Mid-Term Exam #1 Review
ECO 1102
Key Topics
40 Multiple-Choice Questions

Macroeconomics and Life (chapter 1)

- Macroeconomics vs Microeconomics
  - Definition
- Economics: scarcity and choices
- Opportunity and “accounting” cost
- Incentives
- Efficiency and equity
- Models: definition
- Positive and normative statements

Measuring Wealth (chapter 7)

- GDP
  - definition
  - Components of the three measurement methods (3) (e.g., C+G+I+NX)
  - intermediate goods and transfer payments (included or excluded)
  - applications (situations)
  - GDP: A perfect measure of economic well-being? Exclusions.
- Financial (cash; shares; bonds..) and Physical investment (I; K)
  - Definition
- Real vs Nominal GDP
  - Definition
  - Calculation

Measuring Wealth (chapter 7) cont'd

- GDP Deflator
  - Calculation
- Inflation Rate
  - Calculation and interpretation
- GDP as a measure Economic Health
  - GDP per capita
  - GDP growth rates
- Limitations of GDP
  - Home production
  - Parallel (underground) economy
  - Environmental externalities

Problem

1. Depreciation	150
2 Net Exports	75
3. Undistributed Corporate Earnings	100
4. Transfers from Gov`t to Persons	400
5. Personal Incomes Taxes	500
6. Government Expenditures on Goods	400
7. Indirect Taxes less Subsidies	200
8. Personal Consumption	1,200
9. Corporate Income Taxes	180
10. Gross Investment	400

Find:

1. **Nominal and Real GDP**
2. **Net Domestic Income**
3. **Personal Income**
4. **Personal Disposable Income**
5. **Personal Saving**
6. **Net Investment**

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Nominal GDP

=75(=NX)+400(=G)

+1200(=C)+400(=Ig)

=$2075

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NDP

=Nominal GDP-Depreciation

=2075-150

=$1925

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Net National (Domestic) Income

=NDP- (Indirect Taxes-Subsidies)

=1925-200

=$1725

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Personal Income

=Net National Income

-Corporate Taxes

-Undistributed corporate earnings

+Transfer payments to persons

=1725-180-100+400

=$1845

Problem

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10. Gross Investment	400

Disposable Income

=Personal Income

-Personal Taxes

= 1845-500

=$1345

Problem

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7. Indirect Taxes less Subsidies	200
8. Personal Consumption	1,200
9. Corporate Income Taxes	180
10. Gross Investment	400

Personal Saving

=Disposable Income-Personal Consumption (C)

=1845-1200

=$645

Problem

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5. Personal Incomes Taxes	500
6. Government Expenditures on Goods	400
7. Indirect Taxes less Subsidies	200
8. Personal Consumption	1,200
9. Corporate Income Taxes	180
10. Gross Investment	400

Net Investment

=Gross Investment

-Capital Consumption (i.e., depreciation)

=400-150

=$250

Cost of Living (Chapter 8)

- Measuring the cost of living over time
  - Market basket
    - Tracking the basket's value over time
    - Who's the typical consumer? Urban? Rural?
- Consumer price index (CPI)
  - Calculations
  - Measurement challenges (biases)
    - Substitution, innovation (quality changes), outlets
    - Impact on "real" CPI
- Inflation rate and CPI
  - Calculations
  - Deflating nominal variables (e.g., real and nominal interest rates)
- Linking variables to inflation
  - Indexing wages, transfer payments

Problem: GDP, Growth Rates and Inflation

	Year 2017	**Year 2018**
Nominal GDP	**200**	**210**
• **Growth rate**		**A=??**
Real GDP	**196**	**B=??**
• **Growth rate**		**C=??**
GDP Deflator	**D=??**	**105**
Inflation		**E=??**

Problem: GDP, Growth Rates and Inflation

	Year 2017	Year 2018
Nominal GDP	200	210
• Growth rate		A=5%
Real GDP	196	B=200
• Growth rate		C=2.04%
GDP Deflator	D=102.04	105
Inflation		E=2.90%

A=100(210/200-1)=5%
B=100(210/105)=200
C=100(B/196-1)=2.04%
D=100(200/196)=102.04
E=100(105/D-1)=2.90%

Cost of Living (Chapter 8) cont'd

- Indexing
  - Wages, transfer payments (e.g., private and public retirement pensions)
- Purchasing Power Parity (PPP)
  - Adjustment

Problem: Wage Indexation

In 2015, an employer paid his employees an average **real** wage of $10 when the CPI was 100. If the CPI increased to 103 in 2016 (from 100 in 2015) and the employer's objective was to maintain real wages constant (fixed) from year to year, what **actual** wage should he pay (closest 10 cents) his employees in 2016?

Answer:

- **In 2015, real wage = actual wage = $10 (CPI = 100).**
- **In 2016, the real wages must increase by 100(103-100)/100= 3% or $0.30 (i.e., from $10 in 2015 to $10.30 in 2016)**

Problem: Wage Indexation

In 2016, an employer paid his employees an average actual wage of $20 when the CPI was 105. If the CPI increased to 108 in 2017 and the employer increased the actual wage by 2%, what was the real wage of employees (closer 10 cents) in 2017?

Answer:

- **Actual wage in 2017=$20(1.02)=$20.40**
- **Real wage in 2016=100(20.00/105)=$19.04**
- **Real wage in 2017=100(20.40/108)=$18.88**

Problem: Inflation and Purchasing Power

- You purchased 1,000 shares of ABC Company on January 1, 2000 for $20,000 (no brokerage fees).
- Currently (i.e., 15 years later) your shares have a market value of $24,000.
- The CPI increased from 105 on January 1, 2000 to 125 today (i.e., 15 years after you purchased ABC Company shares).

