40	-3.50	-3.93
	(0.11)	(0.39)	(0.26)	(0.17)	(0.00)	(0.00)	(0.00)
L21	10.84	4.59	4.52	3.58	19.00	-3.73	-4.05
	(0.00)	(0.10)	(0.03)	(0.06)	(0.00)	(0.00)	(0.00)
L22	2.31	1.06	0.83	0.29	5.08	-3.84	-4.18
	(0.31)	(0.59)	(0.36)	(0.59)	(0.00)	(0.00)	(0.00)
L23	4.31	2.49	2.37	2.27	3.14	-4.04	-4.31
	(0.12)	(0.29)	(0.12)	(0.13)	(0.00)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 51: Rationality Tests for Real Value Added Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (2007:1-2015:1 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	4.45	2.64	0.08	2.43	1.89	-2.18	9.94
	(0.11)	(0.27)	(0.78)	(0.12)	(0.07)	(0.03)	(0.00)
L2	4.14	2.22	0.05	2.09	36.91	-2.20	0.08
	(0.13)	(0.33)	(0.82)	(0.15)	(0.00)	(0.03)	(0.93)
L3	3.63	1.68	0.01	1.66	15.11	-2.02	0.09
	(0.16)	(0.43)	(0.94)	(0.20)	(0.00)	(0.04)	(0.93)
L4	19.57	14.17	0.13	12.61	11.43	-2.28	-0.93
	(0.00)	(0.00)	(0.71)	(0.00)	(0.00)	(0.02)	(0.35)
L5	9.65	9.29	0.05	8.48	20.02	-2.13	-1.16
	(0.01)	(0.01)	(0.83)	(0.00)	(0.00)	(0.03)	(0.25)
L6	8.36	5.97	0.03	4.93	26.35	-2.14	-1.10
	(0.02)	(0.05)	(0.86)	(0.03)	(0.00)	(0.03)	(0.27)
L7	12.24	6.82	0.10	6.26	14.71	-1.87	-1.30
	(0.00)	(0.03)	(0.75)	(0.01)	(0.00)	(0.06)	(0.19)
L8	8.82	5.24	0.12	4.99	17.73	-2.14	-1.69
	(0.01)	(0.07)	(0.73)	(0.03)	(0.00)	(0.03)	(0.09)
L9	9.66	5.53	0.21	5.32	52.60	-2.19	-1.97
	(0.01)	(0.06)	(0.64)	(0.02)	(0.00)	(0.03)	(0.05)
L10	3.78	1.84	0.96	1.37	16.84	-2.26	-2.39
	(0.15)	(0.40)	(0.33)	(0.24)	(0.00)	(0.02)	(0.02)
L11	1.77	0.89	0.86	0.20	39.15	-2.25	-2.57
	(0.41)	(0.64)	(0.35)	(0.66)	(0.00)	(0.02)	(0.01)
L12	1.88	0.98	0.95	0.25	28.23	-2.08	-2.46
	(0.39)	(0.61)	(0.33)	(0.61)	(0.00)	(0.04)	(0.01)
L13	1.62	2.56	1.62	0.37	5.65	-2.31	-2.89
	(0.44)	(0.28)	(0.20)	(0.54)	(0.00)	(0.02)	(0.00)
L14	1.45	4.08	1.04	1.73	40.16	-2.47	-2.96
	(0.49)	(0.13)	(0.31)	(0.19)	(0.00)	(0.01)	(0.00)
L15	2.49	6.15	1.04	3.02	20.93	-2.28	-2.93
	(0.29)	(0.05)	(0.31)	(0.08)	(0.00)	(0.02)	(0.00)
L16	1.53	1.39	1.39	0.02	7.16	-2.92	-3.48
	(0.47)	(0.50)	(0.24)	(0.90)	(0.00)	(0.00)	(0.00)
L17	1.31	1.63	1.35	0.20	20.11	-2.84	-3.67
	(0.52)	(0.44)	(0.25)	(0.66)	(0.00)	(0.00)	(0.00)
L18	1.68	2.29	1.54	0.51	18.25	-2.84	-3.65
	(0.43)	(0.32)	(0.21)	(0.48)	(0.00)	(0.00)	(0.00)
L19	0.53	0.39	0.37	0.19	2.86	-3.81	-4.10
	(0.77)	(0.82)	(0.54)	(0.66)	(0.01)	(0.00)	(0.00)
L20	0.49	0.40	0.39	0.06	15.49	-3.87	-4.18
	(0.78)	(0.82)	(0.53)	(0.80)	(0.00)	(0.00)	(0.00)
L21	0.52	0.42	0.41	0.10	83.39	-3.86	-4.18
	(0.77)	(0.81)	(0.52)	(0.75)	(0.00)	(0.00)	(0.00)
L22	2.90	1.95	0.08	1.94	3.88	-3.95	-4.38
	(0.23)	(0.38)	(0.78)	(0.16)	(0.00)	(0.00)	(0.00)
L23	0.71	0.69	0.68	0.16	1.96	-4.47	-4.52
	(0.70)	(0.71)	(0.41)	(0.69)	(0.06)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 52: Rationality Tests for Real Value Added Revision Errors with Final Release Equals Last Known Release (2000:3-2006:4 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	14.72	4.64	2.50	0.08	3.83	1.92	10.01
	(0.00)	(0.10)	(0.11)	(0.77)	(0.00)	(0.05)	(0.00)
L2	17.44	5.41	2.57	0.03	59.54	2.27	6.12
	(0.00)	(0.07)	(0.11)	(0.87)	(0.00)	(0.02)	(0.00)
L3	15.54	4.96	3.15	0.45	24.08	2.53	6.63
	(0.00)	(0.08)	(0.08)	(0.50)	(0.00)	(0.01)	(0.00)
L4	17.63	5.90	3.04	0.20	26.94	2.56	6.86
	(0.00)	(0.05)	(0.08)	(0.66)	(0.00)	(0.01)	(0.00)
L5	14.74	4.30	2.77	0.46	38.46	2.26	6.54
	(0.00)	(0.12)	(0.10)	(0.50)	(0.00)	(0.02)	(0.00)
L6	15.11	4.58	2.75	0.41	47.14	2.00	6.26
	(0.00)	(0.10)	(0.10)	(0.52)	(0.00)	(0.05)	(0.00)
L7	15.95	6.53	3.17	0.51	17.27	2.01	5.41
	(0.00)	(0.04)	(0.07)	(0.48)	(0.00)	(0.04)	(0.00)
L8	15.42	5.33	2.55	0.38	64.94	1.68	5.06
	(0.00)	(0.07)	(0.11)	(0.54)	(0.00)	(0.09)	(0.00)
L9	15.93	4.60	1.96	0.11	17.35	1.76	4.70
	(0.00)	(0.10)	(0.16)	(0.74)	(0.00)	(0.08)	(0.00)
L10	16.74	4.51	1.93	0.05	31.62	1.50	4.58
	(0.00)	(0.11)	(0.16)	(0.82)	(0.00)	(0.13)	(0.00)
L11	24.15	6.85	2.49	0.01	71.07	1.77	4.45
	(0.00)	(0.03)	(0.11)	(0.92)	(0.00)	(0.08)	(0.00)
L12	22.07	4.63	2.10	0.03	29.74	1.72	4.78
	(0.00)	(0.10)	(0.15)	(0.87)	(0.00)	(0.09)	(0.00)
L13	22.51	3.86	2.00	0.11	21.67	1.46	4.94
	(0.00)	(0.14)	(0.16)	(0.74)	(0.00)	(0.14)	(0.00)
L14	25.35	3.81	1.60	0.03	25.73	1.15	4.59
	(0.00)	(0.15)	(0.21)	(0.87)	(0.00)	(0.25)	(0.00)
L15	21.78	3.50	2.28	0.25	43.41	1.12	4.44
	(0.00)	(0.17)	(0.13)	(0.62)	(0.00)	(0.26)	(0.00)
L16	19.89	3.94	2.75	0.35	47.72	1.29	4.69
	(0.00)	(0.14)	(0.10)	(0.55)	(0.00)	(0.20)	(0.00)
L17	20.47	4.44	2.78	0.25	42.06	1.47	4.88
	(0.00)	(0.11)	(0.10)	(0.61)	(0.00)	(0.14)	(0.00)
L18	19.14	4.24	3.33	0.62	61.69	1.56	5.28
	(0.00)	(0.12)	(0.07)	(0.43)	(0.00)	(0.12)	(0.00)
L19	15.87	3.88	3.20	0.72	86.72	1.41	5.42
	(0.00)	(0.14)	(0.07)	(0.40)	(0.00)	(0.16)	(0.00)
L20	17.13	3.49	1.77	0.10	46.33	1.09	4.81
	(0.00)	(0.17)	(0.18)	(0.76)	(0.00)	(0.28)	(0.00)
L21	16.53	2.94	1.49	0.06	51.48	0.81	4.21
	(0.00)	(0.23)	(0.22)	(0.81)	(0.00)	(0.42)	(0.00)
L22	14.66	3.25	2.21	0.26	28.00	0.90	3.80
	(0.00)	(0.20)	(0.14)	(0.61)	(0.00)	(0.37)	(0.00)
L23	17.55	4.05	1.62	0.03	40.29	0.87	3.29
	(0.00)	(0.13)	(0.20)	(0.87)	(0.00)	(0.39)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 53: Rationality Tests for Real Value Added Revision Errors with Final Release Equals Last Known Release (2007:1-2015:1 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	159.72	36.66	0.15	35.38	12.89	-1.50	26.70
	(0.00)	(0.00)	(0.70)	(0.00)	(0.00)	(0.13)	(0.00)
L2	140.89	727.8	0.13	27.21	56.23	-1.37	3.60
	(0.00)	(0.00)	(0.72)	(0.00)	(0.00)	(0.17)	(0.00)
L3	126.2	28.5	0.0	28.0	26.5	-1.3	3.4
	6 (0.00)	2 (0.00)	4 (0.83)	1 (0.00)	0 (0.00)	6 (0.17)	4 (0.00)
L4	24.73	8.37	0.39	8.15	7.89	-1.71	2.87
	(0.00)	(0.02)	(0.53)	(0.00)	(0.00)	(0.09)	(0.00)
L5	29.91	10.01	0.36	9.97	25.31	-1.77	3.29
	(0.00)	(0.01)	(0.55)	(0.00)	(0.00)	(0.08)	(0.00)
L6	24.96	8.13	0.53	8.11	53.29	-1.92	2.71
	(0.00)	(0.02)	(0.47)	(0.00)	(0.00)	(0.06)	(0.01)
L7	18.92	7.37	0.12	7.04	17.84	-1.79	2.64
	(0.00)	(0.03)	(0.72)	(0.01)	(0.00)	(0.07)	(0.01)
L8	16.96	7.06	0.22	6.68	32.70	-2.01	2.15
	(0.00)	(0.03)	(0.64)	(0.01)	(0.00)	(0.04)	(0.03)
L9	17.36	7.75	0.06	6.93	51.27	-1.95	1.64
	(0.00)	(0.02)	(0.80)	(0.01)	(0.00)	(0.05)	(0.10)
L10	12.23	6.01	0.01	4.72	33.86	-2.06	1.16
	(0.00)	(0.05)	(0.94)	(0.03)	(0.00)	(0.04)	(0.25)
L11	9.97	4.65	0.02	3.72	30.39	-2.04	0.64
	(0.01)	(0.10)	(0.90)	(0.05)	(0.00)	(0.04)	(0.52)
L12	10.51	4.92	0.04	3.88	92.44	-2.01	0.66
	(0.01)	(0.09)	(0.85)	(0.05)	(0.00)	(0.04)	(0.51)
L13	8.10	4.28	0.13	2.67	11.37	-2.25	0.21
	(0.02)	(0.12)	(0.72)	(0.10)	(0.00)	(0.02)	(0.84)
L14	7.17	3.61	0.02	2.72	57.63	-2.48	-0.19
	(0.03)	(0.16)	(0.88)	(0.10)	(0.00)	(0.01)	(0.85)
L15	5.86	2.82	0.04	2.08	73.00	-2.36	-0.40
	(0.05)	(0.24)	(0.84)	(0.15)	(0.00)	(0.02)	(0.69)
L16	7.72	3.59	0.00	2.76	10.04	-2.24	-0.11
	(0.02)	(0.17)	(0.96)	(0.10)	(0.00)	(0.02)	(0.91)
L17	7.70	3.55	0.03	2.64	67.99	-2.36	0.00
	(0.02)	(0.17)	(0.87)	(0.10)	(0.00)	(0.02)	(1.00)
L18	7.22	3.35	0.04	2.37	75.07	-2.34	-0.09
	(0.03)	(0.19)	(0.85)	(0.12)	(0.00)	(0.02)	(0.93)
L19	7.42	3.08	0.46	3.08	10.66	-2.98	-0.31
	(0.02)	(0.21)	(0.50)	(0.08)	(0.00)	(0.00)	(0.75)
L20	7.09	2.97	0.35	2.95	50.29	-2.88	0.08
	(0.03)	(0.23)	(0.55)	(0.09)	(0.00)	(0.00)	(0.94)
L21	7.25	3.07	0.37	3.04	272.93	-2.8	0.11
	(0.03)	(0.22)	(0.54)	(0.08)	(0.00)	(0.00)	(0.91)
L22	9.15	3.65	0.09	3.56	41.83	-2.38	0.29
	(0.01)	(0.16)	(0.76)	(0.06)	(0.00)	(0.02)	(0.77)
L23	9.32	4.08	0.06	3.99	46.90	-2.41	0.37
	(0.01)	(0.13)	(0.80)	(0.05)	(0.00)	(0.02)	(0.71)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 54: Rationality Tests for Nominal Value Added Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (2000:3-2006:4 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	12.89	6.08	3.21	1.10	3.14	2.91	22.42
	(0.00)	(0.05)	(0.07)	(0.29)	(0.00)	(0.00)	(0.00)
L2	8.56	5.61	2.87	1.01	4.39	1.50	3.38
	(0.01)	(0.06)	(0.09)	(0.32)	(0.00)	(0.13)	(0.00)
L3	9.71	5.30	2.16	0.55	14.20	1.40	3.44
	(0.01)	(0.07)	(0.14)	(0.46)	(0.00)	(0.16)	(0.00)
L4	4.72	6.45	4.77	2.62	12.26	1.33	3.43
	(0.09)	(0.04)	(0.03)	(0.11)	(0.00)	(0.18)	(0.00)
L5	3.37	6.64	4.76	2.03	5.83	0.36	2.35
	(0.19)	(0.04)	(0.03)	(0.15)	(0.00)	(0.72)	(0.02)
L6	3.26	5.97	4.37	1.98	17.53	0.53	2.39
	(0.20)	(0.05)	(0.04)	(0.16)	(0.00)	(0.59)	(0.02)
L7	3.70	9.04	6.86	3.08	22.72	0.78	2.68
	(0.16)	(0.01)	(0.01)	(0.08)	(0.00)	(0.44)	(0.01)
L8	2.79	8.03	5.62	2.43	25.26	0.27	2.33
	(0.25)	(0.02)	(0.02)	(0.12)	(0.00)	(0.79)	(0.02)
L9	2.69	7.41	4.40	1.75	29.41	0.42	2.09
	(0.26)	(0.02)	(0.04)	(0.19)	(0.00)	(0.67)	(0.04)
L10	3.03	6.90	3.30	1.13	19.62	0.34	2.27
	(0.22)	(0.03)	(0.07)	(0.29)	(0.00)	(0.73)	(0.02)
L11	2.71	3.28	1.43	0.48	15.03	-0.44	1.34
	(0.26)	(0.19)	(0.23)	(0.49)	(0.00)	(0.66)	(0.18)
L12	2.09	4.16	2.60	1.08	18.25	-0.40	0.63
	(0.35)	(0.13)	(0.11)	(0.30)	(0.00)	(0.69)	(0.53)
L13	2.04	2.43	1.39	0.60	9.02	-0.77	-0.65
	(0.36)	(0.30)	(0.24)	(0.44)	(0.00)	(0.44)	(0.52)
L14	6.31	1.65	0.03	0.06	12.30	-0.75	-1.23
	(0.04)	(0.44)	(0.86)	(0.81)	(0.00)	(0.45)	(0.22)
L15	5.05	1.00	0.01	0.03	11.91	-1.34	-1.60
	(0.08)	(0.61)	(0.93)	(0.85)	(0.00)	(0.18)	(0.11)
L16	5.32	2.41	0.24	0.00	14.79	-1.24	-1.82
	(0.07)	(0.30)	(0.62)	(0.96)	(0.00)	(0.21)	(0.07)
L17	5.50	2.28	0.27	0.01	31.17	-1.19	-1.87
	(0.06)	(0.32)	(0.60)	(0.93)	(0.00)	(0.23)	(0.06)
L18	2.47	3.10	1.45	0.59	5.96	-1.18	-2.00
	(0.29)	(0.21)	(0.23)	(0.44)	(0.00)	(0.24)	(0.05)
L19	1.58	0.99	0.52	0.26	11.66	-1.81	-1.98
	(0.45)	(0.61)	(0.47)	(0.61)	(0.00)	(0.07)	(0.05)
L20	2.54	3.93	1.61	0.67	9.50	-1.99	-2.38
	(0.28)	(0.14)	(0.20)	(0.41)	(0.00)	(0.05)	(0.02)
L21	1.95	3.90	1.62	0.59	6.78	-2.56	-3.06
	(0.38)	(0.14)	(0.20)	(0.44)	(0.00)	(0.01)	(0.00)
L22	3.28	2.27	0.01	0.21	4.18	-2.88	-3.69
	(0.19)	(0.32)	(0.94)	(0.65)	(0.00)	(0.00)	(0.00)
L23	1.12	0.40	0.06	0.14	6.71	-3.82	-4.10
	(0.57)	(0.82)	(0.81)	(0.71)	(0.00)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 55: Rationality Tests for Nominal Value Added Revision Errors with Final Release Announced 24 Months after the End of Report Quarter (2007:1-2015:1 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	1.38	9.82	0.06	8.29	-0.73	-0.37	7.95
	(0.50)	(0.01)	(0.81)	(0.00)	(0.47)	(0.71)	(0.00)
L2	1.16	9.27	0.06	7.84	32.86	-0.23	9.26
	(0.56)	(0.01)	(0.80)	(0.01)	(0.00)	(0.82)	(0.00)
L3	1.00	8.90	0.02	8.10	28.65	-0.58	9.21
	(0.61)	(0.01)	(0.89)	(0.00)	(0.00)	(0.56)	(0.00)
L4	1.31	1.13	0.08	0.90	10.87	-1.15	6.65
	(0.52)	(0.57)	(0.77)	(0.34)	(0.00)	(0.25)	(0.00)
L5	0.80	1.39	0.06	1.18	54.86	-1.27	5.80
	(0.67)	(0.50)	(0.80)	(0.28)	(0.00)	(0.20)	(0.00)
L6	0.72	1.68	0.04	1.54	35.58	-1.32	5.34
	(0.70)	(0.43)	(0.83)	(0.21)	(0.00)	(0.19)	(0.00)
L7	0.75	1.13	0.14	0.99	9.14	-2.01	3.03
	(0.69)	(0.57)	(0.71)	(0.32)	(0.00)	(0.04)	(0.00)
L8	0.66	0.99	0.12	0.80	27.64	-2.04	2.11
	(0.72)	(0.61)	(0.73)	(0.37)	(0.00)	(0.04)	(0.04)
L9	0.63	0.95	0.13	0.70	28.46	-2.12	1.85
	(0.73)	(0.62)	(0.72)	(0.40)	(0.00)	(0.03)	(0.06)
L10	0.04	2.68	0.18	2.59	24.50	-1.86	1.04
	(0.98)	(0.26)	(0.67)	(0.11)	(0.00)	(0.06)	(0.30)
L11	0.70	0.91	0.09	0.75	23.99	-2.30	0.67
	(0.70)	(0.63)	(0.77)	(0.39)	(0.00)	(0.02)	(0.50)
L12	0.83	0.47	0.06	0.41	21.38	-1.90	0.98
	(0.66)	(0.79)	(0.81)	(0.52)	(0.00)	(0.06)	(0.32)
L13	1.21	0.91	0.43	0.42	11.67	-2.43	-0.11
	(0.55)	(0.63)	(0.51)	(0.52)	(0.00)	(0.01)	(0.91)
L14	0.45	2.27	0.00	2.19	16.26	-2.18	-0.27
	(0.80)	(0.32)	(0.97)	(0.14)	(0.00)	(0.03)	(0.79)
L15	1.06	4.66	0.00	4.49	28.30	-2.27	-0.32
	(0.59)	(0.10)	(0.96)	(0.03)	(0.00)	(0.02)	(0.75)
L16	1.80	1.24	0.92	0.03	3.93	-3.18	-1.80
	(0.41)	(0.54)	(0.34)	(0.86)	(0.00)	(0.00)	(0.07)
L17	1.56	1.00	0.75	0.01	16.27	-3.23	-1.97
	(0.46)	(0.61)	(0.39)	(0.94)	(0.00)	(0.00)	(0.05)
L18	0.40	0.50	0.11	0.13	2.28	-3.09	-2.81
	(0.82)	(0.78)	(0.73)	(0.72)	(0.03)	(0.00)	(0.00)
L19	1.78	2.37	0.55	1.38	2.86	-3.63	-3.30
	(0.41)	(0.31)	(0.46)	(0.24)	(0.01)	(0.00)	(0.00)
L20	1.33	1.41	0.75	0.27	13.42	-3.59	-3.28
	(0.51)	(0.49)	(0.39)	(0.61)	(0.00)	(0.00)	(0.00)
L21	2.26	2.09	1.55	0.28	20.04	-3.72	-3.29
	(0.32)	(0.35)	(0.21)	(0.60)	(0.00)	(0.00)	(0.00)
L22	0.68	0.83	0.83	0.00	1.20	-3.52	-4.13
	(0.71)	(0.66)	(0.36)	(0.98)	(0.24)	(0.00)	(0.00)
L23	1.37	1.40	0.72	1.03	2.69	-4.29	-4.36
	(0.50)	(0.50)	(0.40)	(0.31)	(0.01)	(0.00)	(0.00)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 56: Rationality Tests for Nominal Value Added Revision Errors with Final Release Equals Last Known Release (2000:3-2006:4 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	0.64	1.05	0.00	0.58	0.75	-0.07	19.06
	(0.73)	(0.59)	(0.95)	(0.45)	(0.46)	(0.95)	(0.00)
L2	0.67	0.89	0.00	0.48	35.15	0.04	12.01
	(0.72)	(0.64)	(0.96)	(0.49)	(0.00)	(0.97)	(0.00)
L3	1.16	1.05	0.15	0.28	26.89	-1.15	11.00
	(0.56)	(0.59)	(0.70)	(0.60)	(0.00)	(0.25)	(0.00)
L4	5.87	1.63	1.16	1.17	16.33	-1.00	9.26
	(0.05)	(0.44)	(0.28)	(0.28)	(0.00)	(0.32)	(0.00)
L5	4.27	1.37	1.11	0.85	67.24	-1.09	9.25
	(0.12)	(0.50)	(0.29)	(0.36)	(0.00)	(0.28)	(0.00)
L6	4.40	1.49	1.32	0.76	38.67	-1.33	8.57
	(0.11)	(0.47)	(0.25)	(0.38)	(0.00)	(0.18)	(0.00)
L7	5.29	2.93	2.36	1.86	12.00	-2.00	5.98
	(0.07)	(0.23)	(0.12)	(0.17)	(0.00)	(0.05)	(0.00)
L8	4.71	2.68	2.33	1.71	35.03	-2.16	4.71
	(0.10)	(0.26)	(0.13)	(0.19)	(0.00)	(0.03)	(0.00)
L9	4.69	2.75	2.34	1.91	37.86	-1.99	4.93
	(0.10)	(0.25)	(0.13)	(0.17)	(0.00)	(0.05)	(0.00)
L10	3.73	1.71	1.10	1.32	23.71	-1.83	3.55
	(0.16)	(0.43)	(0.29)	(0.25)	(0.00)	(0.07)	(0.00)
L11	7.65	4.53	2.77	3.51	29.37	-2.17	3.12
	(0.02)	(0.10)	(0.10)	(0.06)	(0.00)	(0.03)	(0.00)
L12	7.82	4.96	2.88	4.15	113.02	-1.96	3.71
	(0.02)	(0.08)	(0.09)	(0.04)	(0.00)	(0.05)	(0.00)
L13	7.76	5.14	4.13	3.79	15.07	-2.23	2.50
	(0.02)	(0.08)	(0.04)	(0.05)	(0.00)	(0.03)	(0.01)
L14	3.50	2.15	1.95	1.48	23.43	-2.45	1.62
	(0.17)	(0.34)	(0.16)	(0.22)	(0.00)	(0.01)	(0.10)
L15	3.27	1.97	1.89	1.12	22.26	-2.63	1.00
	(0.19)	(0.37)	(0.17)	(0.29)	(0.00)	(0.01)	(0.32)
L16	9.51	5.28	3.68	3.40	9.13	-1.62	1.75
	(0.01)	(0.07)	(0.06)	(0.07)	(0.00)	(0.10)	(0.08)
L17	9.87	5.20	3.58	3.42	30.85	-1.84	3.28
	(0.01)	(0.07)	(0.06)	(0.06)	(0.00)	(0.07)	(0.00)
L18	8.79	3.27	1.86	2.63	25.20	-1.42	2.96
	(0.01)	(0.19)	(0.17)	(0.10)	(0.00)	(0.16)	(0.00)
L19	15.39	6.73	3.56	3.27	11.76	-1.59	2.50
	(0.00)	(0.03)	(0.06)	(0.07)	(0.00)	(0.11)	(0.01)
L20	20.43	9.63	4.94	4.44	34.19	-1.76	1.76
	(0.00)	(0.01)	(0.03)	(0.04)	(0.00)	(0.08)	(0.08)
L21	19.82	10.60	5.74	4.78	83.72	-1.82	1.66
	(0.00)	(0.00)	(0.02)	(0.03)	(0.00)	(0.07)	(0.10)
L22	11.66	7.11	2.52	5.56	11.44	-1.40	1.13
	(0.00)	(0.03)	(0.11)	(0.02)	(0.00)	(0.16)	(0.26)
L23	11.64	6.59	2.84	4.33	29.84	-1.83	0.51
	(0.00)	(0.04)	(0.09)	(0.04)	(0.00)	(0.07)	(0.61)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Table 57: Rationality Tests for Nominal Value Added Revision Errors with Final Release Equals Last Known Release (2007:1-2015:1 sample)

Vintage	ME	OFE	Parametric Unbiasedness	Weak Efficiency	Nordhaus Efficiency	Nonparametric Unbiasedness	Nonparametric Efficiency
L1	0.64	1.05	0.00	0.58	0.75	-0.07	19.06
	(0.73)	(0.59)	(0.95)	(0.45)	(0.46)	(0.95)	(0.00)
L2	0.67	0.89	0.00	0.48	35.15	0.04	12.01
	(0.72)	(0.64)	(0.96)	(0.49)	(0.00)	(0.97)	(0.00)
L3	1.16	1.05	0.15	0.28	26.89	-1.15	11.00
	(0.56)	(0.59)	(0.70)	(0.60)	(0.00)	(0.25)	(0.00)
L4	5.87	1.63	1.16	1.17	16.33	-1.00	9.26
	(0.05)	(0.44)	(0.28)	(0.28)	(0.00)	(0.32)	(0.00)
L5	4.27	1.37	1.11	0.85	67.24	-1.09	9.25
	(0.12)	(0.50)	(0.29)	(0.36)	(0.00)	(0.28)	(0.00)
L6	4.40	1.49	1.32	0.76	38.67	-1.33	8.57
	(0.11)	(0.47)	(0.25)	(0.38)	(0.00)	(0.18)	(0.00)
L7	5.29	2.93	2.36	1.86	12.00	-2.00	5.98
	(0.07)	(0.23)	(0.12)	(0.17)	(0.00)	(0.05)	(0.00)
L8	4.71	2.68	2.33	1.71	35.03	-2.16	4.71
	(0.10)	(0.26)	(0.13)	(0.19)	(0.00)	(0.03)	(0.00)
L9	4.69	2.75	2.34	1.91	37.86	-1.99	4.93
	(0.10)	(0.25)	(0.13)	(0.17)	(0.00)	(0.05)	(0.00)
L10	3.73	1.71	1.10	1.32	23.71	-1.83	3.55
	(0.16)	(0.43)	(0.29)	(0.25)	(0.00)	(0.07)	(0.00)
L11	7.65	4.53	2.77	3.51	29.37	-2.17	3.12
	(0.02)	(0.10)	(0.10)	(0.06)	(0.00)	(0.03)	(0.00)
L12	7.82	4.96	2.88	4.15	113.02	-1.96	3.71
	(0.02)	(0.08)	(0.09)	(0.04)	(0.00)	(0.05)	(0.00)
L13	7.76	5.14	4.13	3.79	15.07	-2.23	2.50
	(0.02)	(0.08)	(0.04)	(0.05)	(0.00)	(0.03)	(0.01)
L14	3.50	2.15	1.95	1.48	23.43	-2.45	1.62
	(0.17)	(0.34)	(0.16)	(0.22)	(0.00)	(0.01)	(0.10)
L15	3.27	1.97	1.89	1.12	22.26	-2.63	1.00
	(0.19)	(0.37)	(0.17)	(0.29)	(0.00)	(0.01)	(0.32)
L16	9.51	5.28	3.68	3.40	9.13	-1.62	1.75
	(0.01)	(0.07)	(0.06)	(0.07)	(0.00)	(0.10)	(0.08)
L17	9.87	5.20	3.58	3.42	30.85	-1.84	3.28
	(0.01)	(0.07)	(0.06)	(0.06)	(0.00)	(0.07)	(0.00)
L18	8.79	3.27	1.86	2.63	25.20	-1.42	2.96
	(0.01)	(0.19)	(0.17)	(0.10)	(0.00)	(0.16)	(0.00)
L19	15.39	6.73	3.56	3.27	11.76	-1.59	2.50
	(0.00)	(0.03)	(0.06)	(0.07)	(0.00)	(0.11)	(0.01)
L20	20.43	9.63	4.94	4.44	34.19	-1.76	1.76
	(0.00)	(0.01)	(0.03)	(0.04)	(0.00)	(0.08)	(0.08)
L21	19.82	10.60	5.74	4.78	83.72	-1.82	1.66
	(0.00)	(0.00)	(0.02)	(0.03)	(0.00)	(0.07)	(0.10)
L22	11.66	7.11	2.52	5.56	11.44	-1.40	1.13
	(0.00)	(0.03)	(0.11)	(0.02)	(0.00)	(0.16)	(0.26)
L23	11.64	6.59	2.84	4.33	29.84	-1.83	0.51
	(0.00)	(0.04)	(0.09)	(0.04)	(0.00)	(0.07)	(0.61)

Note: ME is the measurement error test; OFE is the optimal forecast error test. P-values are in parentheses.

Figure 1: Recurve Estimation of the Mincer and Zarnowitz Regression for Real GDP Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

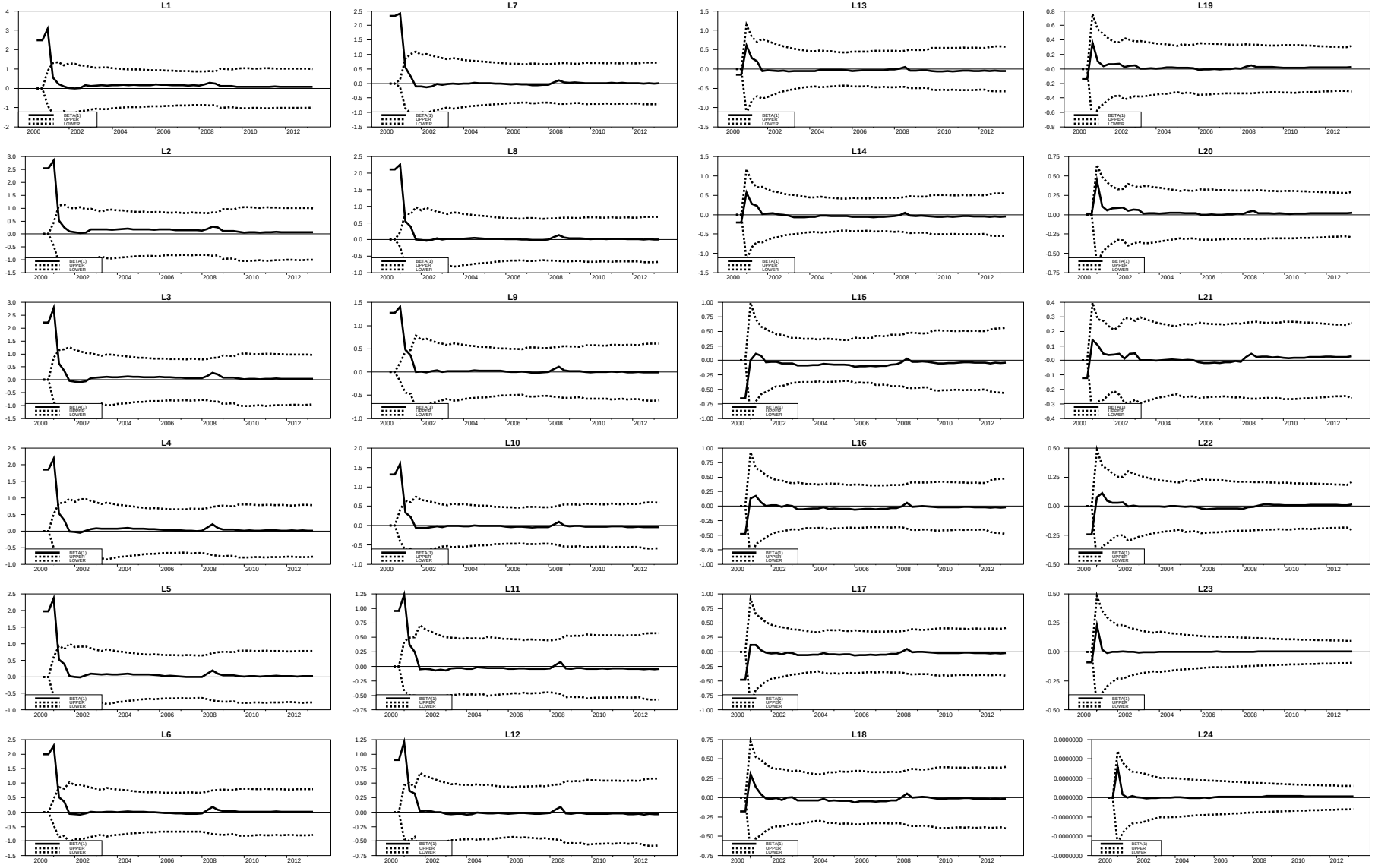

Figure 2: Recurve Estimation of the Nordhaus Regression for Real GDP Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

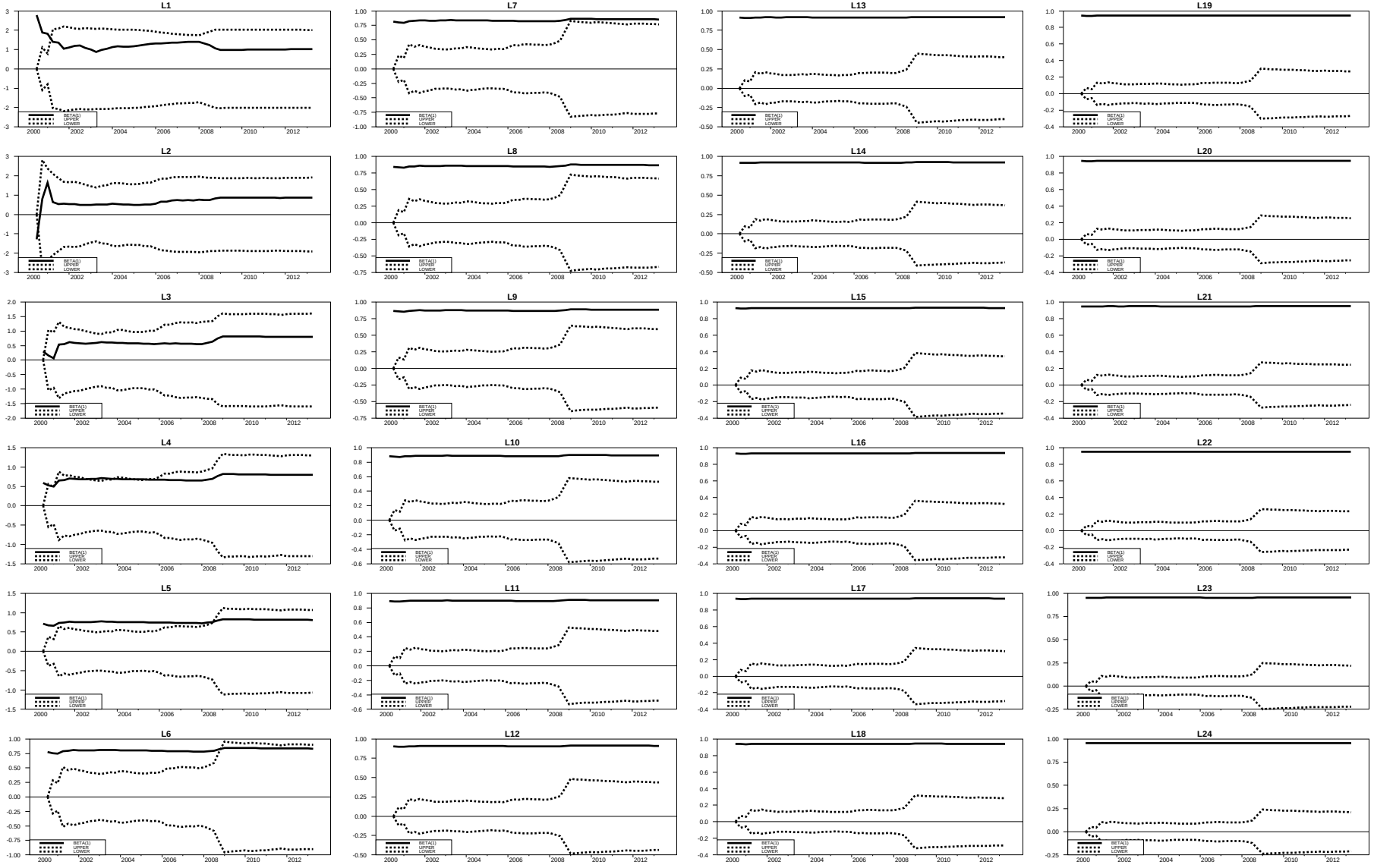

Figure 3: Recurve Estimation of the Mincer and Zarnowitz Regression for Real GDP Revision Errors with Final Release Equals Last Known Release

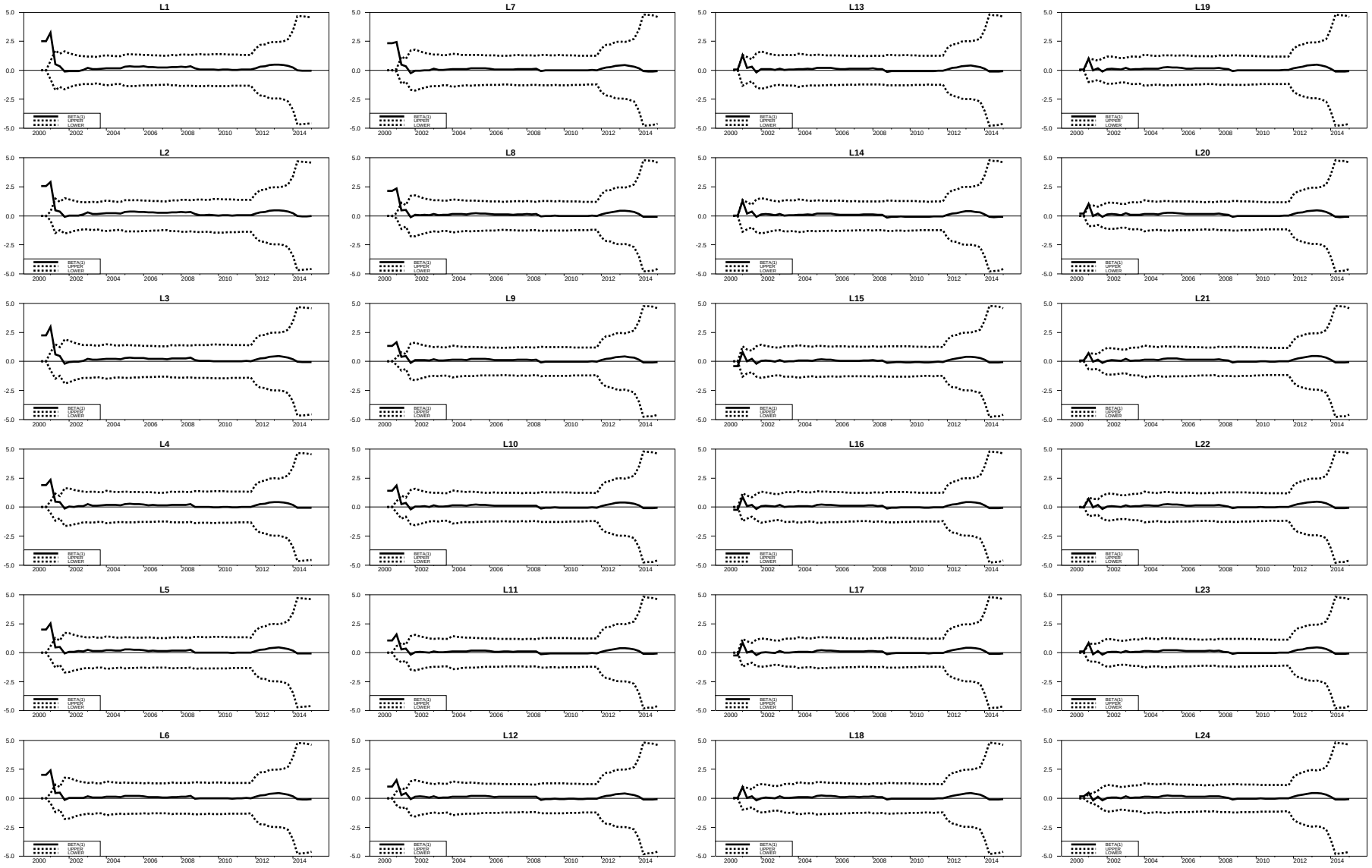

Figure 4: Recurve Estimation of the Nordhaus Regression for Real GDP Revision Errors with Final Release Equals Last Known Release

