Econometrics of XYZ Using R

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Abstract

We develop econometric methods for an important econometric issue. We illustrate its application using an R package 'xxyy' and recent data. This paper also illustrates the use of R in macro-econometrics. –sample text – sample text—- –sample text – sample text—- THIS IS A LATEX TEMPLATE FOR VOLUME 41 OF HANDBOOK OF STATISTICS

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Keywords: Private Investment; Time series; Bootstrapping

1 Introduction

xyz is an important unsolved problem in Econometrics. The aim of this paper is threefold. –sample text – sample text—- – THIS IS A LATEX TEMPLATE FOR VOLUME 41 OF HANDBOOK OF STATISTICS

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Now, we show how to include a figure in the paper and how to refer to it. The folder should have the file named 'figCVS.pdf' for the following to work.

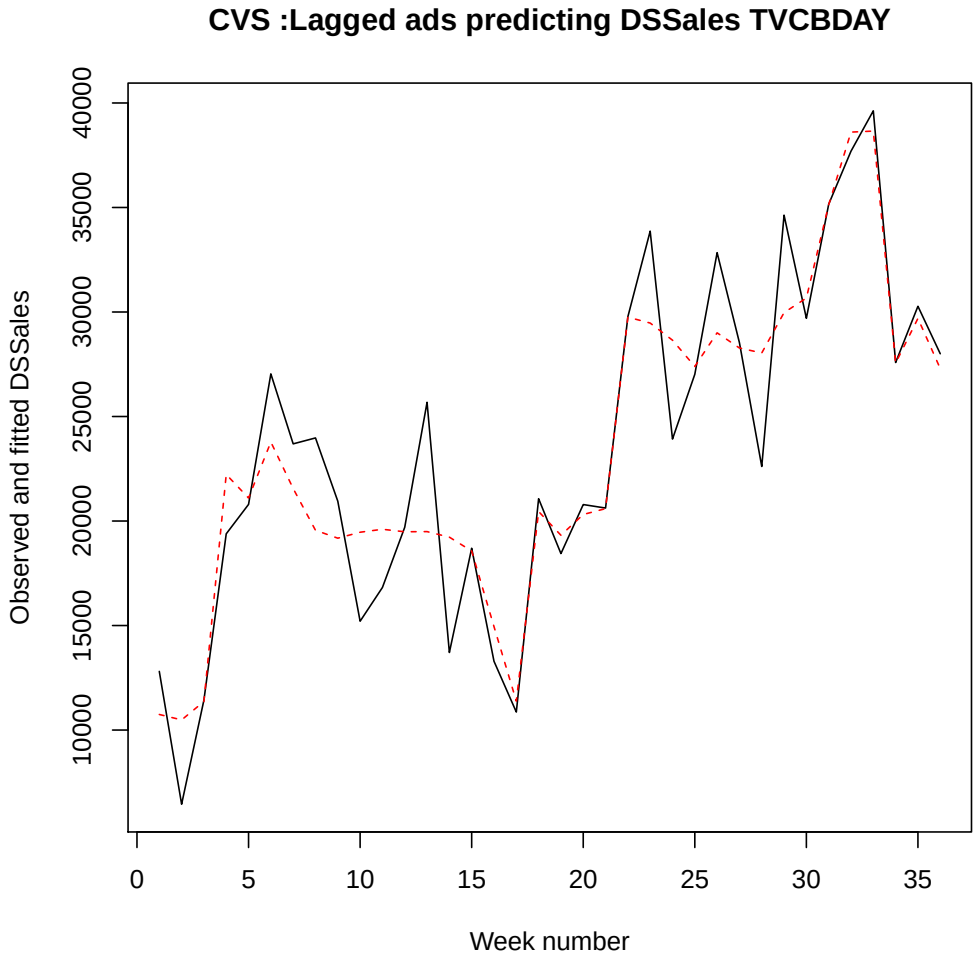

Figure 1: Excellent fit by kernel regressions

Figure 1 shows how the kernel regression fit is excellent compared to OLS.

