Relative Performance of Business and Consumer Economic Expectations Across EU Countries

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Received: 6 June 2021 / Accepted: 18 August 2022 / Published online: 7 September 2022
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Abstract
Survey designs that aim at international comparisons of economic expectations are complex. Question wording and response scales must be applicable across countries to provide policy makers with reliable information. Substantial progress on harmonization has been made by the EU in their member surveys. While forming expectations is a difficult task for anyone, business firms have been thought to have a distinct advantage over consumers. This paper investigates this presumed superiority by examining whether firms change their expectations in advance of households, and whether firms’ expectations provide more accurate forecasts than household expectations. The comparisons are based on monthly expectations data for the countries in the European Union. While linkages were often found to be bidirectional, the data more frequently found unidirectional linkages that went from households to firms for unemployment and GDP. For a modest number of countries, firms and households jointly contributed to forecast accuracy, but the sole impact of household data clearly dominated the comparable results for firms. The objective of this analysis was exploratory, with the goal to identify countries which lacked significant connections for a more detailed investigation of the potential sources of measurement errors.

Keywords Expectations surveys · Firm versus consumer · Accuracy

JEL Classification C83 · E32 · D22 · D84

I wish to thank Yingjia Fu for her expert assistance, and to anonymous referees for making helpful comments. The paper based partly on my lecture at the 35th CIRET Conference for the IKA Lifetime Scholarly Achievement Award.

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1 Introduction

The European Union (EU) has a long history of conducting surveys to assess the current economic conditions facing each member country as well as expected economic developments (European Commission, 2021). Harmonized monthly surveys are conducted within each member country of the business and the consumer sectors. This paper will focus on the questions that assess expected changes in jobs and the overall economic growth rate in each EU country. It has been long held view in the literature that the expectations of business firms would normally be more accurate than those held by consumers (Simon, 1955). Respondents to business surveys are thought to have easy access to more relevant information and are more motivated to form accurate economic expectations. Unfortunately, there has been little research based on an empirical comparison of the economic expectations of firms and households. This article aims to address that void by focusing on the results of surveys of economic expectations conducted within each member country in the EU. Importantly, the relative performances will be solely based on the results for each individual country, in contrast to the more common approach based on the aggregated data for the entire EU community.

There are significant differences and some commonalities in the economic circumstances faced by firms and households. Economic recessions as well as economic expansions act to shape the behavior of all economic agents, regardless of whether the decisions are made within firms or households. The underlying difference has always been related to the timing of decisions, with the advantage usually going to business. The usual hypothesis is that firms form expectations of economic conditions more rapidly and accurately. Expectations held by households, in contrast, exhibit more sluggish responses to economic conditions, tending to lag actual economic developments, or even exhibit no correspondence with actual developments (Carroll, 2003).

The analysis is based on country-by-country comparisons of the economic expectations of firms and households as published by the EU (EU Commission, 2021). The harmonization of question wording is a necessary but not a sufficient condition to compare survey findings across firms and households. There are bound to be significant differences across countries in the composition and size of firms and households, in the manner and frequency that economic information is communicated, the ability and willingness of households to obtain the necessary information to form economic expectations, as well as many other cultural and social differences across countries included in the EU. Moreover, since the firm and household surveys are typically collected by different survey organizations, there is substantial research that has documented “house” effects among professional survey organizations. These “house” effects often reveal different response distributions to identical questions (Hippler & Schwarz, 1987; Schumann, et al., 2020).

The analysis undertaken is necessarily exploratory. The primary research question that will be addressed is whether a country’s firm and consumer data bear any significant relationship with one another, and whether they display a significant
impact in predicting the statistics on employment and GDP published by each country’s official statistical agency. All of the analysis will be limited to the information content of each country’s firm and consumer surveys, with no pooling of data across countries or within any country for the four different types of firms sampled: industrial, construction, service, and retail firms. For each countries and industries, the research design call for the same analytic techniques and assumptions to be used. While this approach may entail some specification errors for individual countries, the analysis is meant to explore the size and extent of the raw differences. Subsequent research can then focus more clearly on any revealed differences as well as the comparative strengths of the firm and consumer data collected by the EU to enhance data quality and economic policy responses. A broadly similar analysis was done by Fair and Shiller (1990), with one key difference: instead of comparing 17 different econometric forecasting models for GDP of a single country (U.S), this analysis compared expectations based predictions of GDP and the unemployment rate across 28 counties based on the same forecasting model.

1.1 Assumed Superiority of Firm’s Expectations

There are three essential tasks when forming economic expectations: the acquisition of the relevant data, the interpretations of the recent data trends, and the ability to perform the calculations required to construct and revise expectations. Business firms are assumed to have the required skills and resources to perform each of these tasks and thus generate more accurate expectations. In contrast, consumers are assumed to be more likely to base their expectations on incomplete data, use naive interpretations of the data, and employ a simplified method to form their expectations (Kahneman & Tversky, 1982; Simon, 1955). Heuristics or rules-of-thumb are commonly thought to be widely used by consumers as well as extrapolation or learning from past errors. All of these shortcuts produce biased expectations. Even if firms also use these shortcuts, the resulting biases are often judged to be relatively smaller among firms than households due to the use by firms of more informed rules-of-thumb. The presumption of firm superiority in forming economic expectations is widespread and plainly evident in most media reports of economic expectations. Indeed, Carroll (2003) theorized consumers form their expectations in response to media reports of experts, usually associated with firms or governmental agencies. Consumers do not need to depend on forming their own forecasts as they can simply adopt the forecasts made by firms or agencies as reported in the media. This implies that households would imitate expert expectations, indicating that consumer expectations would lag behind the expectations held by firms.

The firm’s advantages in forming expectations are supported by a variety of additional factors. The first advantage is motivation: specific employees are usually assigned to maintain economic forecasts, with their salary and career advancement associated with successful forecasts. Even within very small firms, say owner-operators, accurate expectations could mean that the profitability of the firm would be higher, providing a monetary incentive for accurate expectations. Moreover, firms
must repeatedly form the same economic expectations relevant to their business, offering greater learning opportunities. Firms need to make repeated decisions that depend on how economic expectation may have recently changed. Not only is the frequency of updates greater, but the level of concern about accuracy is higher for firms.

There is another theoretical argument that supports the lagged response of households compared with firms, namely the implied dynamics of conventional macro-economic theory. Production plans of firms are necessarily prior to the purchase decisions of households. Business firms are assumed to make independent decisions on future investments and production, whereas consumer spending is endogenous, with their decisions depending on the evolution of incomes and prices (Curtin, 2019). This view implies that expectations of firms should precede its formation by households.