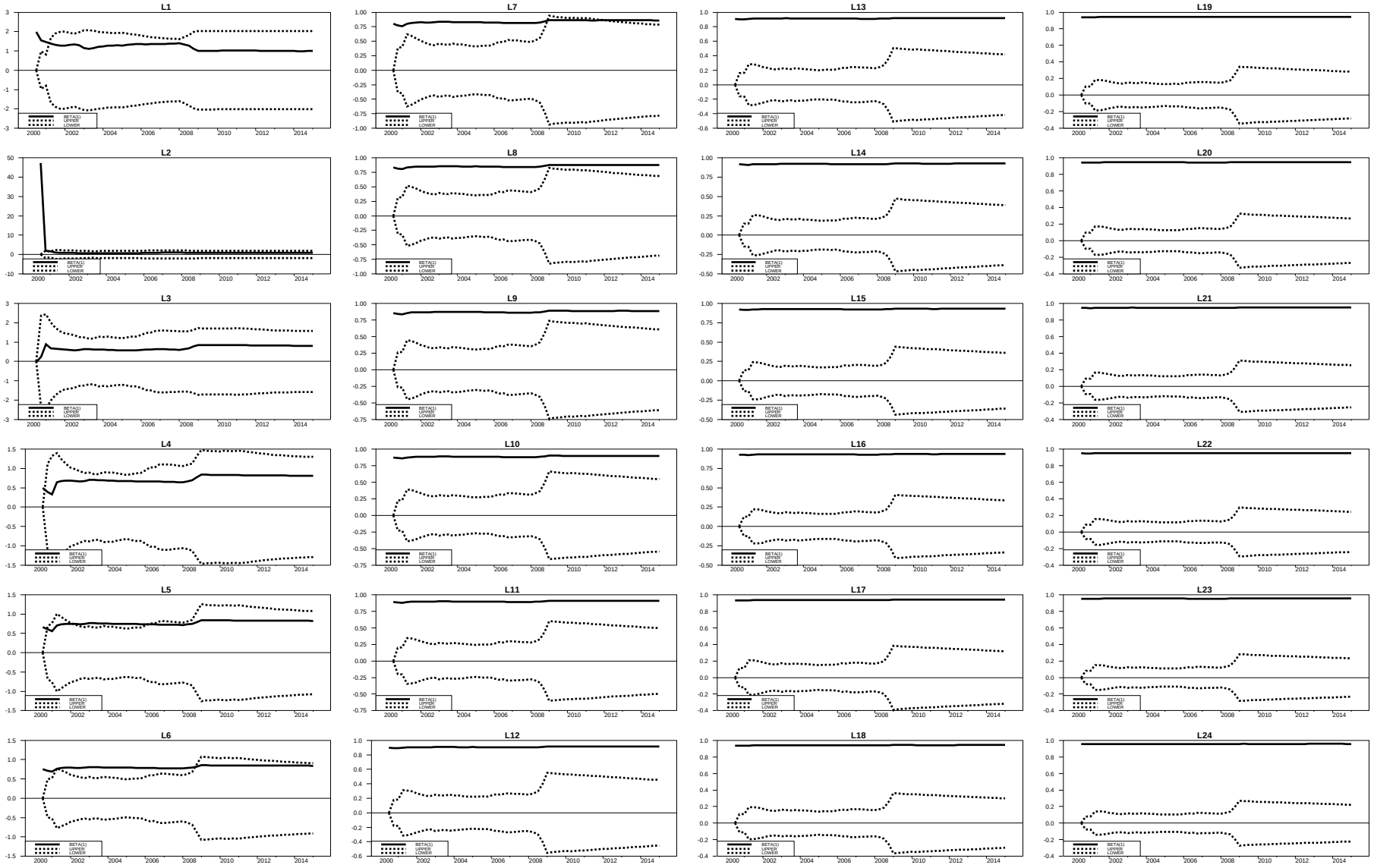

Figure 5: Recurve Estimation of the Mincer and Zarnowitz Regression for Nominal GDP Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

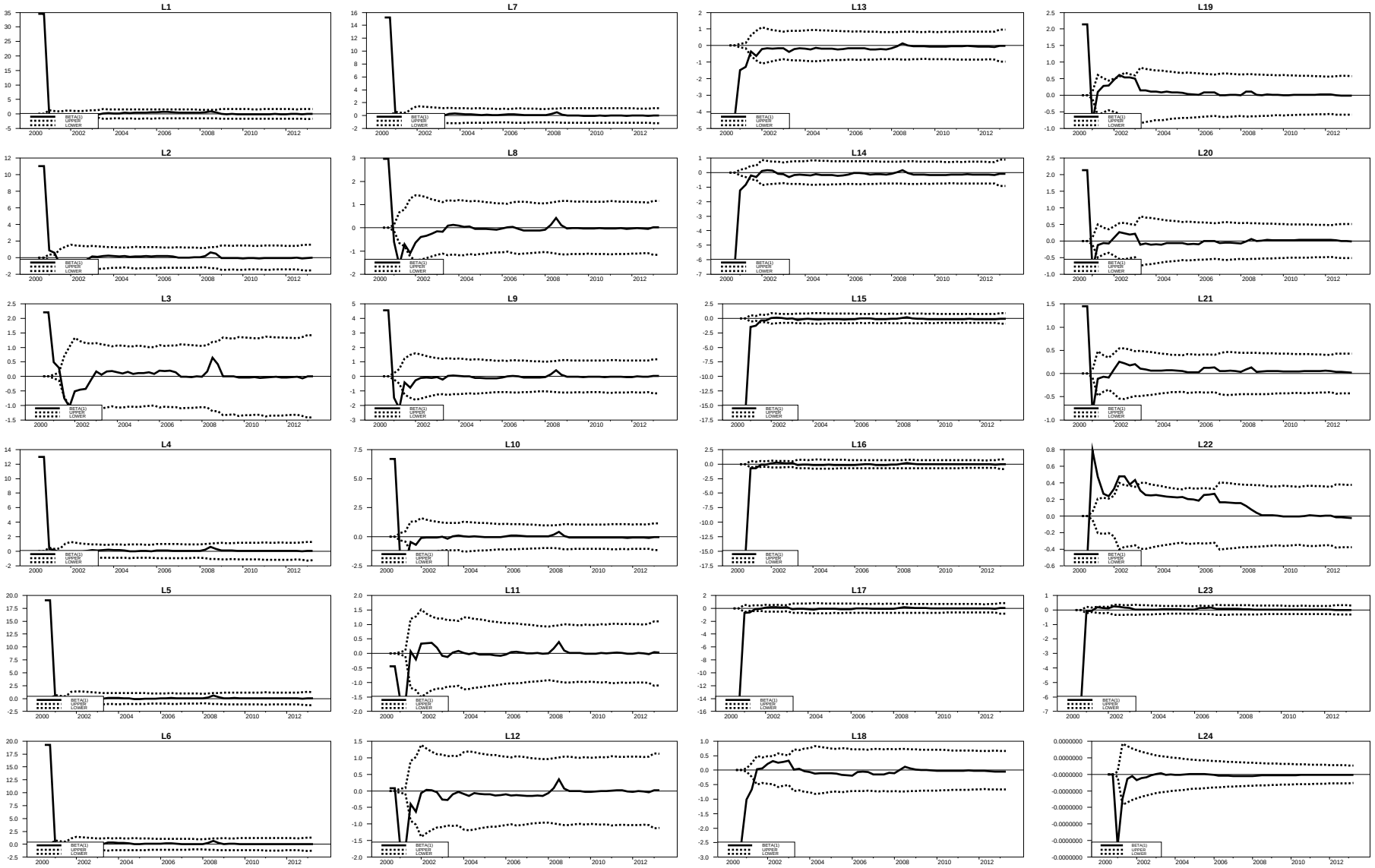

Figure 6: Recurve Estimation of the Nordhaus Regression for Nominal GDP Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

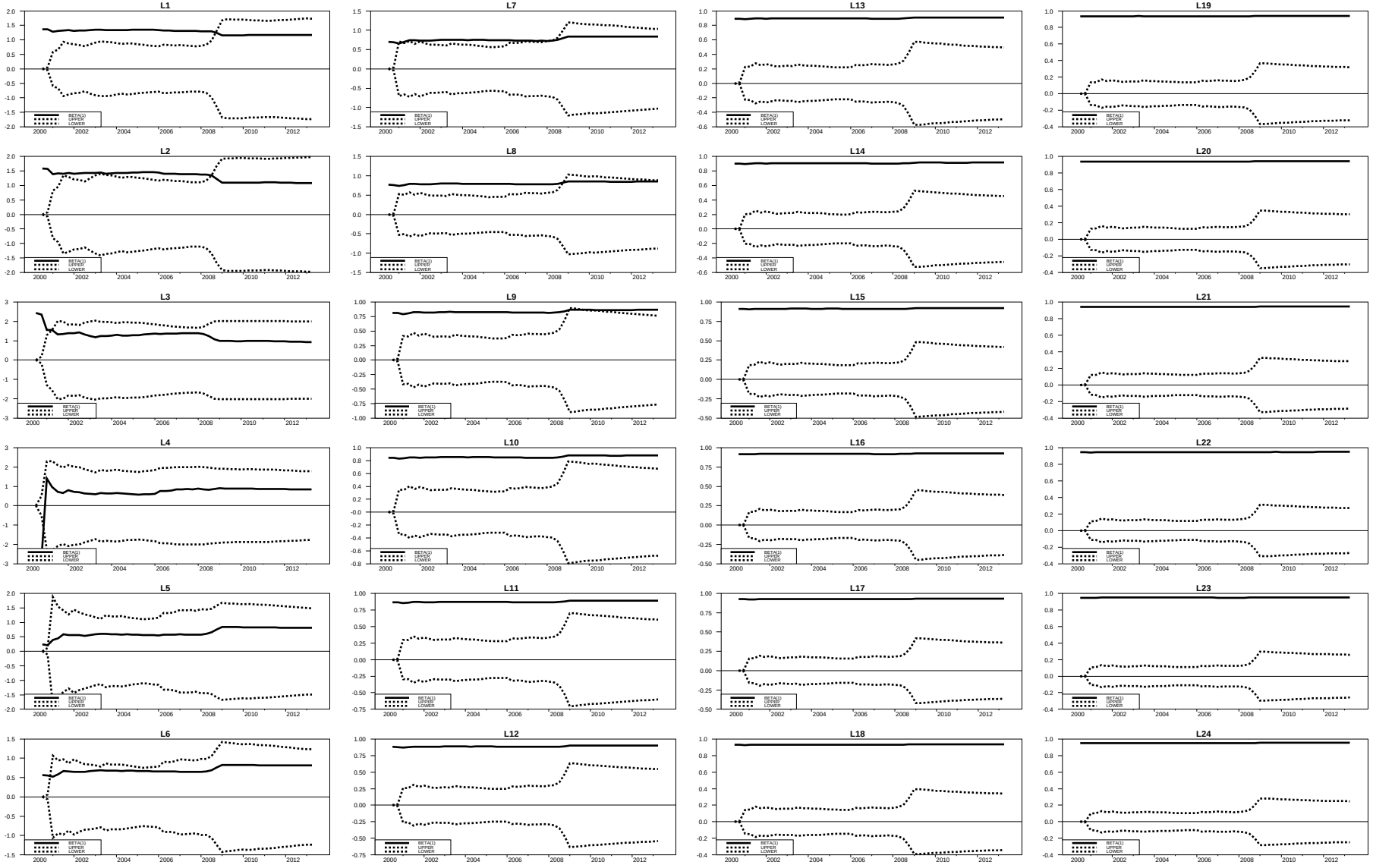

Figure 7: Recurve Estimation of the Mincer and Zarnowitz Regression for Nominal GDP Revision Errors with Final Release Equals Last Known Release

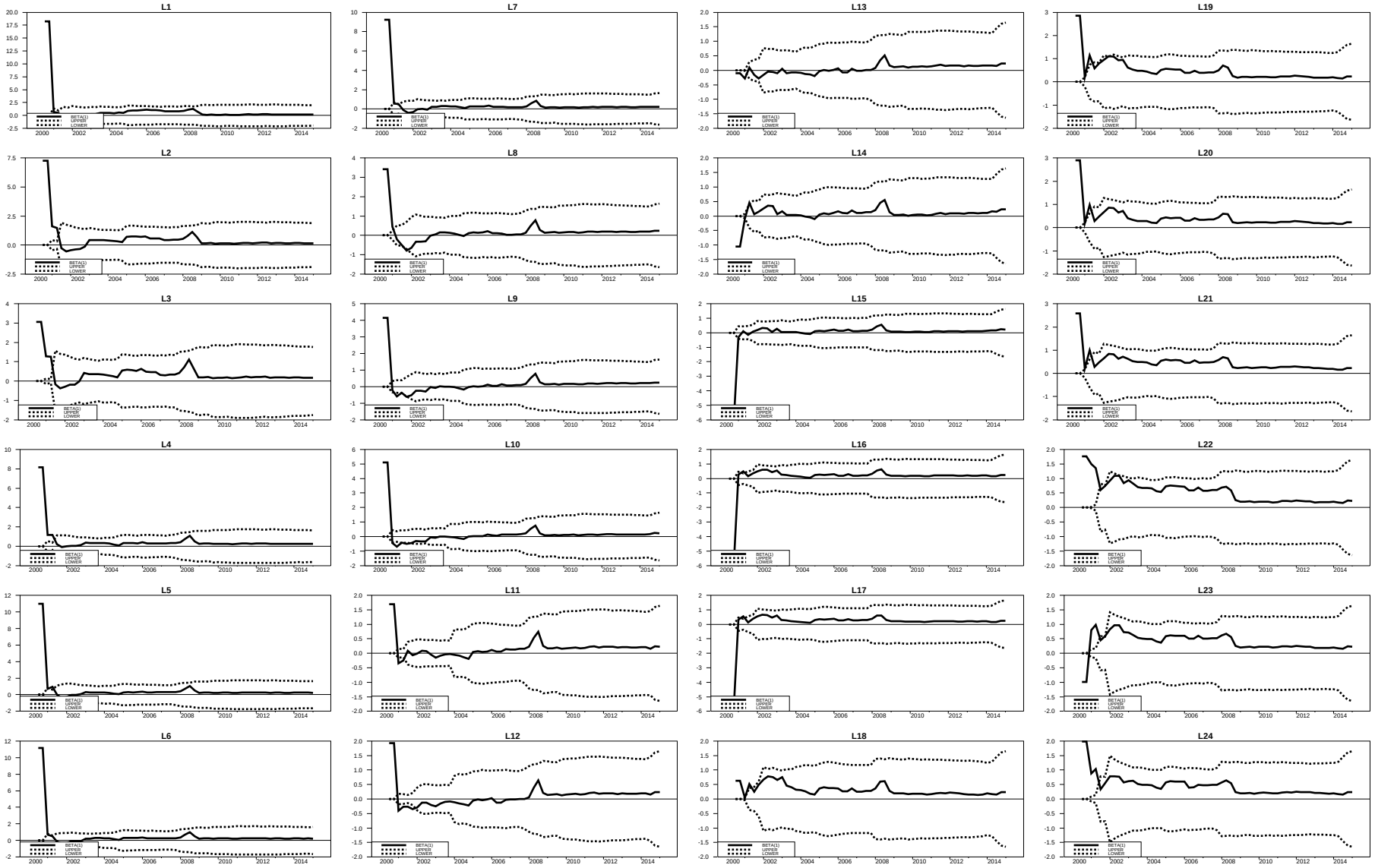

Figure 8: Recurve Estimation of the Nordhaus Regression for Nominal GDP Revision Errors with Final Release Equals Last Known Release

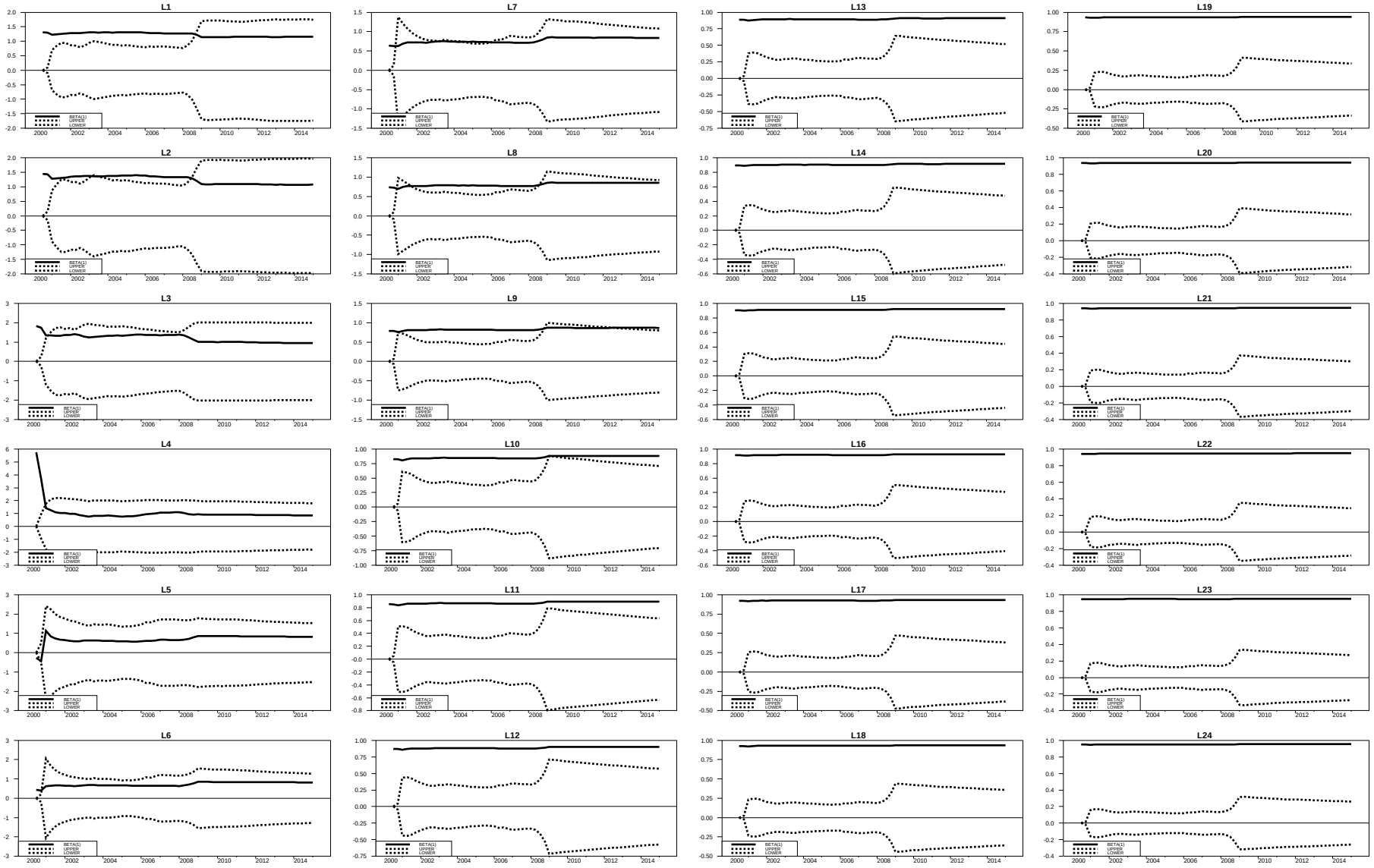

Figure 9: Recurve Estimation of the Mincer and Zarnowitz Regression for Real Consumption Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

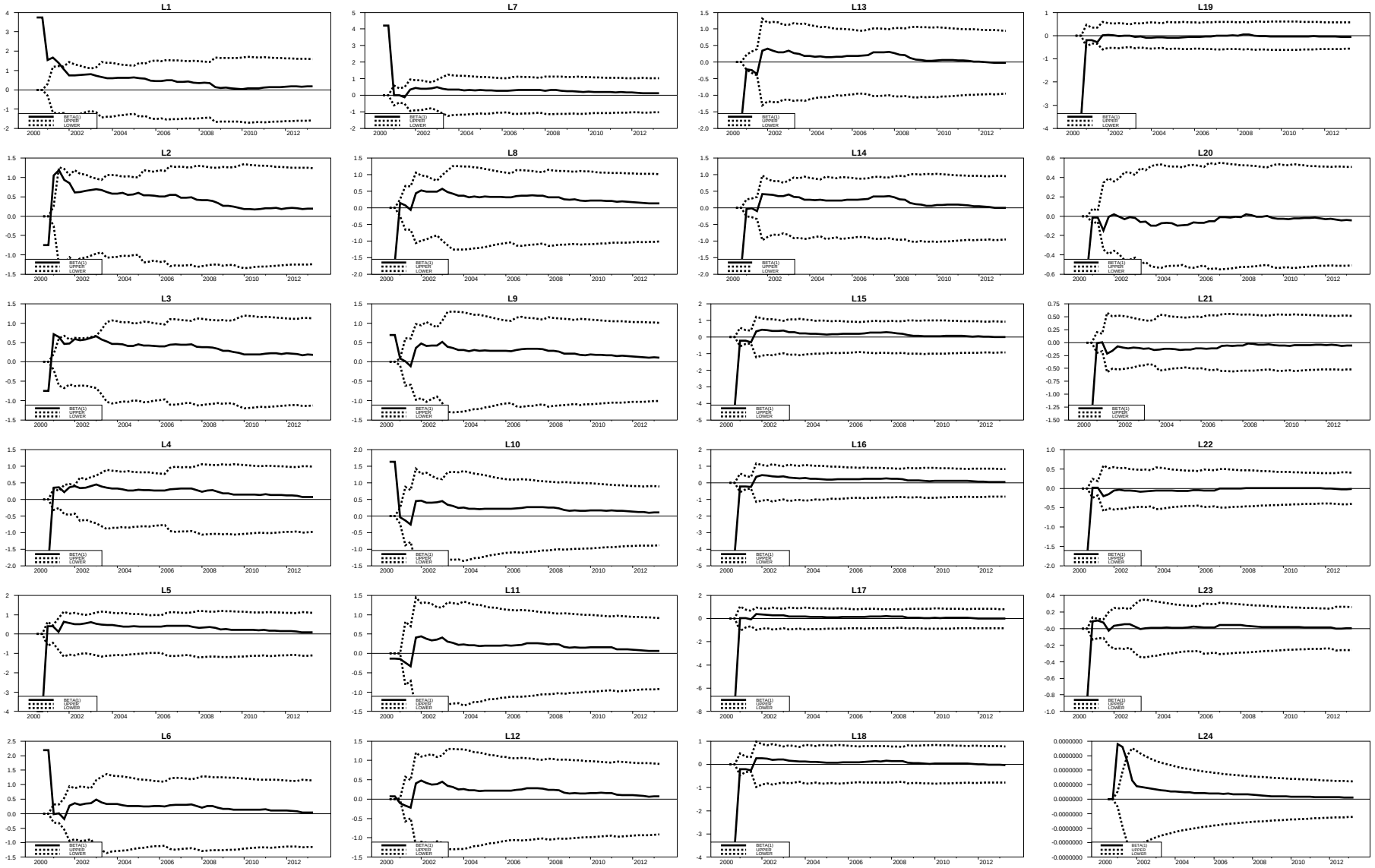

Figure 10: Recurve Estimation of the Nordhaus Regression for Real Consumption Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

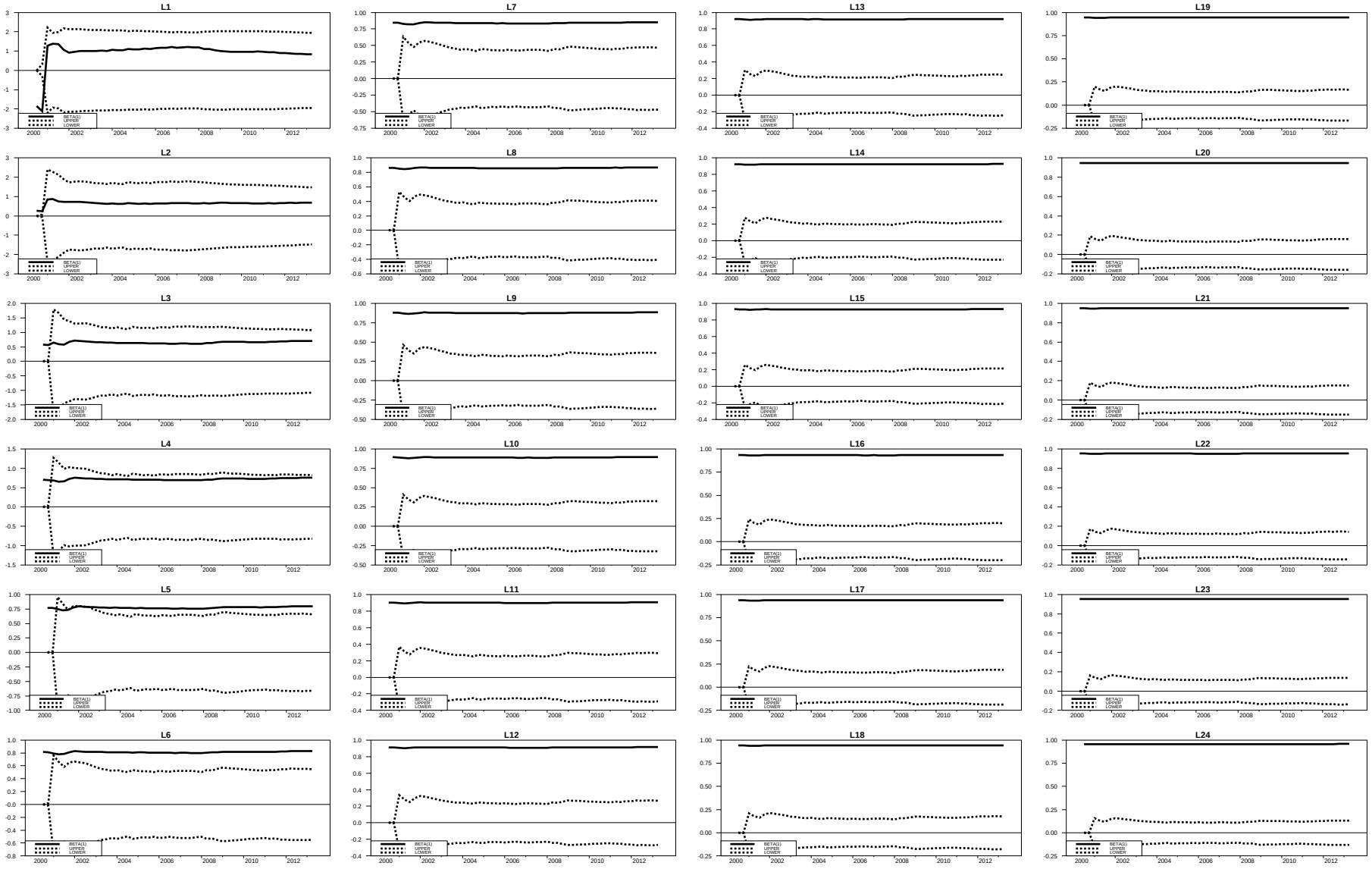

Figure 11: Recurve Estimation of the Mincer and Zarnowitz Regression for Real Consumption Revision Errors with Final Release Equals Last Known Release

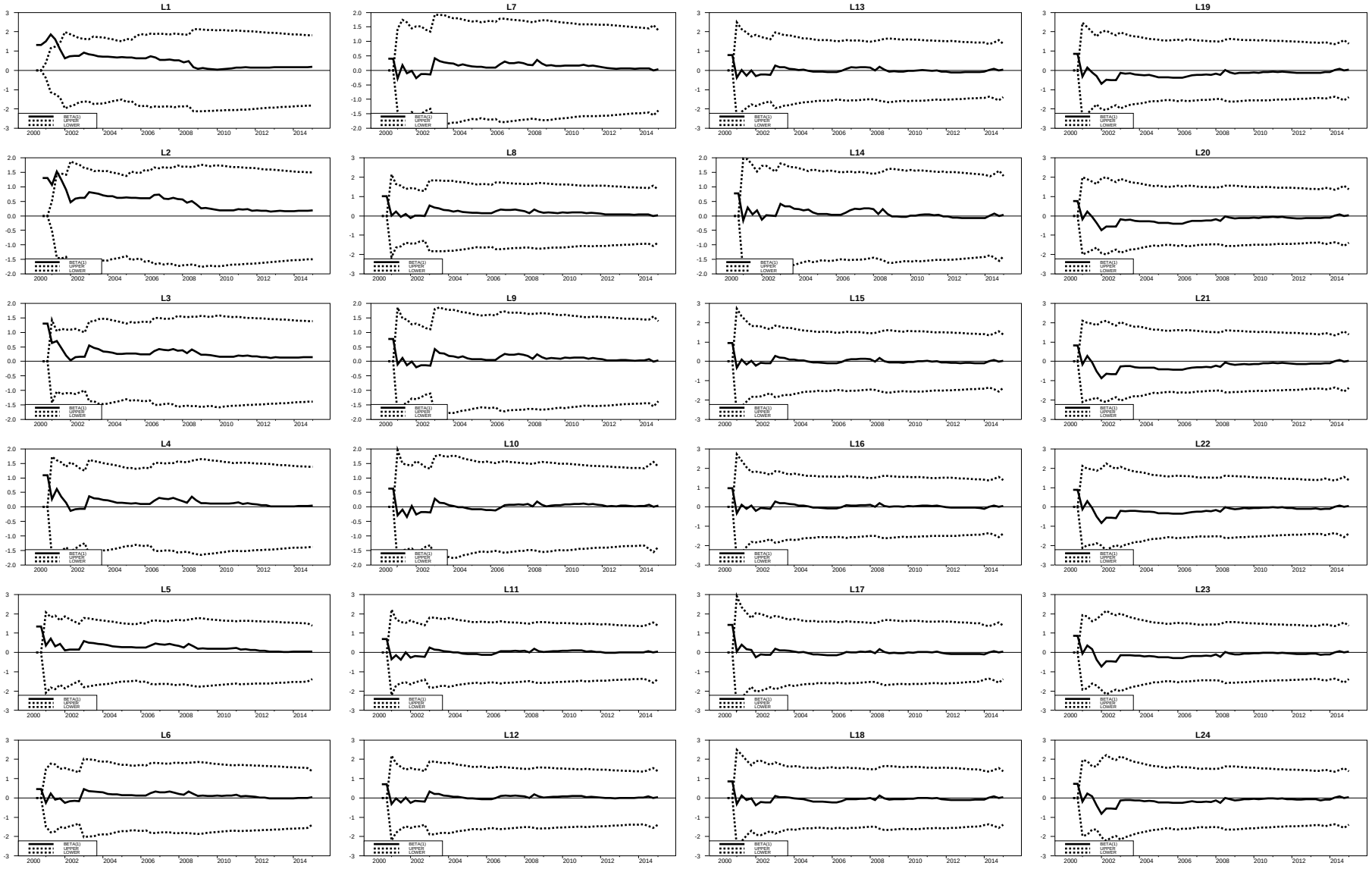

Figure 12: Recurve Estimation of the Nordhaus Regression for Real Consumption Revision Errors with Final Release Equals Last Known Release

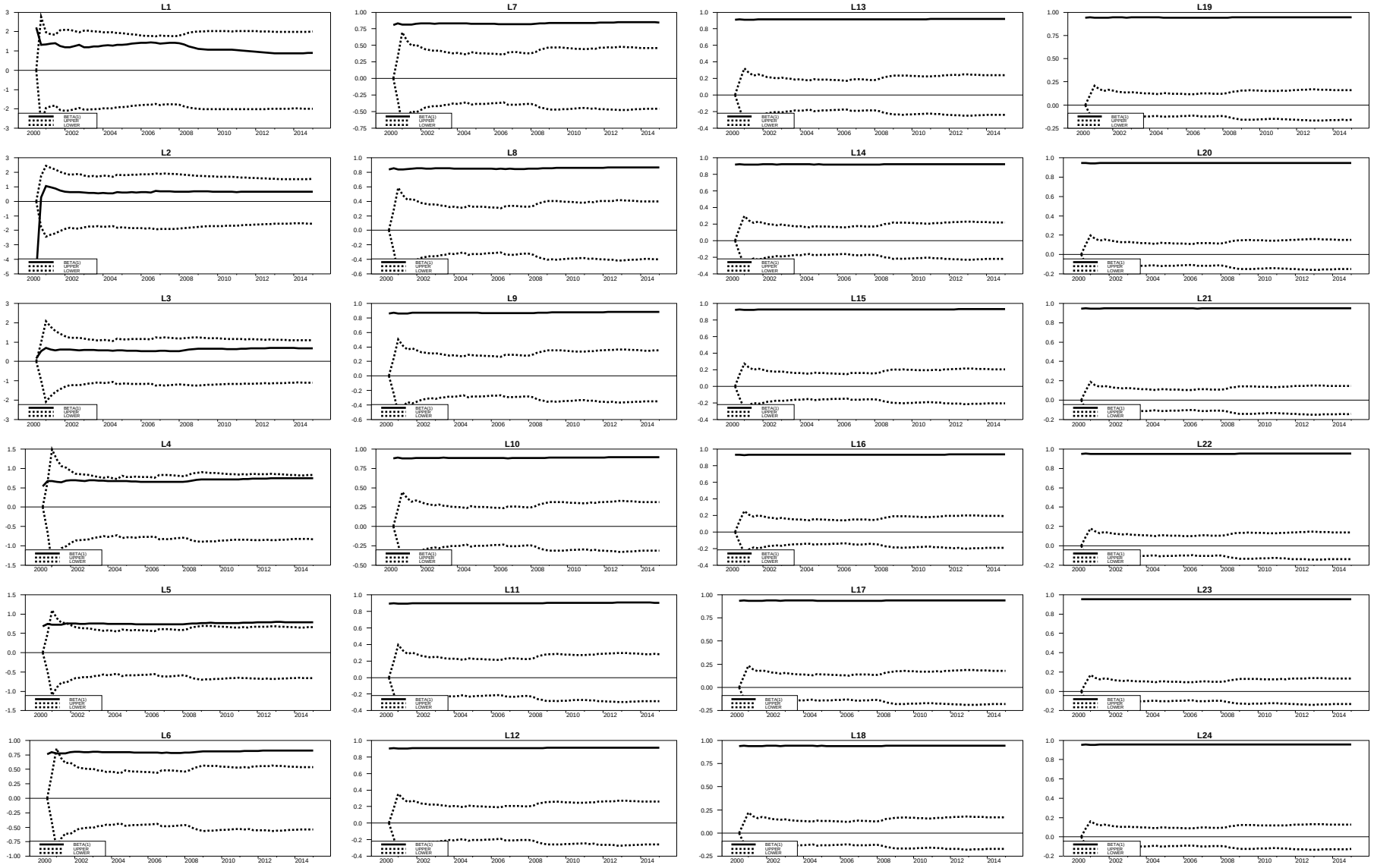

Figure 13: Recurve Estimation of the Mincer and Zarnowitz Regression for Real Government Consumption Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

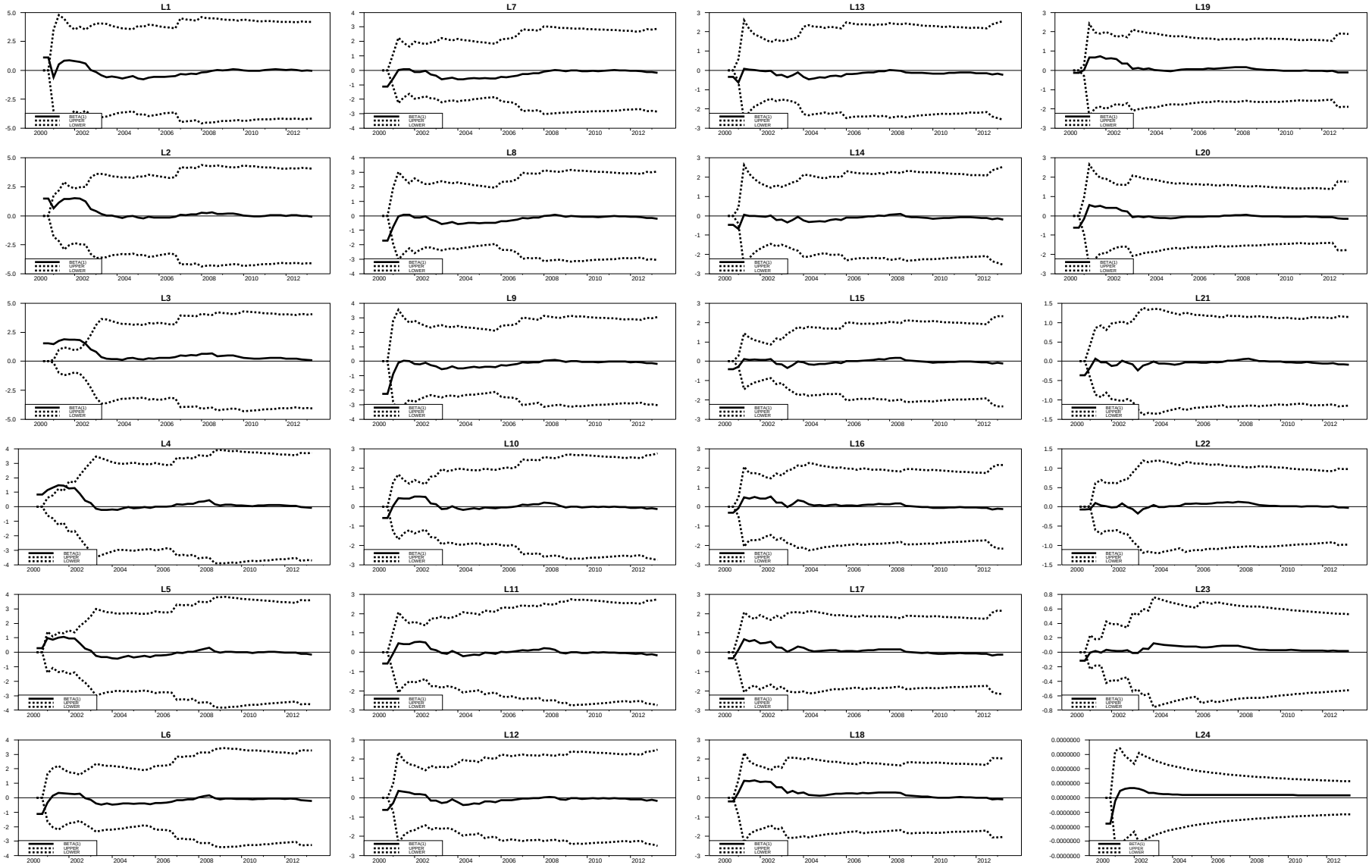

Figure 14: Recurve Estimation of the Nordhaus Regression for Real Government Consumption Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

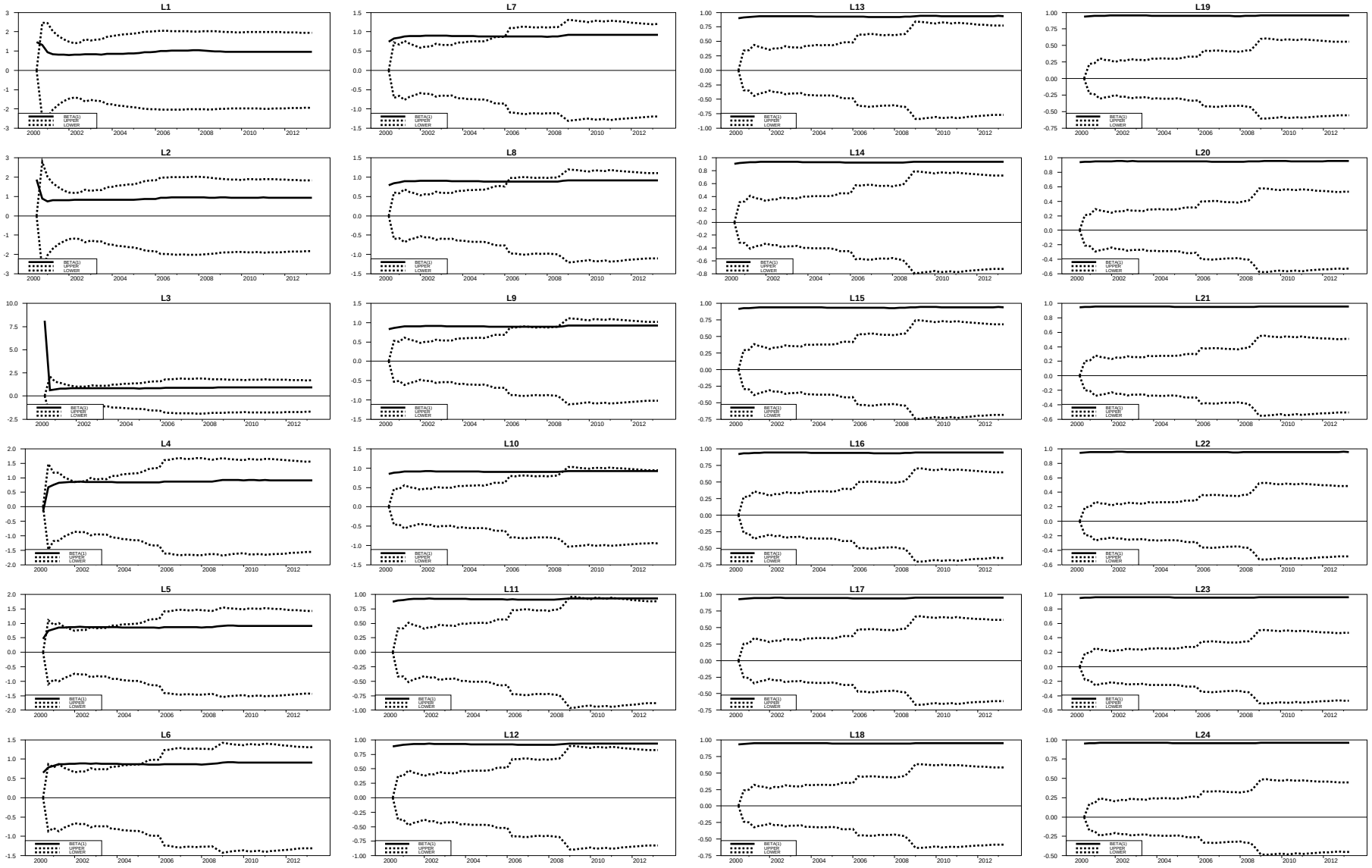

Figure 15: Recurve Estimation of the Mincer and Zarnowitz Regression for Real Government Consumption Revision Errors with Final Release Equals Last Known Release

