Self-evaluation Tests

Vehicles 4

Instructions

- Click **Start**.
- Answer the questions.
- Click **End**.
- The cell **Score:** shows the number of right answers.
- Each question is worth 1 point.
- Click **Correct** to check the correct answers.
- The test starts on the next page.
- Recommended duration: 70 minutes.

Questions

Open the data file `vehicles.gdt` to analyse the evolution of the number of registered vehicles in the Basque Country (RV) as a function of the Brent oil price (BOP, in dollars), the Industrial Production Index of the Basque Country (annual variation rate) and seasonality. Furthermore, include in the model both the effect of the economic crisis and the effect of the PIVE plan implemented by the government to impulse car sales.

$$\begin{aligned} RV_t &= \beta_1 + \beta_2\, BOP_t + \beta_3\, IPIBCR_t + \beta_4\, dm2_t + \\ &+ \beta_5\, dm3_t + \beta_6\, dm4_t + \beta_7\, dm5_t + \beta_8\, dm6_t + \beta_9\, dm7_t + \\ &+ \beta_{10}\, dm8_t + \beta_{11}\, dm9_t + \beta_{12}\, dm10_t + \beta_{13}\, dm11_t + \\ &+ \beta_{14}\, dm12_t + \beta_{15}\, crisis_t + \beta_{16}\, PIVE_t + u_t \end{aligned}$$

where variables $dmi, i = 2, 3, \ldots, 12$, $crisis$ and $PIVE$ are defined in the data file `vehicles.gdt`.

Start **General Linear Regression Model**

1. What is the sample mean of the vehicles registered in 2012?

(a) 2524.86 (b) 4092.0 (c) 2160.20 (d) 3893.5

2. What is the sample mean of the vehicles registered before the crisis?

(a) 4711.7 (b) 4527.22 (c) 3500.25 (d) 3893.5

3. What is the sample mean of the vehicles registered during the PIVE plan?

(a) 4124.3 (b) 3962.87 (c) 4211.52 (d) 3819.6

4. According to the regression model proposed, what is the expected number of registered vehicles in August 2008?

(a) $\beta_1 + \beta_2\, BOP_t + \beta_3\, IPIBCR_t$

(b) $\beta_1 + \beta_2\, BOP_t + \beta_3\, IPIBCR_t + \beta_{10}$

(c) $\beta_1 + \beta_2\, BOP_t + \beta_3\, IPIBCR_t + \beta_{10} + \beta_{15} + \beta_{16}$

(d) $\beta_1 + \beta_2\, BOP_t + \beta_3\, IPIBCR_t + \beta_{10} + \beta_{15}$

5. According to the regression model proposed, what is the expected number of registered vehicles in August 2009?

(a) $\beta_1 + \beta_2\, BOP_t + \beta_3\, IPIBCR_t + \beta_{15}$

(b) $\beta_1 + \beta_2\, BOP_t + \beta_3\, IPIBCR_t + \beta_{10}$

(c) $\beta_1 + \beta_2\, BOP_t + \beta_3\, IPIBCR_t + \beta_{10} + \beta_{15} + \beta_{16}$

(d) $\beta_1 + \beta_2\, BOP_t + \beta_3\, IPIBCR_t + \beta_{10} + \beta_{15}$

6. According to the regression model proposed, what is the expected number of registered vehicles in August 2011?

(a) $\beta_1 + \beta_2\, BOP_t + \beta_3\, IPIBCR_t + \beta_{15}$

(b) $\beta_1 + \beta_2\, BOP_t + \beta_3\, IPIBCR_t + \beta_{10}$

(c) $\beta_1 + \beta_2\, BOP_t + \beta_3\, IPIBCR_t + \beta_{10} + \beta_{15} + \beta_{16}$