Finally, it should be noted that Muth’s (1961) rational expectations hypothesis implies more equal footing for the formation of expectations by firms and consumers. Economic rationality is theorized to be a universal characteristic, and departures from rationality could be anticipated to be just as likely among households or firms. Indeed, households may be just as sensitive to some economic developments as firms, say potential cyclical downturns in employment and incomes. As a result, households as well as firms are motivated to hold accurate expectations of the economic factors that influence their own situation. Conventional economic theory posits that economic agents should hold accurate expectations about the conditions they actually face in decision making (Curtin, 2019).

1.2 Firm Versus Household Samples

The difference between how firm’s and consumer’s economic expectations are measured in the EU surveys reflects commonly assumed differences in the economic situations of firms and households. Perhaps the most common is that households are all treated identically, while differences across firms require that their unique features be recognized and handled appropriately in the wording of questions. Importantly, the questions asked to firms used the generally accepted jargon, presumably in common use across EU countries. For example, the firms output was described as production, order books, turnover, or sales depending on the type of firm. In contrast, all households were treated equivalently. The consumer surveys included no variations in question wording despite sharp differences in economic behaviors across consumers, for example, those in the bottom versus the top of the income distribution, or the youngest just starting households versus older and retired consumers. Although non-response weights are used to achieve a representative sample, the goal of the sampling procedure is to give each household an equal probability of selection (European Commission, 2021). In sharp contrast to the firm samples, where the firm’s size is taken into account when aggregating across firms, no recognition of the differential economic impact of a household’s income on spending is taken into account.
The notion that the typical firm in the business samples has at its disposable more detailed and more recent information on which to base their expectations is also suspect. To be sure, large firms are likely to have the type of personnel with an identified job function to prepare economic forecasts, which the firm uses to guide their future production, employment, and investment expenditures. As such, these business respondents are assumed to form expectations using more rational methods and be least susceptible to biased forecasts. Such large non-financial firms are relatively rare, however, with firms with 250 or more employees accounting for less than one-half of one percent of all EU firms in 2018. At the other extreme, just over nine-in-ten nonfinancial firms in the EU had fewer than 10 employees. Nonetheless, a tiny proportion of large firms employ slightly more people than the smallest firms—35% versus 29%. Moreover, large firms accounted for twice as much value added compared with small firms—47% versus 19% (Eurostat, 2021). Differential selection probabilities as well as the sample weights given to individual firms are employed by the EU to provide estimates that are representative of overall employment and value added. Needless to say, differences in weights across firms can be expected to be very large when fully aggregated to EU totals. This paper’s analysis avoids those complications by focusing the entire investigation based on each firm type within each country, and never across countries or types of firms.

1.3 Question Wording and Country Selection

The European Union has collected monthly data on business and consumer expectations based on harmonized surveys administered by each member country. Monthly survey data are available starting in January 1985 for many members, with new countries added as the size of the European Union increased; all of the data are available in the EU website (EU Commission, 2021). The data series used for this analysis covers 35 years, ending in December 2019, for a total of 420 time-series observations. The end date was selected to avoid data collected during the covid-19 pandemic. All 28 member countries were included in the analysis. A minimum of 120 monthly observations on questions asked to industrial firms were required. The countries included were: Austria, Belgium, Bulgaria, Cyprus, Czechia, Germany, Denmark, Estonia, Greece, Spain, Finland, France, Croatia, Hungary, Ireland, Italy, Lithuania, Latvia, Malta, Netherlands, Poland, Portugal, Romania, Sweden, Slovenia, Slovak Republic, Turkey, and the United Kingdom. There were a few of these countries which had Industry data for at least 10 years, but three had slightly fewer observations for some types of firms: the lowest was 104 observations for Turkey (construction, services, and retail) and Malta (retail), and 116 observations for Denmark (services and retail). Luxembourg was eliminated since it had no observations on service and retail firms, although it met the 120 observation requirement for industrials.

The harmonized wording for questions on employment and production are shown in Table 1. No identically worded questions were asked in both the household and firm surveys. The two key differences were how the surveys described the concept and the time horizon. The household surveys used a one-year time horizon, and the
firm surveys used a three-month horizon. Firms were asked about trends in employment, and households were asked about trends in unemployment. Although trends in employment and unemployment often diverge, the analysis assumed that time trends in one was approximately the inverse of the other; given the range of responses that were included under the broad terms of “increase” or “decrease,” any mismatch in cyclical trends was effectively minimized.

The various measures of “production” differed depending on the characteristics of the industries. Presumably, the differences in wording were introduced to provide a better match between the desired concept and the appropriate language used by firms across EU industries. For firms, the measurement objective was the anticipated behavior of their own firm, which when aggregated across the entire sample in each country, provides an estimate of expected contributions to changes in GDP growth. Although households do not directly participate in production planning, they need some knowledge of the outcomes of those production plans as inputs to forming their own economic plans. For the household surveys, consumers were asked about how they expected the general economic situation in their country to evolve during the next twelve months.

This approach to the measurement of expectations has been formalized as “tailored expectations,” since the questions are tailored to the specific decisions and contexts faced by firms, not the economy-wide expectation (Curtin, 2019). When aggregated, tailored expectations sum to the national totals, even if the means for various subgroups show significant and persistent differences. Rather than a sign of irrationality, differences in mean expectations simply represent the differences in unemployment expectations between low and high skill workers, across different

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Table 1 Question wording

| (Un)employment | Question                                                                 |
|----------------|-------------------------------------------------------------------------|
| Consumer       | How do you expect the number of people unemployed in this country to change over the next 12 months? Will the number increase sharply, increase slightly, remain the same, fall slightly, or fall sharply? |
| All firms      | How do you expect your firm’s total employment to change over the next 3 months? Will it increase, remain unchanged, or decrease? |

**Production/economy**

| Consumer       | How do you expect the general economic situation in this country to develop over the next 12 months? Will it get a lot better, get a little better, stay the same, get a little worse, or get a lot worse? |
| Industry       | How do you expect your production to develop over the next 3 months? Will it increase, remain unchanged, or decrease? |
| Construction   | Do you consider your current overall order books to be more than sufficient/above normal, sufficient/normal for the season, or not sufficient/below normal? |
| Services       | How do you expect the demand (turnover) for your company’s services to change over the next 3 months? Will it increase, remain unchanged, or decrease? |
| Retail         | How do you expect your business activity (sales) to change over the next 3 months? Will it improve/increase, remain unchanged, or deteriorate/decrease? |

Source: Directorate-General for Economic and Financial Affairs, the Joint Harmonized EU Programme of Business and Consumer Surveys: User Guide, Belgium: Brussels, 2016
regions, and so forth. Importantly, despite these mean differences, time-series correlations across subgroups are quite high, indicating that the expectations of each subgroup moves in tandem across business cycles (Curtin, 2019).