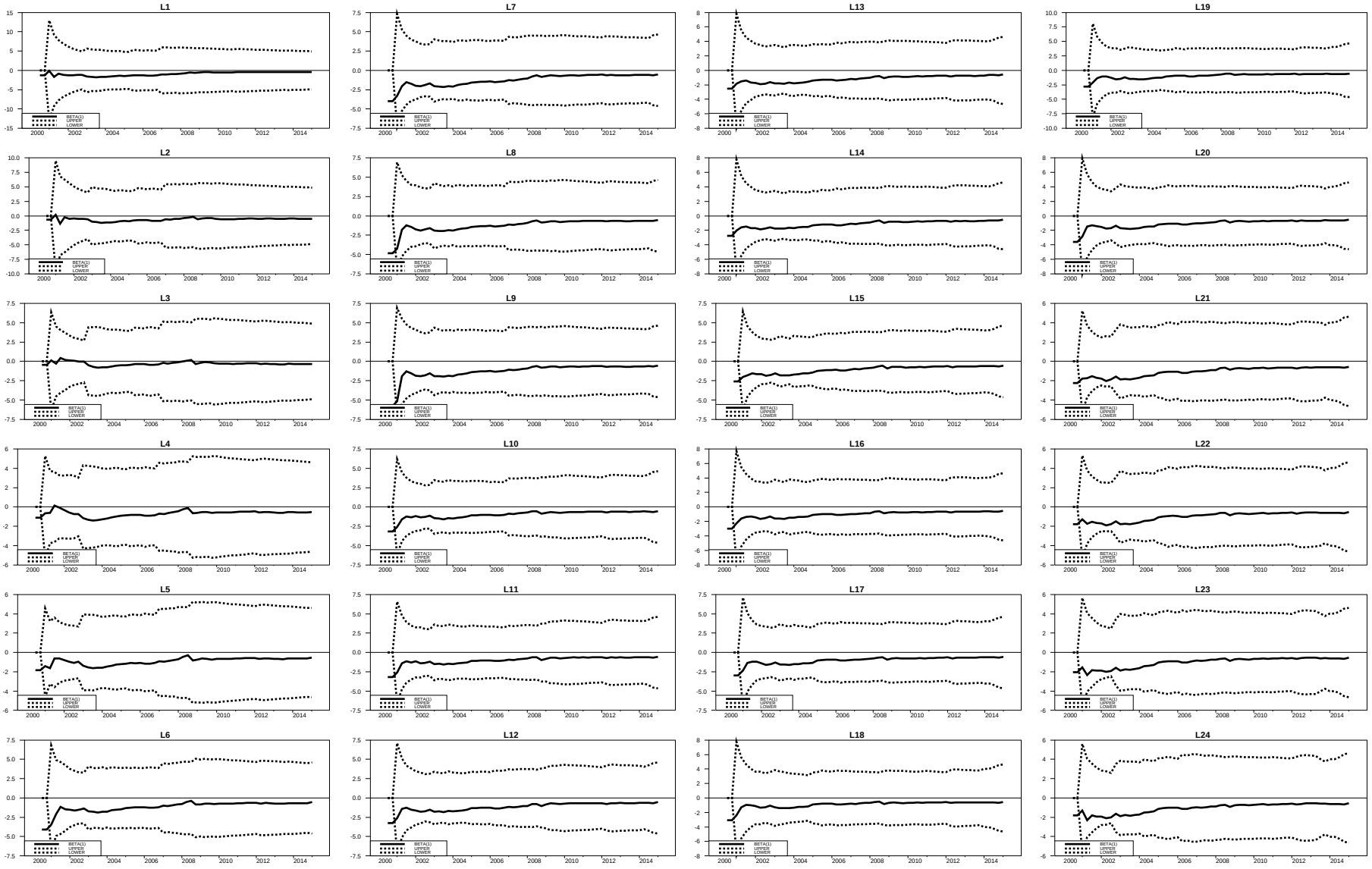

Figure 16: Recurve Estimation of the Nordhaus Regression for Real Government Consumption Revision Errors with Final Release Equals Last Known Release

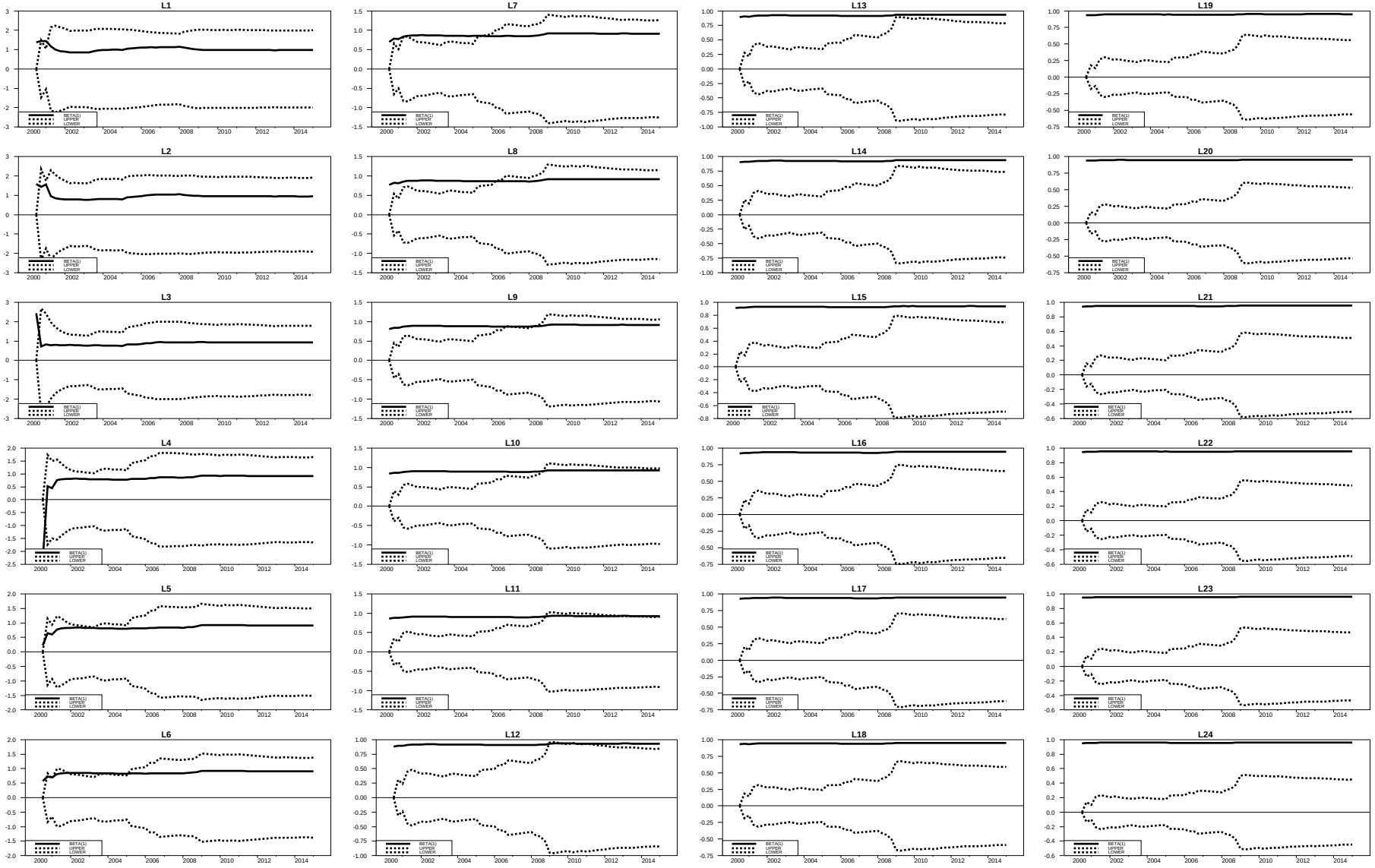

Figure 17: Recurve Estimation of the Mincer and Zarnowitz Regression for Real Investment Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

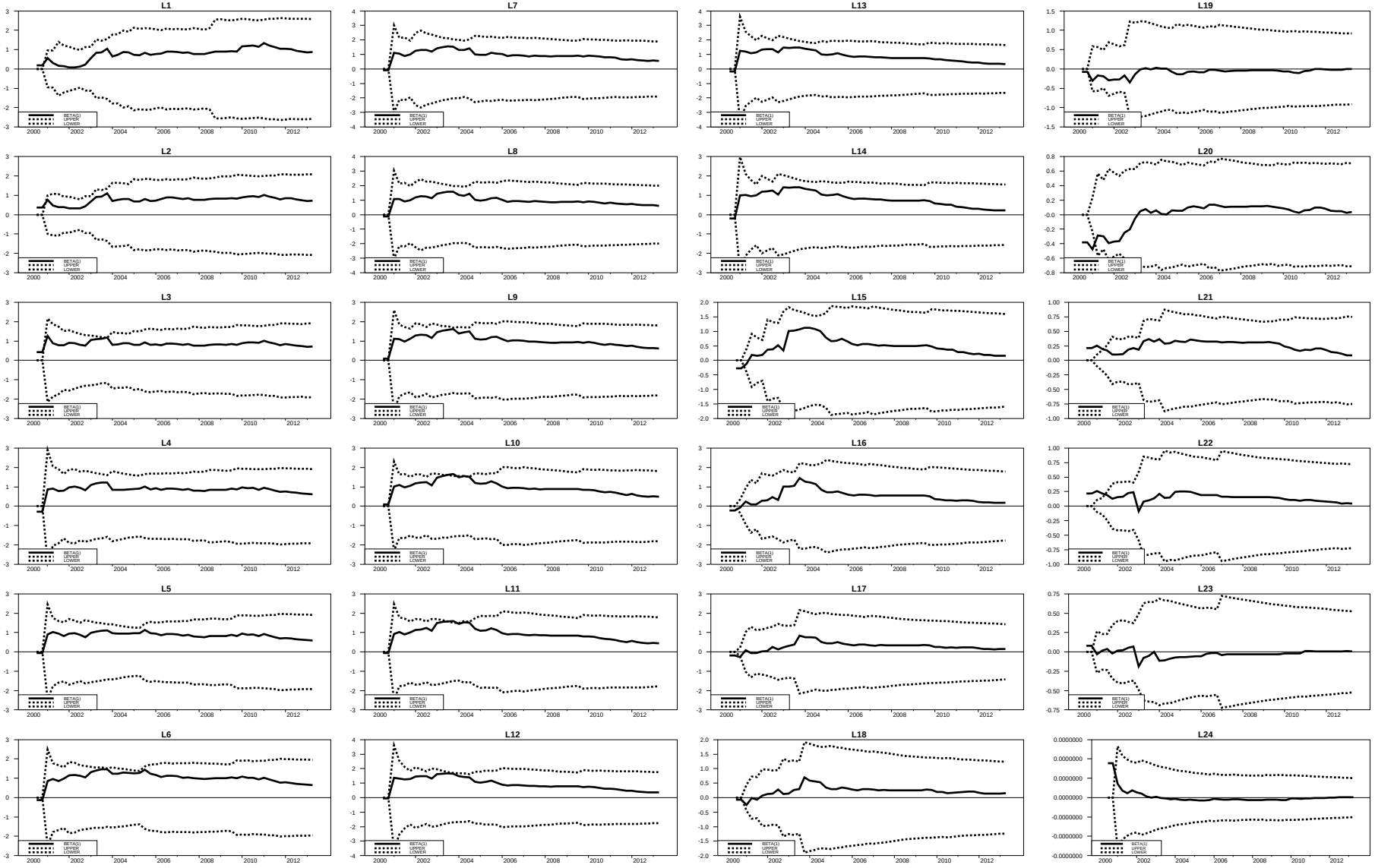

Figure 18: Recurve Estimation of the Nordhaus Regression for Real Investment Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

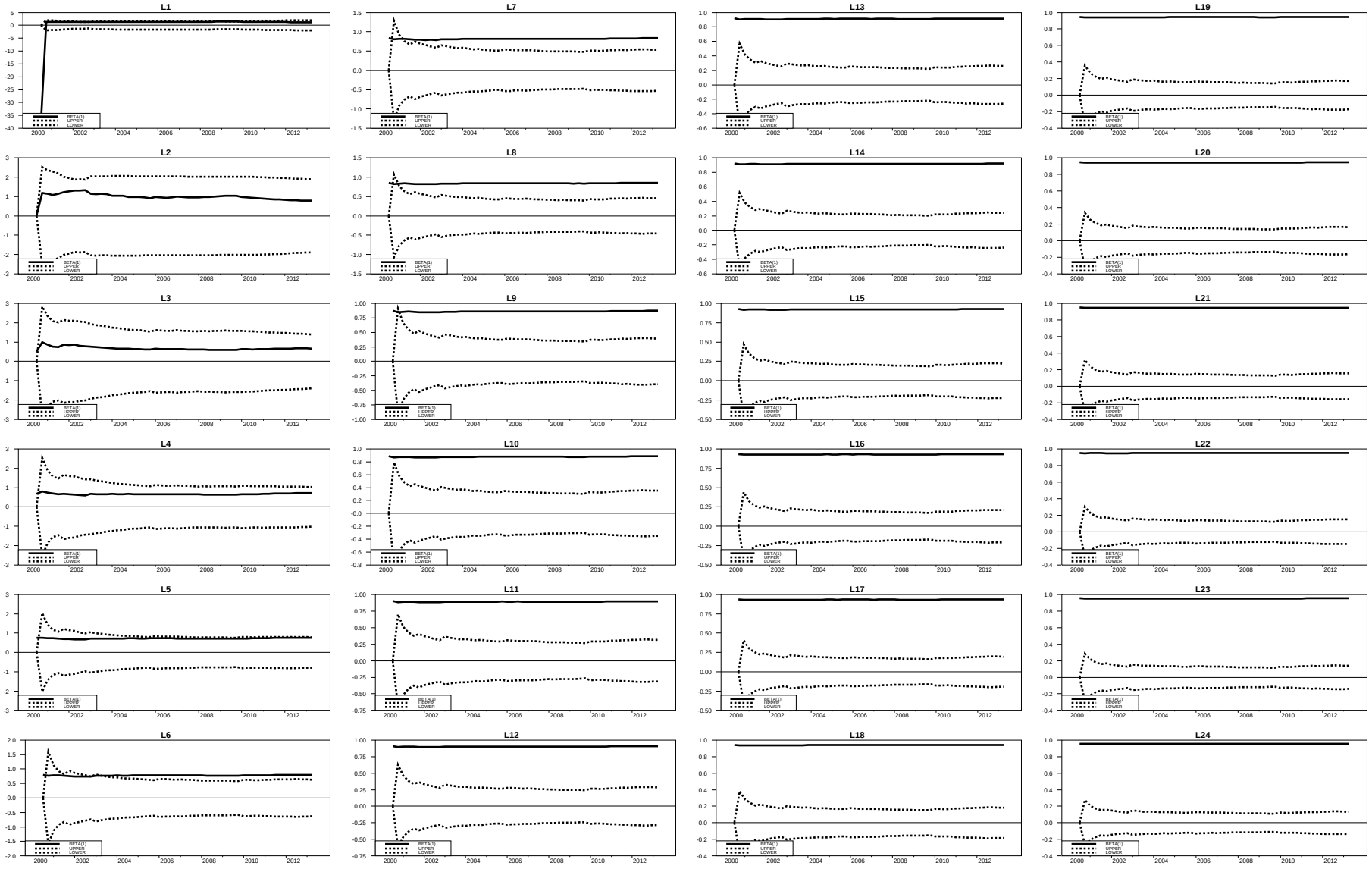

Figure 19: Recurve Estimation of the Mincer and Zarnowitz Regression for Real Investment Revision Errors with Final Release Equals Last Known Release

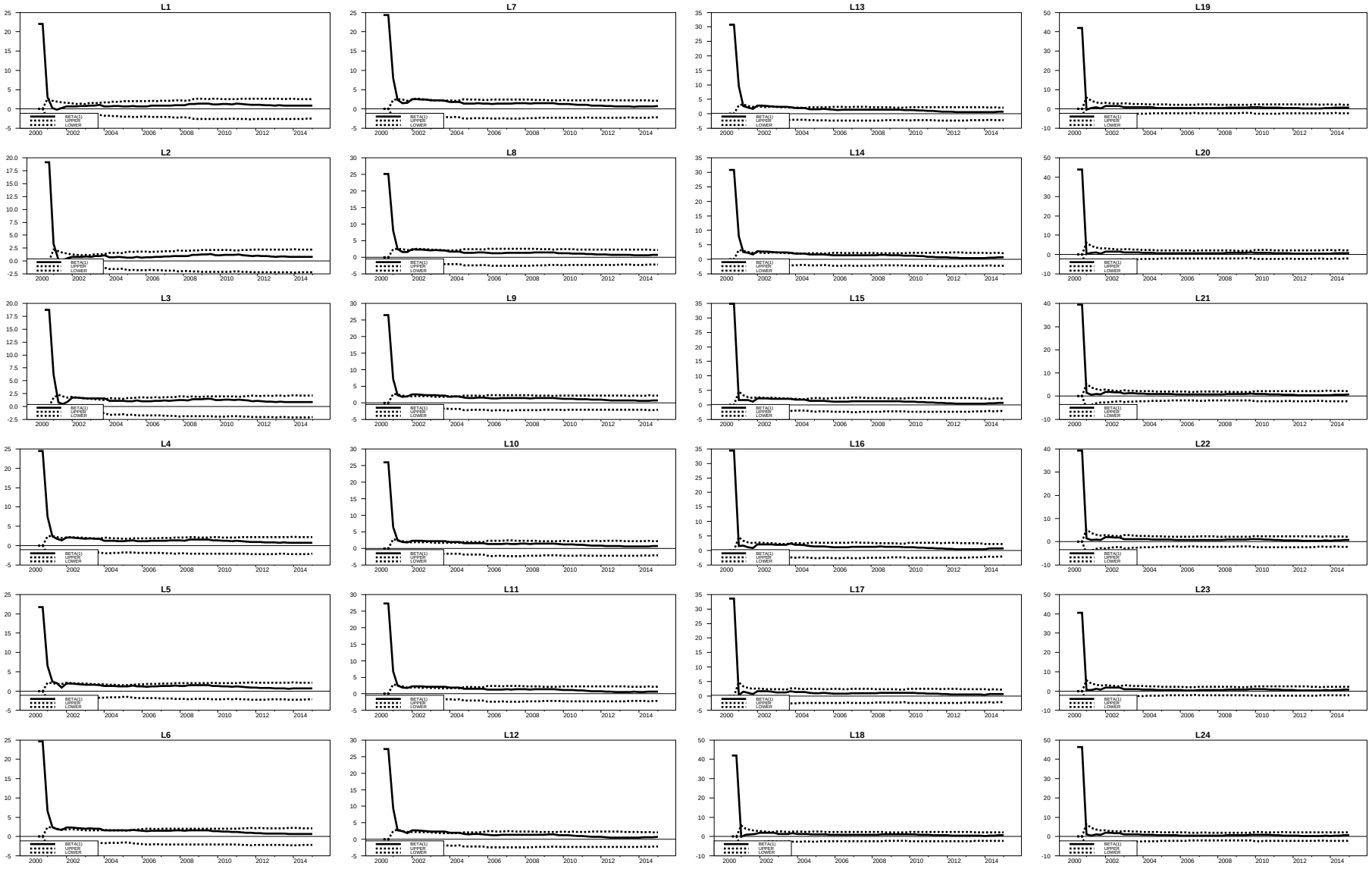

Figure 20: Recurve Estimation of the Nordhaus Regression for Real Investment Revision Errors with Final Release Equals Last Known Release

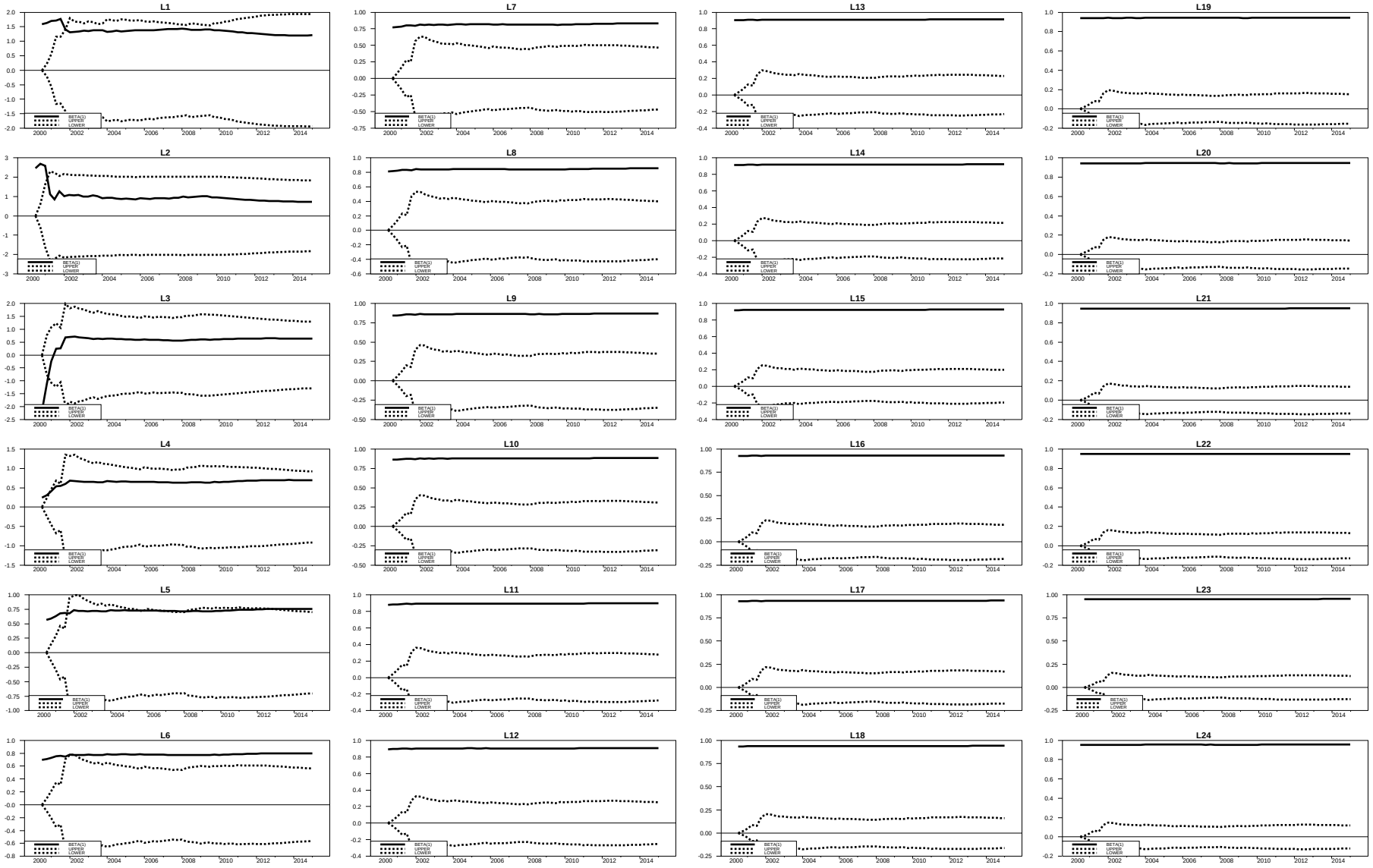

Figure 21: Recurve Estimation of the Mincer and Zarnowitz Regression for Real Net Exports Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

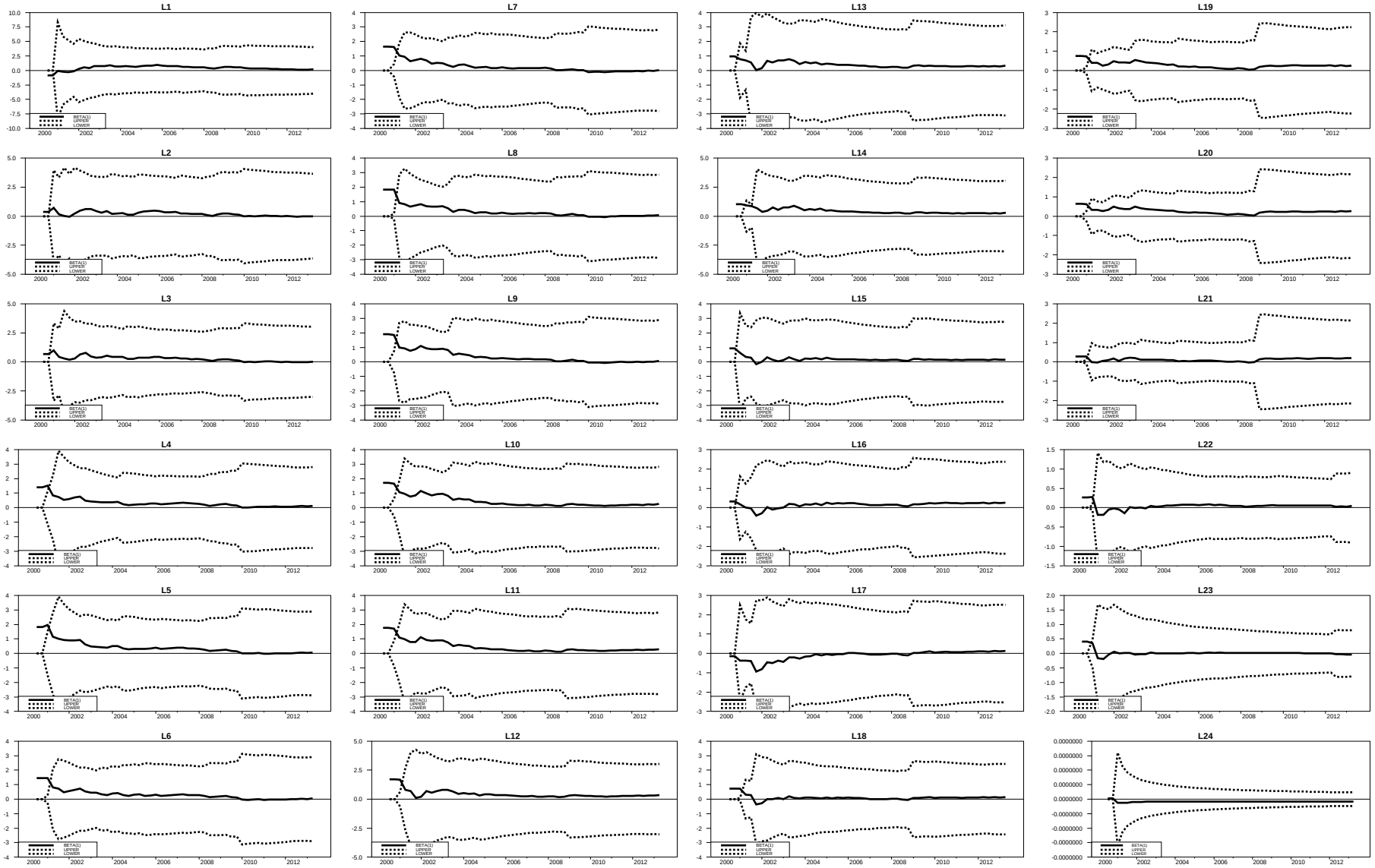

Figure 22: Recurve Estimation of the Nordhaus Regression for Real Net Exports Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

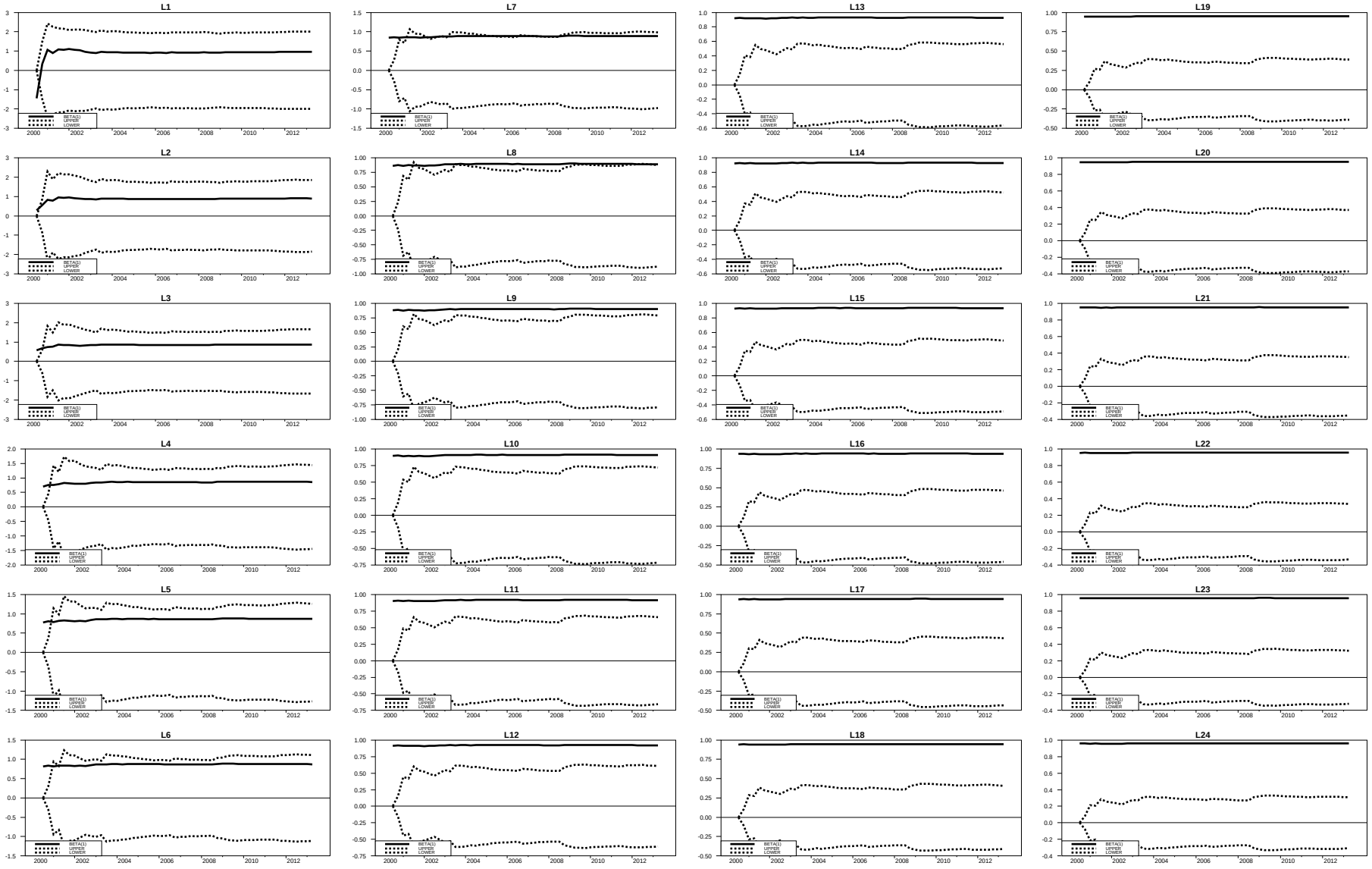

Figure 23: Recurve Estimation of the Mincer and Zarnowitz Regression for Real Net Exports Revision Errors with Final Release Equals Last Known Release

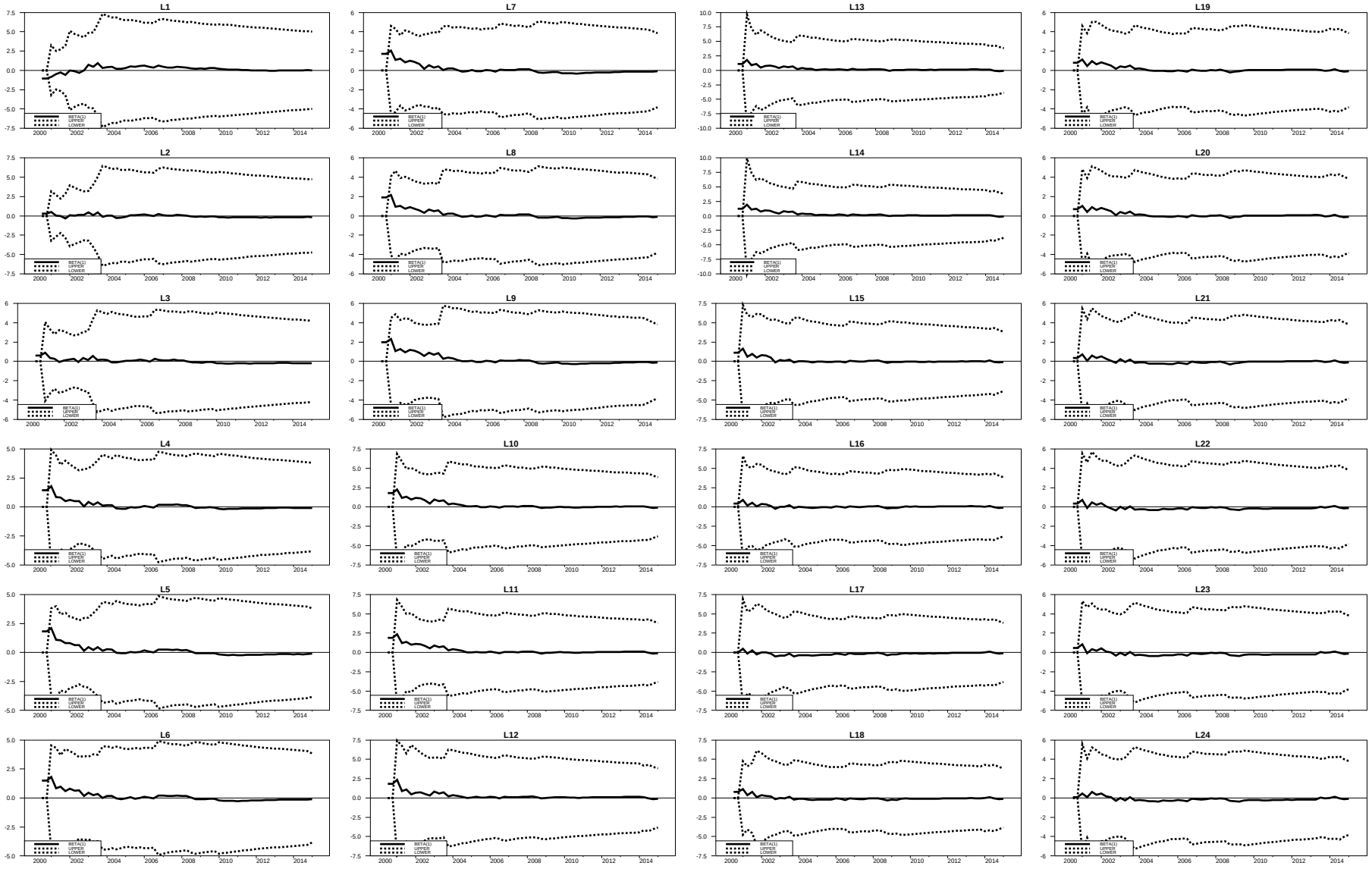

Figure 24: Recurve Estimation of the Nordhaus Regression for Real Net Exports Revision Errors with Final Release Equals Last Known Release

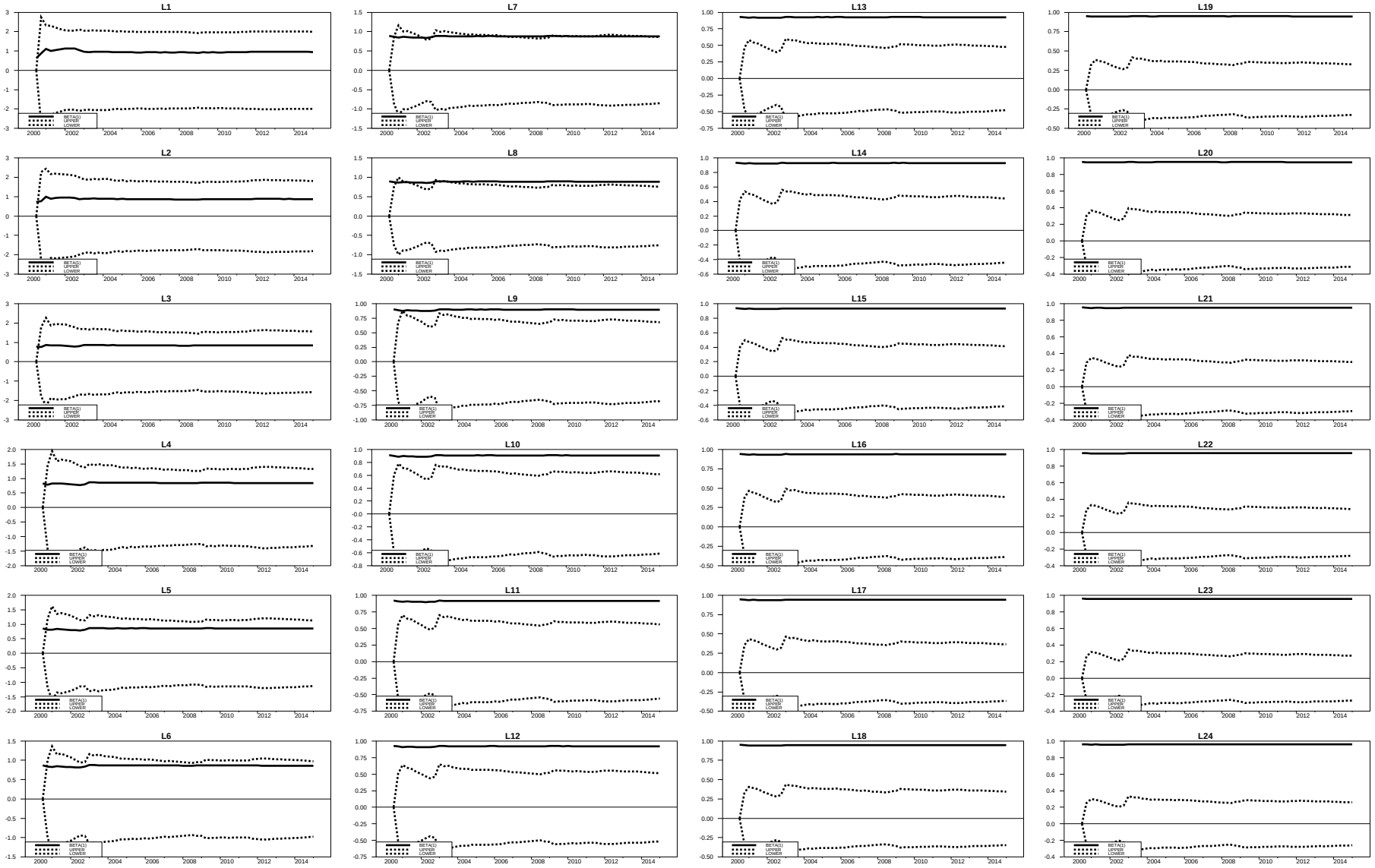

Figure 25: Recurve Estimation of the Mincer and Zarnowitz Regression for Real Value Added Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

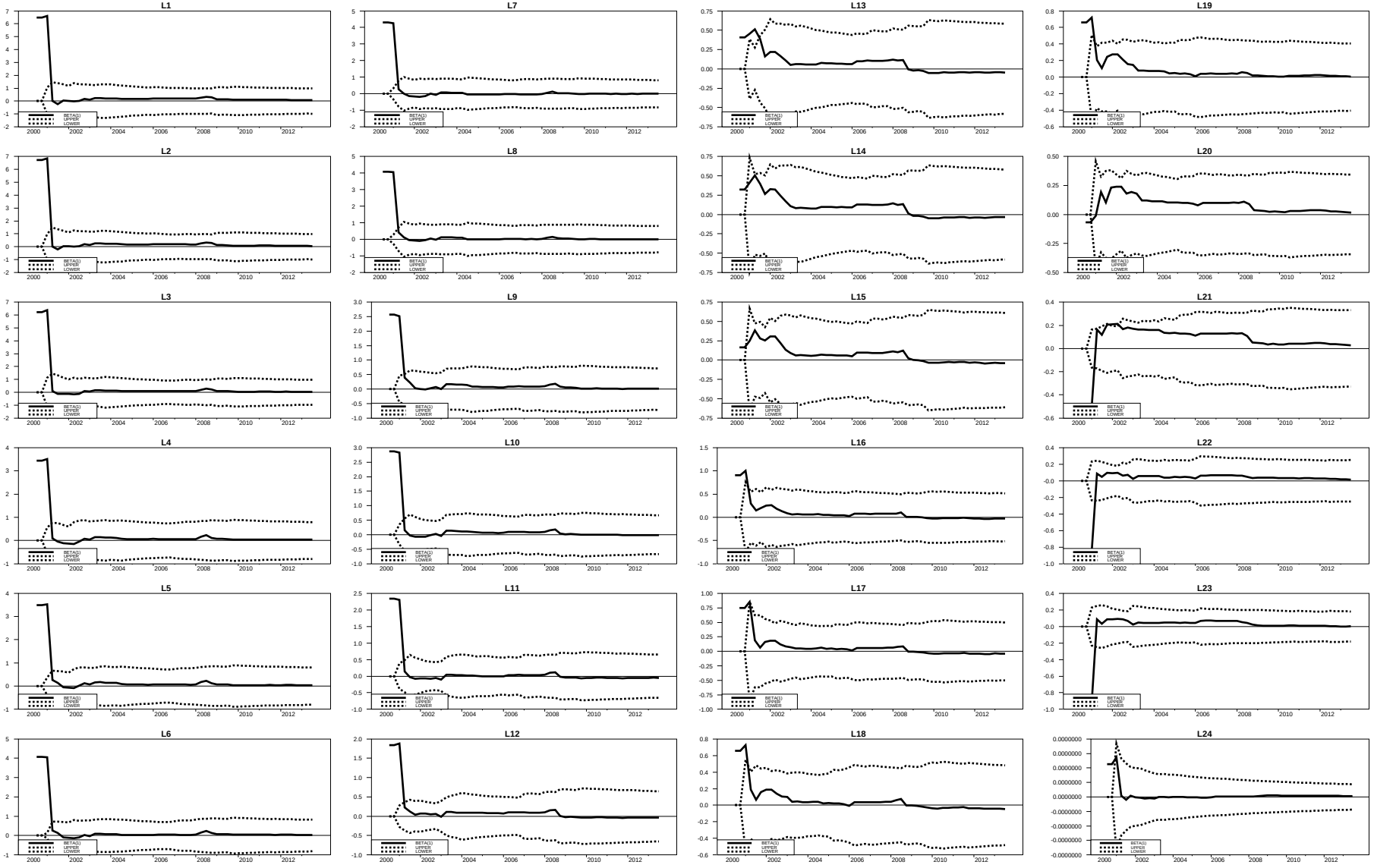

Figure 26: Recurve Estimation of the Nordhaus Regression for Real Value Added Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

