Economics 102
Fall 2017
Answers to Homework #3
Due 10/31/2017

Directions: The homework will be collected in a box **before** the lecture. Please place your name, TA name and section number on top of the homework (legibly). Make sure you write your name as it appears on your ID so that you can receive the correct grade. Please remember the section number for the section **you are registered,** because you will need that number when you submit exams and homework. Late homework will not be accepted so make plans ahead of time. **Please show your work.** Good luck!

Please remember to

- Staple your homework before submitting it.
- Do work that is at a professional level: you are creating your "brand" when you submit this homework!
- Do not submit messy, illegible, sloppy work.
- Show your work to get full credit.

1. The table below describes a variety of cases which can possibly affect US GDP. Please fill in the blanks.

Scenario	Component of GDP affected: C, I, G, X-IM, or NC (not counted)	Effect on GDP (increase, decrease, or no change)
1. A farmer purchases a new tractor.	**I**	**Increase**
2. Businesses increase their current inventories.	**I**	**Increase**
3. You spend $7 to attend a movie.	**C**	**Increase**
4. Worried about consumer confidence, Ford purchases less sheet metal for cars.	**NC**	**No change**
5. A retired man cashes his social security check from the government.	**NC**	**No change**
6. A French company purchases a one-year membership to PartyPeople.com, a U.S.-based company.	**X - IM**	**Increase**
7. A person pays $450 a month to rent an apartment.	**C**	**Increase**
8. Worried about a recession, people begin saving more money.	**C**	**Decrease**
9. The U.S. government hires more workers for constructing a bridge.	**G**	**Increase**
10. Government closes school for the month of March.	**G**	**Decrease**

2. Suppose nominal GDP in 2012 increased by 7% (over its level in 2011). Based on this information, what happened to the rate of inflation (as measured by the GDP deflator) and real GDP between 2011 and 2012? Provide a full analysis given this information and holding everything else constant.

SOLUTION:
Without more information, we can say nothing about inflation as measured by the GDP deflator and real GDP. Nominal GDP can increase because of changes in the price level and/or changes in real output. All that we know from the given information is that nominal GDP rose from 2011 to 2012 by 7%: this may mean that this economy is actually producing more, producing the same, or even producing less.

3. National income accounting deals with the aggregate measure of the outcome of economic activities. The most common measure of the aggregate production in an economy is Gross Domestic Product (GDP). In this problem consider a nation known as "Cocoland." The table below provides Cocoland's national income accounting. Use this data to answer the following questions.

Transfer Payments	$ 54
Interest Income	$ 186
Depreciation	$ 36
Wages	$ 67
Gross Private Investment	$ 124
Business Profits	$ 274
Indirect Business Taxes	$ 74
Rental Income	$ 75
Net Exports	$ 18
Net Foreign Factor Income	$ 12
Government Purchases	$ 156
Household Consumption	$ 304

a. Calculate the GDP using the expenditure approach (Method 2 in your class notes). Show your work and explain your work.

SOLUTION:
As you can see, the table contains more data than is necessary to measure GDP using the expenditure approach. You will need to determine which parts of the table you need to use this approach. The necessary data is highlighted within the table.

Transfer Payments	$ 54
Interest Income	$ 186
Depreciation	$ 36
Wages	$ 67
Gross Private Investment (I)	$ 124

Business Profits	$ 274
Indirect Business Taxes	$ 74
Rental Income	$ 75
Net Exports (X-M)	$ 18
Net Foreign Factor Income	$ 12
Government Purchases (G)	$ 156
Household Consumption (C)	$ 304

Remember: $\mathbf{GDP = C + G + I + (X - M)}$

C is the household consumption represented by $304.
G is the government spending represented by $156.
I is the gross private investment represented by $124.
(X - M) is the net exports represented by $18.
Therefore: GDP = $304 + $156 + $124 + $18 = $602

b. Calculate GDP using the factor payment approach (Method 3 from your class notes) or the income approach. Show your work and explain your work.