### 1.4 Co-movements of Expectations within Countries

As a preliminary step in the analysis, the co-movements in expectations of business firms and households within each country were examined. The correlations indicate a substantial overlap between the responses of firms and households for both

| Country | Types of business firm | N | Industrial | Construction | Services | Retail |
|---------|------------------------|---|------------|--------------|----------|--------|
| AT      | Austria                | 288| 0.754      | 0.412        | 0.620    | 0.380  |
| BE      | Belgium                | 420| 0.782      | 0.685        | 0.682    | 0.429  |
| BG      | Bulgaria               | 224| 0.388      | 0.663        | 0.520    | 0.572  |
| CY      | Cyprus                 | 222| 0.246      | 0.551        | 0.439    | 0.484  |
| CZ      | Czechia                | 285| 0.814      | 0.633        | 0.636    | 0.571  |
| DE      | Germany                | 270| 0.815      | 0.428        | 0.793    | 0.382  |
| DK      | Denmark                | 420| 0.655      | 0.688        | 0.446    | 0.620  |
| EE      | Estonia                | 327| 0.825      | 0.469        | 0.736    | 0.678  |
| EL      | Greece                 | 420| 0.627      | 0.271        | 0.548    | 0.432  |
| ES      | Spain                  | 393| 0.792      | 0.491        | 0.680    | 0.771  |
| FI      | Finland                | 386| 0.411      | 0.522        | 0.711    | 0.535  |
| FR      | France                 | 348| 0.829      | 0.688        | 0.752    | 0.631  |
| HR      | Croatia                | 140| 0.874      | 0.896        | 0.852    | 0.890  |
| HU      | Hungary                | 288| 0.705      | 0.771        | 0.822    | 0.671  |
| IE      | Ireland                | 420| 0.654      | 0.811        | 0.751    | 0.663  |
| IT      | Italy                  | 420| 0.702      | 0.633        | 0.458    | 0.474  |
| LT      | Lithuania              | 224| 0.706      | 0.829        | 0.677    | 0.874  |
| LV      | Latvia                 | 308| 0.858      | 0.762        | 0.827    | 0.872  |
| MT      | Malta                  | 206| 0.566      | 0.778        | 0.744    | 0.520  |
| NL      | Netherlands            | 420| 0.847      | 0.818        | 0.863    | 0.681  |
| PL      | Poland                 | 224| 0.866      | 0.904        | 0.809    | 0.877  |
| PT      | Portugal               | 396| 0.744      | 0.665        | 0.669    | 0.756  |
| RO      | Romania                | 224| 0.568      | 0.636        | 0.632    | 0.575  |
| SE      | Sweden                 | 291| 0.671      | 0.523        | 0.738    | 0.519  |
| SI      | Slovenia               | 286| 0.633      | 0.780        | 0.723    | 0.704  |
| SK      | Slovak Republic        | 249| 0.547      | 0.752        | 0.172    | 0.259  |
| TR      | Turkey                 | 152| 0.499      | 0.738        | 0.777    | 0.678  |
| UK      | United Kingdom         | 420| 0.514      | 0.763        | 0.714    | 0.622  |
| Average of 28 country entries | 0.675 | 0.663 | 0.671 | 0.612 |
employment expectations as well as the anticipated rate of growth in the national economies (see Tables 2 and 3). This overlap was observed despite significant differences in the wording of the questions: the firm question asks about expected employment, and households were asked about expected unemployment; the firm question has a three month time horizon, and the household question covers the next 12 months. For these analyses, the responses to the business question on employment were inverted so all correlation would be positive.

The correlations for the questions on employment expectations indicate a close correspondence of results for firms and households. The range of correlations across the four types of results was quite small, ranging from a low of 0.612 for retail firms
to 0.675 for industrial firms. Across the 28 countries just one country for each firm type had correlations of less than 0.3, and only 7 countries had correlations less than 0.5. In contrast, the correlations for the questions on economic activity differed to a greater extent than for unemployment. The range of correlations by firm type for overall production expectations was quite small, except for construction whose average was 0.417; the other three correlations were in the tight range of 0.537 for industrial firms to 0.577 for service firms. The distinctive industry was construction, as 10 of 28 countries had correlations of less than 0.3 and 16 countries had correlations of less than 0.5. It should be noted that only Finland had three of the four correlations below 0.3, and four countries had two of the four correlation below 0.3: Bulgaria, Italy, Malta, and the Slovak Republic.

It is tempting to conclude that these much lower correlations were due to question wording differences that fit some combinations of country and firm types better than others. That judgement would be premature before the evidence of forecast accuracy is taken into account. The purpose of examining the co-movements was to determine whether a significant overlap exists that could form the basis of comparisons of the relative accuracy of firm versus household economic expectations. A sufficient overlap was indeed found. This finding indicates that for the vast majority of instances, the commonality across firms and households indicated that both groups had focused on the same expectations. To be sure, the association was only moderately high, with the possibility that other differential factors were at play in determining the expectations of households and firms.

How to explain the significant overlap given the differences in time horizons? The pertinent hypotheses are that households based their answers on a shorter time horizon than a year, or firms effectively used a longer time horizon than three months, or both errors were present acting to narrow the difference in time horizons. Similar to distributed lag models, differential weights may be involved. Households could have based their answers on declining weights, with the next few months having a much higher impact, and firms could have anticipated that the same rate would persist for a longer period of time. Another hypothesis is that neither group forms such precisely dated expectations, effectively using the same short-term time horizon. Whatever the source, it would be anticipated that the more likely source of error lies with the household data.

1.5 Granger Tests

Although the statistical procedure is usually termed “Granger causality tests,” that is a misleading description. The test can only indicate whether changes in one variable significantly leads changes in another variable. Granger tests were performed for each of the 28 countries, and each of the four types of firms to determine whether the firm’s expectations preceded the household’s expectations, household’s expectations preceded firm’s expectations, or whether each simultaneously influenced the other’s expectations. The rational expectations theory would hold that both firms and households would form accurate expectations, with each basing their revisions on the same data at the same time. This hypothesis would result in a Granger finding
of simultaneous causation. As already noted, some theorists would give firms the advantage since they have greater access to the appropriate data, are more experienced in calculating expectations, more quickly learn from their past errors, and can more easily afford computer programs or consultants to accomplish this task. In contrast, since households are commonly viewed to possess none of these skills, the best that they can accomplish is to simply adopt their economic expectations from media reports based on the forecasts of firms, financial institutions, government agencies, or consulting firm (Carroll, 2003). These theories would imply that business expectations would lead household expectations.

