

# Business and Economics Forecasting

Econ 3342

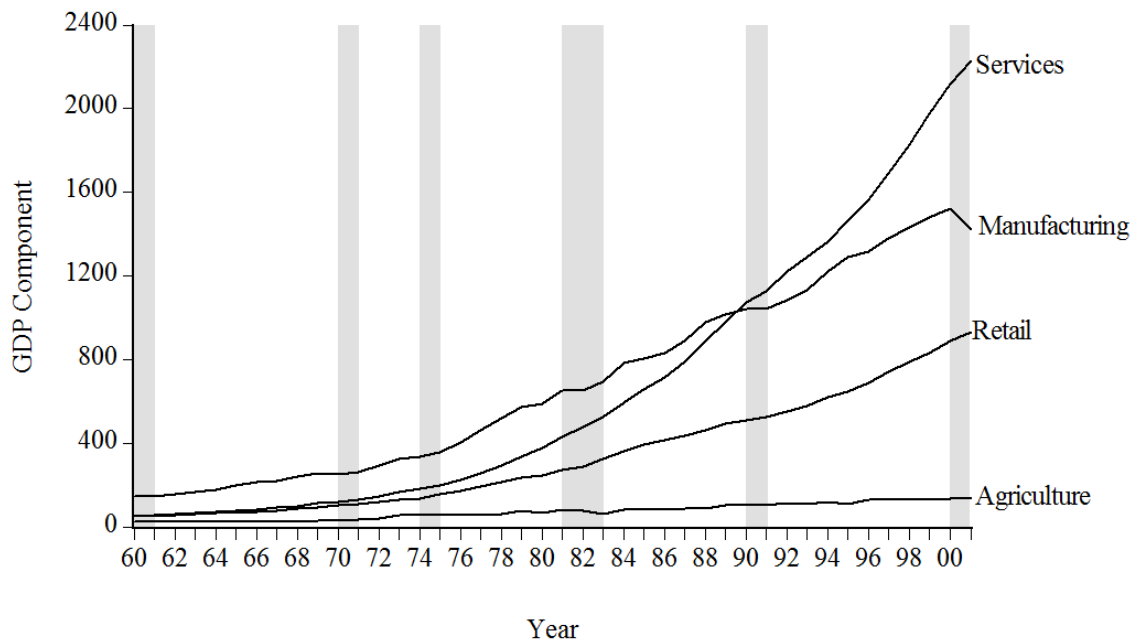
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## Exam 1

Name: \_\_\_\_\_

Total points: 25

The following is a time series graph from 1960 to 2001 that contains four components of the GDP: services, manufacturing, retail and agriculture (in millions of dollars).



The shaded areas indicate the years where the economy was in a recession.

a) Which component of the GDP has been growing more? (2 points)

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b) Which component of the GDP was impacted the most during the 2001 economic recession? (2 points)

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The pair-wise correlation coefficients are calculated to be:

	AGRICULT...	MANUFAC...	RETAIL	SERVICES
AGRICULT...	1.000000	0.983094	0.968574	0.944370
MANUFAC...	0.983094	1.000000	0.990360	0.974336
RETAIL	0.968574	0.990360	1.000000	0.993845
SERVICES	0.944370	0.974336	0.993845	1.000000

c) Explain the positive correlation coefficient between services and retail. (3 points)

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Consider the models:

$$SERVICES_t = \beta_0 + \beta_1 YEAR_t + e_t \quad (1)$$

$$RETAIL_t = \delta_0 + \delta_1 YEAR_t + e_t \quad (2)$$

The computer output gives us the following estimation results for Equations (1) and (2):

Dependent Variable: SERVICES  
Method: Least Squares

Sample: 1960 2001  
Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-98358.32	5985.874	-16.43174	0.0000
YEAR	50.00207	3.022349		0.0000
R-squared	0.872493	Mean dependent var		670.7867
Adjusted R-squared	0.869305	S.D. dependent var		656.7126

Dependent Variable: RETAIL  
Method: Least Squares

Sample: 1960 2001  
Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-40907.94	1802.519	-22.69487	0.0000
YEAR	20.82642	0.910116	22.88325	0.0000
R-squared	0.929033	Mean dependent var		338.7864
Adjusted R-squared	0.927259	S.D. dependent var		265.0741

d) Write down *both* of the estimated equations. (3 points)

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e) What is the interpretation of the slope coefficient  $\beta_I$  in equation (1)? Is it statistically significant? (3 points)

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f) How can comparing the slope coefficients  $\beta_I$  and  $\delta_I$  help you in answering part (a) above? (2 points)

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g) What are the in-sample forecasted values for service and retail in 1997? (2 points)

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h) The actual values for the Service and Retail GDP components for 1997 are 1691.48 and 740.502 million dollars, respectively. What are the forecasting errors for this particular year? (2 points)

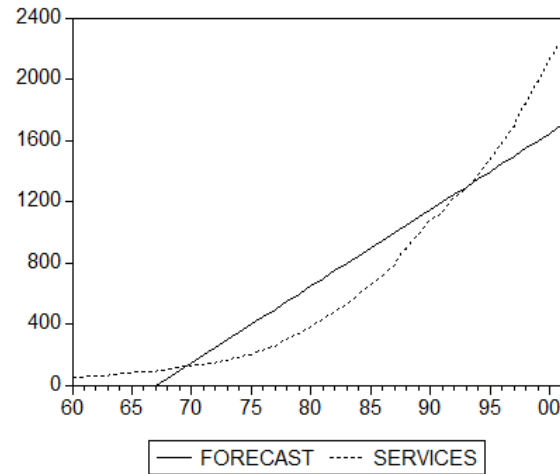
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The graph of the in-sample forecasted values for Services, along with the actual Services data is presented below:



- i) Do you think that the linear model characterized in Equation (1) is a good model to forecast the services component of the GPD? Explain. (2 points)

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- j) If you were to use the model in Equation (1) to forecast the value for 2002, do you think this forecast will overestimate or underestimate the true value? (2 points)

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- k) If you had a multivariate information set to forecast Retail, which other variables would you use? Explain in light of the parsimony principle. (2 points)

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