SOLUTION:
The table also contains the data necessary to calculate GDP using the factor payment approach.

Transfer Payments	$ 54
Interest Income (i)	$ 186
Depreciation	$ 36
Wages (W)	$ 67
Gross Private Investment	$ 124
Business Profits (PR)	$ 274
Indirect Business Taxes	$ 74
Rental Income (R)	$ 75
Net Exports	$ 18
Net Foreign Factor Income	$ 12
Government Purchases	$ 156
Household Consumption	$ 304

In this case we use the formula: **GDP = W + i + R + PR**

W is the wages represented by $67.
R is the rental income represented by $75.
i is the interest income represented by $186.
PR is the business profits represented by $274.

Therefore: GDP = $67 + $186 + $75 + $274 = $602
As you can see, in this case, both approaches to calculating GDP will give the same value for GDP.

4. Suppose you are provided with the following information about an economy comprised of just two firms, a shrimp farm that produces raw shrimp and a seafood restaurant:

SHRIMP FARM		SEAFOOD RESTAURANT	
Revenues (shrimp)		Revenues (fried shrimp)	
Sales to Households	$ 10,000	Sales to Household	$ 50,000
Sales to Foreigners	$ 10,000		
Sales to Seafood Restaurant	$ 10,000		
Expenses		Expenses	
Wages	$ 10,000	Wages	$ 15,000
		Shrimp	$ 10,000
Profits	$ 20,000	Profits	$ 25,000

a. Calculate GDP using the final goods approach. Show work.

SOLUTION:
Final Goods: shrimp to households ($ 10,000)
+ shrimp to foreigners ($ 10,000)
+ fried shrimp ($ 50,000) = $ 70,000

b. Calculate GDP using the value-added approach. Show each step of your calculations.

SOLUTION:
Value Added: The value added at the shrimp farm is equal to $30,000, which is the sum of the sales to the households, the foreigners, and the seafood restaurants. The value added at the seafood restaurant is $40,000, which is the value of all sales ($50,000) minus the cost of the goods entering the seafood restaurant "stage" ($10,000). Thus, total value added is:
Value added in shrimp ($ 30,000)+ Value added in fried shrimp ($ 40,000) = $ 70,000

c. Calculate GDP using the factor payment approach. Show each step of your calculations.

SOLUTION:
Factor Payment: GDP= wages + interest + rent + profits. At the shrimp farm there are only wages and profits of $30,000; at the seafood restaurant there are only wages and profits of $40,000. Thus: GDP = 30,000 + 40,000 = $70,000.

5. The table below gives some labor statistics (from the Bureau of Labor Statistics) for years 1995, 2000 and 2005. Use these data to answer the following questions. Express your answers in percentage terms to ***two*** places past the decimal.

Variable	1995	2000	2005
Population	26,000,000	27,000,000	28,000,000
Adult population	18,000,000	19,000,000	20,500,000
Adult population able to work	17,900,000	18,800,000	20,000,000
Adult population able and wanting to work	15,700,000	16,500,000	18,000,000
Number employed	14,000,000	14,500,000	15,000,000
Number unemployed	1,000,000	1,500,000	2,500,000

a. Define labor force. For each year find the labor force.

SOLUTION:
The labor force covers everyone who is employed and unemployed. Note however, that the unemployed refers only to people without jobs, actively looking for jobs, and available to start a new job.

Accordingly, the labor force in 1995 is 14,000,000 + 1,000,000 = 15,000,000. Similarly it is 16,000,000 in 2000, and 17,500,000 in 2005.

b. Define the term "discouraged workers". For each year find the number of discouraged workers.

SOLUTION:
Discouraged workers are the people who tried to find a job, but have given up after an unsuccessful search. Since they are no longer looking for jobs they are not considered as unemployed. Therefore, they are not part of the labor force.

Discouraged labor is able to work, and they want to work. But they are discouraged in their job search, so that they are no longer looking for jobs. So, the part of the adult population who is able to work and who wants to work, but who are not in the labor force are discouraged workers.