The alternative view that changes in household expectations would significantly lead changes in firm expectations has few adherents, despite the common tenet of business practice that encourages firms to follow the lead of their customers. The dismissal is based on the evidence that consumers lack knowledge of the economic data produced by statistical agencies, even on such common topics of inflation and unemployment. I have developed an alternative theory that holds households base their economic expectations on their own personal experiences, and have developed extensive social networks of people that face the same economic circumstance which provide them with early warnings of potential economic changes (Curtin, 2019). Based on this alternative hypothesis implies that household expectations at least change simultaneously with firm’s expectations.

The results of the Granger tests for the expectations on unemployment and overall economic activity are shown in Tables 4 and 6. Each table only includes the significance levels if they were less than or equal to 0.05; otherwise is simply indicates “ns” for not significant. A three month lag was included for both variables, matching the time horizon in the questions asked of firms. Since most readers are familiar with the underlying equations, they are not reproduced in favor of verbal descriptions. Importantly, the equations that generated the statistical results were identical for all countries. Such a one-size-fits-all approach was used as an exploratory tool that treats all countries equally, with the notion of tentatively identifying raw results that are inconsistent.

The results for the Granger tests on the connection between the employment expectations of firms and households are shown in Table 4 and summarized in Table 5. Significant bidirectional links were reported for 11 out of 28 countries for industrial firms, with bidirectional links among other types of firms ranging from just 3 to 5 firms. On the issue of unidirectional leads, the data provide a clear indication that household’s unemployment expectations lead firm’s expectations for construction (13), services (14), and retail (18) firms. Firm expectations showed many few unidirectional links than households, for construction (1), services (3) or retail (1) firms. Industrial firms had an equal number of countries showing links in both directions (6). Combining simultaneous and unidirectional links indicates that households influenced firm expectations in 17 to 21 out of 28 countries. The comparable data for firms was a comparable 17 firms for industrial firms but for the other three firm types is was between just 4 and 8 firms.

The analysis confirmed the notion that the expectations of firms and households were significantly interrelated for most countries; just 5 to 9 countries recorded no statistical relationship between the expectations of households and firms. Perhaps
| Type of business firm | Industrial | Construction | Services | Retail |
|-----------------------|------------|--------------|----------|--------|
|                       | Firm Cause HH | HH Cause Firm | Firm Cause HH | HH Cause Firm | Firm Cause HH | HH Cause Firm | Firm Cause HH | HH Cause Firm |
| AT Austria            | 0.011      | 0.000        | ns        | ns      | ns        | ns        | 0.008      | ns        |
| BE Belgium            | 0.000      | 0.004        | ns        | ns      | 0.001     | ns        | ns         | 0.021     |
| BG Bulgaria           | ns         | ns           | 0.000     | ns      | ns        | 0.018     | 0.047      | 0.041     |
| CY Cyprus             | ns         | ns           | ns        | ns      | ns        | ns        | ns         | ns        |
| CZ Czechia            | 0.001      | ns           | 0.000     | ns      | ns        | 0.000     | 0.000      | ns        |
| DE Germany            | 0.000      | ns           | ns        | ns      | 0.003     | ns        | ns         | 0.029     |
| DK Denmark            | ns         | 0.000        | 0.009     | 0.000   | ns        | ns        | ns         | 0.015     |
| EE Estonia            | 0.006      | 0.021        | ns        | ns      | ns        | 0.002     | ns         | 0.013     |
| EL Greece             | ns         | 0.009        | ns        | 0.031   | ns        | ns        | ns         | ns        |
| ES Spain              | 0.014      | 0.000        | ns        | ns      | ns        | 0.001     | ns         | 0.000     |
| FI Finland            | 0.000      | ns           | 0.000     | ns      | ns        | 0.000     | ns         | 0.005     |
| FR France             | 0.001      | 0.006        | 0.001     | ns      | 0.000     | 0.000     | ns         | 0.001     |
| HR Croatia            | 0.001      | ns           | 0.022     | 0.039   | ns        | 0.002     | 0.020      | 0.003     |
| HU Hungary            | ns         | 0.000        | ns        | 0.000   | ns        | 0.001     | ns         | 0.000     |
| IE Ireland            | ns         | 0.001        | 0.000     | 0.049   | ns        | 0.000     | ns         | 0.005     |
| IT Italy              | 0.001      | ns           | ns        | 0.001   | ns        | ns        | ns         | ns        |
| LT Lithuania          | ns         | 0.000        | ns        | 0.000   | ns        | 0.001     | ns         | 0.000     |
| LV Latvia             | 0.000      | 0.000        | ns        | ns      | ns        | 0.000     | 0.008      | 0.002     |
| MT Malta              | ns         | ns           | ns        | ns      | ns        | 0.036     | ns         | 0.013     |
| NL Netherlands        | 0.001      | 0.000        | 0.002     | 0.000   | 0.022     | 0.002     | ns         | 0.000     |
| PL Poland             | 0.001      | ns           | 0.048     | 0.001   | 0.001     | 0.009     | ns         | 0.000     |
| PT Portugal           | 0.000      | 0.001        | 0.038     | ns      | 0.009     | ns        | 0.000      | ns        |
| RO Romania            | 0.019      | 0.004        | ns        | 0.000   | ns        | 0.002     | ns         | ns        |
| Type of business firm | Industrial | Construction | Services | Retail |
|----------------------|------------|--------------|----------|--------|
|                     | Firm Cause HH | HH Cause Firm | Firm Cause HH | HH Cause Firm | Firm Cause HH | HH Cause Firm |
| SE Sweden | 0.004 | 0.000 | ns | 0.003 | 0.026 | 0.000 | ns | 0.001 |
| SI Slovenia | 0.001 | 0.010 | ns | 0.004 | 0.045 | 0.002 | ns | 0.000 |
| SK Slovak Republic | ns | ns | ns | 0.000 | ns | ns | ns | ns |
| TR Turkey | ns | ns | ns | ns | 0.025 | ns | ns | ns |
| UK United Kingdom | ns | 0.001 | ns | 0.000 | ns | 0.000 | ns | 0.007 |
even more surprising was that household expectations had a significant advantage in leading firm’s employment expectations. These exploratory results hardly represent a final verdict; even after the predictive ability of household and firm data is discussed, the results will still be tentative.