1. What has been the
   - overall (over 15 years) and the annual percentage increase in the market value of your ABC shares?
     - Overall increase = 100(24,000-20,000)/20,000 = 20%
     - Annual increase from $F=P(1+g)^N$: $24,000=20,000(1+g)^{15}$; g=1.22% annually

PPP-adjustment

- The *PPP-adjustment* recalculates economic statistics to account for differences in price levels across countries.

- $$\textbf{PPI– adjusted GDP} = \textbf{Nominal dollars}_{\textbf{country A}} \times \left[\frac{1}{(1 - \textbf{Price level adjustment (country A)})}\right]$$

- The price level adjustment is the percentage difference in purchasing power between the two countries.
- Suppose Mexico has a GDP per capita of $20,000 CDN$ and that the cost of living is 40% lower than in Canada. The PPI-adjusted GDP for Mexico is

20,000[1/(1-0.4)]= $33,333 CDN$

Problem: Purchasing Power Parity (PPP)

The price of a Big Mac is $3 US in the USA and $3.50 CDN in Canada. What is the implied exchange rate (based on Big Mac (arbitrary) prices in the two countries) in US $ per CDN $?

Answer: 3/3.50 = 0.86 US $ per CDN $.

If the actual exchange rate (at the time of the two Big Mac prices) was 0.90 US $ per CDN $, which currency (US or CDN) was undervalued (overvalued)?

Answer: The CDN $ was overvalued (the implied exchange rate < actual exchange rate) and the US $ was undervalued.

Economic Growth (chapter 9)

- Production function
- Real GDP per capita growth rate

= Nominal GDP growth rate - Inflation rate - Population growth rate

- Compounding and the Rule of 70
  - $F=P(1+g)^N$ (Excluded from mid-term exam #1)
  - Rule of 70 = 70/g = years required to double an amount [g=growth rate]
- Productivity
  - Components: physical and human capital; technology, natural resources
  - Law of diminishing marginal returns

Economic Growth (Chapter 9) cont'd

- Convergence theory
- Growth and Public Policy
  - Investment and savings
    - Investment trade-off
      - Increased savings (reduced consumption) ➔ investment
  - Education and Health
  - Technological development
- Poverty trap
  - The poorer the country, the more difficult is the consumption-savings trade-off

Problem: Real GDP Growth Rate

Real GDP per capita growth during calendar year 2016 Billions of dollars and millions of persons			
	January 1	**December 31**	**Growth in 2016**
Nominal GDP	**$150.0B**	**$155.0B**	**3.3%**
GDP Deflator	**110**	**112**	**1.8%**
Real GDP	**$150.0B/110 =$136.36B**	**$155B/112 = $138.39**	**1.4%**
Population	**60.0M**	**60.2M**	**1%**
Real GDP/Pop	**136.36B/60M =$2,273**	**$138.39B/60.2M = $2,299**	**0.33%**
• **Approximate change in real GDP/Pop = (3.3%-1.8%-1%) = 0.5%**			
• **Precise change in real GDP/Pop = 100(2273-2299)/2299=0.33%**			

Labour force (Chapter 10)

- Key labour market metrics (no calculations on the 1st mid-term exam)
  - Unemployment rate
  - Employment ratio
  - Participation ratio
- The impact of weak (or strong) economic growth on the above labour market metrics
- Discouraged workers
  - definition

Defining and Measuring Unemployment

- Unemployment is a situation where someone wants to work but cannot find a job in the current market.
  - People who do not have jobs and are not interested in obtaining one are not counted as unemployed.
- Statistics Canada defines unemployment as people who:
  1. Didn't work at all in the previous week.
  2. Were available to work if they had been offered a job.
  3. Were making efforts to look for a job.

Key labour market indicators

$$\text{Unemployment rate} = \frac{\text{Number of unemployed}}{\text{Labour force}} \times 100$$

$$\text{Participation rate} = \frac{\text{Labour force}}{\text{Population 15+}} \times 100$$

$$\text{Employment rate} = \frac{\text{Number of employed}}{\text{Population 15+}} \times 100$$

Unemployment Rate = 1 – (Employment Rate/Participation Rate)

Problem 10.1: Labour Markets

Demographic & Labour Force Groups	Number of persons (000s)
Persons 14 years of age or less	=
Persons employed	26 000
Total population	40 000
Persons in labour force	=
Persons involuntarily employed part-time	1 000
Persons employed full-time	=
Persons unemployed	=
Persons of working age	32 000
Persons employed part-time	4 000
Persons not in the labour force	4 000

Problem 10.1: Labour Markets

Demographic & Labour Force Groups	Number of persons (000s)
1. Persons 14 years of age or less	(3. – 8.) = 8 000
2. Persons employed	26 000
3. Total population	40 000
4. Persons in labour force	(8. – 10.) = 28 000
5. Persons involuntarily employed part-time	1 000
6. Persons employed full-time	(2. – 5. – 9.) = 21 000
7. Persons unemployed	(4. – 2.) = 2 000
8. Persons of working age	32 000
9. Persons voluntarily employed part-time	4 000
10. Persons not in the labour force	4 000

Selected Labour Force Metrics

- Unemployment rate
  = 100(2,000/28,000)
  = 7.14%
- Participation Rate
  = 100(28,000/32,000)
  = 87.50%
- Employment Rate
  = 100(26,000/32,000)
  = 81.25%

Demographic & Labour Force Groups	Number of persons (000s)
1. Persons 14 years of age or less	(3. – 8.) = 8 000
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