For example, in 1995, 15,700,000 adults were able and wanted to work, but some were not part of the labor force (15,000,000), therefore they were discouraged workers. So,

there were 700,000 discouraged workers in 1995. Similarly, in 2000 out of 16,500,000 adults able to work, and wanting to work, only 16,000,000 are in the labor force. So, there are 500,000 discouraged workers. The number of discouraged workers remained the same, at 500,000 in 2005.

c. Define the labor-force participation rate. Calculate it for each year.

SOLUTION:
The labor-force participation rate is the percentage of the adult population that participates in the labor force, either employed or unemployed.

This rate in 1995 is therefore, (15,000,000/18,000,000)(100%) = 83.3%. Similarly, it is (16/19)(100%) = 84.2% in 2000, and (17.5/20.5)(100%) = 85.4% in 2005.

d. Calculate the unemployment rate for each year.

SOLUTION:
The unemployment rate gives the percentage of the labor force that is unemployed. The unemployment rate is [(number of unemployed)/(number in the labor force)](100%).

Accordingly, it is (1,000,000/15,000,000)(100%) = 6.67% in 1995. The unemployment rate is (1,500,000/16,000,000)(100%) = 9.38% in 2000, and it is (2,500,000/17,500,000)(100%) = 14.29% in 2005.

6. Which of the following people is considered unemployed by the Bureau of Labor Statistics? Explain your answer in each case.

a. A housewife or househusband.
b. An inmate in the state prison.
c. A college student who is not looking for work.
d. A college student who has just graduated and is looking for a job.
e. A person who was fired 3 months ago and has been looking for a job ever since.
f. A person who was fired 3 months ago and unsuccessfully looked for a job for 1 month, but has not looked for a job recently.

SOLUTION:
a. A housewife or househusband is probably not actively engaged in searching for a job, so they would not be counted as part of the labor force and would not be counted as unemployed.

b. Because an inmate is not actively looking for a job, he or she is not counted as unemployed. (Note that inmates might do some work in prison, but this is not considered part of the "market," and prisoners are not counted as part of the labor force.)

c. This college student is not unemployed because he or she is not looking for a job.

d. A recent graduate who is looking for a job but has not found one will be counted as unemployed.

e. A person who was fired and is looking for a job would be counted as unemployed.

f. If jobless people stop actively seeking work they will not be counted as unemployed--even if they once held a job and would like to have one again.

7. Suppose that Wisconsin economy produces just one kind of output, a bubbler. The table below gives the economy's output of bubblers and the corresponding prices for 2014, 2015, and 2016. Use these data to answer the questions below. For parts b. through d., show the details of your calculations and express your answers in percentage terms to ***two*** places past the decimal.

Year	Units of Bubblers Produced	Price of a Bubbler
2014	500	$ 20
2015	520	$ 21
2016	560	$ 24

a. Calculate nominal GDP for each year. Because the structure of this economy is so simple, it is easy to calculate the GDP deflator. Calculate the GDP deflator (a type of price index) on a 100 point scale for each year *using 2015 as the base year*. Then, calculate real GDP for each year.

SOLUTION:

$$\text{Nominal GDP} = (\text{Units of Produced in a Year}) \times (\text{Price in a Year})$$

GDP deflator = {[Product of (Price in current year)(Quantity in current year) for all final goods and services]/[Product of (Price in base year)Quantity in current year) for all final goods and services]}(scale factor)

GDP deflator in this example can therefore be simplified to:

$$\text{GDP deflator} = \frac{\text{Price in a Year}}{\text{Price in the Base Year}} \times 100$$

(Note: The GDP deflator for the base year is given to be 100.0)

$$\text{Real GDP} = (\text{Nominal GDP for a Year}) \times \frac{\text{Deflator in the Base Year}}{\text{Deflator in a Year}}$$

Year	Nominal GDP	GDP Deflator	Real GDP
2014	$10,000	95.2	$10,504
2015	$10,920	100.0	$10,920
2016	$13,440	114.3	$11,759

b. What is the growth rate in nominal GDP between 2015 and 2016?