Table 6 shows the results for comparable Grange tests on expectations for economic growth among households and firms, while Table 7 includes the summary statistics for the tests on GDP across 28 EU countries. Note that the overall findings of this analysis closely mirrored the data on employment expectations. For GDP output expectations, industrial firms garnered the most bidirectional results (9), and the household data was found to have a large unidirectional advantage over firm data for construction (13 vs 3 countries), services (13 vs 1) and retail (16 vs none). When the simultaneous and unidirectional links were summed, the households held a slight edge for industrial firms (16 vs 15 countries), and a substantial advantage for construction (16 vs 6 countries), services (20 vs 8), and retail (21 vs 5). No relationship between household and firm GDP expectations was found for between 6 (industrial) and 9 (construction) firms.

The substantial matching of the results for expectations about prospects for (un)employment and GDP growth rates indicated at least a partial measurement invariance of these expectations when judged by time-series correlations (as opposed to mean expectations). Nonetheless, the data also suggested that some aspect of the measurement methodologies did not provide sufficient harmonization. The potential to identify and improve measurement procedures is an important outcome of any exploratory research. The final judgement about the measurement methodology depends on an assessment of the comparative accuracy of these economic expectations.

### 1.6 Expectations and Actual Economic Developments

Expectations are typically judged by economists by the accurately that they can predict the actual trends in the corresponding economic series. Since GDP was only available on a quarterly basis for all countries, a quarterly format was used to test the prediction power of unemployment expectations as well. All regressions included one lag of the dependent variable as well as one lag of the independent variables to correct for serial correlation. As with the prior analysis, the widely known format

| Result of Granger tests: | Type of Firm |
|--------------------------|--------------|
|                        | Industrial | Construction | Services | Retail |
| Significant mutual predictions in both directions | 11 | 5 | 5 | 3 |
| Only firm data significant predictor of household | 6 | 1 | 3 | 1 |
| Only household data significant predictor of firm | 6 | 13 | 14 | 18 |
| Neither significant predictor of other | 5 | 9 | 6 | 6 |
Table 6 Granger tests of firm’s employment expectations and household’s unemployment expectations

| Type of business firm | Industrial | Construction | Services | Retail |
|-----------------------|------------|--------------|----------|--------|
|                       | Firm Cause HH | HH Cause Firm | Firm Cause HH | HH Cause Firm | Firm Cause HH | HH Cause Firm |
| AT Austria            | 0.001       | 0.000        | ns       | ns     | 0.003       | 0.000        | 0.017       | 0.020    |
| BE Belgium            | ns          | 0.008        | ns       | ns     | ns          | 0.017        | ns          | 0.000    |
| BG Bulgaria           | ns          | 0.003        | ns       | 0.049  | ns          | 0.017        | ns          | ns       |
| CY Cyprus             | ns          | ns           | ns       | 0.004  | ns          | 0.017        | ns          | ns       |
| CZ Czechia            | ns          | ns           | ns       | ns     | ns          | ns           | ns          | 0.000    |
| DE Germany            | 0.000       | ns           | ns       | ns     | ns          | ns           | ns          | 0.000    |
| DK Denmark            | 0.008       | 0.018        | ns       | 0.007  | ns          | ns           | ns          | 0.044    |
| EE Estonia            | ns          | 0.010        | ns       | ns     | 0.012       | 0.003        | ns          | 0.001    |
| EL Greece             | 0.021       | 0.012        | ns       | ns     | ns          | ns           | ns          | ns       |
| ES Spain              | 0.040       | 0.000        | ns       | ns     | ns          | 0.001        | 0.010       | 0.001    |
| FI Finland            | 0.001       | 0.000        | 0.005    | 0.000  | 0.003       | 0.006        | 0.007       | 0.000    |
| FR France             | ns          | 0.000        | 0.034    | 0.001  | ns          | 0.000        | ns          | 0.000    |
| HR Croatia            | 0.019       | ns           | ns       | 0.030  | 0.007       | ns           | 0.006       | 0.020    |
| HU Hungary            | 0.030       | 0.018        | ns       | 0.001  | 0.018       | 0.000        | ns          | 0.000    |
| IE Ireland            | ns          | 0.000        | ns       | 0.002  | ns          | 0.000        | ns          | 0.004    |
| IT Italy              | 0.011       | ns           | ns       | 0.001  | ns          | 0.018        | ns          | ns       |
| LT Lithuania          | 0.002       | 0.000        | 0.003    | 0.000  | ns          | 0.011        | ns          | 0.000    |
| LV Latvia             | 0.012       | ns           | 0.004    | ns     | ns          | 0.000        | ns          | 0.002    |
| MT Malta              | ns          | ns           | ns       | 0.029  | ns          | ns           | ns          | ns       |
| NL Netherlands        | 0.030       | 0.000        | ns       | 0.000  | ns          | 0.001        | 0.000       | 0.002    |
| PL Poland             | ns          | 0.016        | ns       | ns     | 0.023       | ns           | ns          | 0.001    |
| PT Portugal           | ns          | 0.001        | ns       | 0.015  | ns          | 0.000        | ns          | 0.008    |
| RO Romania            | 0.008       | ns           | ns       | ns     | 0.033       | 0.001        | ns          | 0.001    |
| Type of business firm | Industrial | Construction | Services | Retail |
|----------------------|------------|--------------|----------|--------|
|                      | Firm Cause HH | HH Cause Firm | HH Cause Firm | Firm Cause HH | HH Cause Firm | Firm Cause HH | HH Cause Firm |
| SE Sweden            | 0.000      | 0.000        | ns       | 0.000  | 0.000       | ns            | 0.000         |
| SI Slovenia           | 0.001      | ns           | 0.034    | ns     | 0.010       | ns            | 0.017         |
| SK Slovak Republic   | ns         | ns           | ns       | 0.005  | ns          | ns            | ns            |
| TR Turkey            | ns         | ns           | ns       | ns     | ns          | ns            | ns            |
| UK United Kingdom    | ns         | 0.000        | ns       | 0.001  | ns          | ns            | 0.000         |
of the equations are omitted in favor of a verbal description of the results. The same analytic methods were used for all countries, accepting that it may mask the presence or absence of some underlying relationships in the 140 individual equations across countries and types of firms. For this analysis, the differences in question wording, clearly favored firms: the prediction test was one-quarter in advance, consistent with the three month horizon used for the firm surveys, while household surveys were asked about the following twelve months. Moreover, the minimum prediction horizon of one quarter was selected so as not to set too high a bar. The purpose of the exploratory research is to identify an inability to predict at all rather than the ability to predict over an extended time horizon.

