

Volume 44, Issue 3

Are agents Ricardian? Evidence from the CBC survey

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Abstract

This paper provides survey estimates on whether economic agents show Ricardian-like behaviour, via providing the yes/no answers to the question “If there is a permanent increase in the level of government spending, we can expect an increase in taxation”, in a survey conducted by the Central Bank of Cyprus in 2018. The findings suggest that only 12% of the respondents do not expect an increase in taxation, classifying them as non-Ricardian. Around 85% of the respondents expect an increase in taxation following an increase in government spending, suggesting that they display some degree of forward-looking behaviour. The finding holds important implications for fiscal policy and provides another potential explanation on why fiscal multipliers tend to be less than unity.

The views expressed are solely those of the authors and may not represent those of the Central Bank of Cyprus or the Eurosystem.

Citation: Nektarios Michail and Theodosios Kallenos and Ioanna Evangelou, (2024) "Are agents Ricardian? Evidence from the CBC survey", *Economics Bulletin*, Volume 44, Issue 3, pages 1147-1152

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Submitted: July 22, 2024. **Published:** September 30, 2024.

1. Introduction

In a seminal article, Barro (1974), building on Ricardo (1888) and De Viti (1936), suggested that government bonds are perceived as net wealth only if their value exceeds the capitalized value of the implied stream of future tax liabilities. The implications of this Ricardian equivalence theorem (RET), as it came to be known, pose significant policy challenges, especially on the fiscal front. For example, in the results of quite a few theoretical models (inter alia Colciago, 2011; Boscá et al., 2011; Coenen and Straub, 2004) the number of Ricardian agents plays a crucial role in the setup.

Still, empirical evidence on RET is mixed. The first empirical proof in favour of RET was promoted by Evans (1988), who finds that the nominal interest rate in steady-state equilibrium is an increasing function of the government debt and of government spending, as the net wealth of government bonds would imply. Similarly, Becker (1997) suggests that there is support for RET, but also some deviations from its predictions. The opposing camp started with Buchanan (1976), who suggests that Barro's original arguments on the full capitalization of future tax liabilities do not hold, while Ahiakpor (2013) notes that the assumption of each individual's future tax-capitalization behaviour is implausible. Rose and Hakes (1995) showed that the higher interest rates associated with deficits is a necessary but not sufficient condition for Ricardian equivalence. The debate on whether RET holds empirically has reached no consensus, even though the estimates tend to support its existence, as the comprehensive review made by Seater (1993) shows.

The literature has recently turned to experiments aiming to find additional support to answer this question. For example, Meissner and Afschar (2014) show that the behavior of about 62% of their subjects is inconsistent with the Ricardian proposition. On the other hand, Geiger et al., (2016) show that fiscal contractions are not likely to have expansionary macroeconomic effects, unless the agents have built up a sufficient stock of savings.

Interestingly, the most straightforward way of asking people directly about their economic reactions, is the least used empirical approach. To our knowledge, the first study to examine whether Ricardian equivalence holds using survey data was Allers et al., (1998) who used a mail-in newspaper survey in the Netherlands and find that respondents do not engage in Ricardian-style behaviour. The only other study is Hayo and Neumeier (2017), who show that only 36% of the survey respondents in Germany behave in line with RET.¹

This letter finds results opposing the literature and provides evidence for the existence of Ricardian-like behaviour, using survey data from Cyprus. When asked a direct question, only 12% of the respondents appears to be non-Ricardian, i.e. they expect no change in taxation after an increase in government spending. The vast majority of responders (86%) reply that they expect that higher government spending will be countered with higher taxation in the coming years, suggesting that they display some degree of forward-looking behavior. As such, it appears that the anticipation effect holds, with the RET-abiding behaviour also appears to be prevalent in the population, perhaps also due to the high level of public debt in the economy, as per Nickel and Vansteenkiste (2008). The findings hold important implications for fiscal

¹ Other studies, such as Johnson et al. (2006), Shapiro and Slemrod (2009), Heinemann and Henninghausen (2012), Stix (2013), Parker et al. (2013), and Haug (2019), only engage in indirect tests of the RET.

policy, primarily in providing a potential explanation as to why fiscal multipliers tend to be lower than unity. Given a RET-abiding behaviour, households would not tend to spend all of their new income, as they would save some in order to smooth the expected increase in future tax liabilities.

2. Methodology - The 2018 Financial Literacy Central Bank of Cyprus survey

The 2018 financial literacy sampling survey in Cyprus was conducted by the Central Bank of Cyprus with a final achieved sample of 1000 individuals, within the age bracket of 18 and 79 years old. The data collection phase (fieldwork) was conducted in the period October 2017 – March 2018. The sampling frame was the administrative list of Electricity Authority of Cyprus (EAC) customers, which was used for the stratification of the sample in the districts of the island under the effective control of the Republic of Cyprus.

After the sampling process (random stratified sampling), through which around 5500 individuals were selected, all selected participants were informed via a letter informing them about the conduct, the scope, the importance to participate and the usefulness of the survey. The fieldwork was conducted by a local private market research company, which was selected after a closed and simplified procurement procedure. The participants were contacted via phone to arrange a personal face-to-face interview at their place of preference. The interview which was conducted via CAPI (Computer Assisted Personal Interview) and lasted on average 25 minutes.

