

LC 2012 (SET E): PAPER 2

QUESTION 7 (75 MARKS)

Question 7 (a)

- (i) They have gone up a lot – they were mostly between 1% and 5% in 2009, and mostly between 5% and 15% in 2011.
- (ii) They have gone up a lot too – they were mostly between 2·3% and 4·1% in 2009 and mostly between 4% and 6% in 2011.
- (iii) There appears to be a stronger relationship in 2011 than in 2009.

MARKING SCHEME NOTES

Question 7 (a) (i) [Scale 5B (0, 3, 5)]

3: • Incomplete statement e.g. “it has changed”.

Question 7 (a) (ii) [Scale 5B (0, 3, 5)]

3: • Incomplete or partly correct statement

Question 7 (a) (iii) [Scale 10B (0, 5, 10)]

5: • Incomplete or partly correct statement, e.g.
 “They have changed”
 “Closer to being a line”
 Reference to positive

Question 7 (b)

You would need to know how many mortgage holders are represented by each point on the relevant diagram.

MARKING SCHEME NOTES

Question 7 (b) [Scale 5B (0, 3, 5)]

3: • Some reference to the middle household

NOTE: accept (for full credit) reference to needing information about mortgage holders who are not on standard variable rates.

Question 7 (c)

It is a question of whether higher arrears rates cause interest rates to go up, or whether higher interest rates cause arrears rates to go up, (assuming there is a causal relationship at all).

MARKING SCHEME NOTES

Question 7 (b) [Scale 5C (0, 3, 4, 5)]

3: • Both may be caused by something else

• General statement regarding correlation not implying causality – no context

4: • No reference to reverse situation, (e.g.: “It’s about whether high interest rates cause high arrears rates or not.”)

• Correct interpretation of concept, but not contextualised, (e.g. “It’s a question of which variable causes which.”)

Question 7 (d)

Number of properties = 475 136

Number of properties in negative equity = 145 414

Number of properties in negative equity that are also in arrears = 11 644

Number of properties neither in arrears nor negative equity = 317 355

	Arrears	Not in arrears	Total
Negative Equity	11 644		145 414
Not in Negative Equity		317 355	
Total			475 136

Number of properties in negative equity but not in arrears = $145\,414 - 11\,644 = 133\,770$

Number of properties **not** in negative equity = $475\,136 - 145\,414 = 329\,722$

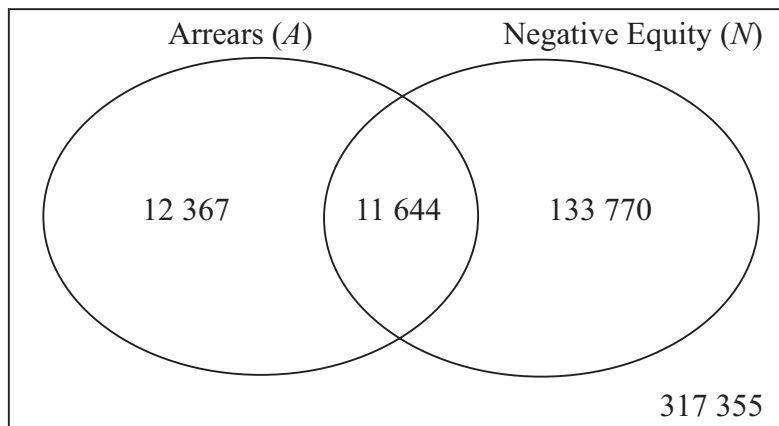
Number of properties that are in arrears but not in negative equity = $329\,722 - 317\,355 = 12\,367$

Number of properties in arrears = $11\,644 + 12\,367 = 24\,011$

Number of properties **not** in arrears = $133\,770 + 317\,355 = 451\,125$

	Arrears	Not in arrears	Total
Negative Equity	11 644	133 770	145 414
Not in Negative Equity	12 367	317 355	329 722
Total	24 011	451 125	475 136

S: Number of properties (475 136)



(i) $P(\text{Property in negative equity}) = \frac{\text{Number of properties in negative equity}}{\text{Number of properties}}$

$$= \frac{145\,414}{475\,136} = 0.30605 \approx 0.31$$

(ii) $P(\text{Property in arrears from those in negative equity}) = \frac{11\,644}{145\,414} = 0.08$

(iii) $P(\text{Property in negative equity from those in arrears}) = \frac{11\,644}{24\,011} = 0.48$

MARKING SCHEME NOTES**Question 7 (d) (i) [Scale 10C* (0, 4, 8, 10)]**

- 4: • Uses a relevant number
 • Writes $\frac{\#E}{\#S}$ or equivalent.
 • Identifies “number of outcomes of interest = ...” or “total number of outcomes = ...”.
- 8: • Answer in the form of a fraction

Question 7 (d) (ii) [Scale 5B* (0, 3, 5)]

- 3: • Uses a relevant number
 • Writes $\frac{\#E}{\#S}$ or equivalent.
 • Identifies “number of outcomes of interest = ...” or “total number of outcomes = ...”.
- Answer in form of a fraction

Question 7 (d) (iii) [Scale 10C* (0, 4, 8, 10)]

- 4: • Attempt to combine (i) and (ii) for part (iii)
 • Calculates total arrears and stops
- 8: • Answer as a fraction
 • $\frac{11\ 644}{12\ 367} = 0.9415 = 0.94$

Question 7 (e)

Null Hypothesis H_0 : $P(\text{Property is in negative equity}) = 0.31$

Alternative Hypothesis H_1 : It has changed. $P(\text{Property is in negative equity}) \neq 0.31$

At the 5% significance level the margin of error for the given sample = $\frac{1}{\sqrt{2000}} \approx 0.0224$

Observed sample proportion = $\frac{552}{2000} \approx 0.276$

Confidence interval = $[0.276 - 0.0224, 0.276 + 0.0224] = [0.2536, 0.2984]$

There is evidence to support the conclusion that the situation has changed since December 2010 because, based on the sample data, any values in the range 25.36% – 29.84% are possible values for the proportion of properties in negative equity.

So reject null hypothesis and accept the alternative hypothesis that the proportion of properties in negative equity has changed.

IMPORTANT NOTE

This approach to finding the confidence interval is no longer used at Higher Level.

MARKING SCHEME NOTES

Question 7 (e) [Scale 20D (0, 7, 10, 18, 20)]

- 7:**
- One relevant step e.g. null hypothesis stated only
 - Margin of error or observed proportion and does not continue
- 10:**
- Substantive work with one or more critical omissions
 - Margin of error and observed proportion found but fails to continue
- 18:**
- Failure to state null hypothesis correctly and/or failure to contextualise answer (e.g., stops at “Reject the null hypothesis”).
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