The use of national data for accuracy comparisons may bias the results since not all industries share the same timing or impact from changes in GDP, just as not all households share the timing or impact from changes in unemployment. This would be a fruitful area of future research. Nonetheless, the goal of the EU surveys is the prediction of aggregate GDP and unemployment. Heterogeneity across industries and population groups is also an important topic for public policies, and data and models need to be develop to test for differences from the overall national trends.

The coefficient estimates may be subject to aggregation bias in the sense that the relationship at the aggregate time-series level may be inconsistent with the relationship at the individual cross-section level. The goal of this analysis, however, is to determine the relationship of the survey expectations aggregated by country with the aggregated (un)employment rate and GDP rate of growth. If the accuracy of each individual respondent in each country were the main issue, the analysis would need to be based on the time-series of cross-section observations. This difference in research designs was debated by George Katona and James Tobin in the 1950s, and revolved around the claim that unless the relationship was confirmed at the individual level, any positive macro relationship was inadmissible evidence (Katona, 1957). This acted to establish the dangers of the aggregation bias by the oft repeated stricture that macroeconomic theory must be consistent with microeconomic evidence, the so-called micro basis of macroeconomics. The purpose of the EU expectation surveys is not theory but the more practical needs of government policies required to maintain full employment and stable prices. The need for such supplemental information is due to the absence of any theoretical rationale for recessions, other than the impact of exogenous forces.

### Table 7
Summary of granger tests on firm’s and household’s economic output expectations: number of countries with significant relationships by type of firm

| Result of Granger test | Type of Firm |
|------------------------|--------------|
|                        | Industrial   | Construction | Services | Retail |
| Significant mutual predictions in both directions | 9 | 3 | 7 | 5 |
| Only firm data significant predictor of household | 6 | 3 | 1 | 0 |
| Only household data significant predictor of firm | 7 | 13 | 13 | 16 |
| Neither significant predictor of other | 6 | 9 | 7 | 7 |
Table 8  Significance levels of firm’s and household unemployment expectations in regressions predicting national unemployment rates (quarterly data)

| Type of business firm | Industrial | Construction | Services | Retail |
|-----------------------|------------|--------------|----------|--------|
|                       | Firm Exp   | HH Exp       | Firm Exp | HH Exp | Firm Exp | HH Exp | Firm Exp | HH Exp | Firm Exp | HH Exp |
| AT Austria            | ns         | 0.010        | ns       | 0.000  | ns       | 0.018  | ns       | 0.010  |
| BE Belgium            | ns         | 0.003        | ns       | 0.000  | ns       | 0.002  | ns       | 0.000  |
| BG Bulgaria           | 0.001      | 0.000        | ns       | 0.000  | ns       | 0.000  | 0.006    | 0.005  |
| CY Cyprus             | 0.000      | 0.000        | 0.007    | 0.012  | ns       | 0.000  | 0.000    | 0.019  |
| CZ Czechia            | 0.001      | 0.006        | 0.039    | 0.000  | ns       | 0.000  | 0.003    | 0.000  |
| DE Germany            | 0.002      | ns           | 0.000    | 0.000  | 0.001    | ns     | 0.003    | 0.000  |
| DK Denmark            | ns         | 0.000        | 0.002    | 0.000  | ns       | ns     | ns       | ns     |
| EE Estonia            | 0.000      | ns           | 0.000    | 0.000  | 0.021    | 0.000  | 0.000    | ns     |
| EL Greece             | 0.047      | 0.000        | 0.000    | 0.000  | 0.000    | 0.000  | 0.000    | 0.000  |
| ES Spain              | ns         | 0.000        | 0.000    | 0.000  | 0.021    | 0.000  | 0.000    | 0.000  |
| FI Finland            | 0.000      | 0.012        | 0.000    | 0.000  | ns       | 0.007  | 0.000    | 0.012  |
| FR France             | ns         | 0.000        | 0.003    | 0.001  | ns       | 0.000  | ns       | 0.000  |
| HR Croatia            | ns         | 0.001        | 0.002    | 0.000  | ns       | 0.000  | 0.011    | 0.006  |
| HU Hungary            | ns         | 0.001        | 0.000    | 0.000  | 0.037    | 0.035  | ns       | 0.000  |
| IE Ireland            | 0.025      | 0.000        | 0.000    | 0.018  | 0.030    | 0.000  | ns       | 0.000  |
| IT Italy              | ns         | 0.001        | 0.036    | 0.004  | ns       | 0.000  | ns       | 0.000  |
| LT Lithuania          | 0.001      | 0.000        | ns       | 0.000  | ns       | 0.000  | ns       | 0.000  |
| LV Latvia             | 0.005      | 0.049        | 0.022    | 0.000  | ns       | 0.000  | 0.004    | 0.007  |
| MT Malta              | ns         | ns           | ns       | 0.014  | 0.000    | 0.000  | ns       | 0.000  |
| NL Netherlands         | ns         | 0.000        | 0.022    | 0.000  | 0.006    | 0.000  | ns       | 0.000  |
| PL Poland             | 0.001      | ns           | ns       | 0.031  | ns       | 0.000  | ns       | 0.001  |
| PT Portugal           | 0.011      | 0.000        | 0.014    | 0.000  | ns       | 0.000  | 0.046    | 0.000  |
| RO Romania            | 0.039      | ns           | ns       | 0.004  | ns       | 0.000  | ns       | ns     |
| SE Sweden             | ns         | 0.000        | ns       | 0.000  | ns       | 0.000  | ns       | 0.000  |
| SI Slovenia            | ns         | 0.000        | 0.018    | ns     | ns       | 0.015  | ns       | 0.003  |
| SK Slovak Republic    | 0.000      | 0.000        | 0.000    | 0.000  | 0.000    | 0.000  | 0.038    | 0.000  |
| TR Turkey             | 0.002      | 0.001        | 0.000    | ns     | 0.000    | 0.000  | 0.000    | ns     |
| UK United Kingdom     | 0.000      | 0.000        | 0.000    | 0.000  | ns       | 0.000  | ns       | 0.000  |

The results of the regressions predicting each countries unemployment rate are shown in Table 8, with the results summarized in Table 9, while the comparable results for predicting each country’s GDP are contained in Tables 10 and 11.