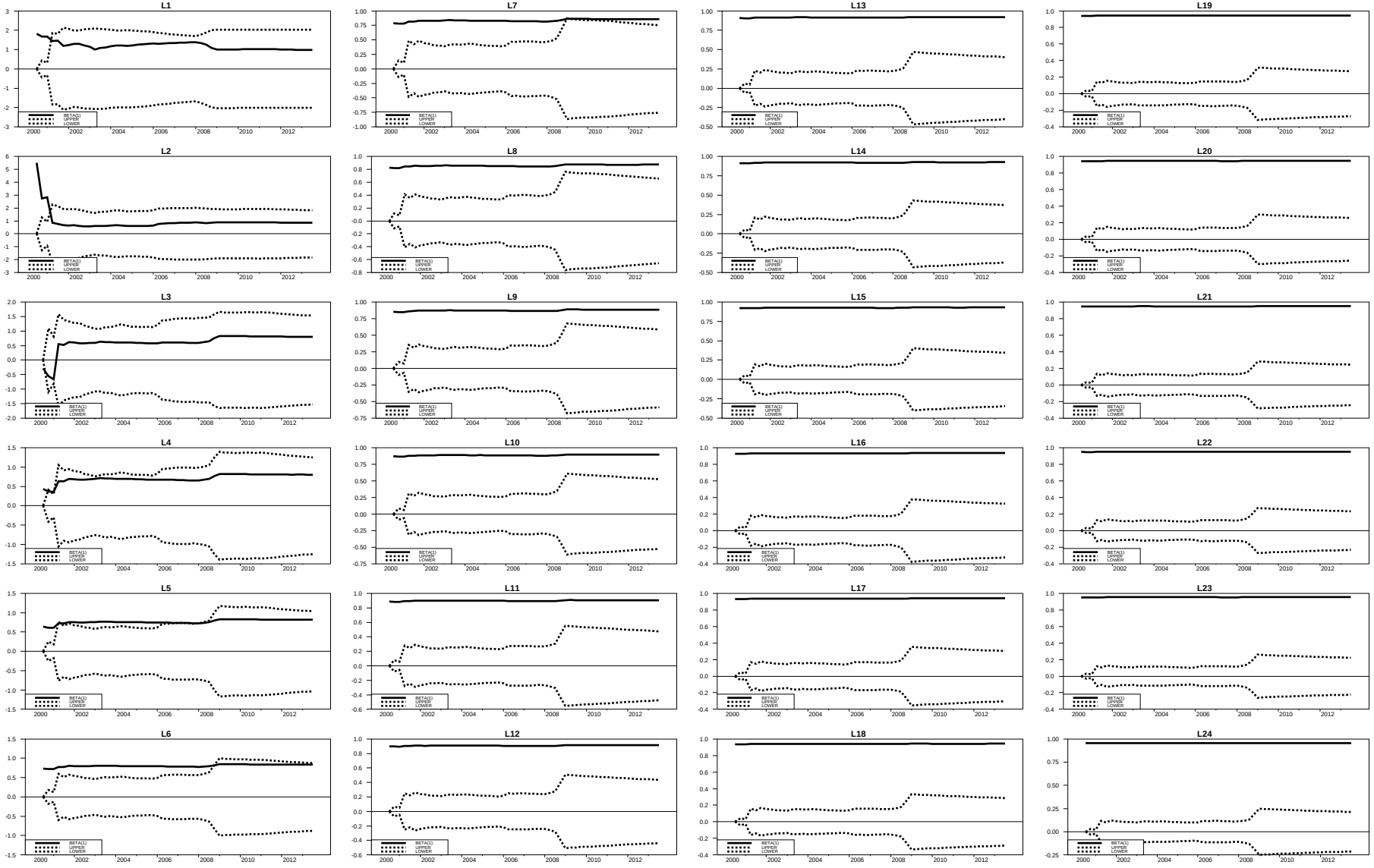

Figure 27: Recurve Estimation of the Mincer and Zarnowitz Regression for Real Value Added Revision Errors with Final Release Equals Last Known Release

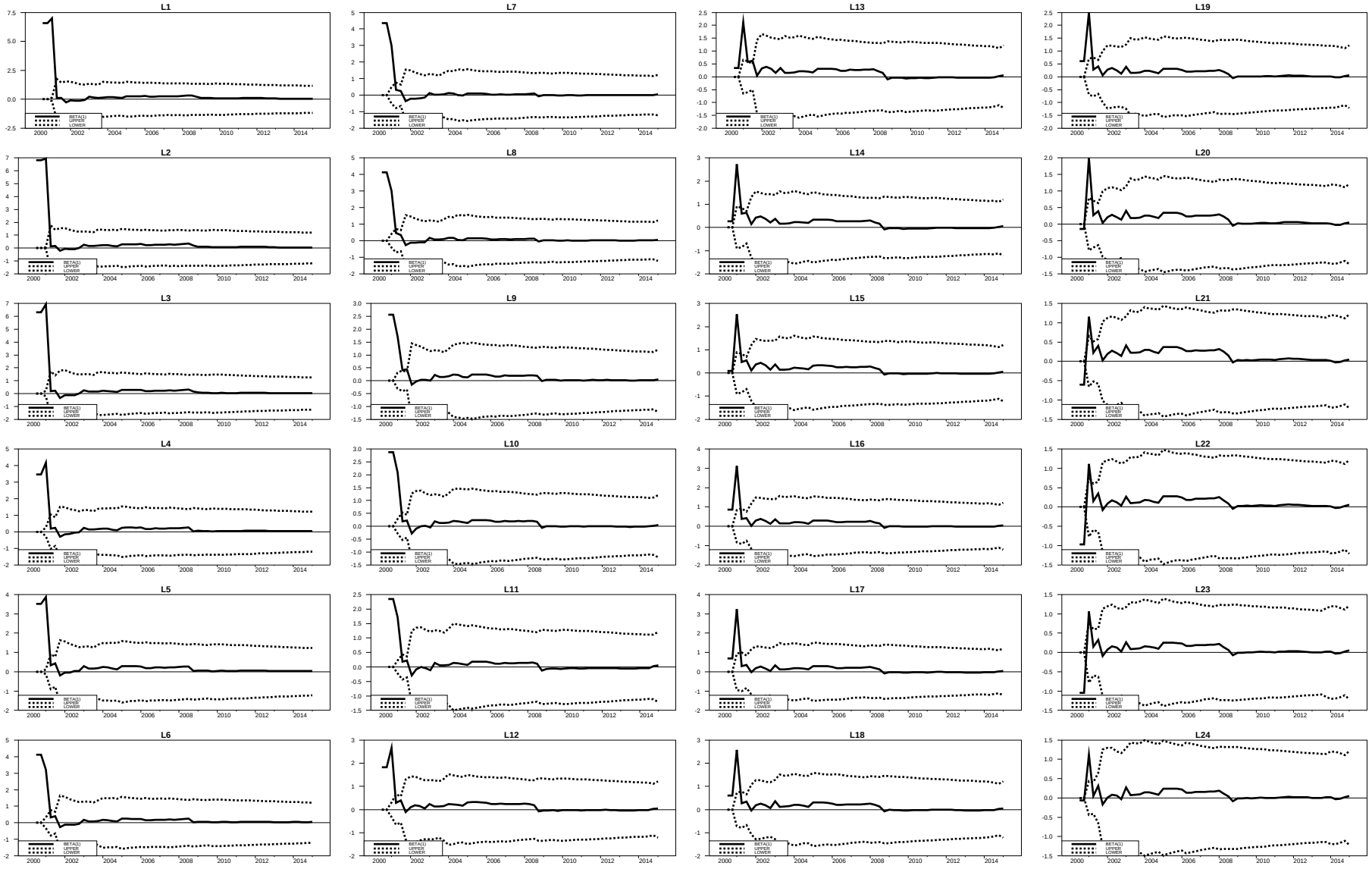

Figure 28: Recurve Estimation of the Nordhaus Regression for Real Value Added Revision Errors with Final Release Equals Last Known Release

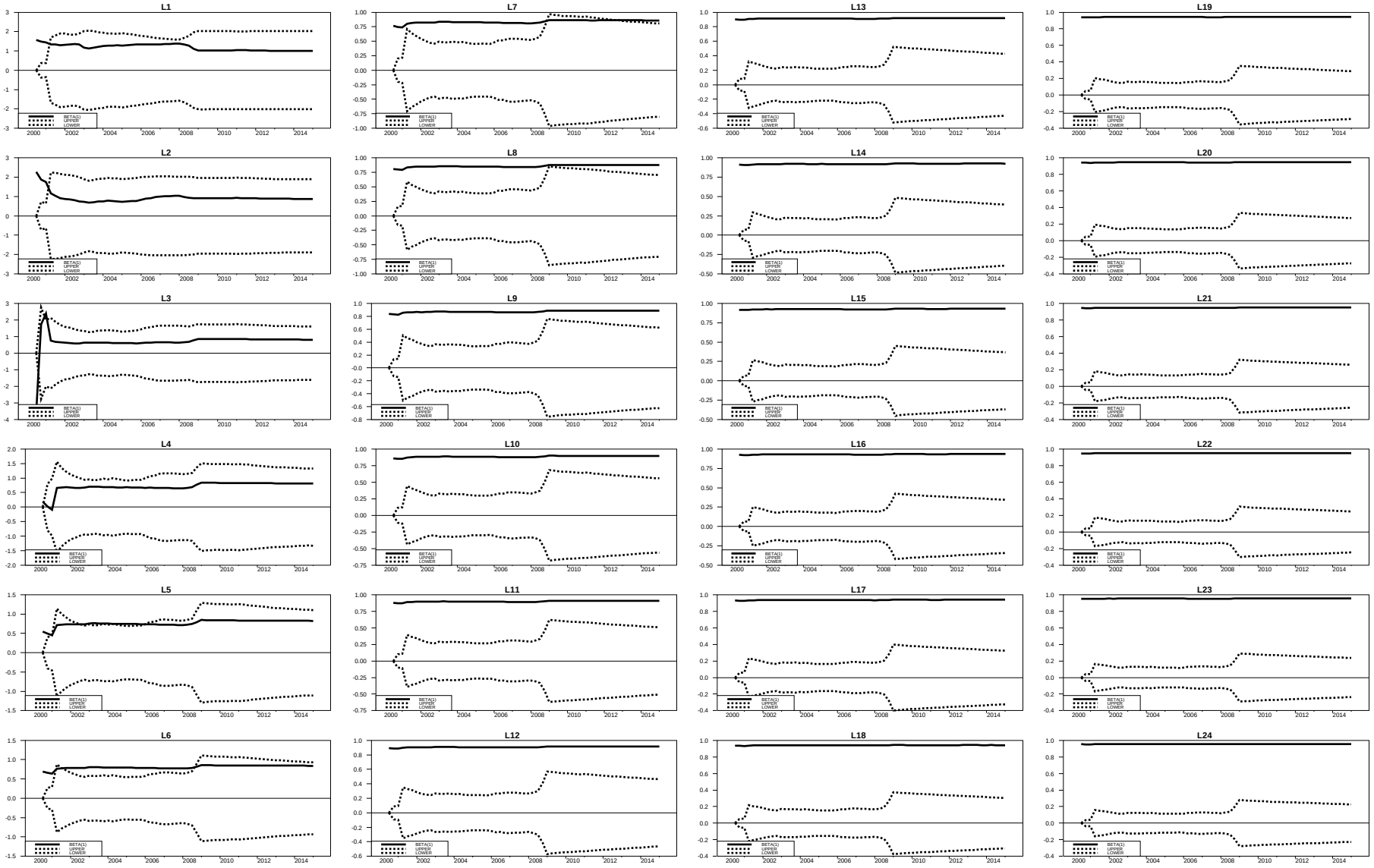

Figure 29: Recurve Estimation of the Mincer and Zarnowitz Regression for Nominal Value Added Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

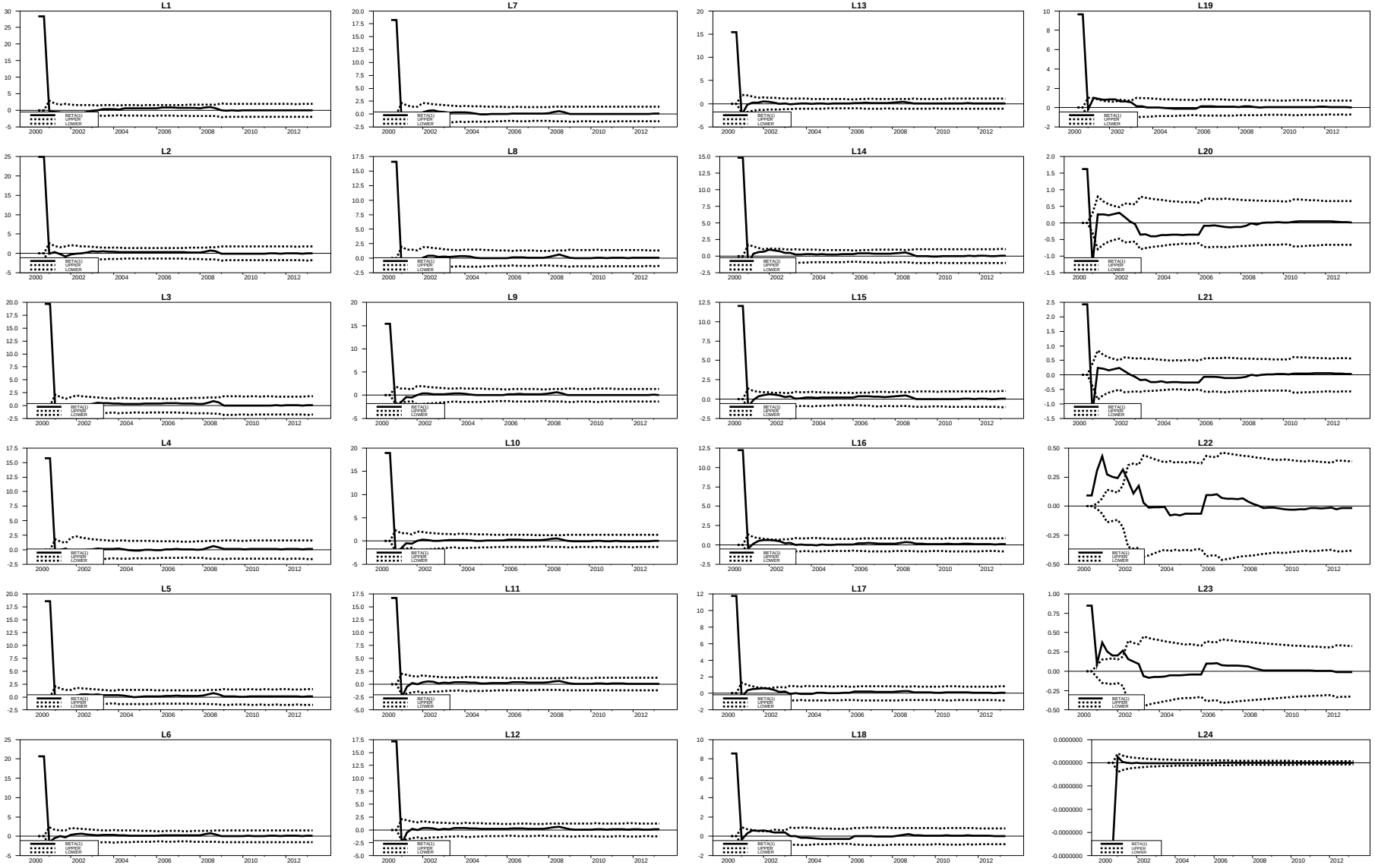

Figure 30: Recurve Estimation of the Nordhaus Regression for Nominal Value Added Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

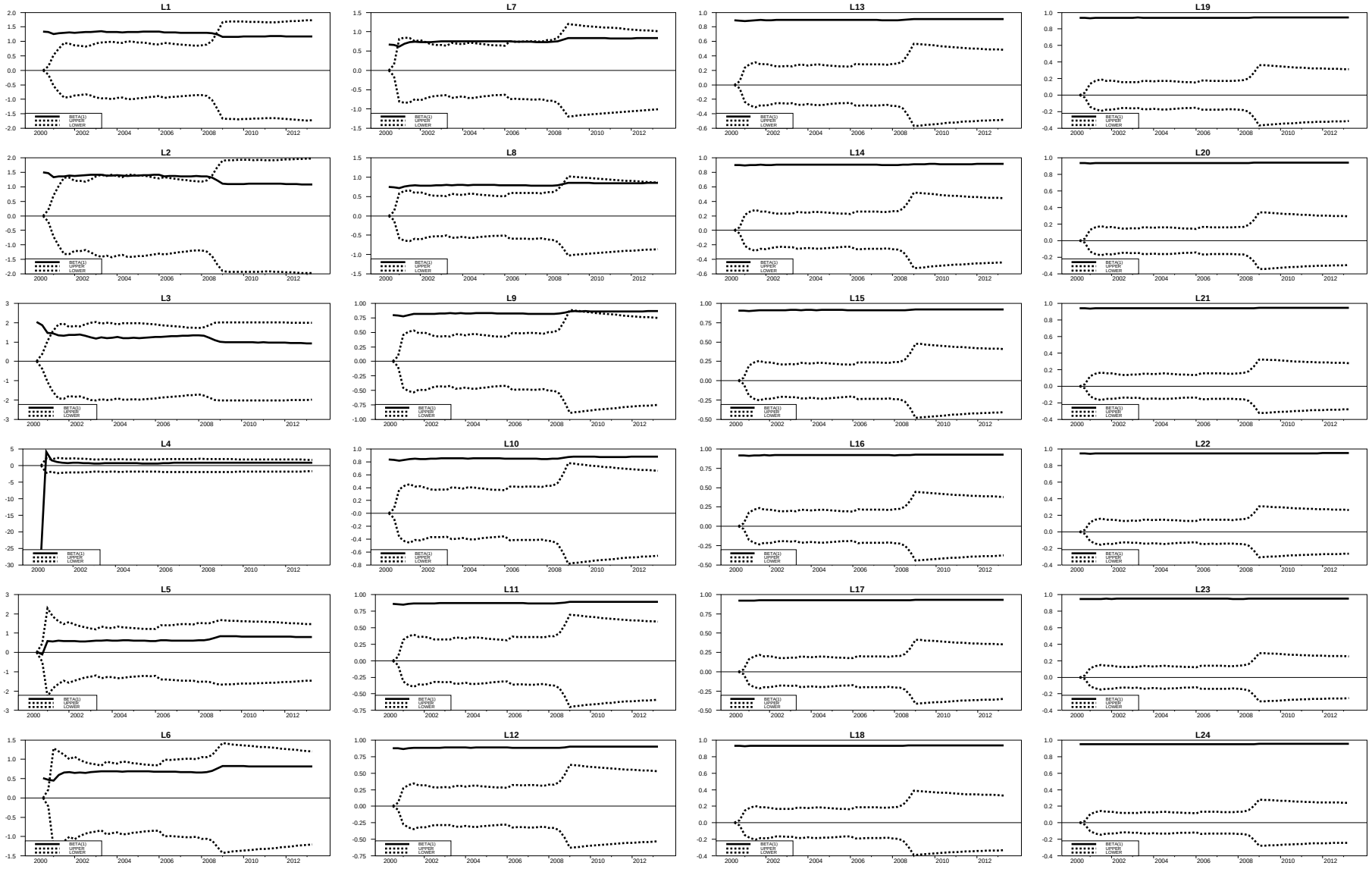

Figure 31: Recurve Estimation of the Mincer and Zarnowitz Regression for Nominal Value Added Revision Errors with Final Release Equals Last Known Release

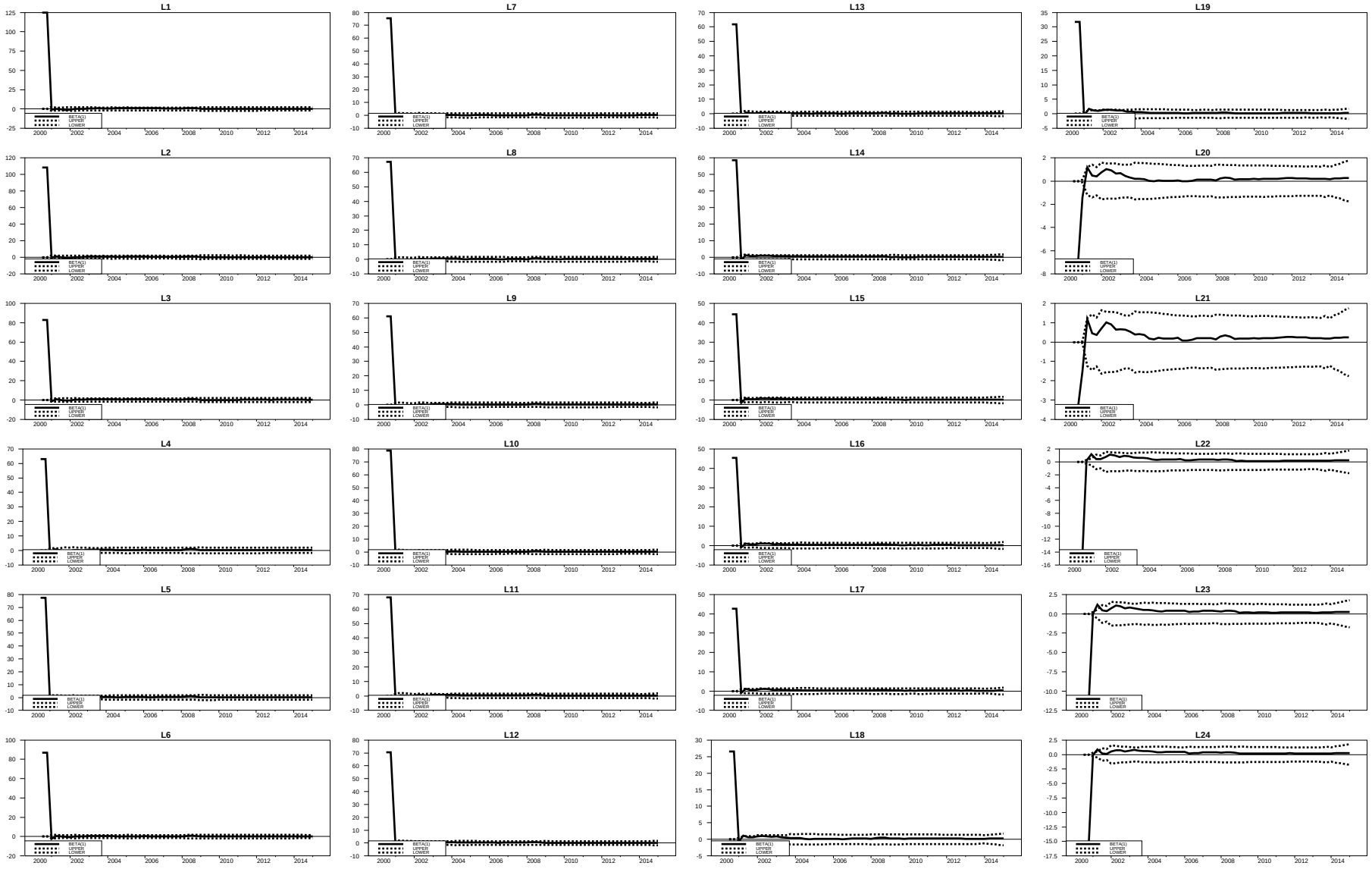

Figure 32: Recurve Estimation of the Nordhaus Regression for Nominal Value Added Revision Errors with Final Release Equals Last Known Release

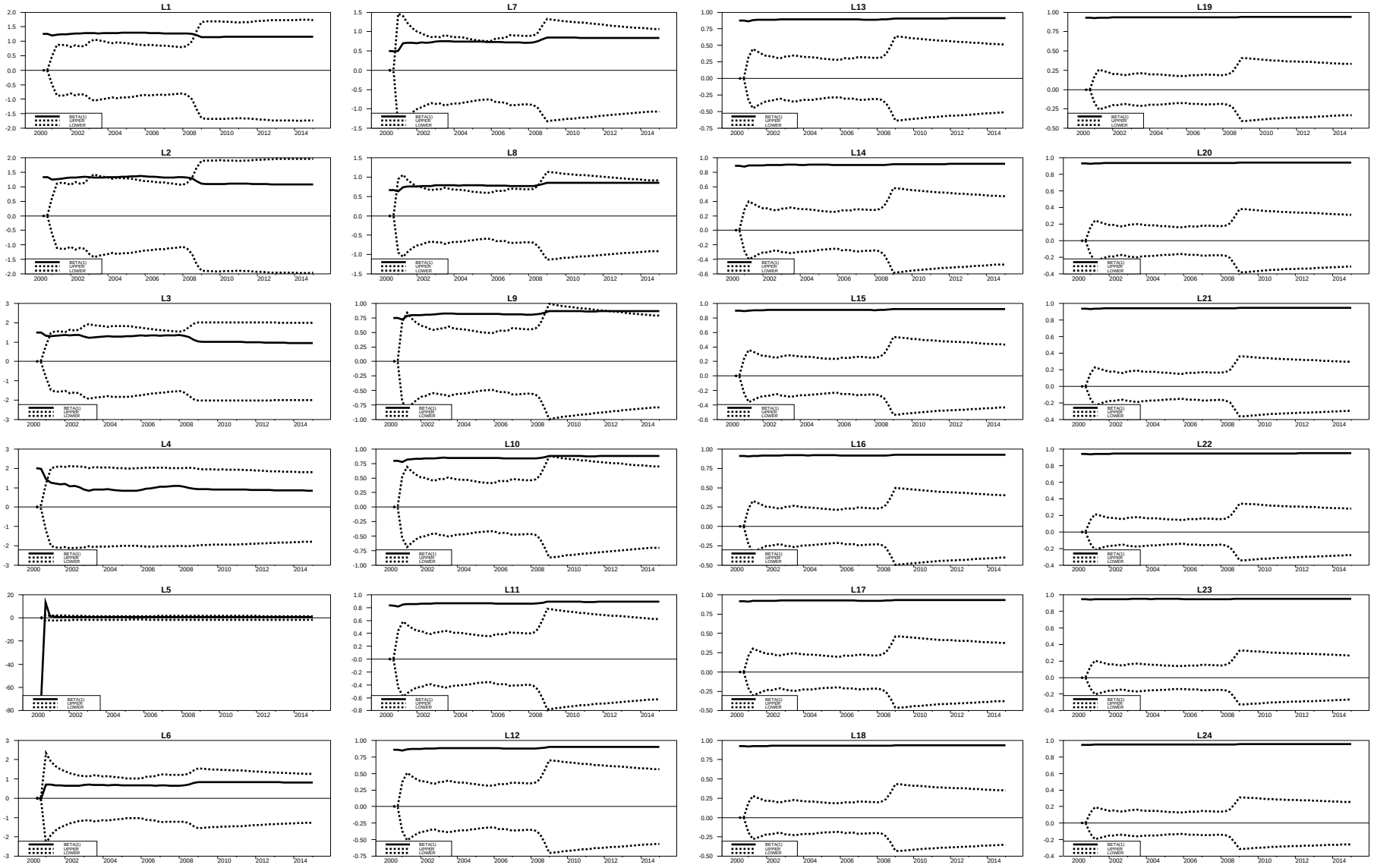

Table 58: Structural Breaks Tests for Real GDP Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

Vintage	Test	Full sample		2000:3 - 2006:4 sample		2007:1-2015:1 sample	
L1	J-B	2.93	(0.23)	0.98	(0.61)	1.56	(0.46)
	A-P	1.32	(0.37)	1.73	(0.24)	2.53	(0.10)
	A-Q	6.93	(0.30)	5.43	(0.49)	10.11	(0.09)
	Breakpoint	2008:04		2001:02		2008:04	
L2	J-B	3.86	(0.15)	0.88	(0.65)	1.55	(0.46)
	A-P	1.56	(0.29)	1.99	(0.18)	2.42	(0.11)
	A-Q	8.11	(0.20)	5.98	(0.41)	9.66	(0.11)
	Breakpoint	2008:04		2003:02		2008:04	
L3	J-B	2.87	(0.24)	0.74	(0.69)	1.24	(0.54)
	A-P	1.34	(0.37)	1.82	(0.22)	2.12	(0.16)
	A-Q	6.24	(0.38)	5.55	(0.47)	8.07	(0.20)
	Breakpoint	2009:02		2003:02		2008:04	
L4	J-B	1.97	(0.37)	0.02	(0.99)	0.79	(0.67)
	A-P	1.01	(0.52)	0.78	(0.66)	1.54	(0.30)
	A-Q	5.66	(0.46)	3.39	(0.83)	5.77	(0.44)
	Breakpoint	2009:02		2001:02		2008:03	
L5	J-B	2.41	(0.30)	0.06	(0.97)	0.93	(0.63)
	A-P	0.94	(0.56)	0.80	(0.65)	1.50	(0.31)
	A-Q	5.51	(0.48)	3.35	(0.84)	6.15	(0.39)
	Breakpoint	2009:02		2003:02		2008:03	
L6	J-B	1.22	(0.54)	0.19	(0.91)	0.33	(0.85)
	A-P	0.99	(0.53)	0.82	(0.63)	1.62	(0.27)
	A-Q	5.22	(0.52)	3.44	(0.82)	6.19	(0.39)
	Breakpoint	2009:02		2001:02		2008:03	
L7	J-B	0.20	(0.90)	0.45	(0.80)	0.63	(0.73)
	A-P	1.32	(0.38)	1.01	(0.52)	1.51	(0.30)
	A-Q	5.65	(0.46)	4.67	(0.61)	5.59	(0.47)
	Breakpoint	2009:02		2001:02		2009:02	
L8	J-B	0.01	(0.99)	0.98	(0.61)	0.32	(0.85)
	A-P	1.39	(0.35)	1.36	(0.36)	1.77	(0.23)
	A-Q	6.52	(0.35)	5.25	(0.52)	6.38	(0.36)
	Breakpoint	2009:02		2001:02		2009:02	
L9	J-B	0.12	(0.94)	0.04	(0.98)	0.42	(0.81)
	A-P	1.55	(0.29)	1.11	(0.47)	1.69	(0.25)
	A-Q	7.51	(0.25)	5.72	(0.45)	6.12	(0.40)
	Breakpoint	2009:02		2001:02		2009:02	
L10	J-B	0.12	(0.94)	0.09	(0.95)	0.05	(0.97)
	A-P	1.38	(0.35)	0.48	(0.88)	1.65	(0.26)
	A-Q	6.69	(0.33)	2.93	(0.90)	5.50	(0.48)
	Breakpoint	2009:02		2001:02		2009:02	
L11	J-B	0.13	(0.94)	0.37	(0.83)	0.37	(0.83)
	A-P	1.05	(0.50)	0.64	(0.75)	1.48	(0.31)
	A-Q	5.35	(0.50)	4.09	(0.71)	5.21	(0.53)
	Breakpoint	2009:03		2001:02		2008:03	
L12	J-B	0.27	(0.87)	1.20	(0.55)	0.68	(0.71)
	A-P	0.97	(0.54)	0.80	(0.65)	1.33	(0.37)
	A-Q	5.13	(0.54)	4.39	(0.66)	5.14	(0.54)
	Breakpoint	2009:03		2001:03		2008:03	
L13	J-B	1.44	(0.49)	0.22	(0.89)	1.46	(0.48)
	A-P	0.44	(0.91)	0.38	(0.95)	1.04	(0.51)
	A-Q	3.44	(0.82)	3.19	(0.86)	4.49	(0.64)
	Breakpoint	2009:02		2006:01		2012:02	
L14	J-B	1.42	(0.49)	2.01	(0.37)	1.20	(0.55)
	A-P	0.49	(0.87)	0.33	(0.98)	1.19	(0.43)
	A-Q	3.36	(0.83)	1.58	(1.00)	5.08	(0.55)
	Breakpoint	2009:02		2001:03		2012:02	
L15	J-B	0.10	(0.95)	2.80	(0.25)	1.16	(0.56)
	A-P	0.64	(0.76)	0.74	(0.68)	1.50	(0.31)
	A-Q	3.64	(0.79)	2.56	(0.94)	5.84	(0.43)
	Breakpoint	2009:02		2004:03		2012:02	
L16	J-B	0.80	(0.67)	0.38	(0.83)	0.59	(0.74)
	A-P	0.48	(0.87)	0.49	(0.87)	1.95	(0.19)
	A-Q	2.97	(0.89)	2.28	(0.97)	8.20	(0.19)
	Breakpoint	2011:03		2004:03		2012:02	
L17	J-B	0.84	(0.66)	0.43	(0.81)	0.85	(0.65)
	A-P	0.52	(0.85)	0.31	(0.99)	1.34	(0.37)
	A-Q	2.67	(0.93)	2.45	(0.96)	6.21	(0.39)
	Breakpoint	2009:02		2004:03		2008:03	
L18	J-B	0.97	(0.62)	0.93	(0.63)	0.77	(0.68)
	A-P	0.58	(0.80)	0.75	(0.68)	1.37	(0.36)
	A-Q	3.09	(0.87)	4.47	(0.65)	6.41	(0.36)
	Breakpoint	2009:02		2004:03		2008:03	
L19	J-B	0.58	(0.75)	1.11	(0.58)	0.25	(0.88)
	A-P	0.47	(0.89)	0.57	(0.80)	1.47	(0.32)
	A-Q	2.47	(0.95)	3.03	(0.88)	6.97	(0.30)
	Breakpoint	2005:04		2005:01		2012:03	
L20	J-B	0.99	(0.61)	1.98	(0.37)	0.29	(0.87)
	A-P	0.72	(0.70)	0.68	(0.73)	1.47	(0.32)
	A-Q	4.06	(0.72)	2.52	(0.95)	7.49	(0.25)
	Breakpoint	2005:04		2005:04		2012:03	
L21	J-B	0.10	(0.95)	1.36	(0.51)	0.09	(0.95)
	A-P	0.72	(0.70)	0.93	(0.56)	1.15	(0.45)
	A-Q	3.38	(0.83)	4.14	(0.70)	6.56	(0.34)
	Breakpoint	2005:04		2004:04		2012:03	
L22	J-B	17.49	(0.00)	0.56	(0.75)	53.36	(0.00)
	A-P	0.76	(0.67)	0.78	(0.66)	4.00	(0.02)
	A-Q	2.96	(0.89)	3.96	(0.73)	13.88	(0.02)
	Breakpoint	2008:01		2005:01		2012:03	
L23	J-B	101.94	(0.00)	11.02	(0.00)	457.95	(0.00)
	A-P	0.56	(0.81)	0.52	(0.84)	3.41	(0.04)
	A-Q	3.44	(0.82)	2.15	(0.98)	12.50	(0.03)
	Breakpoint	2003:01		2003:01		2007:04	

Note: J-B reports the results of Jarque and Bera (1987) normality test; A-P stands for the Andrews and Ploberger and A-Q for Andrews - Quandt structural break tests. P-values are in parentheses.

Table 59: Structural Breaks Tests for Real GDP Revision Errors with Final Release Equals Last Known Release

Vintage	Test	Full sample		2000:3 - 2006:4 sample		2007:1-2015:1 sample	
L1	J-P	328.91	(0.00)	0.53	(0.77)	71.68	(0.00)
	A-P	20.63	(0.00)	0.87	(0.60)	11.81	(0.00)
	A-Q	45.92	(0.00)	4.98	(0.56)	26.65	(0.00)
	Breakpoint	2011:04		2005:01		2011:04	
L2	J-P	325.32	(0.00)	0.46	(0.80)	70.88	(0.00)
	A-P	20.37	(0.00)	0.97	(0.54)	11.65	(0.00)
	A-Q	45.40	(0.00)	5.13	(0.54)	26.32	(0.00)
	Breakpoint	2011:04		2005:01		2011:04	
L3	J-P	318.26	(0.00)	0.23	(0.89)	69.28 (	0.00)
	A-P	20.30	(0.00)	0.78	(0.66)	11.63	(0.00)
	A-Q	45.29	(0.00)	4.22	(0.69)	26.32	(0.00)
	Breakpoint	2011:04		2005:01		2011:04	
L4	J-P	332.81	(0.00)	0.58	(0.75)	69.57 (	0.00)
	A-P	20.69	(0.00)	0.41	(0.93)	11.71	(0.00)
	A-Q	46.06	(0.00)	2.42	(0.96)	26.48	(0.00)
	Breakpoint	2011:04		2005:01		2011:04	
L5	J-P	362.72	(0.00)	0.49	(0.78)	75.63	(0.00)
	A-P	20.75	(0.00)	0.43	(0.92)	11.77	(0.00)
	A-Q	46.19	(0.00)	2.60	(0.94)	26.61	(0.00)
	Breakpoint	2011:04		2005:01		2011:04	
L6	J-P	355.22	(0.00)	0.46	(0.79)	70.15	(0.00)
	A-P	20.97	(0.00)	0.43	(0.91)	11.72	(0.00)
	A-Q	46.54	(0.00)	2.55	(0.95)	26.41	(0.00)
	Breakpoint	2011:04		2005:01		2011:04	
L7	J-P	381.38	(0.00)	0.33	(0.85)	72.18	(0.00)
	A-P	21.30	(0.00)	0.36	(0.96)	11.80	(0.00)
	A-Q	47.23	(0.00)	1.91	(0.99)	26.60	(0.00)
	Breakpoint	2011:04		2005:01		2011:04	
L8	J-P	365.20	(0.00)	0.40	(0.82)	66.18 (	0.00)
	A-P	21.34	(0.00)	0.40	(0.93)	11.65	(0.00)
	A-Q	47.26	(0.00)	1.89	(0.99)	26.23	(0.00)
	Breakpoint	2011:04		2005:01		2011:04	
L9	J-P	369.63	(0.00)	0.40	(0.82)	67.78	(0.00)
	A-P	21.41	(0.00)	0.41	(0.93)	11.66	(0.00)
	A-Q	47.40	(0.00)	2.80	(0.92)	26.26	(0.00)
	Breakpoint	2011:04		2001:03		2011:04	
L10	J-P	367.65	(0.00)	0.42	(0.81)	66.95 (	0.00)
	A-P	21.03	(0.00)	0.40	(0.94)	11.32	(0.00)
	A-Q	46.60	(0.00)	2.17	(0.98)	25.49	(0.00)
	Breakpoint	2011:04		2001:03		2011:04	
L11	J-P	384.77	(0.00)	0.39	(0.82)	70.38	(0.00)
	A-P	21.05	(0.00)	0.47	(0.88)	11.29	(0.00)
	A-Q	46.59	(0.00)	2.66	(0.93)	25.42	(0.00)
	Breakpoint	2011:04		2001:03		2011:04	
L12	J-P	386.20 (	0.00)	0.56	(0.75)	70.28	(0.00)
	A-P	21.01	(0.00)	0.46	(0.89)	11.31	(0.00)
	A-Q	46.51	(0.00)	2.68	(0.93)	25.44	(0.00)
	Breakpoint	2011:04		2001:03		2011:04	
L13	J-P	134.01	(0.00)	0.13	(0.94)	30.49 (	0.00)
	A-P	19.27	(0.00)	0.43	(0.92)	10.36	(0.00)
	A-Q	43.22	(0.00)	2.26	(0.97)	23.84	(0.00)
	Breakpoint	2011:04		2005:01		2011:04	
L14	J-P	140.31	(0.00)	0.09	(0.96)	31.41	(0.00)
	A-P	19.36	(0.00)	0.37	(0.96)	10.42	(0.00)
	A-Q	43.43	(0.00)	2.15	(0.98)	23.98	(0.00)
	Breakpoint	2011:04		2001:03		2011:04	
L15	J-P	138.33 (	0.00)	0.45	(0.80)	31.87	(0.00)
	A-P	19.27	(0.00)	0.36	(0.96)	10.38	(0.00)
	A-Q	43.24	(0.00)	2.27	(0.97)	23.88	(0.00)
	Breakpoint	2011:04		2005:01		2011:04	
L16	J-P	39.24	(0.00)	0.81	(0.67)	3.56	(0.17)
	A-P	16.94	(0.00)	0.43	(0.91)	9.07	(0.00)
	A-Q	38.96	(0.00)	2.45	(0.96)	21.58	(0.00)
	Breakpoint	2011:04		2005:01		2011:04	
L17	J-P	35.05	(0.00)	0.81	(0.67)	2.97	(0.23)
	A-P	16.99	(0.00)	0.44	(0.91)	9.09	(0.00)
	A-Q	39.06	(0.00)	2.66	(0.93)	21.62	(0.00)
	Breakpoint	2011:04		2005:01		2011:04	
L18	J-P	33.95	(0.00)	1.14	(0.57)	2.97	(0.23)
	A-P	16.88	(0.00)	0.53	(0.84)	9.12	(0.00)
	A-Q	38.85	(0.00)	2.97	(0.89)	21.67	(0.00)
	Breakpoint	2011:04		2005:01		2011:04	
L19	J-P	41.59	(0.00)	0.90	(0.64)	4.80	(0.09)
	A-P	16.24	(0.00)	0.46	(0.89)	8.42	(0.00)
	A-Q	37.31	(0.00)	2.78	(0.92)	20.33	(0.00)
	Breakpoint	2011:04		2005:01		2011:04	
L20	J-P	45.85	(0.00)	1.12	(0.57)	5.93	(0.05)
	A-P	16.22	(0.00)	0.46	(0.89)	8.38	(0.00)
	A-Q	37.28	(0.00)	2.54	(0.95)	20.25	(0.00)
	Breakpoint	2011:04		2005:01		2011:04	
L21	J-P	47.50	(0.00)	1.14	(0.56)	6.22	(0.04)
	A-P	16.22	(0.00)	0.51	(0.85)	8.41	(0.00)
	A-Q	37.29	(0.00)	2.65	(0.93)	20.32	(0.00)
	Breakpoint	2011:04		2005:01		2011:04	
L22	J-P	53.71	(0.00)	1.18	(0.56)	8.05	(0.02)
	A-P	15.60	(0.00)	0.47	(0.89)	7.97	(0.00)
	A-Q	36.31	(0.00)	2.56	(0.94)	19.13	(0.00)
	Breakpoint	2011:01		2005:01		2011:04	
L23	J-P	60.56	(0.00)	1.55	(0.46)	8.78	(0.01)
	A-P	15.92	(0.00)	0.38	(0.95)	8.04	(0.00)
	A-Q	36.91	(0.00)	1.90	(0.99)	19.30	(0.00)
	Breakpoint	2011:03		2005:01		2011:04	

Note: J-B reports the results of Jarque and Bera (1987) normality test; A-P stands for the Andrews and Ploberger and A-Q for Andrews - Quandt structural break tests. P-values are in parentheses.