The questionnaire comprised of 45 questions in total, divided in two main sections. The first section collected sociodemographic information and general information about budgeting, personal saving and spending behaviour. The second encompassed targeted questions on financial knowledge, attitude and behaviour, based heavily on the OECD/INFE International Survey of Adult Financial Literacy Competencies (OECD, 2016), and the ‘Big Three’ questions created by Lusardi and Mitchell (2011). One of the questions employed to conduct this analysis was Question 40, stating:

“I would like to know whether you think the following statements are true or false:

a) If someone offers you an investment opportunity that is likely to have high return it would likely have higher risk

b) High inflation means that the cost of living is increasing rapidly.

c) It is likely that you will lose all or a significant part of your money if you invest in more than one financial products.

d) If there is a permanent increase in the level of government spending, we can expect an increase in taxation.”

For the purposes of this letter, we have used sub-question d) to gauge individuals’ perception about the future effect of expansionary fiscal policy. The data was carefully cleaned and edited, and a specific weighting procedure was applied to generate the design and calibrated weights using predefined population marginals (strata, gender, age, household size, education). The results can be found in the following section.

3. Survey Results

Table 1 presents the percentage of correct, wrong and "don't know" answers to the question examining the understanding of the Ricardian Equivalence, as well as the percentage of individuals that refused to answer the question (no answer or do not know). The results are presented for the whole population and various population categories such as gender, age group, household income category, and education category. Age is divided in five groups: 18-29, 30-39, 40-49, 50-59 and 60+. Household income category is divided into the following income brackets: Up to €20,000 per year, between €20,000 and €40,000 per year, between €40,000 and €60,000 per year and €60,000 per year or more. The education categories include: Lower than high school, High school, Technical beyond secondary, University degree and Post-graduate/Ph.D. The estimations use education weights, even though a simple weighting scheme yields very similar results.

Table 1 - Survey Answers

Group	Yes	No	Don't Know	Refused to Answer
Population	85.9%	11.8%	2.1%	0.2%
Gender				
Female	85.5%	11.7%	2.4%	0.3%
Male	86.4%	11.9%	1.7%	0.0%
Age Group				
18-29	83.7%	12.7%	3.6%	0.0%
30-39	89.4%	8.8%	1.9%	0.0%
40-49	85.8%	11.9%	2.3%	0.0%
50-59	85.3%	13.3%	0.3%	1.1%
60+	86.6%	12.4%	0.9%	0.0%
Household Income Category				
Up to €20,000 per year	82.73%	15.35%	1.93%	0.00%
between €20,000 and €40,000 per year	87.42%	10.74%	1.39%	0.44%
between €40,000 and €60,000 per year	89.07%	8.52%	2.42%	0.00%
€60,000 or more	83.51%	14.41%	2.09%	0.00%
Education Category				
Lower than high school	88.42%	11.17%	0.41%	0.00%
Highschool	85.09%	12.59%	1.96%	0.36%
Technical beyond secondary	85.69%	12.67%	1.63%	0.00%
University degree	85.45%	10.16%	4.20%	0.19%
Post-graduate/Ph.D.	85.61%	12.41%	1.98%	0.00%

The table provides the survey answers to the question of "If there is a permanent increase in the level of government spending, we can expect an increase in taxation." broken by various demographics. 95 out of 1000 survey participants did not provide an answer for their income.

Overall, the Table suggests that around 12% of the sample exhibits a clear non-Ricardian behaviour. On the other hand, around 86% of the sample displays some degree of forward-looking behaviour, at least qualitatively. While 86% of the respondents can be viewed as Ricardian-like behaviour, the nature of the question does not allow us to classify them as such. As the previously cited studies note, agents may

expect some tax increase following a rise in government spending, but the expected present discounted value of future tax increases may not align exactly with the amount of the spending hike.

Interestingly, we observe that the answers appear to be uniformly spread over the demographic characteristics of the sample. There is no notable difference between age groups, household income brackets, and perhaps more impressively, neither in the education breakdown. Even more so, it appears that in the lowest education bracket, a slightly less people replied “No”, even though the difference is small.

This finding holds important implications for fiscal policy, namely, to provide a potential explanation on why fiscal multipliers tend to be lower than unity (see, *inter alia*, Blanchard and Perotti, 2002; Perotti, 2005; Gorodnichenko and Auerbach, 2013; Michail et al., 2017). If households were to be considered as Ricardian, then they would tend to refrain from spending all their income from an increase in government spending, in order to smooth the expected increase in future tax liabilities. This would reduce the impact from any fiscal expansion measures and hence dampen the impact of fiscal policy, especially if the public debt burden is high, as Nickel and Vansteenkiste (2008) note.

4. Conclusions

This paper provides survey estimates on whether economic agents exhibit Ricardian-like behaviour. In particular, we provide the “yes/no” answers to the question “If there is a permanent increase in the level of government spending, we can expect an increase in taxation”, in a survey conducted by the Central Bank of Cyprus in 2018. The findings suggest that only 12% of the respondents expect no increase in taxation following an increase in government spending, implying that only a small share of the respondents is clearly non-Ricardian. Out of the 86% who replied that they expect some increase in taxation, while they may or may not strictly conform to Ricardian-like behaviour, they do appear to display some degree of forward-looking behaviour. This holds important implications for fiscal policy, namely, to provide a potential explanation on why fiscal multipliers tend to be lower than unity. Households who exhibit Ricardian-like behaviour would tend to save at least some of their income from an increase in government spending, in order to smooth the expected increase in future tax liabilities.

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