The expectations of firms and households are shown to be significant predictors most country’s respective unemployment rate (see Table 9). Households held the predictive advantage over surveys of all four types of firms: households were more likely to be the sole predictor of the national unemployment rate rather than
firms for each of industrial (11 vs 4 countries), construction (11 vs 3), services (17 vs 3), and retail firms (13 vs 2). The second most common finding was that both households and firms significantly added to the prediction of the national unemployment rate: industrial (12 countries), construction (12), service (7), and retail (10). This finding underscored the fact that both firms and household had independent and significant information that could significantly predict the national unemployment rate. At the other extreme, neither the expectations of households or firms significantly predicted developments in unemployment in just one country for the industrial and construction samples (Malta), one country for services (Denmark), and for three countries for retail (Denmark, Malta, and Romania). These three countries certainly deserve a more detailed examination to determine the potential causes and corrections.

The dominance of household data in predicting unemployment was impressive: household expectations displayed a significant relationship for all four firm types in 18 of 28 countries. In contrast, for only three countries were the expectations of firms significant across all four types (Germany, Estonia, and Turkey). The most dismal showing was by just one country whose household expectations were never significant for all types of firms (Malta), and three countries where firm expectations were never significant (Austria, Belgium, and Sweden). A significance firm expectations were found in just one of four firm types in 10 countries (Denmark, France, Croatia, Hungary, Italy, Lithuania, Malta, Poland, Romania, and Slovenia), but for just one country for the household expectations (Turkey).

In a similar fashion to the results on the predictions of the national unemployment rates, the regressions predicting each country’s annual GDP growth rates were also dominated by household expectations. Indeed, household expectations proved to be the sole significant predictor of GDP for between 12 and 15 countries for construction, services, and retail firms, whereas many fewer firms, just 1 to 4, were the sole predictor of GDP. Industrial firms again represented a different pattern, recording a much closer split between household and business surveys: for 8 countries households were the sole predictor of GDP and for 6 countries the expectations of firms were the sole predictors. The record of predicting GDP was on balance quite impressive, with households, firms, or both demonstrating significant relationships: for industrial and construction firms it totaled 22 of 28 firms, 19 for services, and 20 for the retail sample. Nonetheless, there was

| Significance relationships: | Type of Firm |
|---------------------------|--------------|
|                           | Industrial   | Construction | Services | Retail |
| Both firm and household data significant | 12           | 13           | 7        | 10     |
| Only firm data significant predictor | 4           | 3            | 3        | 2      |
| Only household data significant predictor | 11          | 11           | 17       | 13     |
| Neither significant predictor | 1           | 1            | 1        | 3      |

Table 9   Summary significance levels for firm and household employment expectations in regressions predicting the country’s national unemployment rate: number of countries with significant relationships (quarterly data)
a somewhat greater number of countries in the service and retail industries that were unable to provide significant predictions, between 8 and 9 countries.

The prediction record was much less impressive for the firm surveys. There was no country whose firm surveys demonstrated a significant predictive relationship with GDP in all four firm samples. Even a significant prediction of GDP for three of the four firm samples was found for just 2 firms (Czechia and Spain). In stark comparison, household expectations proved to be a significant predictor of GDP for all

| Type of business firm | Industrial Firm Exp | HH Exp | Construction Firm Exp | HH Exp | Services Firm Exp | HH Exp | Retail Firm Exp | HH Exp |
|-----------------------|---------------------|--------|-----------------------|--------|-------------------|--------|------------------|--------|
| AT Austria            | ns                  | 0.016  | 0.004                 | 0.000  | ns                | 0.000  | 0.028           | 0.004  |
| BE Belgium            | ns                  | ns     | 0.005                 | ns     | 0.000             | ns     | 0.000           | ns     |
| BG Bulgaria            | ns                  | 0.016  | ns                    | 0.016  | ns                | 0.032  | ns              | 0.006  |
| CY Cyprus              | ns                  | ns     | ns                    | 0.021  | ns                | ns     | 0.043           |        |
| CZ Czechia            | 0.014               | 0.030  | 0.021                 | 0.019  | ns                | 0.012  | 0.000           | 0.004  |
| DE Germany            | 0.000               | ns     | ns                    | ns     | ns                | ns     | 0.000           |        |
| DK Denmark            | ns                  | ns     | ns                    | ns     | ns                | ns     | 0.009           |        |
| EE Estonia            | ns                  | ns     | 0.045                 | 0.007  | ns                | 0.000  | ns              | 0.041  |
| EL Greece             | ns                  | ns     | ns                    | ns     | ns                | ns     | ns              | ns     |
| ES Spain              | 0.000               | 0.001  | 0.002                 | 0.000  | 0.025             | 0.001  | ns              | 0.002  |
| FI Finland            | 0.024               | 0.000  | ns                    | 0.000  | ns                | 0.000  | ns              | 0.000  |
| FR France             | ns                  | ns     | 0.008                 | 0.014  | ns                | 0.021  | ns              | 0.025  |
| HR Croatia            | 0.006               | ns     | ns                    | 0.019  | 0.002             | ns     | ns              | ns     |
| HU Hungary            | 0.010               | 0.003  | ns                    | 0.002  | ns                | 0.021  | ns              | 0.017  |
| IE Ireland            | ns                  | 0.001  | ns                    | 0.001  | ns                | 0.028  | ns              | 0.001  |
| IT Italy              | 0.005               | 0.012  | 0.023                 | 0.004  | ns                | 0.005  | ns              | 0.004  |
| LT Lithuania          | ns                  | 0.008  | 0.007                 | 0.000  | ns                | 0.000  | ns              | 0.000  |
| LV Latvia             | 0.002               | ns     | ns                    | 0.027  | ns                | 0.021  | ns              | ns     |
| MT Malta              | ns                  | 0.013  | ns                    | 0.017  | ns                | ns     | 0.032           | ns     |
| NL Netherlands        | ns                  | 0.001  | ns                    | 0.000  | ns                | 0.000  | ns              | 0.000  |
| PL Poland             | 0.005               | 0.046  | ns                    | 0.032  | ns                | 0.000  | ns              | 0.000  |
| PT Portugal           | ns                  | 0.002  | ns                    | 0.001  | ns                | 0.000  | ns              | 0.002  |
| RO Romania            | 0.003               | ns     | ns                    | ns     | ns                | ns     | ns              | ns     |
| SE Sweden             | ns                  | 0.000  | 0.015                 | 0.000  | ns                | 0.000  | 0.001           | 0.000  |
| SI Slovenia           | 0.000               | ns     | ns                    | ns     | ns                | ns     | 0.047           | ns     |
| SK Slovak Republic    | 0.000               | 0.000  | ns                    | 0.001  | 0.006             | ns     | ns              | ns     |
| TR Turkey             | 0.030               | ns     | ns                    | ns     | 0.015             | ns     | ns              | ns     |
| UK United Kingdom     | 0.045               | 0.000  | ns                    | 0.000  | ns                | 0.000  | 0.009           | 0.001  |
No significant relationship between firm expectations and GDP growth was found for six countries (Bulgaria, Cyprus, Greece, Ireland, Netherlands, and Portugal). While no relationship between household data and GDP was found for seven countries (Belgium, Germany, Greece, Croatia, Romania, Slovenia, and Turkey). The worst showing was for Greece, which recorded no significant predictive relationship for all four industries across both household and firm samples.