SOLUTION:
To calculate the growth rate in nominal GDP use the standard percentage change formula: [(New value – initial value)/(Initial value)](100%). Thus,

$$\frac{13{,}440 - 10{,}920}{10{,}920} = 0.2308$$

Therefore, 23.08 %

c. What is the inflation rate between 2014 and 2015 based upon the GDP deflator?

SOLUTION:
To find the inflation rate use the standard percentage change formula:
Inflation rate = [(GDP deflator in year 2015 – GDP deflator in 2014)/(GDP deflator in 2014)](100%). Thus,

$$\frac{100.0 - 95.2}{95.2} = 0.0504$$

Therefore, 5.04 %

8. Suppose that Mr. Badger spends his money just for buying pizzas, cellphones, turkeys, and cheese. The table below shows Mr. Badger's spending on each commodity for 2010 and 2011. Use this data to answer the following question. What is the inflation rate between 2010 and 2011? Express your answers in percentage terms to ***two*** places past the decimal. Assume that 2010 is the base year and that you are using a CPI to compute the rate of inflation. Also, assume that for purposes of this CPI the market basket is defined as the amounts of the goods consumed in the base year.

Good	Year 2010		Year 2011	
	Quantity Consumed	Price	Quantity Consumed	Price
Pizzas	20	$10	30	$11
Cellphones	1	$600	2	$640
Turkeys	1	$100	4	$120
Cheese	1	$50	0.5	$40

SOLUTION:
It is easy to compute the nominal spending in each year: multiply prices and quantities and add them up.

Nominal spending of Year 2010 (this is just the cost of the market basket where we are defining the market basket as the quantities consumed in 2010, our base year):

Expenditure on pizza = $200
Expenditure on cellphones = $600
Expenditure on turkeys = $100
Expenditure on cheeses = $50

Total nominal expenditure in 2010 = $950

Nominal spending of Year 2011 (this is not the cost of the market basket since we have different quantities and not the quantities of the defined market basket):

Expenditure on pizza = $330
Expenditure on cellphones = $1,280
Expenditure on turkeys = $480
Expenditure on cheeses = $20

Total nominal expenditure in 2011 = $2,110

To compute a CPI, we must first choose a base year. Let's assume Year 2010 is the base year.

1. Find the price of the consumption basket in the base year.
2. Multiply the prices and **BASE YEAR** quantities in the next year and add them up:

Good	Quantity (Base Year)	Price (Year 2011)	Expenditure
Pizzas	20	$11	$220
Cellphones	1	$640	$640
Turkeys	1	$120	$120
Cheeses	1	$40	$40
Cost of market basket in 2011			$1,020

The CPI for any year is given by the formula:

$$\frac{\text{Cost of consumption basket in current year}}{\text{Cost of consumption basket in the base year}} \text{ (Scale Factor)}$$

Applying this formula to the second year (Year 2011), we get

$$\text{CPI} = \frac{\$1{,}020}{\$950} = 1.0737$$

Note that the inflation rate is the percent change in the CPI. Here, it would be 7.37 %.

9. Suppose people consume 3 different goods. The following table shows the prices and quantities of each good consumed in 2006, 2007, and 2008. Express your answers in percentage terms to ***one*** place past the decimal.

Year	Price of Fish	Quantity of Fish	Price of Pork	Quantity of Pork	Price of Beef	Quantity of Beef
2006	$ 7/fish	400 fish	$ 8/pound	225 pounds	$ 10/pound	175 pounds
2007	$ 8/fish	550 fish	$ 7/pound	250 pounds	$ 12/pound	275 pounds
2008	$ 9/fish	900 fish	$ 6/pound	275 pounds	$ 15/pound	275 pounds

a. Calculate nominal GDP in each of the three years.