Table 60: Structural Breaks Tests for Nominal GDP Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

Vintage	Test	Full sample		2000:3 - 2006:4 sample		2007:1-2015:1 sample	
L1	J-P	0.38	(0.83)	0.82	(0.66)	0.16	(0.92)
	A-P	2.85	(0.07)	1.07	(0.49)	2.12	(0.16)
	A-Q	8.10	(0.20)	4.80	(0.59)	7.35	(0.26)
	Breakpoint	2010:04		2005:02		2008:04	
L2	J-P	0.22	(0.89)	1.07	(0.59)	0.44	(0.80)
	A-P	2.75	(0.08)	0.60	(0.79)	2.01	(0.18)
	A-Q	7.80	(0.22)	2.37	(0.96)	7.28	(0.27)
	Breakpoint	2010:04		2006:01		2008:04	
L3	J-P	4.12	(0.13)	2.57	(0.28)	0.95	(0.62)
	A-P	2.41	(0.12)	0.52	(0.85)	1.54	(0.30)
	A-Q	6.80	(0.32)	2.42	(0.96)	5.43	(0.49)
	Breakpoint	2008:01		2006:01		2008:04	
L4	J-P	5.43	(0.07)	3.53	(0.17)	1.45	(0.48)
	A-P	2.36	(0.12)	0.49	(0.87)	1.83	(0.22)
	A-Q	7.47	(0.25)	2.79	(0.92)	5.68	(0.46)
	Breakpoint	2009:02		2006:01		2009:03	
L5	J-P	6.39	(0.04)	2.67	(0.26)	2.33	(0.31)
	A-P	2.26	(0.14)	0.61	(0.78)	1.81	(0.22)
	A-Q	6.95	(0.30)	4.33	(0.67)	5.99	(0.41)
	Breakpoint	2009:02		2006:01		2008:03	
L6	J-P	2.63	(0.27)	2.88	(0.24)	1.43	(0.49)
	A-P	2.10	(0.16)	0.57	(0.81)	1.79	(0.23)
	A-Q	6.44	(0.36)	3.91	(0.74)	6.05	(0.41)
	Breakpoint	2009:02		2006:01		2008:03	
L7	J-P	1.68	(0.43)	1.73	(0.42)	4.06	(0.13)
	A-P	1.86	(0.21)	0.47	(0.89)	1.23	(0.41)
	A-Q	6.17	(0.39)	3.86	(0.75)	6.51	(0.35)
	Breakpoint	2008:01		2006:01		2008:03	
L8	J-P	1.62	(0.45)	1.27	(0.53)	3.86	(0.14)
	A-P	2.54	(0.10)	0.49	(0.86)	1.16	(0.44)
	A-Q	8.01	(0.20)	4.16	(0.70)	6.27	(0.38)
	Breakpoint	2006:02		2006:01		2008:03	
L9	J-P	2.33	(0.31)	0.87	(0.65)	3.56	(0.17)
	A-P	2.36	(0.12)	0.86	(0.61)	1.05	(0.50)
	A-Q	7.63	(0.23)	3.97	(0.73)	5.33	(0.51)
	Breakpoint	2008:01		2006:01		2008:03	
L10	J-P	3.88	(0.14)	0.08	(0.96)	4.75	(0.09)
	A-P	2.04	(0.17)	0.82	(0.63)	1.51	(0.31)
	A-Q	6.29	(0.37)	3.16	(0.86)	5.82	(0.44)
	Breakpoint	2008:01		2001:02		2008:03	
L11	J-P	4.54	(0.10)	0.08	(0.96)	3.71	(0.16)
	A-P	2.29	(0.13)	0.73	(0.69)	1.67	(0.26)
	A-Q	6.79	(0.32)	3.20	(0.86)	4.86	(0.58)
	Breakpoint	2010:01		2006:01		2008:03	
L12	J-P	3.71	(0.16)	0.23	(0.89)	3.45	(0.18)
	A-P	2.35	(0.12)	0.39	(0.94)	1.80	(0.22)
	A-Q	6.58	(0.34)	2.27	(0.97)	5.70	(0.45)
	Breakpoint	2010:01		2006:01		2008:03	
L13	J-P	14.17	(0.00)	0.68	(0.71)	11.51	(0.00)
	A-P	1.96	(0.19)	0.38	(0.95)	1.23	(0.41)
	A-Q	7.01	(0.29)	1.76	(1.00)	4.62	(0.62)
	Breakpoint	2010:02		2006:01		2010:02	
L14	J-P	55.52	(0.00)	0.98	(0.61)	44.09	(0.00)
	A-P	1.24	(0.41)	0.78	(0.66)	0.74	(0.68)
	A-Q	4.61	(0.62)	4.02	(0.72)	2.53	(0.95)
	Breakpoint	2010:04		2006:01		2010:04	
L15	J-P	40.58	(0.00)	0.63	(0.73)	30.33	(0.00)
	A-P	1.13	(0.46)	0.72	(0.70)	0.52	(0.85)
	A-Q	3.51	(0.81)	3.56	(0.80)	2.30	(0.97)
	Breakpoint	2006:02		2006:01		2008:03	
L16	J-P	102.06	(0.00)	0.86	(0.65)	63.56	(0.00)
	A-P	1.22	(0.42)	0.73	(0.69)	0.69	(0.72)
	A-Q	4.10	(0.71)	3.37	(0.83)	3.09	(0.88)
	Breakpoint	2006:02		2006:01		2008:03	
L17	J-P	117.82	(0.00)	0.91	(0.63)	77.31	(0.00)
	A-P	1.00	(0.53)	0.75	(0.68)	0.90	(0.59)
	A-Q	3.64	(0.79)	3.08	(0.88)	2.63	(0.94)
	Breakpoint	2011:02		2005:03		2009:01	
L18	J-P	0.86	(0.65)	0.60	(0.74)	0.92	(0.63)
	A-P	1.41	(0.34)	1.03	(0.51)	3.56	(0.03)
	A-Q	4.73	(0.60)	3.77	(0.77)	10.32	(0.08)
	Breakpoint	2003:04		2005:04		2009:01	
L19	J-P	3.44	(0.18)	1.28	(0.53)	1.62	(0.44)
	A-P	0.67	(0.74)	0.81	(0.64)	1.68	(0.25)
	A-Q	2.37	(0.96)	3.86	(0.75)	5.49	(0.48)
	Breakpoint	2005:02		2003:01		2012:02	
L20	J-P	12.35	(0.00)	13.10	(0.00)	1.72	(0.42)
	A-P	1.17	(0.44)	1.06	(0.49)	3.21	(0.05)
	A-Q	3.96	(0.73)	3.71	(0.78)	10.45	(0.08)
	Breakpoint	2010:02		2003:01		2012:02	
L21	J-P	0.02	(0.99)	1.38	(0.50)	0.86	(0.65)
	A-P	0.60	(0.79)	1.11	(0.47)	2.03	(0.17)
	A-Q	3.34	(0.84)	4.52	(0.64)	7.07	(0.29)
	Breakpoint	2010:02		2005:03		2012:02	
L22	J-P	6.91	(0.03)	1.29	(0.53)	10.15	(0.01)
	A-P	1.28	(0.39)	0.89	(0.59)	1.80	(0.22)
	A-Q	4.90	(0.58)	3.59	(0.80)	6.75	(0.32)
	Breakpoint	2003:01		2005:02		2007:04	
L23	J-P	77.38	(0.00)	16.18	(0.00)	75.72	(0.00)
	A-P	1.45	(0.32)	2.64	(0.09)	2.24	(0.14)
	A-Q	5.96	(0.42)	8.17	(0.19)	6.44	(0.36)
	Breakpoint	2010:04		2006:01		2007:04	

Note: J-B reports the results of Jarque and Bera (1987) normality test; A-P stands for the Andrews and Ploberger and A-Q for Andrews - Quandt structural break tests. P-values are in parentheses.

Table 61: Structural Breaks Tests for Nominal GDP Revision Errors with Final Release Equals Last Known Release

Vintage	Test	Full sample		2000:3 - 2006:4 sample		2007:1-2015:1 sample	
L1	J-B	0.58	(0.75)	1.48	(0.48)	0.39	(0.82)
	A-P	3.15	(0.05)	1.47	(0.32)	2.09	(0.16)
	A-Q	10.24	(0.09)	6.28	(0.38)	7.27	(0.27)
	Breakpoint	2007:04		2005:01		2009:03	
L2	J-B	0.21	(0.90)	8.05	(0.02)	1.31	(0.52)
	A-P	2.73	(0.08)	0.85	(0.62)	2.01	(0.18)
	A-Q	9.43	(0.12)	3.84	(0.75)	7.44	(0.25)
	Breakpoint	2007:04		2005:01		2009:03	
L3	J-B	0.81	(0.67)	3.19	(0.20)	1.87	(0.39)
	A-P	2.75	(0.08)	0.74	(0.69)	1.88	(0.20)
	A-Q	9.59	(0.11)	3.13	(0.87)	7.35	(0.26)
	Breakpoint	2007:04		2001:02		2009:03	
L4	J-B	0.32	(0.85)	0.11	(0.94)	0.54	(0.76)
	A-P	2.59	(0.10)	0.95	(0.56)	1.81	(0.22)
	A-Q	8.98	(0.14)	3.05	(0.88)	7.17	(0.28)
	Breakpoint	2007:04		2005:04		2009:03	
L5	J-B	0.08	(0.96)	0.50	(0.78)	1.12	(0.57)
	A-P	2.71	(0.08)	0.65	(0.75)	1.56	(0.29)
	A-Q	9.86	(0.10)	2.35	(0.97)	6.26	(0.38)
	Breakpoint	2007:04		2001:02		2009:03	
L6	J-B	0.18	(0.92)	0.01	(1.00)	1.12	(0.57)
	A-P	2.71	(0.08)	0.74	(0.69)	1.67	(0.26)
	A-Q	9.69	(0.11)	3.14	(0.87)	6.68	(0.33)
	Breakpoint	2007:04		2003:02		2009:03	
L7	J-B	0.06	(0.97)	0.61	(0.74)	1.27	(0.53)
	A-P	2.60	(0.09)	0.65	(0.75)	0.92	(0.57)
	A-Q	9.99	(0.10)	2.71	(0.93)	4.23	(0.69)
	Breakpoint	2007:04		2003:02		2009:03	
L8	J-B	0.05	(0.97)	1.03	(0.60)	1.67	(0.43)
	A-P	3.02	(0.06)	0.60	(0.78)	1.08	(0.48)
	A-Q	10.76	(0.07)	2.00	(0.99)	4.81	(0.59)
	Breakpoint	2007:04		2003:02		2009:03	
L9	J-B	0.09	(0.96)	0.72	(0.70)	2.62	(0.27)
	A-P	3.24	(0.05)	0.86	(0.61)	0.98	(0.54)
	A-Q	11.63	(0.05)	3.28	(0.85)	4.39	(0.66)
	Breakpoint	2007:04		2005:01		2009:03	
L10	J-B	0.22	(0.90)	0.28	(0.87)	1.66	(0.44)
	A-P	3.18	(0.05)	0.80	(0.64)	1.11	(0.47)
	A-Q	11.65	(0.05)	3.48	(0.81)	4.37	(0.66)
	Breakpoint	2007:04		2005:03		2009:03	
L11	J-B	0.65	(0.72)	2.34	(0.31)	1.21	(0.54)
	A-P	3.07	(0.06)	0.64	(0.76)	1.25	(0.41)
	A-Q	11.12	(0.06)	2.58	(0.94)	4.69	(0.61)
	Breakpoint	2007:04		2005:03		2009:03	
L12	J-B	0.32	(0.85)	1.13	(0.57)	1.45	(0.48)
	A-P	3.18	(0.05)	0.67	(0.74)	1.29	(0.39)
	A-Q	11.13	(0.06)	2.89	(0.90)	4.93	(0.57)
	Breakpoint	2007:04		2003:03		2009:02	
L13	J-B	0.11	(0.94)	0.74	(0.69)	3.83	(0.15)
	A-P	2.68	(0.09)	0.57	(0.81)	1.02	(0.52)
	A-Q	10.17	(0.09)	2.79	(0.92)	3.99	(0.73)
	Breakpoint	2007:04		2005:03		2009:03	
L14	J-B	0.28	(0.87)	1.22	(0.54)	2.30	(0.32)
	A-P	2.12	(0.16)	0.69	(0.72)	0.60	(0.79)
	A-Q	8.89	(0.15)	3.23	(0.85)	3.19	(0.86)
	Breakpoint	2007:04		2005:03		2008:01	
L15	J-B	0.59	(0.74)	1.26	(0.53)	1.27	(0.53)
	A-P	2.17	(0.15)	0.62	(0.77)	0.68	(0.73)
	A-Q	8.10	(0.20)	3.17	(0.86)	2.73	(0.92)
	Breakpoint	2007:04		2005:01		2009:03	
L16	J-B	1.13	(0.57)	0.95	(0.62)	0.04	(0.98)
	A-P	2.02	(0.18)	0.68	(0.73)	0.84	(0.62)
	A-Q	7.81	(0.22)	2.87	(0.91)	3.12	(0.87)
	Breakpoint	2007:04		2001:02		2008:01	
L17	J-B	0.80	(0.67)	0.74	(0.69)	0.12	(0.94)
	A-P	1.54	(0.30)	0.69	(0.72)	0.96	(0.55)
	A-Q	6.07	(0.40)	3.04	(0.88)	3.34	(0.84)
	Breakpoint	2007:04		2005:01		2009:02	
L18	J-B	0.64	(0.73)	0.79	(0.67)	0.20	(0.90)
	A-P	1.49	(0.31)	0.77	(0.67)	1.50	(0.31)
	A-Q	5.55	(0.48)	3.36	(0.83)	4.81	(0.59)
	Breakpoint	2007:04		2001:02		2009:03	
L19	J-B	0.63	(0.73)	0.71	(0.70)	0.19	(0.91)
	A-P	1.19	(0.43)	0.62	(0.77)	1.25	(0.40)
	A-Q	5.89	(0.43)	2.99	(0.89)	4.90	(0.58)
	Breakpoint	2007:04		2001:02		2008:01	
L20	J-B	1.37	(0.50)	1.02	(0.60)	0.12	(0.94)
	A-P	1.25	(0.40)	0.55	(0.82)	1.50	(0.31)
	A-Q	5.83	(0.43)	2.70	(0.93)	5.27	(0.52)
	Breakpoint	2007:04		2001:02		2008:01	
L21	J-B	0.85	(0.65)	0.49	(0.78)	0.01	(1.00)
	A-P	0.93	(0.56)	0.56	(0.81)	1.22	(0.42)
	A-Q	5.00	(0.56)	2.56	(0.94)	4.97	(0.56)
	Breakpoint	2007:04		2001:02		2008:01	
L22	J-B	0.24	(0.89)	0.46	(0.80)	0.06	(0.97)
	A-P	0.77	(0.66)	0.84	(0.62)	1.06	(0.50)
	A-Q	4.13	(0.70)	5.12	(0.54)	4.82	(0.59)
	Breakpoint	2011:01		2001:02		2008:01	
L23	J-B	0.70	(0.71)	1.93	(0.38)	0.05	(0.98)
	A-P	0.85	(0.61)	0.78	(0.66)	1.12	(0.47)
	A-Q	4.42	(0.66)	3.89	(0.75)	4.88	(0.58)
	Breakpoint	2007:04		2001:02		2008:01	

Note: J-B reports the results of Jarque and Bera (1987) normality test; A-P stands for the Andrews and Ploberger and A-Q for Andrews - Quandt structural break tests. P-values are in parentheses.

Table 62: Structural Breaks Tests for Real Consumption Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

Vintage	Test	Full sample		2000:3 - 2006:4 sample		2007:1-2015:1 sample	
L1	J-B	1.45	(0.48)	0.79	(0.67)	0.90	(0.64)
	A-P	3.05	(0.06)	1.94	(0.19)	2.76	(0.08)
	A-Q	10.10	(0.09)	6.17	(0.39)	8.37	(0.18)
	Breakpoint	2010:01		2003:01		2010:04	
L2	J-B	1.00	(0.61)	0.59	(0.75)	0.24	(0.89)
	A-P	1.04	(0.50)	1.99	(0.18)	1.45	(0.33)
	A-Q	5.21	(0.53)	5.60	(0.47)	5.89	(0.43)
	Breakpoint	2010:04		2003:02		2010:04	
L3	J-B	1.49	(0.47)	1.19	(0.55)	0.85	(0.65)
	A-P	0.94	(0.56)	2.67	(0.09)	0.62	(0.77)
	A-Q	5.36	(0.50)	8.14	(0.19)	3.48	(0.81)
	Breakpoint	2003:01		2003:01		2010:04	
L4	J-B	0.38	(0.83)	0.51	(0.78)	0.08	(0.96)
	A-P	0.68	(0.73)	2.32	(0.13)	0.39	(0.94)
	A-Q	4.06	(0.72)	8.46	(0.17)	3.54	(0.80)
	Breakpoint	2003:01		2006:01		2008:01	
L5	J-B	1.31	(0.52)	1.37	(0.50)	0.11	(0.95)
	A-P	0.57	(0.81)	1.70	(0.25)	0.43	(0.91)
	A-Q	3.90	(0.74)	6.51	(0.35)	3.35	(0.84)
	Breakpoint	2003:01		2006:01		2008:01	
L6	J-B	0.47	(0.79)	0.64	(0.73)	0.60	(0.74)
	A-P	0.35	(0.97)	1.67	(0.26)	0.46	(0.89)
	A-Q	2.95	(0.90)	5.84	(0.43)	3.64	(0.79)
	Breakpoint	2002:02		2002:01		2008:01	
L7	J-B	0.44	(0.80)	0.19	(0.91)	2.10	(0.35)
	A-P	0.37	(0.95)	1.54	(0.30)	0.24	(1.00)
	A-Q	3.00	(0.89)	5.42	(0.49)	1.35	(1.00)
	Breakpoint	2003:01		2002:01		2008:01	
L8	J-B	0.45	(0.80)	1.25	(0.54)	2.04	(0.36)
	A-P	0.54	(0.83)	1.72	(0.24)	0.23	(1.00)
	A-Q	3.73	(0.77)	6.09	(0.40)	1.59	(1.00)
	Breakpoint	2002:03		2002:01		2008:01	
L9	J-B	0.14	(0.93)	0.70	(0.70)	1.86	(0.39)
	A-P	0.39	(0.94)	1.58	(0.28)	0.23	(1.00)
	A-Q	2.98	(0.89)	6.28	(0.38)	1.35	(1.00)
	Breakpoint	2002:04		2002:01		2007:04	
L10	J-B	2.71	(0.26)	1.40	(0.50)	1.23	(0.54)
	A-P	0.57	(0.81)	1.13	(0.46)	0.43	(0.91)
	A-Q	2.54	(0.95)	5.02	(0.56)	3.14	(0.87)
	Breakpoint	2004:04		2002:01		2008:02	
L11	J-B	2.74	(0.25)	1.55	(0.46)	0.52	(0.77)
	A-P	0.32	(0.99)	0.90	(0.58)	0.72	(0.70)
	A-Q	1.85	(1.00)	4.76	(0.60)	3.51	(0.81)
	Breakpoint	2005:03		2002:01		2008:02	
L12	J-B	0.89	(0.64)	0.78	(0.68)	0.39	(0.82)
	A-P	0.34	(0.98)	1.15	(0.45)	0.34	(0.97)
	A-Q	2.79	(0.92)	5.75	(0.45)	1.64	(1.00)
	Breakpoint	2002:02		2002:01		2007:04	
L13	J-B	7.02	(0.03)	1.94	(0.38)	12.01	(0.00)
	A-P	0.35	(0.97)	0.81	(0.64)	0.95	(0.55)
	A-Q	2.67	(0.93)	4.42	(0.66)	6.65	(0.33)
	Breakpoint	2002:02		2002:01		2007:04	
L14	J-B	6.63	(0.04)	3.96	(0.14)	4.32	(0.12)
	A-P	1.73	(0.24)	1.41	(0.34)	0.72	(0.70)
	A-Q	6.95	(0.30)	5.35	(0.51)	5.86	(0.43)
	Breakpoint	2002:02		2002:01		2007:04	
L15	J-B	4.17	(0.12)	3.65	(0.16)	0.67	(0.72)
	A-P	0.76	(0.67)	1.17	(0.44)	0.61	(0.78)
	A-Q	4.60	(0.62)	5.34	(0.51)	5.04	(0.55)
	Breakpoint	2002:02		2002:01		2007:04	
L16	J-B	5.59	(0.06)	2.89	(0.24)	1.59	(0.45)
	A-P	0.73	(0.70)	1.18	(0.44)	0.67	(0.73)
	A-Q	5.29	(0.51)	5.72	(0.45)	3.18	(0.86)
	Breakpoint	2002:02		2002:01		2008:02	
L17	J-B	0.25	(0.88)	1.12	(0.57)	1.30	(0.52)
	A-P	1.14	(0.45)	1.45	(0.33)	0.74	(0.69)
	A-Q	5.64	(0.46)	6.08	(0.40)	4.12	(0.71)
	Breakpoint	2002:02		2002:01		2008:03	
L18	J-B	1.49	(0.47)	4.09	(0.13)	1.10	(0.58)
	A-P	1.36	(0.36)	1.61	(0.27)	0.80	(0.65)
	A-Q	5.18	(0.53)	5.79	(0.44)	4.10	(0.71)
	Breakpoint	2003:01		2002:01		2008:03	
L19	J-B	1.11	(0.57)	0.26	(0.88)	0.96	(0.62)
	A-P	1.65	(0.26)	2.69	(0.09)	1.32	(0.38)
	A-Q	6.82	(0.31)	7.32	(0.26)	6.52	(0.35)
	Breakpoint	2003:04		2002:03		2008:02	
L20	J-B	0.82	(0.66)	0.49	(0.78)	0.49	(0.78)
	A-P	1.03	(0.51)	2.03	(0.17)	1.03	(0.51)
	A-Q	5.09	(0.54)	5.93	(0.42)	4.75	(0.60)
	Breakpoint	2003:04		2002:03		2008:02	
L21	J-B	1.06	(0.59)	0.17	(0.92)	0.88	(0.65)
	A-P	0.92	(0.57)	1.16	(0.45)	0.71	(0.71)
	A-Q	4.54	(0.64)	3.94	(0.74)	3.63	(0.79)
	Breakpoint	2003:04		2002:03		2008:02	
L22	J-B	9.38	(0.01)	2.78	(0.25)	9.62	(0.01)
	A-P	0.72	(0.70)	0.65	(0.75)	2.01	(0.18)
	A-Q	4.10	(0.71)	2.44	(0.96)	6.42	(0.36)
	Breakpoint	2003:02		2006:01		2012:02	
L23	J-B	34.46	(0.00)	6.98	(0.03)	88.69	(0.00)
	A-P	0.40	(0.94)	0.71	(0.71)	1.42	(0.34)
	A-Q	1.94	(0.99)	3.02	(0.89)	6.48	(0.35)
	Breakpoint	2002:02		2005:04		2007:04	

Note: J-B reports the results of Jarque and Bera (1987) normality test; A-P stands for the Andrews and Ploberger and A-Q for Andrews - Quandt structural break tests. P-values are in parentheses.

Table 63: Structural Breaks Tests for Real Consumption Revision Errors with Final Release Equals Last Known Release

Vintage	Test	Full sample		2000:3 - 2006:4 sample		2007:1-2015:1 sample	
L1	J-P	5.32	(0.01)	1.25	(0.41)	2.62	(0.09)
	A-Q	15.09	(0.01)	4.45	(0.65)	7.73	(0.23)
	Breakpoint	2007:04		2004:03		2011:01	
L2	J-B	0.95	(0.62)	0.29	(0.87)	2.89	(0.24)
	A-P	4.40	(0.01)	1.41	(0.34)	1.40	(0.35)
	A-Q	14.08	(0.02)	4.85	(0.58)	4.91	(0.57)
	Breakpoint	2007:04		2005:01		2008:01	
L3	J-B	1.16	(0.56)	3.83	(0.15)	6.47	(0.04)
	A-P	2.64	(0.09)	2.09	(0.16)	0.75	(0.68)
	A-Q	10.01	(0.09)	6.47	(0.35)	3.35	(0.84)
	Breakpoint	2007:04		2005:01		2008:01	
L4	J-B	19.42	(0.00)	6.40	(0.04)	78.98	(0.00)
	A-P	3.05	(0.06)	2.10	(0.16)	0.80	(0.64)
	A-Q	10.99	(0.06)	6.51	(0.35)	4.70	(0.61)
	Breakpoint	2008:01		2005:01		2008:01	
L5	J-B	15.38	(0.00)	3.83	(0.15)	65.69	(0.00)
	A-P	2.80	(0.08)	1.73	(0.24)	0.62	(0.77)
	A-Q	10.42	(0.08)	5.78	(0.44)	4.44	(0.65)
	Breakpoint	2008:01		2006:01		2008:01	
L6	J-B	21.66	(0.00)	12.44	(0.00)	39.91	(0.00)
	A-P	3.75	(0.03)	1.62	(0.27)	0.67	(0.73)
	A-Q	12.55	(0.03)	5.22	(0.52)	5.14	(0.54)
	Breakpoint	2008:01		2006:01		2008:01	
L7	J-B	12.67	(0.00)	5.47	(0.06)	31.85	(0.00)
	A-P	3.44	(0.04)	1.36	(0.36)	0.28	(1.00)
	A-Q	10.74	(0.07)	4.62	(0.62)	2.37	(0.96)
	Breakpoint	2008:01		2005:01		2008:01	
L8	J-B	15.72	(0.00)	7.88	(0.02)	30.40	(0.00)
	A-P	3.09	(0.06)	1.24	(0.41)	0.36	(0.96)
	A-Q	9.84	(0.10)	3.92	(0.74)	2.16	(0.98)
	Breakpoint	2008:01		2006:01		2008:01	
L9	J-B	11.23	(0.00)	11.04	(0.00)	4.85	(0.09)
	A-P	3.05	(0.06)	1.39	(0.35)	0.48	(0.88)
	A-Q	9.56	(0.11)	4.32	(0.67)	3.17	(0.86)
	Breakpoint	2008:01		2006:01		2013:01	
L10	J-B	3.15	(0.21)	3.35	(0.19)	8.40	(0.01)
	A-P	3.77	(0.03)	0.92	(0.57)	0.50	(0.86)
	A-Q	11.27	(0.06)	2.97	(0.89)	3.63	(0.79)
	Breakpoint	2007:04		2003:01		2013:01	
L11	J-B	4.27	(0.12)	3.14	(0.21)	17.70	(0.00)
	A-P	3.85	(0.03)	0.77	(0.67)	0.30	(1.00)
	A-Q	11.42	(0.05)	2.68	(0.93)	1.78	(1.00)
	Breakpoint	2007:04		2005:01		2008:02	
L12	J-B	8.40	(0.02)	7.08	(0.03)	15.96	(0.00)
	A-P	3.72	(0.03)	0.78	(0.66)	0.38	(0.95)
	A-Q	10.92	(0.07)	2.51	(0.95)	2.89	(0.90)
	Breakpoint	2008:01		2003:01		2008:02	
L13	J-B	5.57	(0.06)	3.61	(0.16)	12.71	(0.00)
	A-P	3.27	(0.05)	0.66	(0.74)	0.37	(0.96)
	A-Q	10.35	(0.08)	2.18	(0.98)	1.83	(1.00)
	Breakpoint	2006:04		2003:02		2008:02	
L14	J-B	5.61	(0.06)	3.44	(0.18)	13.44	(0.00)
	A-P	2.61	(0.09)	0.50	(0.86)	0.43	(0.91)
	A-Q	8.85	(0.15)	1.57	(1.00)	1.82	(1.00)
	Breakpoint	2006:04		2005:01		2012:02	
L15	J-B	3.54	(0.17)	1.00	(0.61)	14.96	(0.00)
	A-P	2.69	(0.09)	0.62	(0.77)	0.63	(0.76)
	A-Q	9.09	(0.14)	2.34	(0.97)	2.56	(0.94)
	Breakpoint	2006:04		2003:01		2012:03	
L16	J-B	1.18	(0.56)	0.44	(0.80)	7.15	(0.03)
	A-P	2.48	(0.11)	0.71	(0.71)	0.52	(0.85)
	A-Q	8.00	(0.20)	3.81	(0.76)	2.93	(0.90)
	Breakpoint	2007:04		2006:01		2012:03	
L17	J-B	0.76	(0.68)	0.69	(0.71)	7.61	(0.02)
	A-P	2.99	(0.06)	0.80	(0.64)	0.50	(0.86)
	A-Q	9.44	(0.12)	5.18	(0.53)	2.70	(0.93)
	Breakpoint	2007:04		2006:01		2012:02	
L18	J-B	1.16	(0.56)	0.80	(0.67)	11.31	(0.00)
	A-P	3.34	(0.04)	0.74	(0.69)	0.41	(0.93)
	A-Q	10.12	(0.09)	4.89	(0.58)	2.11	(0.98)
	Breakpoint	2007:04		2006:01		2012:02	
L19	J-B	0.71	(0.70)	0.33	(0.85)	7.83	(0.02)
	A-P	4.15	(0.02)	0.31	(0.99)	0.36	(0.96)
	A-Q	11.24	(0.06)	2.42	(0.96)	1.76	(1.00)
	Breakpoint	2007:04		2006:01		2012:02	
L20	J-B	0.51	(0.78)	0.32	(0.85)	6.54	(0.04)
	A-P	4.45	(0.01)	0.37	(0.95)	0.33	(0.98)
	A-Q	12.14	(0.04)	2.41	(0.96)	1.83	(1.00)
	Breakpoint	2007:04		2006:01		2007:04	
L21	J-B	0.15	(0.93)	0.73	(0.69)	7.14	(0.03)
	A-P	5.08	(0.01)	0.40	(0.94)	0.34	(0.97)
	A-Q	13.64	(0.02)	1.91	(0.99)	2.09	(0.99)
	Breakpoint	2007:04		2004:03		2007:04	
L22	J-B	0.27	(0.87)	0.67	(0.71)	7.94	(0.02)
	A-P	4.87	(0.01)	0.57	(0.81)	0.33	(0.98)
	A-Q	13.23	(0.02)	2.48	(0.95)	2.54	(0.95)
	Breakpoint	2007:04		2004:03		2008:02	
L23	J-B	1.21	(0.55)	0.15	(0.93)	8.34	(0.02)
	A-P	4.21	(0.02)	0.65	(0.75)	0.58	(0.80)
	A-Q	12.19	(0.04)	2.82	(0.91)	3.49	(0.81)
	Breakpoint	2007:04		2006:01		2008:02	

Note: J-B reports the results of Jarque and Bera (1987) normality test; A-P stands for the Andrews and Ploberger and A-Q for Andrews - Quandt structural break tests. P-values are in parentheses.

Table 64: Structural Breaks Tests for Real Investment Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

Vintage	Test	Full sample		2000:3 - 2006:4 sample		2007:1-2015:1 sample	
L1	J-P	3.73	(0.15)	1.51	(0.47)	2.59	(0.27)
	A-P	7.98	(0.00)	2.83	(0.07)	6.21	(0.00)
	A-Q	22.07	(0.00)	8.74	(0.15)	17.05	(0.00)
	Breakpoint	2009:04		2002:02		2009:04	
L2	J-P	0.89	(0.64)	1.53	(0.47)	0.29	(0.87)
	A-P	6.76	(0.00)	2.78	(0.08)	5.51	(0.01)
	A-Q	19.53	(0.00)	8.64	(0.16)	15.88	(0.01)
	Breakpoint	2009:04		2002:03		2009:04	
L3	J-P	0.46	(0.80)	0.31	(0.86)	0.12	(0.94)
	A-P	6.43	(0.00)	1.12	(0.47)	5.21	(0.01)
	A-Q	18.89	(0.00)	4.84	(0.58)	15.35	(0.01)
	Breakpoint	2009:04		2002:04		2009:04	
L4	J-P	0.12	(0.94)	0.45	(0.80)	0.75	(0.69)
	A-P	3.96	(0.02)	0.86	(0.61)	3.79	(0.03)
	A-Q	13.79	(0.02)	4.17	(0.70)	12.70	(0.03)
	Breakpoint	2009:04		2002:04		2009:04	
L5	J-P	0.66	(0.72)	0.13	(0.94)	0.66	(0.72)
	A-P	3.77	(0.03)	1.19	(0.43)	4.10	(0.02)
	A-Q	13.10	(0.03)	5.07	(0.55)	13.26	(0.02)
	Breakpoint	2009:04		2002:04		2009:04	
L6	J-P	0.94	(0.63)	0.41	(0.82)	1.72	(0.42)
	A-P	3.51	(0.04)	1.40	(0.34)	3.94	(0.02)
	A-Q	12.56	(0.03)	5.95	(0.42)	12.90	(0.03)
	Breakpoint	2009:04		2002:04		2009:04	
L7	J-P	1.96	(0.37)	0.63	(0.73)	4.67	(0.10)
	A-P	2.62	(0.09)	1.17	(0.44)	2.16	(0.15)
	A-Q	9.85	(0.10)	5.06	(0.55)	9.59	(0.11)
	Breakpoint	2009:04		2002:04		2009:04	
L8	J-P	1.73	(0.42)	0.90	(0.64)	2.29	(0.32)
	A-P	2.95	(0.07)	1.41	(0.34)	2.09	(0.16)
	A-Q	10.47	(0.08)	6.01	(0.41)	9.13	(0.13)
	Breakpoint	2009:04		2002:04		2009:04	
L9	J-P	2.62	(0.27)	1.23	(0.54)	3.89	(0.14)
	A-P	2.08	(0.16)	1.40	(0.35)	1.98	(0.18)
	A-Q	8.19	(0.19)	6.27	(0.38)	8.78	(0.15)
	Breakpoint	2009:04		2002:04		2009:04	
L10	J-P	3.52	(0.17)	0.48	(0.79)	10.27	(0.01)
	A-P	1.84	(0.21)	1.55	(0.29)	1.59	(0.28)
	A-Q	8.36	(0.18)	6.56	(0.34)	7.91	(0.21)
	Breakpoint	2002:04		2002:04		2009:04	
L11	J-P	3.60	(0.17)	0.32	(0.85)	18.13	(0.00)
	A-P	1.71	(0.25)	1.36	(0.36)	1.43	(0.33)
	A-Q	7.23	(0.27)	5.77	(0.44)	7.63	(0.23)
	Breakpoint	2002:04		2002:04		2009:04	
L12	J-P	3.50	(0.17)	0.01	(1.00)	28.86	(0.00)
	A-P	1.18	(0.44)	0.77	(0.66)	1.64	(0.27)
	A-Q	5.93	(0.42)	4.34	(0.67)	8.55	(0.17)
	Breakpoint	2009:04		2002:04		2009:04	
L13	J-P	2.69	(0.26)	0.01	(1.00)	22.97	(0.00)
	A-P	1.39	(0.35)	0.60	(0.78)	1.94	(0.19)
	A-Q	6.10	(0.40)	3.94	(0.74)	9.30	(0.12)
	Breakpoint	2009:04		2002:04		2009:04	
L14	J-P	8.66	(0.01)	0.64	(0.72)	35.98	(0.00)
	A-P	0.60	(0.79)	0.63	(0.76)	2.15	(0.15)
	A-Q	4.94	(0.57)	4.07	(0.72)	9.82	(0.10)
	Breakpoint	2002:04		2002:04		2009:04	
L15	J-P	9.49	(0.01)	0.84	(0.66)	40.02	(0.00)
	A-P	1.20	(0.43)	1.45	(0.32)	2.18	(0.15)
	A-Q	5.62	(0.47)	6.68	(0.33)	9.83	(0.10)
	Breakpoint	2002:04		2001:04		2009:04	
L16	J-P	20.79	(0.00)	5.36	(0.07)	85.93	(0.00)
	A-P	2.24	(0.14)	1.65	(0.26)	2.50	(0.11)
	A-Q	7.90	(0.21)	6.52	(0.35)	10.31	(0.08)
	Breakpoint	2009:04		2001:04		2009:04	
L17	J-P	58.96	(0.00)	20.05	(0.00)	0.19	(0.91)
	A-P	3.23	(0.05)	2.43	(0.11)	1.81	(0.22)
	A-Q	11.10	(0.06)	7.09	(0.28)	6.43	(0.36)
	Breakpoint	2002:04		2001:04		2007:04	
L18	J-P	79.32	(0.00)	30.15	(0.00)	0.91	(0.64)
	A-P	1.94	(0.19)	1.65	(0.26)	1.41	(0.34)
	A-Q	6.57	(0.34)	5.43	(0.49)	6.13	(0.39)
	Breakpoint	2002:04		2003:01		2010:03	
L19	J-P	30.11	(0.00)	14.10	(0.00)	0.22	(0.89)
	A-P	2.01	(0.18)	0.76	(0.67)	2.36	(0.12)
	A-Q	6.91	(0.30)	3.52	(0.81)	7.13	(0.28)
	Breakpoint	2010:04		2002:04		2010:04	
L20	J-P	0.06	(0.97)	0.10	(0.95)	0.05	(0.97)
	A-P	0.96	(0.55)	1.92	(0.20)	1.81	(0.22)
	A-Q	5.22	(0.52)	6.56	(0.34)	5.75	(0.45)
	Breakpoint	2002:02		2001:03		2009:01	
L21	J-P	0.85	(0.65)	3.21	(0.20)	0.03	(0.99)
	A-P	1.84	(0.21)	0.79	(0.65)	1.73	(0.24)
	A-Q	7.21	(0.27)	3.19	(0.86)	5.59	(0.47)
	Breakpoint	2009:01		2002:01		2009:01	
L22	J-P	56.65	(0.00)	4.69	(0.10)	269.10	(0.00)
	A-P	1.36	(0.36)	1.55	(0.29)	6.44	(0.00)
	A-Q	6.35	(0.37)	5.15	(0.53)	17.28	(0.00)
	Breakpoint	2002:02		2001:04		2007:04	
L23	J-P	222.38	(0.00)	2.42	(0.30)	592.71	(0.00)
	A-P	2.83	(0.07)	2.92	(0.07)	7.67	(0.00)
	A-Q	9.68	(0.11)	8.58	(0.16)	20.20	(0.00)
	Breakpoint	2003:01		2001:04		2007:04	

Note: J-B reports the results of Jarque and Bera (1987) normality test; A-P stands for the Andrews and Ploberger and A-Q for Andrews - Quandt structural break tests. P-values are in parentheses.

