

Instructions:

- ❑ There are a total of **FOUR** questions.
 - ❑ You need to show all the steps required to obtain the final answers in order to get any credit.
 - ❑ Can be completed and submitted **individually or with at most two other classmates**.
 - ❑ Submit in A2L as a group submission.
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Q1 (20%)

- (a) Comment on this statement: “*There is no need to worry about having a fiscal deficit, since it can be resolved by asking the central bank to print more money.*”
- (b) Describe the economic condition under which the forward exchange rate becomes a downwardly biased predictor of the spot exchange rate to be realized in the future. Explain the governing equilibrium condition.

Q2 (24%)

The annual inflation rates of Australia and New Zealand realized in five consecutive years are tabulated below. The nominal exchange rate at the end of each of these five years are also recorded and presented below. The nominal exchange rate at the beginning of Year 1 was A\$0.9500/NZ\$. Hint: To answer this question, it is easier to define A\$ as the *home currency* and NZ\$ as the *foreign currency*.

Year	Year 1	Year 2	Year 3	Year 4	Year 5
Inflation rate in Australia	1.50%	<i>b</i>	2.00%	1.90%	<i>e</i>
Inflation rate in New Zealand	3.50%	3.90%	<i>c</i>	4.20%	4.40%
Year-end exchange rate	<i>a</i>	A\$0.9155/NZ\$	A\$0.8988/NZ\$	<i>d</i>	A\$0.8612/NZ\$

- (a) What are the values of ***a***, ***b***, ***c***, ***d***, and ***e*** respectively that will result in purchasing power parity being satisfied throughout these five years? You need to show your calculations in arriving at the final answers.
- (b) Now suppose ***a*** = A\$0.9280/NZ\$, ***b*** = 3.00%, ***c*** = 2.00%, ***d*** = A\$0.8600/NZ\$, and ***e*** = 5.20%. By indexing the price levels of the two countries to 100 at the beginning of Year 1, compute the price levels of the two countries at the end of each of these five years. Compute the real value of NZ\$1 in Australia (i.e., real exchange rate) at the end of each of these five years.

- (c) Again, suppose $a = \text{A}\$0.9280/\text{NZ}\$, b = 3.00\%, c = 2.00\%, d = \text{A}\$0.8600/\text{NZ}\$, and $e = 5.20\%$. Based on your answers in (b), describe any changes in the relative competitiveness of the goods and services produced by Australia vs. New Zealand during these five-year period.$

Q3 (28%)

- (a) The following exchange rates and interest rates are observed for two countries – *Country A* and *Country B* – **at the beginning (January 1st)** of Year 2016, 2017, 2018, 2019, 2020, and 2021. Both the spot and one-year forward exchange rates are expressed with Country A’s currency as the unit of denomination. That is, they are values of one unit of Country B’s currency in terms of Country A’s currency. All the interest rates are one-year interest rates observed at the beginning of the respective year. If IFE, IRP, and UFR are satisfied, what are the missing values a to i ? You need to show and explain your calculations in arriving at the answers. In answering this question, you assume the realized spot exchange rates are indeed the respective expected spot exchange rates.

Observation date	Spot exchange rate	One-year forward exchange rate	One-year interest rate	
			Country A	Country B
January 1, 2016	1.4500	a	4.20%	4.80%
January 1, 2017	b	1.4239	3.90%	c
January 1, 2018	d	1.3983	e	5.60%
January 1, 2019	1.3983	f	3.50%	5.90%
January 1, 2020	g	1.3293	h	6.20%
January 1, 2021	1.3293	i	3.10%	6.20%

- (b) The following exchange rates and interest rates are observed for two countries – *Country C* and *Country D* – **at the beginning (January 1st)** of Year 2016, 2017, 2018, 2019, 2020, and 2021. Both the spot and one-year forward exchange rates are expressed with Country C’s currency as the unit of denomination. That is, they are values of one unit of Country D’s currency in terms of Country C’s currency. All the interest rates are one-year interest rates observed at the beginning of the respective year. In answering this question, you assume the realized spot exchange rates are indeed the respective expected spot exchange rates.

- (i) Do the observed exchange rates and interest rates satisfy IFE, IRP, and UFR? Explain how you arrive at your conclusions by conducting analysis using the information provided.
- (ii) Based on your conclusion regarding the UFR condition in (i), comment on the perceived riskiness of investing in Country C vs. Country D. Specifically, how does the relative degree of riskiness change over time? Explain how you arrive at the conclusion.

Observation date	Spot exchange rate	One-year forward exchange rate	One-year interest rate	
			Country C	Country D
January 1, 2016	0.8600	0.8452	2.50%	4.30%
January 1, 2017	0.8302	0.8152	2.90%	4.80%
January 1, 2018	0.8100	0.7946	3.20%	5.20%
January 1, 2019	0.8141	0.7983	3.50%	5.55%
January 1, 2020	0.8182	0.8016	3.65%	5.80%
January 1, 2021	0.8220	0.8046	3.80%	6.05%

Q4 (28%)

The following exchange rate and interest rate quotations are observed for Australian Dollar (A\$) and New Zealand Dollar (NZ\$). Note that:

- Bid interest rate is your lending rate (i.e., rate of investment return), while ask interest rate is your financing interest rate; and
- To calculate the effective 90-day interest rates, you can simply divide the quoted per annum interest rates by 4 (e.g., effective 90-day financing interest rate in NZ\$ is 0.975% (= 3.90%/4)).

	Interest rates 90-day (% annum)		FX quotes of A\$ vs. NZ\$	
			Spot	90-day forward
	A\$	NZ\$		
Bid	Y	3.80	NZ\$1.1510/A\$	NZ\$1.1390/A\$
Ask	4.50	3.90	NZ\$1.1515/A\$	NZ\$ X /A\$

- (a) Suppose you do not know the value of X . Is there any arbitrage profit opportunity if $Y = 4.40$? If yes, what steps must you take to profit from it? How much is the arbitrage profit in percentage of transaction amount (give your answer to the nearest 0.01%)? What is the range of value of Y that can ensure no arbitrage opportunity (give your answer up to the third decimal place)?
- (b) Suppose you do not know the value of Y . Is there any arbitrage profit opportunity if $X = 1.1395$? If yes, what steps must you take to profit from it? How much is the arbitrage profit in percentage of transaction amount (give your answer to the nearest 0.01%)? What is the range of value of X that can ensure no arbitrage opportunity (give your answer up to the fourth decimal place)?