SOLUTION:
Nominal GDP is simply equal to the sum of the current year price×current year quantity of all the goods.
2006: (7×400) + (8×225) + (10×175) = 2,800 + 1,800 + 1,750 = $ 6,350.
2007: (8×550) + (7×250) + (12×275) = 4,400 + 1,750 + 3,300 = $ 9,450.
2008: (9×900) + (6×275) + (15×275) = 8,100 + 1,650 + 4,125 = $ 13,875.

b. Calculate Real GDP in each of the three years, using 2006 as the base year.

SOLUTION:
Real GDP is equal to the sum of the base year price×current year quantity of all the goods.
2006: (7×400) + (8×225) + (10×175) = 2,800 + 1,800 + 1,750 = $ 6,350.
2007: (7×550) + (8×250) + (10×275) = 3,850 + 2,000 + 2,750 = $ 8,600.
2008: (7×900) + (8×275) + (10×275) = 6,300 + 2,200 + 2,750 = $ 11,250.

c. Calculate the GDP deflator for each of the three years.

SOLUTION:
The GDP deflator is equal to **(Nominal GDP / Real GDP) ×100**.
2006: 100. Because 2006 is the base year we know the deflator has to equal 100 even without doing any calculations.
2007: (9,450 / 8,600) ×100 = 109.9.
2008: (13,875 / 11,250) ×100 = 123.3.

d. Calculate the rate of inflation for 2007 and 2008 using the GDP deflator as your price index. Assume that 2006 is still the base year.

SOLUTION:
Inflation is equal to the growth rate of the GDP deflator. The growth rate formula is:

$$\frac{\textbf{GDP deflator of Year}_2 - \textbf{GDP deflator of Year}_1}{\textbf{GDP deflator of Year}_1} \times \mathbf{100}$$

2007: ((109.9 – 100)/100) ×100 = 9.9%.
2008: ((123.3 – 109.9)/109.9) ×100 = 12.2%.

e. Using the quantities from 2006 for your market basket, and 2006 as your base year, calculate the CPI for 2006, 2007 and 2008.

SOLUTION:
To calculate CPI, First: Fix the market basket. This means that the quantities you choose should not change for this part. For part a. the fixed basket is: 400 fish, 225 pounds of pork and 175 pounds of beef. Step two is to find prices. The prices are given in the problem, and the prices will change. Step three is to compute the cost of the market basket:

2006: ($7×400) + ($8×225) + ($10×175) = 2800 + 1800 + 1750 = $ 6,350.
2007: ($8×400) + ($7×225) + ($12×175) = 3200 + 1575 + 2100 = $ 6,875.
2008: ($9×400) + ($6×225) + ($15×175) = 3600 + 1350 + 2625 = $ 7,575.
(Note: When calculating market basket cost for CPI only the prices change; the quantities are held constant as specified by the market basket.)

Once we have the cost of the market basket, step four is to calculate the CPI.
The formula for CPI is: **(Current year cost / Base year cost) ×100**
2006 CPI: (6350/6350) ×100 = 100.
2007 CPI: (6875/6350) ×100 = 108.3.
2008 CPI: (7575/6350) ×100 = 119.3.

f. Using the CPI calculate the rate of inflation.

SOLUTION:
The way that CPI is determined makes the inflation rate simply the growth rate of CPI. The growth rate formula is:

$$\frac{\textbf{CPI of Year}_2 - \textbf{CPI of Year}_1}{\textbf{CPI of Year}_1} \times \mathbf{100}$$

2007 Inflation: ((108.3-100)/100) ×100 = 8.3%.
2008 Inflation: ((119.3-108.3)/108.3) ×100 = 10.1%.

g. Recalculate CPI and inflation using the 2006 quantities for your market basket but with 2008 as your base year.

SOLUTION:
When you change the base year, there is no need to recalculate the market basket cost, because the basket has not changed. You simply need to recalculate CPI.