Table 65: Structural Breaks Tests for Real Investment Revision Errors with Final Release Equals Last Known Release

Vintage	Test	Full sample		2000:3 - 2006:4 sample		2007:1-2015:1 sample	
L1	J-B	10.08	(0.01)	0.59	(0.74)	7.04	(0.03)
	A-P	6.59	(0.00)	0.94	(0.56)	6.97	(0.00)
	A-Q	18.79	(0.00)	3.17	(0.86)	18.92	(0.00)
	Breakpoint	2009:03		2001:04		2009:03	
L2	J-B	0.13	(0.94)	0.54	(0.76)	0.33	(0.85)
	A-P	5.79	(0.00)	1.06	(0.49)	6.60	(0.00)
	A-Q	16.91	(0.00)	3.24	(0.85)	18.10	(0.00)
	Breakpoint	2009:03		2005:04		2009:03	
L3	J-B	0.36	(0.84)	1.89	(0.39)	0.04	(0.98)
	A-P	5.75	(0.00)	0.41	(0.93)	6.08	(0.00)
	A-Q	16.90	(0.00)	1.77	(1.00)	17.08	(0.00)
	Breakpoint	2009:03		2001:04		2009:03	
L4	J-B	4.63	(0.10)	3.69	(0.16)	3.10	(0.21)
	A-P	4.40	(0.01)	0.69	(0.72)	4.79	(0.01)
	A-Q	13.42	(0.02)	3.35	(0.83)	13.73	(0.02)
	Breakpoint	2009:03		2002:01		2009:03	
L5	J-B	4.14	(0.13)	5.81	(0.05)	1.26	(0.53)
	A-P	3.87	(0.03)	0.42	(0.92)	4.67	(0.01)
	A-Q	12.26	(0.04)	2.09	(0.99)	13.60	(0.02)
	Breakpoint	2009:03		2001:04		2009:03	
L6	J-B	1.93	(0.38)	2.70	(0.26)	0.33	(0.85)
	A-P	3.70	(0.03)	1.19	(0.43)	3.70	(0.03)
	A-Q	11.66	(0.05)	5.29	(0.51)	11.32	(0.06)
	Breakpoint	2009:03		2002:01		2009:03	
L7	J-B	6.08	(0.05)	5.07	(0.08)	0.68	(0.71)
	A-P	3.66	(0.03)	1.41	(0.34)	2.69	(0.09)
	A-Q	10.43	(0.08)	6.49	(0.35)	8.23	(0.19)
	Breakpoint	2009:03		2002:01		2009:03	
L8	J-B	1.26	(0.53)	0.81	(0.67)	0.55	(0.76)
	A-P	3.22	(0.05)	1.08	(0.48)	2.21	(0.14)
	A-Q	9.31	(0.12)	5.18	(0.53)	7.82	(0.22)
	Breakpoint	2009:03		2002:01		2008:01	
L9	J-B	2.98	(0.23)	2.14	(0.34)	0.77	(0.68)
	A-P	2.86	(0.07)	1.32	(0.38)	1.87	(0.21)
	A-Q	8.55	(0.17)	5.26	(0.52)	6.48	(0.35)
	Breakpoint	2002:04		2002:01		2008:01	
L10	J-B	1.05	(0.59)	0.46	(0.79)	0.95	(0.62)
	A-P	2.27	(0.13)	0.83	(0.63)	1.71	(0.25)
	A-Q	7.05	(0.29)	3.47	(0.82)	6.01	(0.41)
	Breakpoint	2009:03		2002:01		2009:03	
L11	J-B	0.60	(0.74)	0.15	(0.93)	0.51	(0.78)
	A-P	2.69	(0.09)	0.80	(0.65)	1.86	(0.21)
	A-Q	8.31	(0.18)	3.26	(0.85)	6.47	(0.35)
	Breakpoint	2009:03		2002:01		2009:03	
L12	J-B	7.58	(0.02)	3.52	(0.17)	1.12	(0.57)
	A-P	2.49	(0.11)	0.95	(0.56)	1.66	(0.26)
	A-Q	7.05	(0.29)	3.75	(0.77)	5.97	(0.42)
	Breakpoint	2008:01		2002:01		2008:01	
L13	J-B	13.57	(0.00)	6.55	(0.04)	1.55	(0.46)
	A-P	2.89	(0.07)	1.02	(0.52)	1.74	(0.24)
	A-Q	8.15	(0.19)	3.67	(0.78)	6.82	(0.31)
	Breakpoint	2008:01		2002:04		2008:01	
L14	J-B	23.37	(0.00)	13.27	(0.00)	6.66	(0.04)
	A-P	2.43	(0.11)	1.19	(0.43)	1.90	(0.20)
	A-Q	7.64	(0.23)	4.40	(0.66)	6.92	(0.30)
	Breakpoint	2002:04		2002:04		2008:01	
L15	J-B	10.54	(0.01)	4.85	(0.09)	7.55	(0.02)
	A-P	2.55	(0.10)	0.55	(0.82)	1.76	(0.23)
	A-Q	7.78	(0.22)	2.17	(0.98)	6.47	(0.35)
	Breakpoint	2010:01		2002:04		2008:01	
L16	J-B	11.03	(0.00)	6.26	(0.04)	14.97	(0.00)
	A-P	2.98	(0.06)	0.55	(0.82)	1.99	(0.18)
	A-Q	9.36	(0.12)	2.55	(0.95)	6.80	(0.32)
	Breakpoint	2010:01		2003:04		2009:03	
L17	J-B	4.49	(0.11)	5.88	(0.05)	5.74	(0.06)
	A-P	3.03	(0.06)	0.37	(0.96)	2.60	(0.09)
	A-Q	11.70	(0.05)	2.14	(0.98)	9.57	(0.11)
	Breakpoint	2009:03		2001:04		2009:03	
L18	J-B	3.94	(0.14)	4.63	(0.10)	7.10	(0.03)
	A-P	2.97	(0.06)	0.43	(0.91)	2.63	(0.09)
	A-Q	11.59	(0.05)	2.27	(0.97)	9.72	(0.11)
	Breakpoint	2009:03		2003:04		2009:03	
L19	J-B	9.34	(0.01)	11.18	(0.00)	5.73	(0.06)
	A-P	3.06	(0.06)	0.52	(0.84)	2.69	(0.09)
	A-Q	12.51	(0.03)	2.90	(0.90)	10.04	(0.09)
	Breakpoint	2009:03		2001:03		2009:03	
L20	J-B	10.46	(0.01)	11.81	(0.00)	4.39	(0.11)
	A-P	1.91	(0.20)	0.90	(0.58)	2.14	(0.15)
	A-Q	9.95	(0.10)	4.62	(0.62)	8.80	(0.15)
	Breakpoint	2009:03		2001:02		2009:03	
L21	J-B	14.57	(0.00)	14.77	(0.00)	6.11	(0.05)
	A-P	1.51	(0.31)	0.67	(0.73)	1.90	(0.20)
	A-Q	9.13	(0.13)	3.58	(0.80)	8.31	(0.18)
	Breakpoint	2009:03		2001:03		2009:03	
L22	J-B	12.45	(0.00)	12.08	(0.00)	5.33	(0.07)
	A-P	1.92	(0.20)	0.50	(0.86)	2.18	(0.15)
	A-Q	9.93	(0.10)	2.31	(0.97)	8.68	(0.16)
	Breakpoint	2009:03		2001:03		2009:03	
L23	J-B	17.86	(0.00)	27.43	(0.00)	5.05	(0.08)
	A-P	2.81	(0.08)	0.87	(0.60)	2.44	(0.11)
	A-Q	12.15	(0.04)	3.57	(0.80)	9.42	(0.12)
	Breakpoint	2009:03		2001:03		2009:03	

Note: J-B reports the results of Jarque and Bera (1987) normality test; A-P stands for the Andrews and Ploberger and A-Q for Andrews - Quandt structural break tests. P-values are in parentheses.

Table 66: Structural Breaks Tests for Real Government Consumption Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

Vintage	Test	Full sample		2000:3 - 2006:4 sample		2007:1-2015:1 sample	
L1	J-B	1.44	(0.49)	0.47	(0.79)	1.58	(0.45)
	A-P	2.81	(0.08)	3.30	(0.05)	2.35	(0.12)
	A-Q	9.71	(0.11)	10.42	(0.08)	8.12	(0.20)
	Breakpoint	2008:01		2002:03		2008:01	
L2	J-B	1.38	(0.50)	0.78	(0.68)	0.95	(0.62)
	A-P	1.06	(0.49)	4.38	(0.02)	2.53	(0.10)
	A-Q	4.77	(0.60)	12.82	(0.03)	8.48	(0.17)
	Breakpoint	2008:01		2002:03		2008:01	
L3	J-B	1.49	(0.47)	1.52	(0.47)	0.85	(0.65)
	A-P	1.56	(0.29)	5.19	(0.01)	2.74	(0.08)
	A-Q	7.79	(0.22)	14.88	(0.01)	7.85	(0.22)
	Breakpoint	2002:02		2002:02		2008:01	
L4	J-B	0.56	(0.75)	0.85	(0.65)	0.16	(0.92)
	A-P	1.03	(0.51)	3.99	(0.02)	2.54	(0.10)
	A-Q	6.52	(0.35)	12.19	(0.04)	7.25	(0.27)
	Breakpoint	2002:02		2002:02		2009:03	
L5	J-B	0.03	(0.98)	1.23	(0.54)	0.01	(0.99)
	A-P	0.96	(0.55)	3.39	(0.04)	2.63	(0.09)
	A-Q	4.92	(0.57)	11.07	(0.06)	7.39	(0.26)
	Breakpoint	2002:02		2002:02		2009:03	
L6	J-B	0.73	(0.69)	1.72	(0.42)	0.22	(0.89)
	A-P	1.39	(0.35)	1.80	(0.22)	2.82	(0.07)
	A-Q	7.24	(0.27)	7.00	(0.29)	7.91	(0.21)
	Breakpoint	2006:02		2005:04		2009:03	
L7	J-B	0.30	(0.86)	1.20	(0.55)	0.59	(0.75)
	A-P	1.41	(0.34)	1.48	(0.32)	3.46	(0.04)
	A-Q	6.74	(0.32)	7.58	(0.24)	9.13	(0.13)
	Breakpoint	2006:02		2005:04		2011:04	
L8	J-B	0.02	(0.99)	0.12	(0.94)	0.01	(1.00)
	A-P	0.99	(0.53)	1.39	(0.35)	2.98	(0.06)
	A-Q	5.53	(0.48)	7.22	(0.27)	7.80	(0.22)
	Breakpoint	2006:02		2005:04		2011:04	
L9	J-B	0.18	(0.92)	0.63	(0.73)	0.05	(0.98)
	A-P	0.76	(0.67)	1.05	(0.50)	2.77	(0.08)
	A-Q	4.57	(0.63)	5.92	(0.42)	7.43	(0.25)
	Breakpoint	2011:03		2005:04		2011:04	
L10	J-B	2.24	(0.33)	6.28	(0.04)	0.22	(0.89)
	A-P	0.97	(0.54)	1.22	(0.42)	1.91	(0.20)
	A-Q	5.32	(0.51)	4.86	(0.58)	6.67	(0.33)
	Breakpoint	2006:03		2002:03		2012:03	
L11	J-B	1.86	(0.40)	3.16	(0.21)	0.43	(0.81)
	A-P	0.73	(0.69)	1.08	(0.48)	1.76	(0.23)
	A-Q	3.30	(0.84)	4.26	(0.68)	6.76	(0.32)
	Breakpoint	2002:03		2002:03		2012:03	
L12	J-B	0.34	(0.84)	0.30	(0.86)	0.62	(0.73)
	A-P	0.65	(0.75)	1.03	(0.51)	1.88	(0.21)
	A-Q	3.96	(0.73)	3.44	(0.82)	7.20	(0.27)
	Breakpoint	2011:02		2003:01		2012:03	
L13	J-B	4.29	(0.12)	0.86	(0.65)	5.09	(0.08)
	A-P	0.42	(0.92)	1.09	(0.48)	1.71	(0.25)
	A-Q	3.43	(0.82)	3.98	(0.73)	6.75	(0.32)
	Breakpoint	2011:03		2003:01		2012:03	
L14	J-B	4.78	(0.09)	0.02	(0.99)	6.51	(0.04)
	A-P	0.51	(0.85)	0.82	(0.63)	1.56	(0.29)
	A-Q	3.45	(0.82)	3.44	(0.82)	6.34	(0.37)
	Breakpoint	2011:03		2003:01		2012:03	
L15	J-B	10.47	(0.01)	0.17	(0.92)	10.32	(0.01)
	A-P	0.49	(0.87)	0.59	(0.79)	0.95	(0.56)
	A-Q	2.10	(0.98)	3.60	(0.79)	3.05	(0.88)
	Breakpoint	2008:03		2005:04		2008:03	
L16	J-B	15.84	(0.00)	0.56	(0.76)	28.81	(0.00)
	A-P	0.79	(0.66)	1.15	(0.45)	0.65	(0.75)
	A-Q	4.23	(0.69)	4.87	(0.58)	2.91	(0.90)
	Breakpoint	2003:04		2003:04		2008:03	
L17	J-B	18.92	(0.00)	1.03	(0.60)	33.09	(0.00)
	A-P	0.82	(0.64)	1.16	(0.45)	0.47	(0.88)
	A-Q	4.09	(0.71)	4.07	(0.71)	1.91	(0.99)
	Breakpoint	2002:03		2002:03		2008:03	
L18	J-B	38.08	(0.00)	0.82	(0.66)	66.87	(0.00)
	A-P	1.85	(0.21)	1.40	(0.34)	0.88	(0.60)
	A-Q	7.29	(0.27)	5.19	(0.53)	3.30	(0.84)
	Breakpoint	2002:03		2002:03		2012:03	
L19	J-B	69.22	(0.00)	0.24	(0.89)	102.71	(0.00)
	A-P	1.26	(0.40)	1.68	(0.25)	1.20	(0.43)
	A-Q	5.53	(0.48)	6.13	(0.39)	4.08	(0.71)
	Breakpoint	2002:03		2001:04		2012:03	
L20	J-B	134.49	(0.00)	2.65	(0.27)	166.39	(0.00)
	A-P	1.14	(0.46)	1.53	(0.30)	2.17	(0.15)
	A-Q	5.28	(0.52)	4.81	(0.59)	8.39	(0.18)
	Breakpoint	2011:02		2002:03		2012:03	
L21	J-B	0.11	(0.95)	0.06	(0.97)	0.31	(0.86)
	A-P	0.90	(0.58)	0.59	(0.80)	2.24	(0.14)
	A-Q	4.72	(0.60)	2.67	(0.93)	7.03	(0.29)
	Breakpoint	2011:02		2001:04		2008:03	
L22	J-B	3.72	(0.16)	0.33	(0.85)	19.85	(0.00)
	A-P	1.15	(0.45)	0.76	(0.67)	2.08	(0.17)
	A-Q	4.31	(0.67)	2.80	(0.92)	7.51	(0.24)
	Breakpoint	2002:04		2006:01		2012:03	
L23	J-B	185.41	(0.00)	25.61	(0.00)	109.77	(0.00)
	A-P	1.23	(0.41)	3.33	(0.04)	1.94	(0.19)
	A-Q	4.94	(0.57)	9.28	(0.13)	6.38	(0.36)
	Breakpoint	2004:01		2003:02		2007:04	

Note: J-B reports the results of Jarque and Bera (1987) normality test; A-P stands for the Andrews and Ploberger and A-Q for Andrews - Quandt structural break tests. P-values are in parentheses.

Table 67: Structural Breaks Tests for Real Government Consumption Revision Errors with Final Release Equals Last Known Release

Vintage	Test	Full sample		2000:3 - 2006:4 sample		2007:1-2015:1 sample	
L1	J-B	1.55	(0.46)	2.64	(0.27)	1.99	(0.37)
	A-P	8.34	(0.00)	2.00	(0.18)	3.18	(0.05)
	A-Q	21.95	(0.00)	7.19	(0.27)	11.46	(0.05)
	Breakpoint	2008:01		2005:01		2008:01	
L2	J-B	2.47	(0.29)	1.72	(0.42)	2.73	(0.26)
	A-P	4.48	(0.01)	2.29	(0.13)	2.96	(0.06)
	A-Q	14.11	(0.02)	8.16	(0.19)	9.82	(0.10)
	Breakpoint	2008:01		2005:01		2008:04	
L3	J-B	1.98	(0.37)	3.35	(0.19)	1.64	(0.44)
	A-P	2.61	(0.09)	2.11	(0.16)	2.30	(0.13)
	A-Q	9.31	(0.12)	6.84	(0.31)	8.42	(0.18)
	Breakpoint	2008:01		2005:01		2008:04	
L4	J-B	0.69	(0.71)	1.83	(0.40)	0.86	(0.65)
	A-P	2.56	(0.10)	1.61	(0.27)	1.96	(0.19)
	A-Q	8.00	(0.21)	6.06	(0.40)	7.79	(0.22)
	Breakpoint	2007:02		2005:01		2008:04	
L5	J-B	0.30	(0.86)	2.30	(0.32)	0.47	(0.79)
	A-P	3.21	(0.05)	1.20	(0.42)	1.77	(0.23)
	A-Q	9.65	(0.11)	4.90	(0.58)	7.19	(0.27)
	Breakpoint	2007:02		2005:01		2008:04	
L6	J-B	0.39	(0.82)	2.15	(0.34)	0.47	(0.79)
	A-P	3.75	(0.03)	1.12	(0.46)	1.71	(0.25)
	A-Q	10.79	(0.07)	5.37	(0.50)	6.29	(0.37)
	Breakpoint	2007:02		2005:01		2008:04	
L7	J-B	0.37	(0.83)	1.84	(0.40)	0.63	(0.73)
	A-P	5.61	(0.00)	1.11	(0.47)	1.74	(0.24)
	A-Q	13.89	(0.02)	4.47	(0.65)	6.53	(0.35)
	Breakpoint	2007:02		2005:01		2009:02	
L8	J-B	0.44	(0.80)	1.99	(0.37)	0.42	(0.81)
	A-P	4.77	(0.01)	0.99	(0.53)	1.55	(0.29)
	A-Q	12.31	(0.04)	4.07	(0.72)	6.06	(0.40)
	Breakpoint	2007:02		2005:01		2008:01	
L9	Vintage:	L9					
	J-B	0.31	(0.86)	2.14	(0.34)	0.15	(0.93)
	A-P	4.64	(0.01)	1.44	(0.33)	1.55	(0.29)
	A-Q	11.52	(0.05)	4.84	(0.58)	6.44	(0.36)
L10	Breakpoint	2008:01		2005:01		2008:01	
	J-B	0.02	(0.99)	2.18	(0.34)	0.45	(0.80)
	A-P	2.63	(0.09)	1.48	(0.32)	0.78	(0.66)
	A-Q	7.69	(0.23)	5.25	(0.52)	4.09	(0.71)
L11	Breakpoint	2007:02		2005:01		2008:01	
	J-B	0.38	(0.83)	1.89	(0.39)	0.70	(0.71)
	A-P	2.40	(0.12)	1.41	(0.34)	0.58	(0.80)
	A-Q	6.63	(0.33)	4.79	(0.59)	3.42	(0.82)
L12	Breakpoint	2007:02		2005:01		2008:04	
	J-B	0.03	(0.98)	0.47	(0.79)	0.63	(0.73)
	A-P	3.08	(0.06)	0.49	(0.87)	0.56	(0.82)
	A-Q	8.28	(0.18)	3.30	(0.84)	3.10	(0.87)
L13	Breakpoint	2007:02		2005:01		2008:04	
	J-B	2.03	(0.36)	0.60	(0.74)	5.11	(0.08)
	A-P	3.51	(0.04)	0.46	(0.89)	0.70	(0.71)
	A-Q	9.07	(0.14)	3.36	(0.83)	4.32	(0.67)
L14	Breakpoint	2007:02		2005:01		2008:04	
	J-B	2.23	(0.33)	0.46	(0.79)	4.32	(0.12)
	A-P	2.91	(0.07)	0.48	(0.87)	0.62	(0.77)
	A-Q	8.06	(0.20)	3.44	(0.82)	2.99	(0.89)
L15	Breakpoint	2007:02		2005:01		2008:04	
	J-B	2.90	(0.23)	0.55	(0.76)	7.60	(0.02)
	A-P	2.92	(0.07)	0.61	(0.78)	0.62	(0.77)
	A-Q	7.75	(0.22)	4.16	(0.70)	3.10	(0.87)
L16	Breakpoint	2007:02		2005:01		2008:04	
	J-B	2.06	(0.36)	0.32	(0.85)	6.81	(0.03)
	A-P	2.85	(0.07)	1.19	(0.43)	0.49	(0.87)
	A-Q	7.55	(0.24)	6.24	(0.38)	2.46	(0.95)
L17	Breakpoint	2006:03		2005:01		2008:04	
	J-B	2.00	(0.37)	0.28	(0.87)	8.22	(0.02)
	A-P	2.71	(0.08)	1.21	(0.42)	0.51	(0.86)
	A-Q	7.44	(0.25)	6.74	(0.32)	2.87	(0.91)
L18	Breakpoint	2006:03		2005:01		2008:04	
	J-B	1.78	(0.41)	0.09	(0.96)	6.75	(0.03)
	A-P	2.31	(0.13)	0.82	(0.63)	0.55	(0.83)
	A-Q	6.52	(0.35)	4.85	(0.58)	2.72	(0.93)
L19	Breakpoint	2006:03		2005:01		2008:04	
	J-B	1.28	(0.53)	0.66	(0.72)	2.67	(0.26)
	A-P	2.90	(0.07)	0.82	(0.63)	0.64	(0.76)
	A-Q	7.60	(0.24)	4.45	(0.65)	2.46	(0.96)
L20	Breakpoint	2006:03		2005:01		2009:02	
	J-B	1.17	(0.56)	0.56	(0.76)	1.48	(0.48)
	A-P	3.79	(0.03)	0.94	(0.56)	0.77	(0.66)
	A-Q	9.48	(0.12)	5.04	(0.55)	2.61	(0.94)
L21	Breakpoint	2006:03		2005:01		2009:02	
	J-B	1.16	(0.56)	0.19	(0.91)	2.23	(0.33)
	A-P	3.77	(0.03)	0.89	(0.59)	0.61	(0.78)
	A-Q	9.87	(0.10)	5.40	(0.50)	1.98	(0.99)
L22	Breakpoint	2006:03		2005:01		2009:02	
	J-B	1.43	(0.49)	0.19	(0.91)	2.26	(0.32)
	A-P	3.36	(0.04)	0.87	(0.60)	0.61	(0.78)
	A-Q	8.73	(0.16)	5.39	(0.50)	1.84	(1.00)
L23	Breakpoint	2006:03		2005:01		2008:01	
	J-B	1.23	(0.54)	0.45	(0.80)	1.34	(0.51)
	A-P	3.69	(0.03)	1.15	(0.45)	0.82	(0.63)
	A-Q	9.19	(0.13)	6.36	(0.37)	2.42	(0.96)
	Breakpoint	2008:01		2005:01		2011:02	

Note: J-B reports the results of Jarque and Bera (1987) normality test; A-P stands for the Andrews and Ploberger and A-Q for Andrews - Quandt structural break tests. P-values are in parentheses.

Table 68: Structural Breaks Tests for Real Net Exports Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

Vintage	Test	Full sample		2000:3 - 2006:4 sample		2007:1-2015:1 sample	
L1	J-B	0.20	(0.90)	0.18	(0.91)	1.56	(0.46)
	A-P	4.30	(0.02)	1.32	(0.37)	1.28	(0.39)
	A-Q	10.98	(0.06)	4.34	(0.67)	5.11	(0.54)
	Breakpoint	2005:04		2005:01		2009:01	
L2	J-B	0.36	(0.84)	1.14	(0.56)	1.14	(0.56)
	A-P	2.18	(0.15)	0.75	(0.68)	1.23	(0.41)
	A-Q	7.03	(0.29)	3.64	(0.79)	4.79	(0.59)
	Breakpoint	2009:01		2001:04		2009:02	
L3	J-B	5.85	(0.05)	6.08	(0.05)	2.25	(0.32)
	A-P	2.36	(0.12)	0.52	(0.84)	2.07	(0.17)
	A-Q	9.17	(0.13)	2.91	(0.90)	7.31	(0.26)
	Breakpoint	2009:02		2002:01		2009:02	
L4	J-B	14.50	(0.00)	8.06	(0.02)	3.17	(0.21)
	A-P	3.23	(0.05)	0.50	(0.86)	2.29	(0.13)
	A-Q	12.08	(0.04)	3.42	(0.82)	8.18	(0.19)
	Breakpoint	2009:02		2001:02		2009:02	
L5	J-B	20.47	(0.00)	3.88	(0.14)	6.51	(0.04)
	A-P	4.66	(0.01)	0.49	(0.86)	3.26	(0.05)
	A-Q	15.14	(0.01)	3.33	(0.84)	10.31	(0.08)
	Breakpoint	2009:02		2001:02		2009:02	
L6	J-B	16.02	(0.00)	3.54	(0.17)	5.83	(0.05)
	A-P	4.45	(0.01)	0.43	(0.92)	3.01	(0.06)
	A-Q	14.66	(0.01)	2.83	(0.91)	9.89	(0.10)
	Breakpoint	2009:02		2003:04		2009:02	
L7	J-B	14.43	(0.00)	4.21	(0.12)	8.60	(0.01)
	A-P	2.46	(0.11)	0.70	(0.72)	1.72	(0.24)
	A-Q	9.76	(0.10)	2.90	(0.90)	6.76	(0.32)
	Breakpoint	2009:02		2003:04		2009:02	
L8	J-B	7.05	(0.03)	2.45	(0.29)	5.66	(0.06)
	A-P	1.92	(0.20)	0.90	(0.59)	1.60	(0.28)
	A-Q	8.36	(0.18)	4.85	(0.58)	6.47	(0.35)
	Breakpoint	2009:02		2003:03		2009:02	
L9	J-B	3.88	(0.14)	1.17	(0.56)	4.49	(0.11)
	A-P	2.06	(0.17)	1.73	(0.24)	1.74	(0.24)
	A-Q	8.41	(0.18)	7.09	(0.28)	6.68	(0.33)
	Breakpoint	2009:02		2003:02		2009:02	
L10	J-B	8.93	(0.01)	0.79	(0.67)	18.11	(0.00)
	A-P	0.86	(0.61)	1.69	(0.25)	0.76	(0.68)
	A-Q	4.13	(0.71)	6.57	(0.34)	3.59	(0.80)
	Breakpoint	2003:02		2003:02		2012:03	
L11	J-B	49.00	(0.00)	0.51	(0.77)	52.39	(0.00)
	A-P	0.57	(0.81)	1.70	(0.25)	0.48	(0.88)
	A-Q	3.07	(0.88)	6.40	(0.36)	2.45	(0.96)
	Breakpoint	2003:02		2003:02		2012:03	
L12	J-B	25.83	(0.00)	1.34	(0.51)	47.90	(0.00)
	A-P	0.88	(0.60)	1.20	(0.43)	0.54	(0.83)
	A-Q	3.78	(0.76)	3.81	(0.76)	2.26	(0.97)
	Breakpoint	2002:03		2001:02		2012:03	
L13	J-B	61.62	(0.00)	1.08	(0.58)	90.10	(0.00)
	A-P	0.72	(0.70)	0.76	(0.67)	0.60	(0.79)
	A-Q	2.77	(0.92)	2.51	(0.95)	3.15	(0.87)
	Breakpoint	2002:03		2001:02		2012:03	
L14	J-B	26.07	(0.00)	0.77	(0.68)	53.56	(0.00)
	A-P	0.83	(0.63)	0.84	(0.62)	0.61	(0.78)
	A-Q	3.10	(0.87)	3.70	(0.78)	3.50	(0.81)
	Breakpoint	2003:02		2001:02		2012:03	
L15	J-B	70.01	(0.00)	0.58	(0.75)	82.17	(0.00)
	A-P	0.39	(0.94)	0.30	(1.00)	0.46	(0.89)
	A-Q	2.35	(0.97)	1.19	(1.00)	2.66	(0.93)
	Breakpoint	2009:02		2002:04		2012:03	
L16	J-B	68.07	(0.00)	0.33	(0.85)	74.58	(0.00)
	A-P	0.33	(0.98)	0.51	(0.85)	0.66	(0.75)
	A-Q	3.42	(0.82)	2.69	(0.93)	3.66	(0.78)
	Breakpoint	2008:04		2001:04		2012:03	
L17	J-B	102.73	(0.00)	0.95	(0.62)	100.05	(0.00)
	A-P	0.51	(0.85)	1.16	(0.45)	0.52	(0.84)
	A-Q	3.40	(0.83)	5.31	(0.51)	3.09	(0.88)
	Breakpoint	2002:03		2001:04		2012:03	
L18	J-B	151.02	(0.00)	9.24	(0.01)	100.43	(0.00)
	A-P	0.30	(1.00)	0.55	(0.82)	0.53	(0.84)
	A-Q	2.14	(0.98)	2.88	(0.91)	3.10	(0.87)
	Breakpoint	2008:04		2002:01		2012:03	
L19	J-B	432.40	(0.00)	9.17	(0.01)	134.74	(0.00)
	A-P	0.51	(0.85)	1.45	(0.33)	0.64	(0.75)
	A-Q	5.08	(0.55)	6.06	(0.40)	3.47	(0.82)
	Breakpoint	2008:04		2003:02		2008:04	
L20	J-B	882.27	(0.00)	3.20	(0.20)	212.95	(0.00)
	A-P	0.69	(0.72)	1.66	(0.26)	0.58	(0.80)
	A-Q	6.72	(0.32)	6.78	(0.32)	4.28	(0.68)
	Breakpoint	2008:04		2003:02		2008:04	
L21	J-B	1589.22	(0.00)	8.61	(0.01)	305.67	(0.00)
	A-P	0.85	(0.61)	1.22	(0.42)	0.52	(0.85)
	A-Q	7.18	(0.28)	4.73	(0.60)	3.96	(0.73)
	Breakpoint	2008:04		2002:02		2008:04	
L22	J-B	42.73	(0.00)	12.40	(0.00)	28.94	(0.00)
	A-P	2.24	(0.14)	2.25	(0.14)	1.66	(0.26)
	A-Q	7.92	(0.21)	7.48	(0.25)	8.72	(0.16)
	Breakpoint	2002:03		2002:03		2012:02	
L23	J-B	118.56	(0.00)	5.84	(0.05)	341.18	(0.00)
	A-P	1.44	(0.33)	0.66	(0.74)	6.26	(0.00)
	A-Q	4.49	(0.64)	2.67	(0.93)	18.51	(0.00)
	Breakpoint	2010:04		2001:03		2012:02	

Note: J-B reports the results of Jarque and Bera (1987) normality test; A-P stands for the Andrews and Ploberger and A-Q for Andrews - Quandt structural break tests. P-values are in parentheses.

Table 69: Structural Breaks Tests for Real Net Exports Revision Errors with Final Release Equals Last Known Release

Vintage	Test	Full sample		2000:3 - 2006:4 sample		2007:1-2015:1 sample	
L1	J-B	7.09	(0.03)	0.28	(0.87)	0.26	(0.88)
	A-P	2.52	(0.10)	0.90	(0.58)	1.52	(0.30)
	A-Q	8.48	(0.17)	3.94	(0.74)	5.66	(0.46)
	Breakpoint	2008:03		2003:01		2008:03	
L2	J-B	5.89	(0.05)	0.46	(0.79)	2.66	(0.26)
	A-P	1.65	(0.26)	1.50	(0.31)	1.41	(0.34)
	A-Q	6.72	(0.32)	6.97	(0.30)	6.39	(0.36)
	Breakpoint	2003:01		2003:01		2008:03	
L3	J-B	12.18	(0.00)	1.22	(0.54)	3.29	(0.19)
	A-P	1.38	(0.35)	1.75	(0.24)	1.21	(0.42)
	A-Q	6.95	(0.30)	6.66	(0.33)	4.53	(0.64)
	Breakpoint	2003:01		2003:01		2008:03	
L4	J-B	14.37	(0.00)	2.66	(0.26)	15.69	(0.00)
	A-P	0.76	(0.67)	1.55	(0.29)	0.77	(0.67)
	A-Q	5.59	(0.47)	6.44	(0.36)	2.65	(0.93)
	Breakpoint	2003:01		2005:04		2012:02	
L5	J-B	11.42	(0.00)	1.97	(0.37)	16.98	(0.00)
	A-P	1.20	(0.43)	1.73	(0.24)	0.97	(0.54)
	A-Q	7.44	(0.25)	6.70	(0.33)	3.68	(0.78)
	Breakpoint	2003:01		2005:04		2012:02	
L6	J-B	6.88	(0.03)	0.83	(0.66)	19.95	(0.00)
	A-P	0.84	(0.62)	1.36	(0.36)	1.27	(0.39)
	A-Q	5.21	(0.53)	5.49	(0.48)	4.25	(0.68)
	Breakpoint	2003:01		2005:04		2012:02	
L7	J-B	4.68	(0.10)	1.69	(0.43)	13.01	(0.00)
	A-P	0.71	(0.71)	1.04	(0.51)	1.44	(0.33)
	A-Q	4.75	(0.60)	4.75	(0.60)	4.10	(0.71)
	Breakpoint	2003:01		2005:04		2010:04	
L8	J-B	3.93	(0.14)	0.64	(0.72)	8.79	(0.01)
	A-P	1.01	(0.52)	1.24	(0.41)	1.42	(0.34)
	A-Q	6.35	(0.37)	4.75	(0.60)	3.97	(0.73)
	Breakpoint	2003:01		2003:01		2012:03	
L9	J-B	5.21	(0.07)	0.73	(0.70)	4.17	(0.12)
	A-P	0.84	(0.62)	0.87	(0.60)	1.42	(0.34)
	A-Q	5.79	(0.44)	4.49	(0.64)	4.82	(0.59)
	Breakpoint	2003:01		2003:01		2013:01	
L10	J-B	4.35	(0.11)	0.19	(0.91)	0.73	(0.69)
	A-P	0.69	(0.72)	0.68	(0.73)	0.99	(0.53)
	A-Q	4.61	(0.62)	3.44	(0.82)	6.48	(0.35)
	Breakpoint	2008:04		2003:01		2008:04	
L11	J-B	3.80	(0.15)	0.22	(0.90)	1.20	(0.55)
	A-P	0.64	(0.76)	0.75	(0.68)	0.95	(0.55)
	A-Q	4.46	(0.65)	3.76	(0.77)	6.43	(0.36)
	Breakpoint	2008:04		2003:01		2008:04	
L12	J-B	1.33	(0.52)	0.10	(0.95)	0.40	(0.82)
	A-P	0.76	(0.67)	0.46	(0.89)	0.99	(0.53)
	A-Q	5.14	(0.54)	2.69	(0.93)	6.40	(0.36)
	Breakpoint	2008:04		2005:04		2008:04	
L13	J-B	0.40	(0.82)	0.26	(0.88)	1.04	(0.59)
	A-P	0.69	(0.72)	0.56	(0.81)	0.71	(0.71)
	A-Q	4.52	(0.64)	3.06	(0.88)	5.09	(0.54)
	Breakpoint	2008:04		2005:04		2008:04	
L14	J-B	0.80	(0.67)	0.03	(0.99)	0.46	(0.79)
	A-P	0.78	(0.66)	0.64	(0.76)	1.03	(0.51)
	A-Q	5.20	(0.53)	3.61	(0.79)	6.50	(0.35)
	Breakpoint	2008:04		2005:04		2008:04	
L15	J-B	1.28	(0.53)	0.19	(0.91)	0.97	(0.62)
	A-P	0.77	(0.67)	0.69	(0.72)	1.47	(0.32)
	A-Q	5.44	(0.49)	3.64	(0.79)	7.76	(0.22)
	Breakpoint	2008:04		2005:04		2008:04	
L16	J-B	0.36	(0.84)	0.02	(0.99)	1.67	(0.43)
	A-P	0.48	(0.88)	0.77	(0.67)	0.93	(0.57)
	A-Q	3.22	(0.86)	3.83	(0.76)	5.34	(0.51)
	Breakpoint	2008:04		2005:04		2008:04	
L17	J-B	0.73	(0.70)	0.51	(0.78)	2.56	(0.28)
	A-P	0.57	(0.81)	0.96	(0.55)	0.76	(0.67)
	A-Q	4.12	(0.71)	3.64	(0.79)	4.30	(0.68)
	Breakpoint	2002:03		2005:04		2008:04	
L18	J-B	0.92	(0.63)	0.25	(0.88)	2.71	(0.26)
	A-P	0.42	(0.92)	0.95	(0.55)	0.63	(0.76)
	A-Q	2.16	(0.98)	4.92	(0.57)	3.68	(0.78)
	Breakpoint	2002:03		2005:04		2008:04	
L19	J-B	2.43	(0.30)	1.48	(0.48)	1.62	(0.44)
	A-P	0.52	(0.85)	1.15	(0.45)	0.94	(0.56)
	A-Q	3.43	(0.82)	5.82	(0.44)	5.83	(0.43)
	Breakpoint	2008:04		2005:04		2008:04	
L20	J-B	2.86	(0.24)	1.52	(0.47)	3.82	(0.15)
	A-P	0.59	(0.79)	1.08	(0.49)	1.42	(0.34)
	A-Q	4.76	(0.60)	5.61	(0.47)	7.55	(0.24)
	Breakpoint	2008:04		2005:04		2008:04	
L21	J-B	3.46	(0.18)	1.84	(0.40)	4.39	(0.11)
	A-P	0.53	(0.84)	0.92	(0.57)	1.23	(0.42)
	A-Q	4.56	(0.63)	4.97	(0.56)	6.90	(0.30)
	Breakpoint	2008:04		2005:04		2008:04	
L22	J-B	3.78	(0.15)	1.16	(0.56)	13.57	(0.00)
	A-P	0.43	(0.92)	0.83	(0.63)	0.52	(0.85)
	A-Q	2.17	(0.98)	4.44	(0.65)	2.44	(0.96)
	Breakpoint	2003:01		2005:04		2009:01	
L23	J-B	3.27	(0.19)	1.45	(0.48)	6.47	(0.04)
	A-P	0.55	(0.82)	0.94	(0.56)	0.74	(0.68)
	A-Q	3.11	(0.87)	4.79	(0.59)	3.40	(0.83)
	Breakpoint	2003:01		2005:04		2009:01	

Note: J-B reports the results of Jarque and Bera (1987) normality test; A-P stands for the Andrews and Ploberger and A-Q for Andrews - Quandt structural break tests. P-values are in parentheses.

Table 70: Structural Breaks Tests for Real Value Added Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

Vintage	Test	Full sample		2000:3 - 2006:4 sample		2007:1-2015:1 sample	
L1	J-B	9.65	(0.01)	5.95	(0.05)	5.84	(0.05)
	A-P	2.86	(0.07)	4.12	(0.02)	2.87	(0.07)
	A-Q	9.68	(0.11)	10.80	(0.07)	11.35	(0.05)
	Breakpoint	2003:01		2001:02		2008:04	
L2	J-B	8.66	(0.01)	4.48	(0.11)	5.29	(0.07)
	A-P	1.62	(0.27)	3.06	(0.06)	2.60	(0.09)
	A-Q	6.28	(0.38)	8.25	(0.19)	10.69	(0.07)
	Breakpoint	2003:01		2001:02		2008:04	
L3	J-B	6.69	(0.04)	7.89	(0.02)	1.84	(0.40)
	A-P	1.47	(0.32)	2.98	(0.06)	1.59	(0.28)
	A-Q	6.06	(0.40)	7.84	(0.22)	7.32	(0.26)
	Breakpoint	2003:01		2002:01		2008:04	
L4	J-B	1.44	(0.49)	1.30	(0.52)	0.27	(0.87)
	A-P	0.69	(0.72)	1.45	(0.33)	1.15	(0.45)
	A-Q	3.09	(0.88)	5.21	(0.53)	5.73	(0.45)
	Breakpoint	2002:03		2003:02		2007:04	
L5	J-B	0.23	(0.89)	1.00	(0.61)	0.00	(1.00)
	A-P	0.64	(0.75)	1.45	(0.33)	0.98	(0.54)
	A-Q	2.68	(0.93)	5.57	(0.47)	5.17	(0.53)
	Breakpoint	2002:04		2003:02		2008:01	
L6	J-B	0.34	(0.84)	0.95	(0.62)	0.07	(0.96)
	A-P	0.68	(0.73)	1.37	(0.35)	1.21	(0.42)
	A-Q	2.53	(0.95)	4.33	(0.67)	6.37	(0.37)
	Breakpoint	2007:03		2001:04		2008:01	
L7	J-B	0.40	(0.82)	0.00	(1.00)	0.64	(0.73)
	A-P	1.45	(0.33)	1.40	(0.35)	1.46	(0.32)
	A-Q	5.12	(0.54)	4.93	(0.57)	7.09	(0.29)
	Breakpoint	2007:04		2003:02		2008:01	
L8	J-B	0.15	(0.93)	0.03	(0.98)	0.12	(0.94)
	A-P	1.34	(0.37)	1.36	(0.36)	1.23	(0.41)
	A-Q	4.67	(0.61)	4.72	(0.60)	6.29	(0.38)
	Breakpoint	2007:04		2001:02		2008:01	
L9	J-B	0.28	(0.87)	1.68	(0.43)	0.05	(0.98)
	A-P	1.06	(0.49)	1.59	(0.28)	1.19	(0.43)
	A-Q	4.28	(0.68)	4.92	(0.57)	6.11	(0.40)
	Breakpoint	2004:02		2004:02		2007:04	
L10	J-B	0.83	(0.66)	2.14	(0.34)	0.36	(0.84)
	A-P	1.07	(0.49)	1.77	(0.23)	0.88	(0.60)
	A-Q	4.53	(0.64)	5.45	(0.49)	4.93	(0.57)
	Breakpoint	2004:02		2004:02		2008:01	
L11	J-B	0.18	(0.92)	0.12	(0.94)	0.07	(0.97)
	A-P	0.47	(0.89)	2.01	(0.18)	0.85	(0.61)
	A-Q	2.10	(0.98)	5.08	(0.55)	5.13	(0.54)
	Breakpoint	2003:01		2004:04		2008:01	
L12	J-B	1.12	(0.57)	0.29	(0.87)	0.34	(0.84)
	A-P	0.49	(0.87)	1.01	(0.52)	1.06	(0.49)
	A-Q	3.53	(0.81)	3.23	(0.85)	6.54	(0.35)
	Breakpoint	2008:03		2003:01		2008:01	
L13	J-B	7.65	(0.02)	5.66	(0.06)	4.67	(0.10)
	A-P	1.13	(0.46)	2.94	(0.07)	0.43	(0.92)
	A-Q	5.00	(0.56)	7.64	(0.23)	2.96	(0.89)
	Breakpoint	2002:02		2002:02		2007:04	
L14	J-B	5.08	(0.08)	4.02	(0.13)	3.52	(0.17)
	A-P	0.82	(0.64)	1.77	(0.23)	0.42	(0.92)
	A-Q	4.60	(0.63)	5.64	(0.46)	2.54	(0.95)
	Breakpoint	2002:02		2002:02		2007:04	
L15	J-B	1.22	(0.54)	0.45	(0.80)	0.50	(0.78)
	A-P	0.80	(0.65)	1.84	(0.21)	0.94	(0.56)
	A-Q	4.73	(0.60)	6.64	(0.33)	4.96	(0.57)
	Breakpoint	2002:02		2002:02		2007:04	
L16	J-B	0.10	(0.95)	0.27	(0.87)	0.26	(0.88)
	A-P	1.49	(0.31)	1.88	(0.20)	1.56	(0.29)
	A-Q	7.47	(0.25)	6.83	(0.31)	6.67	(0.33)
	Breakpoint	2002:02		2002:02		2008:03	
L17	J-B	1.12	(0.57)	0.53	(0.77)	0.47	(0.79)
	A-P	0.71	(0.71)	1.15	(0.45)	1.44	(0.33)
	A-Q	3.94	(0.74)	4.75	(0.60)	6.22	(0.38)
	Breakpoint	2008:03		2006:01		2008:03	
L18	J-B	0.97	(0.62)	0.34	(0.84)	0.55	(0.76)
	A-P	0.89	(0.59)	1.35	(0.36)	1.97	(0.19)
	A-Q	4.39	(0.66)	5.56	(0.47)	7.60	(0.24)
	Breakpoint	2008:03		2006:01		2008:03	
L19	J-B	0.24	(0.89)	0.50	(0.78)	0.14	(0.93)
	A-P	0.68	(0.73)	1.76	(0.23)	1.84	(0.21)
	A-Q	5.61	(0.47)	6.31	(0.37)	5.32	(0.51)
	Breakpoint	2002:02		2002:02		2012:01	
L20	J-B	0.06	(0.97)	0.03	(0.98)	0.13	(0.94)
	A-P	1.01	(0.52)	1.02	(0.52)	1.47	(0.32)
	A-Q	4.71	(0.61)	3.99	(0.73)	4.42	(0.66)
	Breakpoint	2002:02		2002:02		2012:01	
L21	J-B	0.77	(0.68)	0.70	(0.71)	0.13	(0.94)
	A-P	1.58	(0.28)	0.84	(0.62)	1.25	(0.41)
	A-Q	5.22	(0.52)	3.06	(0.88)	4.01	(0.72)
	Breakpoint	2003:02		2003:02		2012:01	
L22	J-B	0.79	(0.67)	0.81	(0.67)	0.19	(0.91)
	A-P	1.64	(0.27)	1.25	(0.40)	2.99	(0.06)
	A-Q	5.83	(0.44)	7.57	(0.24)	8.65	(0.16)
	Breakpoint	2006:01		2006:01		2008:01	
L23	J-B	56.97	(0.00)	12.53	(0.00)	118.76	(0.00)
	A-P	1.62	(0.27)	1.99	(0.18)	1.32	(0.37)
	A-Q	5.23	(0.52)	7.65	(0.23)	5.56	(0.47)
	Breakpoint	2006:04		2006:01		2010:04	

Note: J-B reports the results of Jarque and Bera (1987) normality test; A-P stands for the Andrews and Ploberger and A-Q for Andrews - Quandt structural break tests. P-values are in parentheses.