2 Review of Stylized Facts

See Table 1 for a review of some stylized facts.

THIS TEMPLATE shows one way of including a table containing text in a Latex document.

Table 1: Stylized facts of major interest rates in India

Interest rates	Stylized Facts
Call money market rate	Usually exhibits large volatility
Bank rate	Usually non-varying in nature
Prime Lending rate	A potential indicator of long term rate and exhibits stickiness
Redemption yield - on Government securities	A potential indicator of long term rate in case of shift from - seigniorage financing to bond financing of fiscal deficit
Treasury Bills rate	A significant reference rate in the short term

Source: Author's analysis

3 Frish's Problem and Rao's Solution

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Linear regressions are common in Econometrics even though nonlinear nonparametric methods are receiving attention these days. Ragnar Frisch, winner of 1969 Nobel in Economics, had posed the following problem before the Oxford Conference of the Econometric Society in September 1936. Let x_1 and x_2 be two variables such that

$$\begin{aligned} x_1 &= a\xi + \epsilon_1, \\ x_2 &= b\xi + \epsilon_2, \end{aligned} \tag{1}$$

where $\xi, \epsilon_1, \epsilon_2$ are independent random variables, and where a, b are unknown constants. Frish's problem was: What are the conditions under which the regression of x_1 on x_2 is linear?

Rao (1947) and Rao (1949) assume that: (i) expectations $E(\xi), E(\epsilon_1)$, and $E(\epsilon_2)$ exist, (ii) ϵ_2 is independent of ξ and ϵ_1, and (iii) the conditional expectation, $E(\epsilon_1|\xi) = 0$, while ϵ_1 is not necessarily independent of ξ. Rao then proved that the necessary and sufficient condition for the regression of x_1 on x_2 to be linear, whatever may be the constants (a, b), is that the characteristic function of ξ is $exp[c|t|^d]$ and the characteristic function of ϵ_2 is $exp[c'|t|^d]$.

4 Application to cars data

–sample file – sample file—- –sample file – sample file—- We let y be the stopping distance of a car (in feet), and x be the speed of the car in miles per hour, using Ezekeil's data called 'cars' always available in R. We are regressing y on x to show that faster a car is driving longer is the distance before it comes to a full stop.

Our first R input code is:

```
> rbind(head(cars,3),tail(cars,3)) # first \& last 3 row of data
```

```
   speed dist
1      4    2
2      4   10
3      7    4
48    24   93
49    24  120
50    25   85
```

We have combined the first and last three rows of data for brevity in the following R output.

```
> nrow(cars)
```

```
[1] 50
```

The R output above shows that 'cars' data in R has $p = 1, T = 50$. Instead of reporting the (50×2) X matrix, brevity demands that we report the first three and last three rows of data.

The simplest linear regression for cars data using R is implemented by 'lm' function creating an R object called 'reg' in the R code below.

The output of the above code is in a form suitable to produce the following (Latex) Table 2 where standard errors of regression coefficients are in parentheses under the coefficient values.

```
> library(stargazer)
> attach(cars) #to access columns by name
> reg=lm(dist~speed) #standard R method for regression
> stargazer(reg, label="tab.reg")
```

Table 2

	Dependent variable:
	dist
speed	3.932***
	(0.416)
Constant	−17.579**
	(6.758)
Observations	50
R^2	0.651
Adjusted R^2	0.644
Residual Std. Error	15.380 (df = 48)
F Statistic	89.567*** (df = 1; 48)
Note:	*p<0.1; **p<0.05; ***p<0.01

5 Summary and Final Remarks

This chapter has attempted to solve an important econometric problem and illustrated its solution using R.

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Vinod (1993) illustrates how to cite an article in a collection.

Vinod (2007) illustrates how to cite an unpublished article.

R Development Core Team (2018) illustrates how to cite a book or an electronic document in the form of a book.

Please see the Ref-sample.bib file in the folder for the exact format to type references into a *.bib file.

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