2006 CPI: (6350/7575) ×100 = 83.8.
2007 CPI: (6875/7575) ×100 = 90.8.
2008 CPI: (7575/7575) ×100 = 100.
Then recalculate inflation:
2007 Inflation: ((90.8-83.8)/83.8) ×100 = 8.3%.
2008 Inflation: ((100-90.8)/90.8) ×100 = 10.1%.
(Note: These inflation numbers are exactly the same as the ones in part f.)

h. Now calculate CPI and inflation using 2008 quantities as your market basket and 2006 as your base year.

SOLUTION:
In this part, the market basket has changed, so we need to recalculate the cost. Remember when calculating the market basket cost, the quantities remain fixed.

2006: ($7×900) + ($8×275) + ($10×275) = 6300 + 2200 + 2750 = $ 11,250.
2007: ($8×900) + ($7×275) + ($12×275) = 7200 + 1925 + 3300 = $ 12,425.
2008: ($9×900) + ($6×275) + ($15×275) = 8100 + 1650 + 4125 = $ 13,875.

The CPI calculation does not change:
2006 CPI: (11250/11250) ×100 = 100.
2007 CPI: (12425/11250) ×100 = 110.4.
2008 CPI: (13875/11250) ×100 = 123.3.

Recalculate inflation:
2007 Inflation: ((110.4-100)/100) ×100 = 10.4%.
2008 Inflation: ((123.3-110.4)/110.4) ×100 = 11.7%.
(Note: These numbers are very different than parts f. and g., the difference is significant and not due to rounding error.)

i. Does which year you choose as a base year matter when using the CPI to compute the rate of inflation? Does your choice of quantities for the market basket used to compute the CPI impact the rate of inflation?

SOLUTION:
As you can see from the inflation numbers in parts f. and g., the choice of a base year does not affect inflation at all. As a matter of fact the choice of a base year is completely arbitrary.

However, changing the composition of the market basket is important. Notice that not all of the prices in this problem increased by the same amount over time. The price of fish increased by 28.6% = ((9-7)/7) ×100, while the price of pork decreased by 25% = ((6-8)/8) ×100 and the price of beef increased by 50% = ((15-10)/10) ×100. Inflation would be different if the market basket contained only beef, then if the market basket contained only fish. Therefore, the choice of a market basket is very important in calculating the rate of inflation.

j. Compare your answers from part d. with your answers from part f. If they are the same, why are they the same? If they are different, why are they different?

SOLUTION:
The rate of inflation is different depending on the method that you use to calculate it. Note however that the numbers are similar. With the GDP deflator we are keeping prices fixed and changing quantities, with CPI we are keeping quantities fixed and changing prices.

10. The World Bank and the International Monetary Fund provide a lot of data that is readily available for us to use. Go to the following website to get the data this question calls for:

https://data.worldbank.org/indicator/FP.CPI.TOTL?locations=US&name_desc=false

At this link you can see time-series data for the U.S. CPI from 1960 to 2016 where the base year is 2010. This means that in 2010 the CPI for the U.S. is equal to 100. This data set also provides CPI data for many countries (see the list below the graph at this website) and for each country the CPI base year is 2010. This means that the CPI in 2010 for every single country is going to be 100.

a. The G20 (or G-20 or Group of Twenty) is an international forum for the governments as well as the central bank governors from 20 major economies. Currently, these major economies in alphabetic order are: Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, United Kingdom, United States, and the European Union. Founded in 1999, the G20 aims to discuss policy issues pertaining to the promotion of international financial stability. Except for Argentina and European Union, construct a summary table of the CPI in 2005 and the CPI 2015 for each country in the G20. Express your answers in percentage terms to ***one*** place past the decimal. This implies that you will need to go to this website and collect the available CPI data for each country listed in the table below and for the two dates in the table.