Table 71: Structural Breaks Tests for Real Value Added Revision Errors with Final Release Equals Last Known Release

Vintage	Test	Full sample		2000:3 - 2006:4 sample		2007:1-2015:1 sample	
L1	J-B	4.40	(0.11)	0.26	(0.88)	9.83	(0.01)
	A-P	1.82	(0.22)	1.62	(0.27)	2.11	(0.16)
	A-Q	6.35	(0.37)	5.86	(0.43)	7.29	(0.27)
	Breakpoint	2005:01		2005:01		2009:01	
L2	J-B	3.44	(0.18)	0.31	(0.86)	8.00	(0.02)
	A-P	1.33	(0.37)	1.40	(0.34)	2.03	(0.17)
	A-Q	5.30	(0.51)	5.25	(0.52)	7.43	(0.25)
	Breakpoint	2008:01		2005:01		2008:01	
L3	J-B	1.67	(0.43)	0.08	(0.96)	6.29	(0.04)
	A-P	1.93	(0.19)	1.17	(0.44)	1.64	(0.27)
	A-Q	6.65	(0.33)	4.58	(0.63)	7.02	(0.29)
	Breakpoint	2008:01		2005:01		2008:01	
L4	J-B	20.46	(0.00)	0.41	(0.82)	56.20	(0.00)
	A-P	1.60	(0.28)	1.01	(0.52)	0.93	(0.56)
	A-Q	5.91	(0.42)	4.10	(0.71)	4.80	(0.59)
	Breakpoint	2008:01		2005:01		2008:01	
L5	J-B	5.87	(0.05)	0.16	(0.92)	25.02	(0.00)
	A-P	1.64	(0.27)	1.04	(0.51)	0.80	(0.65)
	A-Q	5.79	(0.44)	4.12	(0.71)	4.49	(0.64)
	Breakpoint	2008:01		2005:01		2008:01	
L6	J-B	7.77	(0.02)	0.31	(0.85)	25.85	(0.00)
	A-P	1.73	(0.24)	0.91	(0.58)	0.93	(0.56)
	A-Q	5.99	(0.41)	3.75	(0.77)	4.42	(0.65)
	Breakpoint	2007:04		2005:01		2008:01	
L7	J-B	19.92	(0.00)	0.05	(0.98)	57.16	(0.00)
	A-P	2.39	(0.12)	0.87	(0.60)	0.73	(0.69)
	A-Q	7.32	(0.26)	3.17	(0.86)	4.74	(0.60)
	Breakpoint	2008:01		2003:02		2008:01	
L8	J-B	18.55	(0.00)	0.00	(1.00)	64.47	(0.00)
	A-P	2.13	(0.16)	0.88	(0.59)	0.86	(0.61)
	A-Q	6.47	(0.35)	3.21	(0.86)	4.96	(0.57)
	Breakpoint	2004:04		2003:02		2008:04	
L9	J-B	17.69	(0.00)	0.14	(0.93)	81.09	(0.00)
	A-P	1.45	(0.33)	1.10	(0.47)	0.85	(0.62)
	A-Q	4.95	(0.57)	4.63	(0.62)	5.59	(0.47)
	Breakpoint	2005:01		2005:01		2008:04	
L10	J-B	11.33	(0.00)	0.22	(0.90)	69.48	(0.00)
	A-P	1.14	(0.45)	1.00	(0.53)	0.73	(0.69)
	A-Q	4.51	(0.64)	4.64	(0.62)	5.06	(0.55)
	Breakpoint	2005:01		2005:01		2008:04	
L11	J-B	6.99	(0.03)	0.47	(0.79)	41.73	(0.00)
	A-P	1.08	(0.49)	0.85	(0.61)	0.65	(0.75)
	A-Q	4.74	(0.60)	4.02	(0.72)	5.34	(0.51)
	Breakpoint	2008:04		2005:01		2008:04	
L12	J-B	5.96	(0.05)	0.89	(0.64)	39.11	(0.00)
	A-P	0.84	(0.62)	0.74	(0.69)	0.60	(0.79)
	A-Q	4.23	(0.69)	3.62	(0.79)	5.00	(0.56)
	Breakpoint	2008:04		2005:01		2008:04	
L13	J-B	4.51	(0.10)	1.48	(0.48)	55.03	(0.00)
	A-P	0.98	(0.54)	0.94	(0.56)	1.15	(0.45)
	A-Q	4.95	(0.57)	4.18	(0.70)	7.43	(0.25)
	Breakpoint	2008:04		2005:01		2008:04	
L14	J-B	3.42	(0.18)	2.05	(0.36)	43.27	(0.00)
	A-P	0.79	(0.65)	0.71	(0.71)	0.90	(0.58)
	A-Q	4.19	(0.69)	3.29	(0.85)	6.56	(0.34)
	Breakpoint	2008:04		2005:01		2008:04	
L15	J-B	4.08	(0.13)	2.77	(0.25)	35.95	(0.00)
	A-P	0.94	(0.56)	0.68	(0.73)	1.26	(0.40)
	A-Q	4.44	(0.65)	3.35	(0.84)	7.42	(0.25)
	Breakpoint	2008:04		2005:01		2008:04	
L16	J-B	10.48	(0.01)	2.45	(0.29)	69.78	(0.00)
	A-P	1.21	(0.42)	0.71	(0.71)	1.97	(0.19)
	A-Q	5.96	(0.42)	3.46	(0.82)	9.42	(0.12)
	Breakpoint	2008:04		2005:01		2008:04	
L17	J-B	12.57	(0.00)	2.89	(0.24)	70.18	(0.00)
	A-P	1.08	(0.48)	0.63	(0.76)	2.29	(0.13)
	A-Q	6.03	(0.41)	3.43	(0.82)	10.19	(0.09)
	Breakpoint	2008:04		2005:01		2008:04	
L18	J-B	11.93	(0.00)	2.97	(0.23)	73.06	(0.00)
	A-P	1.26	(0.40)	0.79	(0.65)	2.30	(0.13)
	A-Q	5.97	(0.42)	3.84	(0.75)	10.09	(0.09)
	Breakpoint	2008:04		2005:01		2008:04	
L19	J-B	10.35	(0.01)	2.57	(0.28)	75.43	(0.00)
	A-P	1.46	(0.32)	0.80	(0.65)	1.87	(0.21)
	A-Q	5.98	(0.41)	3.63	(0.79)	8.67	(0.16)
	Breakpoint	2008:04		2005:01		2008:04	
L20	J-B	14.35	(0.00)	2.72	(0.26)	75.14	(0.00)
	A-P	0.91	(0.58)	0.68	(0.73)	1.77	(0.23)
	A-Q	5.51	(0.48)	3.26	(0.85)	8.29	(0.18)
	Breakpoint	2008:04		2005:01		2008:04	
L21	J-B	14.53	(0.00)	3.04	(0.22)	73.83	(0.00)
	A-P	0.81	(0.64)	0.64	(0.75)	1.77	(0.23)
	A-Q	5.42	(0.49)	3.07	(0.88)	8.39	(0.18)
	Breakpoint	2008:04		2005:01		2008:04	
L22	J-B	16.50	(0.00)	2.73	(0.26)	59.24	(0.00)
	A-P	1.14	(0.45)	0.58	(0.80)	1.48	(0.32)
	A-Q	5.98	(0.42)	2.79	(0.92)	7.22	(0.27)
	Breakpoint	2008:04		2005:01		2008:04	
L23	J-B	10.73	(0.00)	2.10	(0.35)	45.45	(0.00)
	A-P	0.86	(0.61)	0.55	(0.82)	1.04	(0.50)
	A-Q	4.94	(0.57)	2.80	(0.92)	6.07	(0.40)
	Breakpoint	2008:04		2005:01		2008:04	

Note: J-B reports the results of Jarque and Bera (1987) normality test; A-P stands for the Andrews and Ploberger and A-Q for Andrews - Quandt structural break tests. P-values are in parentheses.

Table 72: Structural Breaks Tests for Nominal Value Added Revision Errors with Final Release Announced 24 Months after the End of Report Quarter

Vintage	Test	Full sample		2000:3 - 2006:4 sample		2007:1-2015:1 sample	
L1	J-B	0.80	(0.67)	0.93	(0.63)	1.13	(0.57)
	A-P	3.42	(0.04)	1.07	(0.49)	2.04	(0.17)
	A-Q	11.70	(0.05)	4.63	(0.62)	6.51	(0.35)
	Breakpoint	2008:01		2005:02		2008:01	
L2	J-B	0.17	(0.92)	3.59	(0.17)	0.85	(0.65)
	A-P	3.64	(0.03)	0.84	(0.62)	2.02	(0.18)
	A-Q	12.28	(0.04)	4.54	(0.63)	6.91	(0.30)
	Breakpoint	2008:01		2002:01		2008:01	
L3	J-B	0.27	(0.87)	2.01	(0.37)	0.92	(0.63)
	A-P	3.09	(0.06)	0.81	(0.64)	1.81	(0.22)
	A-Q	10.91	(0.07)	4.23	(0.69)	6.72	(0.32)
	Breakpoint	2008:01		2002:01		2008:01	
L4	J-B	0.03	(0.99)	4.02	(0.13)	1.05	(0.59)
	A-P	2.82	(0.07)	0.78	(0.66)	1.99	(0.18)
	A-Q	9.54	(0.11)	3.65	(0.79)	5.43	(0.49)
	Breakpoint	2008:01		2002:01		2009:02	
L5	J-B	0.34	(0.85)	0.93	(0.63)	0.94	(0.63)
	A-P	2.59	(0.10)	0.35	(0.97)	2.00	(0.18)
	A-Q	8.94	(0.14)	1.69	(1.00)	6.17	(0.39)
	Breakpoint	2008:01		2005:02		2008:01	
L6	J-B	0.05	(0.97)	4.01	(0.13)	1.05	(0.59)
	A-P	2.44	(0.11)	0.49	(0.87)	1.85	(0.21)
	A-Q	8.75	(0.15)	2.08	(0.99)	5.82	(0.44)
	Breakpoint	2008:01		2002:01		2008:01	
L7	J-B	0.81	(0.67)	3.32	(0.19)	1.17	(0.56)
	A-P	2.29	(0.13)	0.43	(0.91)	1.22	(0.42)
	A-Q	8.21	(0.19)	1.57	(1.00)	5.50	(0.48)
	Breakpoint	2008:01		2006:01		2008:03	
L8	J-B	0.21	(0.90)	0.44	(0.80)	0.82	(0.66)
	A-P	1.78	(0.23)	0.44	(0.90)	1.06	(0.50)
	A-Q	7.02	(0.29)	1.70	(1.00)	5.41	(0.50)
	Breakpoint	2008:01		2006:01		2008:03	
L9	J-B	0.02	(0.99)	0.22	(0.90)	0.95	(0.62)
	A-P	1.63	(0.27)	0.68	(0.73)	1.20	(0.42)
	A-Q	6.50	(0.35)	1.87	(1.00)	5.85	(0.43)
	Breakpoint	2008:01		2005:02		2008:03	
L10	J-B	0.11	(0.95)	0.68	(0.71)	1.42	(0.49)
	A-P	1.62	(0.27)	1.03	(0.51)	1.51	(0.31)
	A-Q	5.76	(0.45)	2.75	(0.92)	6.24	(0.38)
	Breakpoint	2008:01		2005:02		2008:03	
L11	J-B	0.25	(0.88)	0.21	(0.90)	0.89	(0.64)
	A-P	1.49	(0.31)	0.78	(0.66)	1.60	(0.28)
	A-Q	6.09	(0.40)	2.79	(0.92)	5.79	(0.44)
	Breakpoint	2009:01		2005:01		2009:01	
L12	J-B	0.13	(0.94)	0.27	(0.87)	0.01	(1.00)
	A-P	1.48	(0.32)	0.32	(0.99)	1.43	(0.33)
	A-Q	5.79	(0.44)	1.46	(1.00)	5.12	(0.54)
	Breakpoint	2009:01		2001:02		2009:01	
L13	J-B	0.88	(0.65)	2.01	(0.37)	0.01	(0.99)
	A-P	1.79	(0.23)	0.60	(0.79)	1.49	(0.31)
	A-Q	6.96	(0.30)	2.59	(0.94)	5.00	(0.56)
	Breakpoint	2010:01		2001:04		2010:01	
L14	J-B	1.03	(0.60)	1.99	(0.37)	0.28	(0.87)
	A-P	1.44	(0.33)	0.51	(0.85)	0.89	(0.59)
	A-Q	5.59	(0.47)	2.17	(0.98)	3.29	(0.85)
	Breakpoint	2010:01		2001:04		2008:03	
L15	J-B	1.19	(0.55)	1.44	(0.49)	0.79	(0.67)
	A-P	1.15	(0.45)	0.69	(0.72)	0.71	(0.71)
	A-Q	4.75	(0.60)	2.70	(0.93)	2.99	(0.89)
	Breakpoint	2010:01		2005:03		2008:04	
L16	J-B	0.58	(0.75)	0.92	(0.63)	2.46	(0.29)
	A-P	0.90	(0.59)	0.84	(0.62)	1.67	(0.26)
	A-Q	3.58	(0.80)	3.02	(0.89)	5.96	(0.42)
	Breakpoint	2010:02		2004:02		2008:04	
L17	J-B	0.34	(0.85)	1.17	(0.56)	2.81	(0.25)
	A-P	0.82	(0.63)	0.98	(0.54)	1.72	(0.24)
	A-Q	3.19	(0.86)	3.46	(0.82)	6.46	(0.35)
	Breakpoint	2010:02		2005:03		2009:01	
L18	J-B	1.26	(0.53)	2.45	(0.29)	1.50	(0.47)
	A-P	1.39	(0.35)	1.80	(0.22)	3.66	(0.03)
	A-Q	4.30	(0.67)	5.68	(0.46)	11.45	(0.05)
	Breakpoint	2006:01		2006:01		2009:01	
L19	J-B	6.44	(0.04)	1.38	(0.50)	16.65	(0.00)
	A-P	1.13	(0.46)	2.27	(0.13)	2.25	(0.14)
	A-Q	3.83	(0.76)	6.52	(0.35)	7.41	(0.25)
	Breakpoint	2002:02		2005:02		2012:02	
L20	J-B	17.65	(0.00)	6.08	(0.05)	19.89	(0.00)
	A-P	2.29	(0.13)	3.09	(0.06)	2.15	(0.15)
	A-Q	6.70	(0.33)	9.07	(0.14)	6.75	(0.32)
	Breakpoint	2005:02		2006:01		2012:02	
L21	J-B	9.26	(0.01)	0.18	(0.91)	23.08	(0.00)
	A-P	1.73	(0.24)	2.33	(0.13)	1.05	(0.50)
	A-Q	5.65	(0.46)	7.58	(0.24)	3.75	(0.77)
	Breakpoint	2005:02		2005:02		2010:02	
L22	J-B	9.97	(0.01)	5.18	(0.08)	5.86	(0.05)
	A-P	0.41	(0.93)	3.28	(0.05)	1.06	(0.50)
	A-Q	3.42	(0.82)	9.38	(0.12)	6.64	(0.33)
	Breakpoint	2002:02		2005:02		2007:04	
L23	J-B	59.84	(0.00)	15.12	(0.00)	151.40	(0.00)
	A-P	0.66	(0.74)	3.37	(0.04)	1.87	(0.21)
	A-Q	3.89	(0.75)	9.10	(0.13)	7.33	(0.26)
	Breakpoint	2002:02		2006:01		2007:04	

Note: J-B reports the results of Jarque and Bera (1987) normality test; A-P stands for the Andrews and Ploberger and A-Q for Andrews - Quandt structural break tests. P-values are in parentheses.

Table 73: Structural Breaks Tests for Nominal Value Added Revision Errors with Final Release Equals Last Known Release

Vintage	Test	Full sample		2000:3 - 2006:4 sample		2007:1-2015:1 sample	
L1	J-B	0.71	(0.70)	2.04	(0.36)	0.76	(0.69)
	A-P	4.18	(0.02)	0.92	(0.57)	1.94	(0.19)
	A-Q	13.47	(0.02)	4.50	(0.64)	9.13	(0.13)
	Breakpoint	2007:04		2005:02		2008:04	
L2	J-B	0.90	(0.64)	1.29	(0.52)	0.68	(0.71)
	A-P	4.04	(0.02)	0.73	(0.70)	1.73	(0.24)
	A-Q	13.37	(0.02)	3.16	(0.87)	8.39	(0.18)
	Breakpoint	2007:04		2002:01		2008:04	
L3	J-B	0.95	(0.62)	1.81	(0.40)	1.31	(0.52)
	A-P	4.32	(0.02)	0.80	(0.64)	1.47	(0.32)
	A-Q	14.10	(0.02)	3.45	(0.82)	7.03	(0.29)
	Breakpoint	2007:04		2002:01		2008:04	
L4	J-B	0.05	(0.97)	0.66	(0.72)	0.51	(0.77)
	A-P	4.46	(0.01)	0.80	(0.65)	1.44	(0.33)
	A-Q	14.03	(0.02)	2.81	(0.91)	6.31	(0.37)
	Breakpoint	2007:04		2002:01		2008:01	
L5	J-B	0.64	(0.73)	1.98	(0.37)	0.37	(0.83)
	A-P	3.68	(0.03)	1.04	(0.51)	1.52	(0.30)
	A-Q	12.51	(0.03)	4.22	(0.69)	6.70	(0.33)
	Breakpoint	2007:04		2003:03		2008:01	
L6	J-B	0.81	(0.67)	1.57	(0.46)	0.43	(0.81)
	A-P	3.84	(0.03)	0.73	(0.69)	1.50	(0.31)
	A-Q	12.75	(0.03)	3.50	(0.81)	5.99	(0.41)
	Breakpoint	2007:04		2003:03		2008:01	
L7	J-B	0.67	(0.72)	1.39	(0.50)	1.51	(0.47)
	A-P	4.51	(0.01)	0.65	(0.75)	1.79	(0.23)
	A-Q	13.08	(0.03)	3.25	(0.85)	7.89	(0.21)
	Breakpoint	2007:04		2003:03		2008:03	
L8	J-B	1.61	(0.45)	1.58	(0.45)	2.57	(0.28)
	A-P	4.01	(0.02)	0.81	(0.64)	2.06	(0.17)
	A-Q	11.97	(0.04)	3.58	(0.80)	8.54	(0.17)
	Breakpoint	2008:01		2003:03		2008:04	
L9	J-B	1.07	(0.59)	1.54	(0.46)	1.37	(0.50)
	A-P	3.70	(0.03)	0.92	(0.57)	2.17	(0.15)
	A-Q	11.46	(0.05)	3.52	(0.81)	8.84	(0.15)
	Breakpoint	2007:04		2003:03		2008:04	
L10	J-B	0.50	(0.78)	1.20	(0.55)	0.48	(0.79)
	A-P	3.36	(0.04)	0.74	(0.69)	1.71	(0.25)
	A-Q	11.01	(0.06)	3.24	(0.85)	7.61	(0.24)
	Breakpoint	2007:04		2005:04		2008:04	
L11	J-B	0.66	(0.72)	1.36	(0.51)	0.78	(0.68)
	A-P	2.60	(0.09)	0.64	(0.76)	1.67	(0.26)
	A-Q	8.92	(0.14)	3.15	(0.87)	7.24	(0.27)
	Breakpoint	2007:04		2003:03		2008:04	
L12	J-B	0.43	(0.80)	1.53	(0.47)	0.77	(0.68)
	A-P	2.81	(0.08)	0.69	(0.72)	1.86	(0.21)
	A-Q	9.35	(0.12)	3.50	(0.81)	7.53	(0.24)
	Breakpoint	2008:01		2003:03		2008:03	
L13	J-B	0.27	(0.87)	1.23	(0.54)	0.38	(0.83)
	A-P	3.03	(0.06)	0.76	(0.67)	1.51	(0.31)
	A-Q	9.81	(0.10)	3.82	(0.76)	7.19	(0.27)
	Breakpoint	2007:04		2005:04		2008:04	
L14	J-B	0.48	(0.79)	1.18	(0.55)	0.53	(0.77)
	A-P	2.44	(0.11)	0.74	(0.69)	1.38	(0.35)
	A-Q	8.43	(0.17)	2.84	(0.91)	7.43	(0.25)
	Breakpoint	2007:04		2005:04		2008:04	
L15	J-B	0.79	(0.68)	1.31	(0.52)	0.81	(0.67)
	A-P	2.12	(0.16)	0.86	(0.61)	1.61	(0.27)
	A-Q	8.20	(0.19)	3.47	(0.82)	8.09	(0.20)
	Breakpoint	2007:01		2005:04		2008:04	
L16	J-B	0.39	(0.82)	0.99	(0.61)	0.07	(0.96)
	A-P	2.04	(0.17)	0.86	(0.61)	1.30	(0.38)
	A-Q	7.67	(0.23)	3.41	(0.83)	6.43	(0.36)
	Breakpoint	2007:01		2001:02		2008:04	
L17	J-B	0.22	(0.89)	1.15	(0.56)	0.30	(0.86)
	A-P	2.00	(0.18)	0.74	(0.68)	1.32	(0.37)
	A-Q	7.41	(0.25)	3.01	(0.89)	6.48	(0.35)
	Breakpoint	2007:01		2001:02		2008:04	
L18	J-B	0.00	(1.00)	0.25	(0.88)	0.01	(1.00)
	A-P	2.32	(0.13)	1.17	(0.44)	1.83	(0.22)
	A-Q	7.79	(0.22)	4.37	(0.66)	6.98	(0.30)
	Breakpoint	2008:01		2003:02		2008:04	
L19	J-B	1.68	(0.43)	0.31	(0.86)	1.44	(0.49)
	A-P	2.17	(0.15)	0.88	(0.60)	1.17	(0.44)
	A-Q	7.30	(0.26)	3.47	(0.82)	4.39	(0.66)
	Breakpoint	2007:01		2001:02		2012:04	
L20	J-B	1.59	(0.45)	0.33	(0.85)	1.59	(0.45)
	A-P	3.08	(0.06)	0.64	(0.76)	1.05	(0.50)
	A-Q	9.28	(0.13)	3.10	(0.87)	3.74	(0.77)
	Breakpoint	2008:01		2001:02		2012:04	
L21	J-B	2.05	(0.36)	0.45	(0.80)	1.83	(0.40)
	A-P	2.79	(0.08)	0.66	(0.74)	0.80	(0.65)
	A-Q	8.74	(0.16)	3.06	(0.88)	3.75	(0.77)
	Breakpoint	2008:01		2001:02		2012:04	
L22	J-B	1.99	(0.37)	1.57	(0.46)	0.48	(0.79)
	A-P	1.45	(0.33)	1.01	(0.52)	0.44	(0.91)
	A-Q	5.53	(0.48)	5.25	(0.52)	2.83	(0.91)
	Breakpoint	2008:01		2001:02		2008:01	
L23	J-B	1.67	(0.43)	1.52	(0.47)	0.26	(0.88)
	A-P	1.36	(0.36)	0.97	(0.54)	0.64	(0.76)
	A-Q	5.51	(0.48)	4.93	(0.57)	3.33	(0.84)
	Breakpoint	2008:01		2001:02		2008:01	

Note: J-B reports the results of Jarque and Bera (1987) normality test; A-P stands for the Andrews and Ploberger and A-Q for Andrews - Quandt structural break tests. P-values are in parentheses.

Table 74: Rationality Tests for Real GDP Revision Errors with Dummys (full sample)

		final= l24				final=last known			
Vintage	Tests	without Dummy		With dummy		without Dummy		With dummy	
L1	UN	0.06	(0.81)	140.11	(0.00)	2.44	(0.12)	2.56	(0.28)
	EF	0.62	(0.43)	438.21	(0.00)	3.65	(0.06)	4.19	(0.12)
	NH	1.71	(0.09)	1.57	(0.21)	3.55	(0.00)	12.85	(0.00)
L2	UN	0.04	(0.84)	147.99	(0.00)	2.42	(0.12)	2.92	(0.23)
	EF	0.56	(0.45)	449.81	(0.00)	3.66	(0.06)	3.87	(0.14)
	NH	28.93	(0.00)	840.27	(0.00)	375.71	(0.00)	145641.04	(0.00)
L3	UN	0.01	(0.91)	2.50	(0.29)	2.53	(0.11)	3.01	(0.22)
	EF	0.22	(0.64)	0.33	(0.85)	3.76	(0.05)	3.93	(0.14)
	NH	21.15	(0.00)	468.49	(0.00)	176.82	(0.00)	31257.63	(0.00)
L4	UN	0.09	(0.77)	88.00	(0.00)	2.60	(0.11)	2.67	(0.26)
	EF	0.89	(0.35)	6.74	(0.03)	3.80	(0.05)	4.38	(0.11)
	NH	12.82	(0.00)	151.65	(0.00)	151.77	(0.00)	30789.11	(0.00)
L5	UN	0.06	(0.80)	1381.57	(0.00)	2.59	(0.11)	2.63	(0.27)
	EF	0.22	(0.64)	25.29	(0.00)	3.90	(0.05)	4.74	(0.09)
	NH	47.10	(0.00)	2181.15	(0.00)	180.22	(0.00)	32751.84	(0.00)
L6	UN	0.12	(0.73)	1405.28	(0.00)	2.65	(0.10)	2.74	(0.25)
	EF	0.00	(0.99)	22.96	(0.00)	4.18	(0.04)	5.10	(0.08)
	NH	47.50	(0.00)	2077.85	(0.00)	121.39	(0.00)	13640.52	(0.00)
L7	UN	0.18	(0.67)	681.32	(0.00)	2.66	(0.10)	2.71	(0.26)
	EF	0.08	(0.77)	17.27	(0.00)	4.24	(0.04)	6.33	(0.04)
	NH	16.98	(0.00)	293.91	(0.00)	190.79	(0.00)	36789.48	(0.00)
L8	UN	0.12	(0.73)	576.80	(0.00)	2.57	(0.11)	2.59	(0.27)
	EF	0.10	(0.75)	14.35	(0.00)	4.26	(0.04)	6.44	(0.04)
	NH	29.99	(0.00)	826.05	(0.00)	526.98	(0.00)	277617.75	(0.00)
L9	UN	0.33	(0.56)	689.91	(0.00)	2.61	(0.11)	2.62	(0.27)
	EF	0.02	(0.90)	20.91	(0.00)	4.14	(0.04)	5.66	(0.06)
	NH	20.99	(0.00)	450.61	(0.00)	321.11	(0.00)	105431.47	(0.00)
L10	UN	1.61	(0.20)	2773.04	(0.00)	2.48	(0.12)	2.55	(0.28)
	EF	0.56	(0.45)	57.89	(0.00)	4.12	(0.04)	6.59	(0.04)
	NH	27.11	(0.00)	741.67	(0.00)	530.26	(0.00)	279982.45	(0.00)
L11	UN	1.69	(0.19)	5.83	(0.05)	2.55	(0.11)	2.58	(0.28)
	EF	0.03	(0.86)	0.04	(0.98)	4.13	(0.04)	5.98	(0.05)
	NH	24.50	(0.00)	601.99	(0.00)	213.61	(0.00)	45021.85	(0.00)
L12	UN	1.26	(0.26)	5.90	(0.05)	2.48	(0.12)	2.50	(0.29)
	EF	0.03	(0.85)	0.12	(0.94)	4.12	(0.04)	6.10	(0.05)
	NH	31.85	(0.00)	1014.65	(0.00)	716.09	(0.00)	521539.86	(0.00)
L13	UN	2.66	(0.10)	766.52	(0.00)	0.72	(0.40)	0.80	(0.67)
	EF	1.28	(0.26)	36.10	(0.00)	1.53	(0.22)	2.01	(0.37)
	NH	11.31	(0.00)	127.01	(0.00)	179.39	(0.00)	32020.00	(0.00)
L14	UN	2.65	(0.10)	458.33	(0.00)	0.69	(0.41)	0.71	(0.70)
	EF	5.69	(0.02)	21.91	(0.00)	1.63	(0.20)	3.08	(0.21)
	NH	23.95	(0.00)	546.57	(0.00)	246.52	(0.00)	69693.77	(0.00)
L15	UN	2.05	(0.15)	391.50	(0.00)	0.65	(0.42)	0.66	(0.72)
	EF	7.36	(0.01)	21.42	(0.00)	1.70	(0.19)	3.38	(0.18)
	NH	19.06	(0.00)	361.54	(0.00)	277.49	(0.00)	76668.22	(0.00)
L16	UN	0.68	(0.41)	179.01	(0.00)	0.00	(0.96)	0.23	(0.89)
	EF	1.56	(0.21)	5.33	(0.07)	0.52	(0.47)	1.10	(0.58)
	NH	12.16	(0.00)	147.35	(0.00)	138.85	(0.00)	26018.21	(0.00)
L17	UN	0.69	(0.41)	476.86	(0.00)	0.00	(0.94)	0.01	(1.00)
	EF	1.22	(0.27)	21.10	(0.00)	0.48	(0.49)	1.57	(0.46)
	NH	9.53	(0.00)	90.68	(0.00)	58.93	(0.00)	3473.10	(0.00)
L18	UN	0.47	(0.49)	310.49	(0.00)	0.01	(0.94)	0.01	(0.99)
	EF	1.49	(0.22)	13.42	(0.00)	0.50	(0.48)	1.66	(0.44)
	NH	39.97	(0.00)	2057.60	(0.00)	472.41	(0.00)	221370.08	(0.00)
L19	UN	1.01	(0.31)	1007.25	(0.00)	0.53	(0.47)	23.99	(0.00)
	EF	0.01	(0.90)	178.63	(0.00)	0.14	(0.71)	0.72	(0.70)
	NH	6.69	(0.00)	41.87	(0.00)	76.68	(0.00)	5894.09	(0.00)
L20	UN	1.01	(0.31)	877.91	(0.00)	0.66	(0.42)	23.11	(0.00)
	EF	0.46	(0.50)	180.65	(0.00)	0.09	(0.76)	0.66	(0.72)
	NH	24.45	(0.00)	588.95	(0.00)	93.19	(0.00)	8665.43	(0.00)
L21	UN	1.86	(0.17)	262.01	(0.00)	0.69	(0.41)	22.03	(0.00)
	EF	0.01	(0.92)	73.07	(0.00)	0.12	(0.73)	0.55	(0.76)
	NH	11.31	(0.00)	123.65	(0.00)	224.42	(0.00)	52805.60	(0.00)
L22	UN	0.86	(0.35)	82.15	(0.00)	1.34	(0.25)	29.07	(0.00)
	EF	0.00	(0.99)	84.35	(0.00)	0.04	(0.85)	55.35	(0.00)
	NH	6.09	(0.00)	37.13	(0.00)	298.70	(0.00)	134156.98	(0.00)
L23	UN	0.35	(0.55)	411397.66	(0.00)	1.39	(0.24)	222.61	(0.00)
	EF	0.01	(0.92)	97.79	(0.00)	0.03	(0.87)	1.46	(0.48)
	NH	1.99	(0.05)	3.20	(0.00)	121.51	(0.00)	14687.07	(0.00)

Table 75: Rationality Tests for Nominal GDP Revision Errors with Dummys (full sample)

		final= l24				final=last known			
Vintage	Tests	without Dummy		With dummy		without Dummy		With dummy	
L1	UN	2.49	(0.11)	458.04	(0.00)	1.69	(0.19)	45.22	(0.00)
	EF	2.76	(0.10)	30.21	(0.00)	0.03	(0.86)	27.58	(0.00)
	NH	0.85	(0.40)	0.41	(0.52)	3.33	(0.00)	10.61	(0.00)
L2	UN	1.85	(0.17)	982.18	(0.00)	1.25	(0.26)	136.55	(0.00)
	EF	2.81	(0.09)	63.51	(0.00)	0.02	(0.88)	72.61	(0.00)
	NH	8.71	(0.00)	74.10	(0.00)	13.81	(0.00)	194.22	(0.00)
L3	UN	1.59	(0.21)	7.82	(0.02)	0.67	(0.41)	139.18	(0.00)
	EF	1.81	(0.18)	5.67	(0.06)	0.66	(0.42)	78.77	(0.00)
	NH	20.30	(0.00)	420.35	(0.00)	33.22	(0.00)	109.46	(0.00)
L4	UN	0.57	(0.45)	484.27	(0.00)	0.05	(0.82)	424.48	(0.00)
	EF	0.01	(0.91)	24.93	(0.00)	3.01	(0.08)	206.14	(0.00)
	NH	17.01	(0.00)	287.04	(0.00)	27.55	(0.00)	760.95	(0.00)
L5	UN	0.53	(0.47)	115.13	(0.00)	0.00	(0.95)	497.90	(0.00)
	EF	0.18	(0.67)	29.97	(0.00)	3.29	(0.07)	219.03	(0.00)
	NH	24.46	(0.00)	549.13	(0.00)	39.35	(0.00)	148.14	(0.00)
L6	UN	0.65	(0.42)	103.89	(0.00)	0.00	(0.95)	419.24	(0.00)
	EF	0.36	(0.55)	28.38	(0.00)	3.32	(0.07)	195.45	(0.00)
	NH	24.64	(0.00)	607.32	(0.00)	43.95	(0.00)	192.61	(0.00)
L7	UN	1.07	(0.30)	25.88	(0.00)	0.00	(0.99)	306.67	(0.00)
	EF	0.59	(0.44)	21.33	(0.00)	4.38	(0.04)	176.80	(0.00)
	NH	17.00	(0.00)	288.42	(0.00)	36.86	(0.00)	128.69	(0.00)
L8	UN	1.32	(0.25)	50.19	(0.00)	0.01	(0.90)	320.11	(0.00)
	EF	0.78	(0.38)	53.63	(0.00)	4.27	(0.04)	172.40	(0.00)
	NH	36.07	(0.00)	1306.74	(0.00)	56.12	(0.00)	314.67	(0.00)
L9	UN	0.98	(0.32)	35.82	(0.00)	0.00	(0.94)	351.92	(0.00)
	EF	0.51	(0.47)	31.05	(0.00)	4.96	(0.03)	186.94	(0.00)
	NH	31.10	(0.00)	958.64	(0.00)	43.98	(0.00)	190.23	(0.00)
L10	UN	2.82	(0.09)	17.71	(0.00)	0.10	(0.75)	425.70	(0.00)
	EF	0.91	(0.34)	12.33	(0.00)	3.95	(0.05)	239.17	(0.00)
	NH	23.25	(0.00)	538.56	(0.00)	45.26	(0.00)	210.27	(0.00)
L11	UN	0.67	(0.41)	8.29	(0.02)	0.04	(0.83)	407.52	(0.00)
	EF	0.09	(0.76)	0.97	(0.61)	4.65	(0.03)	251.23	(0.00)
	NH	21.36	(0.00)	454.92	(0.00)	30.42	(0.00)	934.79	(0.00)
L12	UN	1.06	(0.30)	8.17	(0.02)	0.04	(0.85)	397.80	(0.00)
	EF	0.18	(0.67)	0.75	(0.69)	5.59	(0.02)	248.74	(0.00)
	NH	30.46	(0.00)	924.76	(0.00)	42.85	(0.00)	177.10	(0.00)
L13	UN	1.63	(0.20)	2.09	(0.35)	0.02	(0.88)	486.52	(0.00)
	EF	0.58	(0.45)	3.65	(0.16)	7.10	(0.01)	289.68	(0.00)
	NH	14.53	(0.00)	211.46	(0.00)	29.24	(0.00)	914.79	(0.00)
L14	UN	4.48	(0.03)	5.52	(0.06)	0.11	(0.74)	611.92	(0.00)
	EF	3.60	(0.06)	5.32	(0.07)	6.41	(0.01)	297.79	(0.00)
	NH	13.97	(0.00)	190.78	(0.00)	35.59	(0.00)	126.65	(0.00)
L15	UN	3.96	(0.05)	75.29	(0.00)	0.03	(0.87)	112.05	(0.00)
	EF	6.19	(0.01)	56.37	(0.00)	4.57	(0.03)	100.63	(0.00)
	NH	28.39	(0.00)	865.24	(0.00)	24.80	(0.00)	609.32	(0.00)
L16	UN	0.41	(0.52)	48.06	(0.00)	0.38	(0.53)	59.93	(0.00)
	EF	0.09	(0.76)	54.13	(0.00)	7.07	(0.01)	110.89	(0.00)
	NH	11.99	(0.00)	142.06	(0.00)	25.49	(0.00)	646.80	(0.00)
L17	UN	0.35	(0.55)	37.91	(0.00)	0.37	(0.54)	59.05	(0.00)
	EF	0.01	(0.94)	3.73	(0.16)	7.84	(0.01)	112.28	(0.00)
	NH	31.73	(0.00)	103.53	(0.00)	60.58	(0.00)	366.02	(0.00)
L18	UN	2.42	(0.12)	913.15	(0.00)	0.00	(0.98)	58.73	(0.00)
	EF	0.04	(0.84)	264.29	(0.00)	5.54	(0.02)	98.24	(0.00)
	NH	3.03	(0.00)	9.01	(0.00)	17.27	(0.00)	288.66	(0.00)
L19	UN	0.67	(0.41)	138.62	(0.00)	0.17	(0.68)	215.85	(0.00)
	EF	0.00	(0.95)	54.94	(0.00)	6.43	(0.01)	243.86	(0.00)
	NH	9.70	(0.00)	83.18	(0.00)	30.22	(0.00)	123.21	(0.00)
L20	UN	0.39	(0.53)	7.55	(0.02)	0.18	(0.67)	271.12	(0.00)
	EF	0.07	(0.79)	10.69	(0.00)	5.50	(0.02)	272.38	(0.00)
	NH	11.74	(0.00)	139.63	(0.00)	40.99	(0.00)	186.01	(0.00)
L21	UN	0.03	(0.86)	10.57	(0.00)	0.49	(0.48)	284.14	(0.00)
	EF	0.30	(0.58)	28.12	(0.00)	6.09	(0.01)	277.71	(0.00)
	NH	5.19	(0.00)	25.37	(0.00)	45.61	(0.00)	206.98	(0.00)
L22	UN	2.21	(0.14)	236.16	(0.00)	0.23	(0.63)	7.44	(0.02)
	EF	0.11	(0.74)	189.59	(0.00)	6.50	(0.01)	7.55	(0.02)
	NH	5.48	(0.00)	30.00	(0.00)	28.53	(0.00)	834.25	(0.00)
L23	UN	0.88	(0.35)	1.11	(0.57)	0.35	(0.55)	221.15	(0.00)
	EF	0.92	(0.34)	1.11	(0.57)	5.13	(0.02)	271.55	(0.00)
	NH	5.09	(0.00)	28.36	(0.00)	39.98	(0.00)	145.83	(0.00)