An obvious limitation of this research design was that the official statistics on jobs and GDP were not measured separately for each of the four different types of firms. To be sure, national rates sometimes hide substantial divergences across the selected types of firms. These differences in levels, however, do not imply differences in time-series correlations. Indeed, empirical analyses have found extensive and persistence differences in unemployment levels among subgroups defined by skill and experience, but nonetheless have also found extremely high time-series correlations (Curtin, 2019). It should be no surprise that nearly all subgroups rise or fall in tandem when an economy is expanding or contracting.

### 2 Discussion

Harmonization is a central element of research designs that aim to aggregate data across countries in order to produce robust economic predictions. The starting point of this approach is to craft questions and response scales whose meaning can be effectively translated into a broad range of languages and fashion comparable measures of actual economic performance that are used by the state statistical agencies. In the middle of these two boundaries lie a good deal of heterogeneity. While this starting point is a necessary condition, it does not suffice to ensure full harmonization. There are many other factors that can disrupt the connection between input harmonization and the robustness of outcome predictions. Given that the data provides advance information useful for policy purposes on country specific as well as for EU wide economic trends, it would be useful to determine any shortcoming to achieving the goal of harmonization.

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**Table 11** Summary significance levels for firm and household expectations for economic output in regressions predicting country’s gross domestic product: number of countries with significant relationships (quarterly data)

| Significance Relationships                              | Type of Firm |
|----------------------------------------------------------|--------------|
|                                                          | Industrial   | Construction | Services | Retail |
| Both firm and household significant                      | 8            | 8            | 2        | 4      |
| Only firm data significant predictor                     | 6            | 1            | 2        | 4      |
| Only household data significant predictor                | 8            | 13           | 15       | 12     |
| Neither significant predictor                           | 6            | 6            | 9        | 8      |
This paper has taken an approach to the identification of potential weaknesses by examining the outcomes by country that may indicate the lack of consistent analytic results due to any and all deficiencies in terms of objective standards for accuracy. The alternative approaches would be to examine a number of specific hypotheses aimed at exploring each potential source of error, or comparing a number of different statistical techniques to assess the predictive power of expectations. Those alternative would involve an enormous number of tests and estimating equations. Instead of a detailed examination of inputs and forecasting techniques, this paper took on the task of identifying which EU countries indicated survey results that were grossly inconsistent with the measurement goals. The outcomes of this design would allow a more focused research on selected countries and topics. To be sure, the design would ignore offsetting results whereby some country would have multiple sources of errors that balance out when considering the country’s overall results. In addition, if a country had a very minor share of total EU GDP, the country’s data would automatically be given a very small weight when the EU aggregate was used, although it would still be of importance for the individual country. Needless to say, the consumer and firm measures have other important uses aside from predicting overall economic trends. The performance of these survey questions in other analyses is an important topic that was left unmentioned. Moreover, the selection and weighting of each country’s survey questions were not optimized to achieve maximum predictive ability; rather, the raw data was assessed to determine its inherent predictive powers. Would the results have differed if the data were aligned with the differences in the questions’ time horizon? Perhaps, but the tests used the firm’s time horizon of three months, yet the results generally favored the household data.

The basic goal of the surveys of consumers and firms is to provide the EU, and its member countries, the necessary data to make the most effective policy choices. Although state statistical agencies compile the official measures of the performance of the economy, the survey results are available in advance of the official data releases. This makes the timing and accuracy of the results drawn from the consumer and firm surveys critical to the success of the program. The research design used these criteria to examine the relative effectiveness of two important measures: unemployment and GDP. The first step was to verify that both consumer and firm measures were highly correlated over time, indicating that the consumer and firm measures of expectations were both focused on the same outcomes. Then the issue of the timing of those expectations compared, implying whether consumers or firms had an advance edge over the other. Finally, analyses were conducted on whether the firm or consumer held more accurate expectations as determined by the official data from the state statistical offices. In each of these cases, the data were displayed for each country, enabling country level as well as analysis by type of firm.

Perhaps the most surprising finding was that the economic expectations of households typically changed in advance of the expectations of firms. It was a surprising finding given that it has been repeatedly shown that few consumers have knowledge of economic statistics, and among those who do claim knowledge, the figures they cite are typically incorrect (Blinder & Krueger, 2004; Carroll, 2003; Curtin, 2019). This ignores a more tenable hypothesis: differences in question wording between the firm and household measures. The consumer and
firm questions on (un)employment prospects were most comparable, while the questionnaire measures of the overall output of the economy differed substantially. Importantly, the analysis does not claim that the expectations of households outperform firm’s expectations. Rather, the statistical findings indicate that the knowledge gap between firms and households has been greatly exaggerated. Most empirical tests ignore the basic tenets of expectation theories, namely that economic agents, whether members of households or firms, form expectations about economic outcomes that they actually face and thus could influence their own economic decisions (Curtin, 2019). No theory holds that agents form expectations about the national economic outcomes that they do not face in the marketplace.

This was an exploratory analysis to determine the extent of errors and outliers among EU countries. It also recognizes that a neglected goal of harmonization is the predictive accuracy of these expectation measures. While a more difficult task, harmonization must be judged by both question wording and its correspondence to the actual objective measures that enable more efficient policy decisions. This exploratory analysis aimed at providing the starting point for improved data collection methodologies for the EU surveys of economic expectations.

**Author contributions** Richard Curtin is solely responsible for all aspects of this article.

**Declarations**

**Conflict of interest** The author did not receive support from any organization for the submitted work. The author has no relevant financial or non-financial interests to disclose. The author has no financial or proprietary interests in any material discussed in this article.

**Research involving Human Participants** As a review article, all materials referenced in this paper represent secondary analyses of previously published materials in academic journals, books, and data files in the public domain.

**Informed consent** No informed consent was required as no human subjects were contacted as part of this review article.

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