(d) $\beta_1 + \beta_2\, BOP_t + \beta_3\, IPIBCR_t + \beta_{10} + \beta_{15}$

7. According to the regression model proposed, what is the expected number of registered vehicles in January 2012?

(a) $\beta_1 + \beta_2\, BOP_t + \beta_3\, IPIBCR_t + \beta_{15}$

(b) $\beta_1 + \beta_2\, BOP_t + \beta_3\, IPIBCR_t + \beta_{10}$

(c) $\beta_1 + \beta_2\, BOP_t + \beta_3\, IPIBCR_t + \beta_{10} + \beta_{15} + \beta_{16}$

(d) $\beta_1 + \beta_2\, BOP_t + \beta_3\, IPIBCR_t + \beta_{14} + \beta_{15}$

8. The OLS estimate of β_{16} is:

(a) 195.92 (b) 1239.63 (c) 4994.8 (d) 1327.56

9. Given the estimation results:

(a) It is estimated that the number of registered vehicles increases by 38.3720 units when the annual variation rate of IPI increases by one point, holding the price of Brent constant.

(b) It is estimated that the number of registered vehicles increases by 38.3720 units in January when the annual variation rate of IPI increases by one point, before the economic crisis and without the PIVE plan.

(c) It is estimated that the number of registered vehicles increases by 38.3720 units when the annual variation rate of IPI increases by one point, holding the variables price of Brent, seasonality, economic crisis and PIVE plan constant.

(d) It is estimated that the number of registered vehicles increases by 38.3720 units when the annual variation rate of IPI increases by one point, holding the variables price of Brent and seasonality constant.

10. Given the estimation results:

(a) It is estimated that 1528.13 vehicles less are registered after the crisis, holding the variables price of Brent, annual variation rate of IPI, seasonality and PIVE plan constant.

(b) The estimated difference between the number of registered vehicles after and before the crisis is 1528.13 units, holding the variables price of Brent, annual variation of IPI and PIVE plan constant.

(c) The estimated difference between the number of registered vehicles after and before the crisis is 1528.13 units, holding the variables price of Brent, annual variation rate of IPI, seasonality and PIVE plan constant.

(d) The estimated difference between the number of registered vehicles before and after the crisis is -1528.13 units, holding the variables price of Brent, annual variation rate of IPI, seasonality and PIVE plan constant.

11. The estimated number of registered vehicles for October 2008 is:

(a) 2516.718 (b) 3674.555 (c) 1457.91 (d) 2813.651

12. The OLS residual for December 2008 is:

(a) -351.186 (b) -391.134 (c) -449.869 (d) -596.287

13. The expected difference between the number of registered vehicles in December 2012 and May 2010, holding the rest of the factors constant, is:

(a) β_{14}
(b) $\beta_{14} - \beta_7 + \beta_{16}$
(c) $\beta_{14} - \beta_7 - \beta_{16}$
(d) $\beta_{14} - \beta_7$

14. Is this difference statistically significant? (α =5%)

(a) Yes
(b) No

15. The expected difference between the number of registered vehicles in December 2012 and May 2012, holding the rest of the factors constant, is:

(a) β_{14}
(b) $\beta_{14} - \beta_7 + \beta_{16}$
(c) $\beta_{14} + \beta_7 - \beta_{16}$
(d) $\beta_{14} - \beta_7$

16. Is this difference statistically significant? (α =5%)

(a) Yes
(b) No

17. The expected difference between the number of registered vehicles in October 2008 and October 2007, holding the rest of the factors constant, is:

(a) $\beta_{15} + \beta_1$
(b) $\beta_{15} + \beta_{16}$
(c) β_{15}
(d) $\beta_{15} - \beta_{16}$

18. Is this difference statistically significant? (α =5%)

(a) Yes (b) No

19. The expected difference between the number of registered vehicles in December 2008 and May 2007, holding the rest of the factors constant, is:

(a) $\beta_{14} - \beta_7 + \beta_{15} + \beta_{16}$ (b) $\beta_{14} - \beta_7 + \beta_{16}$

(c) $\beta_{14} + \beta_7 - \beta_{15} - \beta_{16} = 0$ (d) $\beta_{14} - \beta_7 + \beta_{15}$

20. Is this difference statistically significant? (α =5%)

(a) Yes (b) No

End Correct