Table 76: Rationality Tests for Real Private Consumption Revision Errors with Dummys(full sample)

		final= l24				final=last known			
Vintage	Tests	without Dummy		With dummy		without Dummy		With dummy	
L1	UN	0.09	(0.76)	143.92	(0.00)	2.66	(0.10)	558.52	(0.00)
	EF	0.27	(0.60)	110.61	(0.00)	2.88	(0.09)	170.42	(0.00)
	NH	3.96	(0.00)	14.76	(0.00)	4.27	(0.00)	17.28	(0.00)
L2	UN	0.18	(0.67)	0.41	(0.81)	1.52	(0.22)	373.49	(0.00)
	EF	2.27	(0.13)	6.07	(0.05)	0.04	(0.84)	195.78	(0.00)
	NH	9.79	(0.00)	95.68	(0.00)	11.43	(0.00)	115.32	(0.00)
L3	UN	0.51	(0.48)	61.13	(0.00)	1.11	(0.29)	560.20	(0.00)
	EF	3.46	(0.06)	53.29	(0.00)	0.05	(0.83)	275.25	(0.00)
	NH	10.26	(0.00)	104.72	(0.00)	13.47	(0.00)	179.89	(0.00)
L4	UN	0.01	(0.94)	67.14	(0.00)	4.44	(0.04)	523.76	(0.00)
	EF	2.81	(0.09)	76.48	(0.00)	0.08	(0.78)	11.60	(0.00)
	NH	10.14	(0.00)	100.97	(0.00)	13.33	(0.00)	175.79	(0.00)
L5	UN	0.00	(1.00)	88.91	(0.00)	3.98	(0.05)	562.52	(0.00)
	EF	0.32	(0.57)	112.96	(0.00)	1.62	(0.20)	12.10	(0.00)
	NH	16.43	(0.00)	254.19	(0.00)	36.83	(0.00)	134.67	(0.00)
L6	UN	0.46	(0.50)	195.78	(0.00)	6.45	(0.01)	161.50	(0.00)
	EF	0.00	(0.96)	83.23	(0.00)	2.28	(0.13)	16.10	(0.00)
	NH	16.60	(0.00)	271.84	(0.00)	26.55	(0.00)	699.06	(0.00)
L7	UN	0.40	(0.53)	186.34	(0.00)	2.24	(0.13)	729.96	(0.00)
	EF	0.32	(0.57)	206.55	(0.00)	1.46	(0.23)	16.04	(0.00)
	NH	12.13	(0.00)	217.80	(0.00)	20.85	(0.00)	412.68	(0.00)
L8	UN	0.49	(0.48)	0.85	(0.65)	2.18	(0.14)	569.21	(0.00)
	EF	0.42	(0.52)	3.01	(0.22)	1.26	(0.26)	17.77	(0.00)
	NH	15.64	(0.00)	207.34	(0.00)	30.95	(0.00)	951.30	(0.00)
L9	UN	0.22	(0.64)	4.34	(0.11)	2.94	(0.09)	720.90	(0.00)
	EF	0.28	(0.60)	1.04	(0.59)	1.32	(0.25)	8.88	(0.00)
	NH	28.20	(0.00)	101.98	(0.00)	35.76	(0.00)	127.48	(0.00)
L10	UN	0.67	(0.41)	4.15	(0.13)	2.13	(0.14)	721.53	(0.00)
	EF	1.75	(0.19)	2.75	(0.25)	0.61	(0.44)	67.66	(0.00)
	NH	9.74	(0.00)	94.80	(0.00)	20.70	(0.00)	409.77	(0.00)
L11	UN	0.02	(0.88)	15.79	(0.00)	2.96	(0.09)	639.54	(0.00)
	EF	0.49	(0.48)	28.89	(0.00)	1.38	(0.24)	59.41	(0.00)
	NH	34.08	(0.00)	112.10	(0.00)	35.48	(0.00)	124.17	(0.00)
L12	UN	0.02	(0.88)	169.31	(0.00)	2.77	(0.10)	122.58	(0.00)
	EF	0.44	(0.51)	92.90	(0.00)	1.50	(0.22)	3.06	(0.22)
	NH	26.99	(0.00)	682.64	(0.00)	45.85	(0.00)	339.46	(0.00)
L13	UN	1.33	(0.25)	350.88	(0.00)	6.13	(0.01)	930.48	(0.00)
	EF	0.56	(0.45)	87.17	(0.00)	5.30	(0.02)	449.66	(0.00)
	NH	11.97	(0.00)	123.04	(0.00)	25.85	(0.00)	653.62	(0.00)
L14	UN	0.67	(0.41)	47.52	(0.00)	6.33	(0.01)	562.80	(0.00)
	EF	0.25	(0.61)	20.52	(0.00)	3.70	(0.05)	383.74	(0.00)
	NH	24.79	(0.00)	611.95	(0.00)	55.18	(0.00)	305.84	(0.00)
L15	UN	0.79	(0.37)	46.01	(0.00)	7.06	(0.01)	818.93	(0.00)
	EF	0.73	(0.39)	17.03	(0.00)	5.62	(0.02)	406.38	(0.00)
	NH	24.50	(0.00)	589.43	(0.00)	36.58	(0.00)	154.04	(0.00)
L16	UN	0.02	(0.89)	87.99	(0.00)	4.74	(0.03)	154.01	(0.00)
	EF	0.93	(0.33)	43.64	(0.00)	6.78	(0.01)	16.99	(0.00)
	NH	9.29	(0.00)	75.49	(0.00)	32.00	(0.00)	978.14	(0.00)
L17	UN	0.60	(0.44)	84.47	(0.00)	5.65	(0.02)	149.54	(0.00)
	EF	2.33	(0.13)	39.62	(0.00)	8.97	(0.00)	17.91	(0.00)
	NH	16.37	(0.00)	264.53	(0.00)	33.24	(0.00)	104.17	(0.00)
L18	UN	1.19	(0.28)	4.07	(0.13)	6.21	(0.01)	114.75	(0.00)
	EF	1.86	(0.17)	1.89	(0.39)	8.21	(0.00)	14.15	(0.00)
	NH	29.32	(0.00)	858.89	(0.00)	57.63	(0.00)	325.78	(0.00)
L19	UN	2.95	(0.09)	581.90	(0.00)	6.69	(0.01)	310.76	(0.00)
	EF	2.35	(0.13)	187.52	(0.00)	7.15	(0.01)	33.98	(0.00)
	NH	8.66	(0.00)	72.81	(0.00)	19.87	(0.00)	385.06	(0.00)
L20	UN	2.61	(0.11)	770.21	(0.00)	6.18	(0.01)	588.73	(0.00)
	EF	0.42	(0.52)	211.01	(0.00)	4.81	(0.03)	53.74	(0.00)
	NH	13.97	(0.00)	191.99	(0.00)	39.63	(0.00)	128.60	(0.00)
L21	UN	3.54	(0.06)	707.62	(0.00)	6.50	(0.01)	563.91	(0.00)
	EF	0.40	(0.53)	117.30	(0.00)	5.01	(0.03)	50.90	(0.00)
	NH	13.24	(0.00)	175.68	(0.00)	54.34	(0.00)	285.53	(0.00)
L22	UN	0.94	(0.33)	1513.51	(0.00)	4.83	(0.03)	822.28	(0.00)
	EF	0.01	(0.92)	102.28	(0.00)	4.35	(0.04)	66.16	(0.00)
	NH	5.14	(0.00)	22.83	(0.00)	33.44	(0.00)	114.55	(0.00)
L23	UN	0.01	(0.91)	19.65	(0.00)	3.78	(0.05)	874.90	(0.00)
	EF	0.36	(0.55)	14.18	(0.00)	3.63	(0.06)	77.72	(0.00)
	NH	3.69	(0.00)	17.67	(0.00)	30.81	(0.00)	109.31	(0.00)

Table 77: Rationality Tests for Real Investment Revision Errors with Dummys (full sample)

		final= l24				final=last known			
Vintage	Tests	without Dummy		With dummy		without Dummy		With dummy	
L1	UN	15.23	(0.00)	1789.61	(0.00)	19.81	(0.00)	26.75	(0.00)
	EF	16.21	(0.00)	162.58	(0.00)	22.62	(0.00)	23.41	(0.00)
	NH	6.83	(0.00)	48.72	(0.00)	6.24	(0.00)	36.09	(0.00)
L2	UN	9.14	(0.00)	3103.50	(0.00)	19.75	(0.00)	25.81	(0.00)
	EF	9.45	(0.00)	180.44	(0.00)	23.14	(0.00)	26.78	(0.00)
	NH	11.26	(0.00)	125.54	(0.00)	11.26	(0.00)	108.23	(0.00)
L3	UN	6.25	(0.01)	3000.47	(0.00)	22.15	(0.00)	26.47	(0.00)
	EF	4.86	(0.03)	193.09	(0.00)	20.62	(0.00)	27.53	(0.00)
	NH	21.19	(0.00)	423.36	(0.00)	27.38	(0.00)	747.25	(0.00)
L4	UN	4.20	(0.04)	30503.40	(0.00)	15.08	(0.00)	16.27	(0.00)
	EF	4.32	(0.04)	201.16	(0.00)	13.16	(0.00)	67.99	(0.00)
	NH	11.74	(0.00)	121.01	(0.00)	11.71	(0.00)	127.95	(0.00)
L5	UN	2.67	(0.10)	2741.90	(0.00)	12.85	(0.00)	14.07	(0.00)
	EF	2.86	(0.09)	341.91	(0.00)	11.45	(0.00)	62.04	(0.00)
	NH	16.62	(0.00)	501.68	(0.00)	25.08	(0.00)	976.19	(0.00)
L6	UN	2.70	(0.10)	2817.15	(0.00)	13.27	(0.00)	13.55	(0.00)
	EF	3.78	(0.05)	333.43	(0.00)	15.80	(0.00)	62.16	(0.00)
	NH	23.22	(0.00)	536.02	(0.00)	21.48	(0.00)	461.43	(0.00)
L7	UN	1.89	(0.17)	13663.04	(0.00)	11.88	(0.00)	11.98	(0.00)
	EF	3.57	(0.06)	319.56	(0.00)	14.51	(0.00)	34.67	(0.00)
	NH	12.12	(0.00)	143.34	(0.00)	13.33	(0.00)	175.70	(0.00)
L8	UN	1.62	(0.20)	21150.04	(0.00)	10.85	(0.00)	12.48	(0.00)
	EF	6.46	(0.01)	334.02	(0.00)	20.67	(0.00)	32.39	(0.00)
	NH	38.95	(0.00)	1487.52	(0.00)	27.44	(0.00)	730.43	(0.00)
L9	UN	0.56	(0.46)	22719.63	(0.00)	8.05	(0.00)	1613.87	(0.00)
	EF	2.77	(0.10)	370.23	(0.00)	14.13	(0.00)	155.24	(0.00)
	NH	23.63	(0.00)	549.85	(0.00)	28.50	(0.00)	1000.86	(0.00)
L10	UN	1.15	(0.28)	2235.86	(0.00)	11.48	(0.00)	41.46	(0.00)
	EF	3.38	(0.07)	220.59	(0.00)	18.91	(0.00)	20.18	(0.00)
	NH	20.98	(0.00)	429.26	(0.00)	30.51	(0.00)	1068.81	(0.00)
L11	UN	1.51	(0.22)	1504.56	(0.00)	10.36	(0.00)	40.29	(0.00)
	EF	2.68	(0.10)	190.74	(0.00)	16.17	(0.00)	18.70	(0.00)
	NH	39.28	(0.00)	1535.61	(0.00)	27.54	(0.00)	748.37	(0.00)
L12	UN	1.71	(0.19)	13014.16	(0.00)	11.91	(0.00)	68.71	(0.00)
	EF	3.06	(0.08)	501.36	(0.00)	13.74	(0.00)	25.79	(0.00)
	NH	12.61	(0.00)	125.06	(0.00)	16.61	(0.00)	273.07	(0.00)
L13	UN	1.66	(0.20)	335355.62	(0.00)	11.36	(0.00)	50.21	(0.00)
	EF	1.52	(0.22)	384.85	(0.00)	9.97	(0.00)	20.28	(0.00)
	NH	23.47	(0.00)	542.21	(0.00)	26.35	(0.00)	648.17	(0.00)
L14	UN	2.60	(0.11)	11094.11	(0.00)	11.29	(0.00)	3503.14	(0.00)
	EF	1.71	(0.19)	412.47	(0.00)	9.23	(0.00)	175.33	(0.00)
	NH	18.87	(0.00)	365.96	(0.00)	29.33	(0.00)	855.77	(0.00)
L15	UN	3.36	(0.07)	7500.14	(0.00)	13.63	(0.00)	659.75	(0.00)
	EF	2.28	(0.13)	351.36	(0.00)	11.41	(0.00)	512.17	(0.00)
	NH	13.05	(0.00)	169.50	(0.00)	29.42	(0.00)	865.02	(0.00)
L16	UN	4.84	(0.03)	20737.79	(0.00)	13.09	(0.00)	395.11	(0.00)
	EF	3.28	(0.07)	449.78	(0.00)	12.41	(0.00)	701.78	(0.00)
	NH	15.79	(0.00)	408.21	(0.00)	25.11	(0.00)	625.64	(0.00)
L17	UN	3.01	(0.08)	900.95	(0.00)	11.14	(0.00)	15.55	(0.00)
	EF	0.55	(0.46)	411.11	(0.00)	10.93	(0.00)	11.55	(0.00)
	NH	6.68	(0.00)	59.74	(0.00)	20.04	(0.00)	481.95	(0.00)
L18	UN	1.29	(0.26)	1539.48	(0.00)	9.83	(0.00)	15.22	(0.00)
	EF	0.22	(0.64)	669.92	(0.00)	11.17	(0.00)	11.40	(0.00)
	NH	11.96	(0.00)	142.53	(0.00)	37.84	(0.00)	1429.82	(0.00)
L19	UN	2.38	(0.12)	242.34	(0.00)	9.48	(0.00)	69.37	(0.00)
	EF	0.30	(0.58)	1.18	(0.56)	10.55	(0.00)	27.17	(0.00)
	NH	2.03	(0.05)	23.06	(0.00)	8.24	(0.00)	388.96	(0.00)
L20	UN	0.49	(0.49)	4.19	(0.12)	7.63	(0.01)	69.11	(0.00)
	EF	0.02	(0.89)	8.86	(0.01)	9.71	(0.00)	29.00	(0.00)
	NH	2.56	(0.01)	21.75	(0.00)	17.96	(0.00)	322.68	(0.00)
L21	UN	0.00	(0.96)	6.50	(0.04)	6.05	(0.01)	72.84	(0.00)
	EF	0.00	(0.98)	9.80	(0.01)	8.91	(0.00)	32.93	(0.00)
	NH	8.57	(0.00)	70.05	(0.00)	37.38	(0.00)	1345.32	(0.00)
L22	UN	0.27	(0.60)	0.70	(0.71)	7.83	(0.01)	65.56	(0.00)
	EF	1.39	(0.24)	1.86	(0.39)	13.00	(0.00)	30.10	(0.00)
	NH	4.62	(0.00)	19.98	(0.00)	30.42	(0.00)	882.49	(0.00)
L23	UN	0.44	(0.51)	424.56	(0.00)	8.21	(0.00)	45.31	(0.00)
	EF	1.15	(0.28)	529.60	(0.00)	12.58	(0.00)	22.44	(0.00)
	NH	2.76	(0.01)	7.70	(0.01)	32.18	(0.00)	894.25	(0.00)

Table 78: Rationality Tests for Real Government Consumption Revision Errors with Dummys (full sample)

		final= l24				final=last known			
Vintage	Tests	without Dummy		With dummy		without Dummy		With dummy	
L1	UN	0.02	(0.90)	67.02	(0.00)	1.75	(0.19)	16.39	(0.00)
	EF	0.44	(0.51)	164.04	(0.00)	0.01	(0.93)	90.58	(0.00)
	NH	6.63	(0.00)	42.29	(0.00)	6.00	(0.00)	35.05	(0.00)
L2	UN	0.00	(0.94)	82.48	(0.00)	2.69	(0.10)	17.38	(0.00)
	EF	0.12	(0.73)	193.34	(0.00)	0.02	(0.90)	107.06	(0.00)
	NH	13.72	(0.00)	176.27	(0.00)	24.94	(0.00)	630.99	(0.00)
L3	UN	0.33	(0.56)	226.01	(0.00)	1.23	(0.27)	16.66	(0.00)
	EF	0.03	(0.87)	119.84	(0.00)	0.08	(0.77)	99.13	(0.00)
	NH	20.09	(0.00)	82.82	(0.00)	24.98	(0.00)	627.07	(0.00)
L4	UN	0.01	(0.93)	63.05	(0.00)	3.42	(0.06)	252.27	(0.00)
	EF	0.90	(0.34)	37.34	(0.00)	0.75	(0.39)	46.68	(0.00)
	NH	8.13	(0.00)	65.26	(0.00)	11.12	(0.00)	121.71	(0.00)
L5	UN	0.17	(0.68)	78.13	(0.00)	4.04	(0.04)	260.79	(0.00)
	EF	1.09	(0.30)	48.42	(0.00)	0.90	(0.34)	54.29	(0.00)
	NH	29.56	(0.00)	883.41	(0.00)	59.88	(0.00)	379.80	(0.00)
L6	UN	0.53	(0.47)	278.86	(0.00)	4.68	(0.03)	290.98	(0.00)
	EF	0.29	(0.59)	358.44	(0.00)	0.66	(0.42)	51.21	(0.00)
	NH	20.29	(0.00)	406.44	(0.00)	40.80	(0.00)	188.66	(0.00)
L7	UN	0.35	(0.55)	141.64	(0.00)	4.37	(0.04)	282.89	(0.00)
	EF	0.41	(0.52)	383.74	(0.00)	0.03	(0.87)	37.27	(0.00)
	NH	17.32	(0.00)	290.53	(0.00)	20.69	(0.00)	428.18	(0.00)
L8	UN	0.47	(0.49)	194.50	(0.00)	4.76	(0.03)	854.44	(0.00)
	EF	0.02	(0.89)	349.59	(0.00)	0.34	(0.56)	46.99	(0.00)
	NH	36.59	(0.00)	114.72	(0.00)	34.31	(0.00)	115.79	(0.00)
L9	UN	0.37	(0.54)	78.58	(0.00)	5.12	(0.02)	39.26	(0.00)
	EF	0.04	(0.83)	2.67	(0.27)	0.27	(0.60)	103.69	(0.00)
	NH	57.76	(0.00)	302.05	(0.00)	73.10	(0.00)	569.99	(0.00)
L10	UN	0.19	(0.66)	12.00	(0.00)	4.69	(0.03)	694.08	(0.00)
	EF	0.00	(0.96)	1.99	(0.37)	0.15	(0.70)	54.96	(0.00)
	NH	13.73	(0.00)	183.16	(0.00)	18.85	(0.00)	311.68	(0.00)
L11	UN	0.37	(0.54)	344.44	(0.00)	5.28	(0.02)	555.27	(0.00)
	EF	0.01	(0.91)	5.62	(0.00)	0.12	(0.73)	60.28	(0.00)
	NH	17.11	(0.00)	290.54	(0.00)	27.82	(0.00)	774.80	(0.00)
L12	UN	0.60	(0.44)	52.97	(0.00)	5.20	(0.02)	385.52	(0.00)
	EF	0.03	(0.87)	6.05	(0.00)	0.32	(0.57)	43.98	(0.00)
	NH	10.96	(0.00)	109.41	(0.00)	71.37	(0.00)	509.71	(0.00)
L13	UN	1.33	(0.25)	129.93	(0.00)	7.40	(0.01)	337.78	(0.00)
	EF	0.61	(0.43)	1.95	(0.38)	0.41	(0.52)	28.74	(0.00)
	NH	6.16	(0.00)	37.99	(0.00)	13.74	(0.00)	178.54	(0.00)
L14	UN	0.90	(0.34)	172.91	(0.00)	6.46	(0.01)	3677.46	(0.00)
	EF	1.09	(0.30)	4.42	(0.11)	0.59	(0.44)	29.25	(0.00)
	NH	24.92	(0.00)	639.08	(0.00)	59.42	(0.00)	355.95	(0.00)
L15	UN	0.26	(0.61)	82.75	(0.00)	5.30	(0.02)	683.04	(0.00)
	EF	1.16	(0.28)	49.05	(0.00)	0.64	(0.42)	18.34	(0.00)
	NH	11.41	(0.00)	219.60	(0.00)	27.78	(0.00)	732.21	(0.00)
L16	UN	0.41	(0.52)	184.70	(0.00)	5.62	(0.02)	26.63	(0.00)
	EF	0.43	(0.51)	198.64	(0.00)	0.41	(0.52)	2.63	(0.27)
	NH	9.39	(0.00)	78.38	(0.00)	37.67	(0.00)	140.47	(0.00)
L17	UN	0.56	(0.46)	1112.82	(0.00)	5.93	(0.01)	49.18	(0.00)
	EF	0.17	(0.68)	52.32	(0.00)	0.30	(0.58)	6.94	(0.03)
	NH	26.88	(0.00)	673.82	(0.00)	56.39	(0.00)	357.77	(0.00)
L18	UN	0.22	(0.64)	114.57	(0.00)	5.61	(0.02)	52.71	(0.00)
	EF	0.54	(0.46)	36.71	(0.00)	0.37	(0.54)	8.48	(0.01)
	NH	9.51	(0.00)	89.24	(0.00)	35.90	(0.00)	127.59	(0.00)
L19	UN	0.56	(0.46)	107.65	(0.00)	5.62	(0.02)	17.61	(0.00)
	EF	0.05	(0.82)	15.72	(0.00)	0.16	(0.69)	0.35	(0.84)
	NH	15.90	(0.00)	255.89	(0.00)	28.76	(0.00)	813.27	(0.00)
L20	UN	1.40	(0.24)	394.32	(0.00)	5.76	(0.02)	18.68	(0.00)
	EF	0.00	(0.98)	92.54	(0.00)	0.32	(0.57)	0.43	(0.81)
	NH	13.91	(0.00)	144.45	(0.00)	51.04	(0.00)	240.32	(0.00)
L21	UN	1.05	(0.31)	852.05	(0.00)	4.62	(0.03)	24.13	(0.00)
	EF	0.62	(0.43)	170.73	(0.00)	0.30	(0.59)	1.48	(0.48)
	NH	5.46	(0.00)	29.80	(0.00)	47.90	(0.00)	211.25	(0.00)
L22	UN	0.11	(0.75)	883.30	(0.00)	3.73	(0.05)	14.54	(0.00)
	EF	0.04	(0.83)	99.41	(0.00)	0.52	(0.47)	0.63	(0.73)
	NH	6.87	(0.00)	39.34	(0.00)	75.91	(0.00)	573.37	(0.00)
L23	UN	0.27	(0.60)	530.57	(0.00)	2.84	(0.09)	66.31	(0.00)
	EF	0.46	(0.50)	157.64	(0.00)	0.51	(0.48)	7.20	(0.03)
	NH	2.58	(0.01)	6.62	(0.00)	53.41	(0.00)	282.16	(0.00)

Table 79: Rationality Tests for Real Net Exports Revision Errors with Dummys (full sample)

		final= l24				final=last known			
Vintage	Tests	without Dummy		With dummy		without Dummy		With dummy	
L1	UN	0.00	(0.97)	342.35	(0.00)	0.62	(0.43)	8.61	(0.01)
	EF	6.22	(0.01)	57.58	(0.00)	19.50	(0.00)	187.17	(0.00)
	NH	0.62	(0.54)	0.40	(0.53)	0.41	(0.69)	0.11	(0.74)
L2	UN	0.20	(0.65)	236.25	(0.00)	1.40	(0.24)	218.31	(0.00)
	EF	2.79	(0.09)	350.89	(0.00)	13.82	(0.00)	386.06	(0.00)
	NH	11.36	(0.00)	133.61	(0.00)	17.21	(0.00)	302.50	(0.00)
L3	UN	0.08	(0.78)	5.21	(0.07)	1.60	(0.21)	268.37	(0.00)
	EF	1.06	(0.30)	9.29	(0.01)	10.94	(0.00)	579.13	(0.00)
	NH	12.54	(0.00)	137.56	(0.00)	16.72	(0.00)	274.59	(0.00)
L4	UN	0.04	(0.84)	0.05	(0.97)	1.04	(0.31)	314.55	(0.00)
	EF	0.21	(0.65)	2.48	(0.29)	8.32	(0.00)	654.75	(0.00)
	NH	9.78	(0.00)	98.85	(0.00)	15.40	(0.00)	227.40	(0.00)
L5	UN	0.00	(0.95)	0.18	(0.91)	1.49	(0.22)	281.70	(0.00)
	EF	0.73	(0.39)	1.46	(0.48)	10.59	(0.00)	577.07	(0.00)
	NH	17.15	(0.00)	283.05	(0.00)	41.55	(0.00)	1691.62	(0.00)
L6	UN	0.03	(0.87)	0.05	(0.97)	1.45	(0.23)	283.77	(0.00)
	EF	0.50	(0.48)	1.68	(0.43)	9.99	(0.00)	539.19	(0.00)
	NH	26.68	(0.00)	694.28	(0.00)	30.61	(0.00)	937.02	(0.00)
L7	UN	0.06	(0.80)	1.85	(0.40)	1.47	(0.23)	962.60	(0.00)
	EF	0.50	(0.48)	23.88	(0.00)	13.49	(0.00)	874.58	(0.00)
	NH	10.75	(0.00)	65.15	(0.00)	20.17	(0.00)	407.22	(0.00)
L8	UN	0.00	(0.99)	0.61	(0.74)	0.91	(0.34)	713.33	(0.00)
	EF	0.50	(0.48)	11.69	(0.00)	11.59	(0.00)	734.13	(0.00)
	NH	39.26	(0.00)	1658.42	(0.00)	32.91	(0.00)	1169.34	(0.00)
L9	UN	0.01	(0.92)	0.27	(0.87)	0.90	(0.34)	727.05	(0.00)
	EF	1.09	(0.30)	12.47	(0.00)	13.38	(0.00)	692.04	(0.00)
	NH	20.58	(0.00)	917.89	(0.00)	30.16	(0.00)	2308.73	(0.00)
L10	UN	0.64	(0.42)	545.93	(0.00)	0.33	(0.57)	2.52	(0.28)
	EF	0.70	(0.40)	48.03	(0.00)	11.30	(0.00)	330.08	(0.00)
	NH	5.61	(0.00)	31.39	(0.00)	15.25	(0.00)	226.62	(0.00)
L11	UN	0.94	(0.33)	167.97	(0.00)	0.24	(0.62)	2.83	(0.24)
	EF	0.28	(0.60)	18.50	(0.00)	9.70	(0.00)	315.65	(0.00)
	NH	17.58	(0.00)	297.13	(0.00)	44.13	(0.00)	1879.15	(0.00)
L12	UN	1.06	(0.30)	343.07	(0.00)	0.17	(0.68)	1.72	(0.42)
	EF	1.26	(0.26)	6.46	(0.04)	12.52	(0.00)	324.53	(0.00)
	NH	52.94	(0.00)	2577.60	(0.00)	45.18	(0.00)	2013.60	(0.00)
L13	UN	0.78	(0.38)	650.11	(0.00)	0.23	(0.63)	1.69	(0.43)
	EF	0.77	(0.38)	4.74	(0.09)	10.57	(0.00)	273.17	(0.00)
	NH	17.93	(0.00)	320.43	(0.00)	37.72	(0.00)	1384.45	(0.00)
L14	UN	0.67	(0.41)	7940.10	(0.00)	0.33	(0.57)	3.34	(0.19)
	EF	1.32	(0.25)	102.39	(0.00)	11.43	(0.00)	377.39	(0.00)
	NH	24.84	(0.00)	552.04	(0.00)	34.87	(0.00)	1276.86	(0.00)
L15	UN	0.18	(0.67)	2.69	(0.26)	0.70	(0.40)	4.71	(0.09)
	EF	0.26	(0.61)	3.76	(0.15)	9.45	(0.00)	337.78	(0.00)
	NH	9.20	(0.00)	94.10	(0.00)	24.71	(0.00)	612.74	(0.00)
L16	UN	1.07	(0.30)	2.19	(0.34)	0.37	(0.54)	6.21	(0.04)
	EF	0.04	(0.84)	0.64	(0.72)	8.35	(0.00)	389.69	(0.00)
	NH	10.42	(0.00)	108.25	(0.00)	25.48	(0.00)	638.68	(0.00)
L17	UN	0.09	(0.76)	1360.06	(0.00)	0.86	(0.36)	845.01	(0.00)
	EF	0.00	(1.00)	35.24	(0.00)	8.34	(0.00)	58.13	(0.00)
	NH	20.28	(0.00)	485.08	(0.00)	29.24	(0.00)	852.17	(0.00)
L18	UN	0.19	(0.66)	1.64	(0.44)	0.91	(0.34)	525.07	(0.00)
	EF	0.01	(0.93)	2.33	(0.31)	8.97	(0.00)	17.08	(0.00)
	NH	14.63	(0.00)	234.09	(0.00)	27.06	(0.00)	749.82	(0.00)
L19	UN	1.40	(0.24)	8.53	(0.00)	0.33	(0.57)	5.16	(0.08)
	EF	0.10	(0.75)	11.74	(0.00)	8.40	(0.00)	326.35	(0.00)
	NH	5.78	(0.00)	31.46	(0.00)	14.55	(0.00)	210.53	(0.00)
L20	UN	1.69	(0.19)	4.08	(0.13)	0.23	(0.63)	5.98	(0.05)
	EF	0.32	(0.57)	2.54	(0.28)	7.59	(0.01)	362.96	(0.00)
	NH	15.46	(0.00)	244.79	(0.00)	68.17	(0.00)	4597.77	(0.00)
L21	UN	1.00	(0.32)	5.52	(0.06)	0.42	(0.52)	5.59	(0.06)
	EF	0.01	(0.92)	2.78	(0.25)	9.17	(0.00)	358.22	(0.00)
	NH	7.87	(0.00)	122.98	(0.00)	46.40	(0.00)	2134.25	(0.00)
L22	UN	0.35	(0.56)	13183.73	(0.00)	1.45	(0.23)	207.13	(0.00)
	EF	0.23	(0.63)	147.92	(0.00)	12.12	(0.00)	354.08	(0.00)
	NH	1.56	(0.13)	2.41	(0.12)	6.69	(0.00)	36.34	(0.00)
L23	UN	0.62	(0.43)	1.15	(0.56)	2.09	(0.15)	219.52	(0.00)
	EF	0.41	(0.52)	1.15	(0.56)	12.35	(0.00)	376.72	(0.00)
	NH	4.14	(0.00)	17.17	(0.00)	38.94	(0.00)	1514.95	(0.00)

Table 80: Rationality Tests for Real Value Added Revision Errors with Dummys (full sample)

		final= l24				final=last known			
Vintage	Tests	without Dummy		With dummy		without Dummy		With dummy	
L1	UN	0.10	(0.75)	5334.39	(0.00)	0.04	(0.84)	733.73	(0.00)
	EF	1.82	(0.18)	17.57	(0.00)	15.97	(0.00)	361.49	(0.00)
	NH	2.32	(0.02)	3.69	(0.05)	7.88	(0.00)	63.53	(0.00)
L2	UN	0.01	(0.91)	5760.66	(0.00)	0.12	(0.73)	110.82	(0.00)
	EF	2.00	(0.16)	15.18	(0.00)	15.85	(0.00)	91.89	(0.00)
	NH	39.35	(0.00)	1440.92	(0.00)	81.84	(0.00)	6636.51	(0.00)
L3	UN	0.02	(0.89)	624.37	(0.00)	0.34	(0.56)	46.96	(0.00)
	EF	1.48	(0.22)	5.43	(0.07)	11.32	(0.00)	35.40	(0.00)
	NH	21.71	(0.00)	471.93	(0.00)	32.80	(0.00)	1075.59	(0.00)
L4	UN	0.04	(0.85)	600.13	(0.00)	0.06	(0.80)	13.70	(0.00)
	EF	12.60	(0.00)	118.26	(0.00)	6.66	(0.01)	13.28	(0.00)
	NH	14.39	(0.00)	270.24	(0.00)	17.04	(0.00)	331.60	(0.00)
L5	UN	0.06	(0.81)	4642.57	(0.00)	0.05	(0.83)	12.40	(0.00)
	EF	7.82	(0.01)	89.89	(0.00)	6.61	(0.01)	11.52	(0.00)
	NH	21.89	(0.00)	703.45	(0.00)	37.84	(0.00)	1397.78	(0.00)
L6	UN	0.02	(0.90)	153.35	(0.00)	0.03	(0.86)	10.02	(0.01)
	EF	4.70	(0.03)	72.16	(0.00)	5.72	(0.02)	17.02	(0.00)
	NH	27.56	(0.00)	746.80	(0.00)	67.65	(0.00)	4574.07	(0.00)
L7	UN	0.29	(0.59)	1.12	(0.57)	0.25	(0.62)	6.15	(0.05)
	EF	3.09	(0.08)	3.60	(0.17)	5.10	(0.02)	7.20	(0.03)
	NH	17.10	(0.00)	370.70	(0.00)	23.89	(0.00)	570.66	(0.00)
L8	UN	0.13	(0.72)	2.13	(0.34)	0.12	(0.73)	243.36	(0.00)
	EF	2.35	(0.13)	3.42	(0.18)	5.04	(0.02)	25.72	(0.00)
	NH	28.24	(0.00)	711.59	(0.00)	61.53	(0.00)	3572.14	(0.00)
L9	UN	0.05	(0.82)	180.49	(0.00)	0.13	(0.72)	490.54	(0.00)
	EF	4.37	(0.04)	148.53	(0.00)	5.87	(0.02)	262.02	(0.00)
	NH	15.00	(0.00)	217.78	(0.00)	29.62	(0.00)	859.58	(0.00)
L10	UN	0.71	(0.40)	171.43	(0.00)	0.42	(0.52)	494.90	(0.00)
	EF	1.01	(0.31)	183.92	(0.00)	4.47	(0.03)	270.34	(0.00)
	NH	19.30	(0.00)	368.14	(0.00)	42.24	(0.00)	1769.24	(0.00)
L11	UN	2.47	(0.12)	191152.02	(0.00)	1.04	(0.31)	21.69	(0.00)
	EF	0.60	(0.44)	47.34	(0.00)	4.38	(0.04)	11.83	(0.00)
	NH	20.18	(0.00)	659.03	(0.00)	61.84	(0.00)	5170.43	(0.00)
L12	UN	1.34	(0.25)	373.80	(0.00)	0.71	(0.40)	18.70	(0.00)
	EF	0.72	(0.40)	167.24	(0.00)	4.13	(0.04)	11.89	(0.00)
	NH	19.23	(0.00)	374.23	(0.00)	46.19	(0.00)	2118.67	(0.00)
L13	UN	2.18	(0.14)	12.28	(0.00)	0.87	(0.35)	18.55	(0.00)
	EF	0.08	(0.77)	15.15	(0.00)	2.70	(0.10)	10.43	(0.01)
	NH	6.97	(0.00)	48.38	(0.00)	25.73	(0.00)	678.99	(0.00)
L14	UN	1.47	(0.23)	1.47	(0.48)	0.70	(0.40)	19.78	(0.00)
	EF	0.48	(0.49)	2.98	(0.23)	3.09	(0.08)	11.94	(0.00)
	NH	20.38	(0.00)	389.99	(0.00)	36.91	(0.00)	1329.41	(0.00)
L15	UN	1.79	(0.18)	3.51	(0.17)	0.79	(0.37)	13.31	(0.00)
	EF	2.22	(0.14)	12.24	(0.00)	2.05	(0.15)	7.34	(0.03)
	NH	27.87	(0.00)	775.03	(0.00)	60.71	(0.00)	3638.29	(0.00)
L16	UN	1.38	(0.24)	63.57	(0.00)	0.55	(0.46)	12.92	(0.00)
	EF	0.01	(0.93)	63.36	(0.00)	2.58	(0.11)	5.98	(0.05)
	NH	9.73	(0.00)	94.35	(0.00)	30.46	(0.00)	927.95	(0.00)
L17	UN	2.33	(0.13)	169.55	(0.00)	0.82	(0.36)	14.58	(0.00)
	EF	0.01	(0.91)	107.21	(0.00)	2.70	(0.10)	6.47	(0.04)
	NH	15.72	(0.00)	246.65	(0.00)	58.40	(0.00)	3316.42	(0.00)
L18	UN	2.80	(0.09)	182.14	(0.00)	0.85	(0.36)	11.91	(0.00)
	EF	0.27	(0.60)	118.63	(0.00)	2.09	(0.15)	4.49	(0.11)
	NH	25.32	(0.00)	574.97	(0.00)	80.40	(0.00)	6463.86	(0.00)
L19	UN	0.00	(0.99)	4.61	(0.10)	0.16	(0.69)	5.09	(0.08)
	EF	0.01	(0.92)	1.83	(0.40)	2.69	(0.10)	7.22	(0.03)
	NH	5.99	(0.00)	32.67	(0.00)	36.46	(0.00)	1338.16	(0.00)
L20	UN	0.31	(0.58)	8.07	(0.02)	0.09	(0.76)	7.07	(0.03)
	EF	0.54	(0.46)	1.49	(0.48)	3.19	(0.07)	6.99	(0.03)
	NH	14.39	(0.00)	191.27	(0.00)	54.34	(0.00)	2874.27	(0.00)
L21	UN	1.21	(0.27)	1243.76	(0.00)	0.03	(0.85)	6.91	(0.03)
	EF	0.37	(0.54)	73.42	(0.00)	3.31	(0.07)	6.85	(0.03)
	NH	31.98	(0.00)	1090.56	(0.00)	75.90	(0.00)	5754.42	(0.00)
L22	UN	0.59	(0.44)	260.10	(0.00)	0.10	(0.75)	4.48	(0.11)
	EF	1.11	(0.29)	372.87	(0.00)	3.17	(0.07)	11.83	(0.00)
	NH	5.95	(0.00)	37.10	(0.00)	37.55	(0.00)	1328.89	(0.00)
L23	UN	0.00	(0.99)	11.86	(0.00)	0.23	(0.63)	6.21	(0.04)
	EF	0.86	(0.35)	34.19	(0.00)	4.19	(0.04)	15.02	(0.00)
	NH	3.59	(0.00)	12.65	(0.00)	55.41	(0.00)	2931.78	(0.00)

Table 81: Rationality Tests for Nominal Value Added Revision Errors with Dummys (full sample)

		final= l24				final=last known			
Vintage	Tests	without Dummy		With dummy		without Dummy		With dummy	
	UN	3.01	(0.08)	18.54	(0.00)	1.67	(0.20)	305.89	(0.00)
	EF	3.45	(0.06)	16.69	(0.00)	0.01	(0.92)	136.29	(0.00)
L2	NH	0.87	(0.39)	0.45	(0.50)	2.62	(0.01)	5.37	(0.00)
	UN	2.39	(0.12)	22.28	(0.00)	1.35	(0.25)	576.43	(0.00)
	EF	3.39	(0.07)	23.74	(0.00)	0.00	(0.95)	216.16	(0.00)
L3	NH	9.31	(0.00)	84.14	(0.00)	14.37	(0.00)	205.76	(0.00)
	UN	2.21	(0.14)	14.40	(0.00)	0.82	(0.37)	593.94	(0.00)
	EF	3.06	(0.08)	12.73	(0.00)	0.05	(0.82)	225.66	(0.00)
L4	NH	29.99	(0.00)	835.97	(0.00)	37.14	(0.00)	1320.34	(0.00)
	UN	0.96	(0.33)	50.86	(0.00)	0.16	(0.69)	551.29	(0.00)
	EF	0.54	(0.46)	67.48	(0.00)	1.80	(0.18)	214.51	(0.00)
L5	NH	14.67	(0.00)	215.09	(0.00)	22.99	(0.00)	494.52	(0.00)
	UN	0.68	(0.41)	57.86	(0.00)	0.03	(0.86)	523.91	(0.00)
	EF	0.59	(0.44)	78.98	(0.00)	2.10	(0.15)	236.35	(0.00)
L6	NH	13.50	(0.00)	182.28	(0.00)	18.58	(0.00)	336.53	(0.00)
	UN	0.97	(0.33)	75.42	(0.00)	0.02	(0.88)	425.45	(0.00)
	EF	0.82	(0.37)	98.65	(0.00)	2.40	(0.12)	211.07	(0.00)
L7	NH	33.74	(0.00)	1143.27	(0.00)	48.15	(0.00)	233.36	(0.00)
	UN	1.42	(0.23)	93.44	(0.00)	0.01	(0.91)	23.51	(0.00)
	EF	0.54	(0.46)	122.67	(0.00)	4.17	(0.04)	31.31	(0.00)
L8	NH	14.46	(0.00)	196.80	(0.00)	20.41	(0.00)	415.66	(0.00)
	UN	0.99	(0.32)	115.25	(0.00)	0.00	(0.96)	2.11	(0.35)
	EF	0.46	(0.50)	172.09	(0.00)	3.71	(0.05)	3.75	(0.15)
L9	NH	32.78	(0.00)	103.76	(0.00)	41.62	(0.00)	1729.36	(0.00)
	UN	0.88	(0.35)	76.94	(0.00)	0.01	(0.93)	22.56	(0.00)
	EF	0.30	(0.59)	137.12	(0.00)	4.00	(0.05)	35.06	(0.00)
L10	NH	38.67	(0.00)	138.22	(0.00)	41.37	(0.00)	148.31	(0.00)
	UN	3.36	(0.07)	62.68	(0.00)	0.20	(0.66)	46.20	(0.00)
	EF	1.14	(0.29)	96.24	(0.00)	3.47	(0.06)	54.88	(0.00)
L11	NH	28.26	(0.00)	777.54	(0.00)	33.95	(0.00)	143.85	(0.00)
	UN	0.38	(0.54)	0.62	(0.73)	0.13	(0.72)	50.48	(0.00)
	EF	0.16	(0.69)	1.54	(0.46)	6.55	(0.01)	67.37	(0.00)
L12	NH	21.59	(0.00)	459.67	(0.00)	37.51	(0.00)	142.53	(0.00)
	UN	0.51	(0.48)	0.74	(0.69)	0.14	(0.71)	0.15	(0.93)
	EF	0.18	(0.67)	1.28	(0.53)	6.89	(0.01)	10.65	(0.00)
L13	NH	26.69	(0.00)	906.41	(0.00)	66.25	(0.00)	514.33	(0.00)
	UN	0.07	(0.79)	5.02	(0.08)	0.53	(0.47)	51.09	(0.00)
	EF	0.06	(0.81)	2.19	(0.33)	7.44	(0.01)	70.30	(0.00)
L14	NH	14.59	(0.00)	219.94	(0.00)	20.72	(0.00)	441.11	(0.00)
	UN	0.44	(0.51)	6.74	(0.03)	0.11	(0.74)	47.41	(0.00)
	EF	0.26	(0.61)	2.39	(0.30)	4.20	(0.04)	69.32	(0.00)
L15	NH	20.11	(0.00)	390.34	(0.00)	40.53	(0.00)	163.25	(0.00)
	UN	0.47	(0.49)	11.36	(0.00)	0.08	(0.78)	22.00	(0.00)
	EF	0.91	(0.34)	4.46	(0.11)	3.63	(0.06)	99.85	(0.00)
L16	NH	23.10	(0.00)	518.54	(0.00)	36.84	(0.00)	128.54	(0.00)
	UN	0.06	(0.81)	26.65	(0.00)	0.47	(0.49)	60.55	(0.00)
	EF	0.49	(0.48)	15.69	(0.00)	6.98	(0.01)	209.86	(0.00)
L17	NH	7.32	(0.00)	49.61	(0.00)	18.71	(0.00)	339.48	(0.00)
	UN	0.02	(0.89)	18.28	(0.00)	0.39	(0.53)	58.12	(0.00)
	EF	0.50	(0.48)	11.28	(0.00)	6.90	(0.01)	217.95	(0.00)
L18	NH	28.42	(0.00)	814.12	(0.00)	61.20	(0.00)	374.13	(0.00)
	UN	0.33	(0.57)	1.42	(0.49)	0.01	(0.92)	99.55	(0.00)
	EF	0.00	(0.96)	1.87	(0.39)	4.29	(0.04)	173.42	(0.00)
L19	NH	4.69	(0.00)	21.65	(0.00)	24.75	(0.00)	612.51	(0.00)
	UN	0.13	(0.72)	38.02	(0.00)	0.15	(0.70)	66.73	(0.00)
	EF	0.24	(0.63)	37.66	(0.00)	6.83	(0.01)	201.34	(0.00)
L20	NH	8.34	(0.00)	66.44	(0.00)	22.61	(0.00)	866.27	(0.00)
	UN	0.22	(0.64)	33.11	(0.00)	0.16	(0.69)	126.34	(0.00)
	EF	0.01	(0.94)	18.44	(0.00)	8.22	(0.00)	170.52	(0.00)
L21	NH	14.25	(0.00)	220.11	(0.00)	36.18	(0.00)	139.65	(0.00)
	UN	0.00	(0.96)	49.08	(0.00)	0.40	(0.53)	124.33	(0.00)
	EF	0.00	(0.96)	33.27	(0.00)	8.48	(0.00)	163.36	(0.00)
L22	NH	8.99	(0.00)	80.67	(0.00)	76.49	(0.00)	572.45	(0.00)
	UN	1.30	(0.25)	128.69	(0.00)	0.13	(0.72)	108.42	(0.00)
	EF	0.34	(0.56)	160.87	(0.00)	9.15	(0.00)	178.31	(0.00)
L23	NH	2.75	(0.01)	6.71	(0.01)	21.75	(0.00)	432.34	(0.00)
	UN	0.86	(0.35)	142.54	(0.00)	0.21	(0.65)	120.13	(0.00)
	EF	0.14	(0.71)	192.78	(0.00)	7.45	(0.01)	221.92	(0.00)
	NH	6.55	(0.00)	42.95	(0.00)	48.68	(0.00)	248.36	(0.00)