	CPI (2005) with base year 2010	CPI (2015) with base year 2010
Australia	86.4	112.2
Brazil	79.6	138.4
Canada	91.9	108.7
China	75.4	100.0
France	92.7	105.6

Germany	92.5	106.9
India	65.8	147.7
Indonesia	68.7	132.3
Italy	91.0	107.5
Japan	100.4	103.6
Mexico	80.5	119.4
Russia	61.4	151.5
Saudi Arabia	77.2	118.2
South Africa	71.6	130.1
South Korea	86.2	109.8
Turkey	65.9	146.1
United Kingdom	87.3	111.8
United States	89.6	108.7

b. Let's suppose that 2005 is the base year instead of 2010: this means that you will need to compute new CPI values for all these economies. Provide a general description of how you will calculate these new CPI values for these countries and then entered them in the table below.

SOLUTION:
To alter the base year to 2005 we need to take [(each country's CPI value for 2005 with base year 2010)/(each country's CPI value for 2005 with base year 2010)](scale factor) for the numbers in the 2005 column.

To alter the base year to 2005 for the CPI values for 2015 we need to take [(each country's CPI value for 2015 with base year 2010)/(each country's CPI value for 2005 with base year 2010)](scale factor).

	CPI (2005) with base year 2005	CPI (2015) with base year 2005
Australia	(86.4/86.4)*100 = 100	(112.2/86.4)*100 = 129.9
Brazil	(79.6/79.6)*100 = 100	(138.4/79.6)*100 = 173.9
Canada	(91.9/91.9)*100 = 100	(108.7/91.9)*100 = 118.3
China	(75.4/75.4)*100 = 100	(100.0/75.4)*100 = 132.6
France	(92.7/92.7)*100 = 100	(105.6/92.7)*100 = 113.9
Germany	(92.5/92.5)*100 = 100	(106.9/92.5)*100 = 115.6
India	(65.8/65.8)*100 = 100	(147.7/65.8)*100 = 224.5
Indonesia	(68.7/68.7)*100 = 100	(132.3/68.7)*100 = 192.6
Italy	(91.0/91.0)*100 = 100	(107.5/91.0)*100 = 118.1
Japan	(100.4/100.4)*100 = 100	(103.6/100.4)*100 =103.2
Mexico	(80.5/80.5)*100 = 100	(119.4/80.5)*100 = 148.3
Russia	(61.4/61.4)*100 = 100	(151.5/61.4)*100 = 246.7
Saudi Arabia	(77.2/77.2)*100 = 100	(118.2/77.2)*100 = 153.1
South Africa	(71.6/71.6)*100 = 100	(130.1/71.6)*100 = 181.7
South Korea	(86.2/86.2)*100 = 100	(109.8/86.2)*100 = 127.4
Turkey	(65.9/65.9)*100 = 100	(146.1/65.9)*100 = 221.7
United Kingdom	(87.3/87.3)*100 = 100	(111.8/87.3)*100 = 128.1

United States	(89.6/89.6)*100 = 100	(108.7/89.6)*100 = 121.3

c. Based on your answers in part (b), which country experienced the greatest fall in the purchasing power of the dollar between 2005 and 2015?

SOLUTION: Russia had the greatest decrease in the purchasing power of the dollar over this time period since its CPI rose the most between 2005 and 2015.

d. Let's suppose that 2005 is the base year. Based on your answer in part (b), which country did experience the smallest fall in the purchasing power of the dollar between 2005 and 2015?

SOLUTION: Japan had the smallest decrease in the purchasing power of the dollar over this time period since its CPI rose the least between 2005 and 2015.

e. Suppose you can have a chance to work as an economist for a multinational giant firm. This firm has economic research centers in all of the countries we have considered in this question. You have nominal monthly payroll information for 2015 which are described in the table below and you know that the purchasing power of the dollar is same among countries in 2005 (that is the CPI in all of the countries in 2005 is equal to 100).

	Nominal Monthly Payment in 2015 Dollars
Australia	$ 9,700
Brazil	$ 8,700
Canada	$ 8,850
China	$ 5,300
France	$ 5,700
Germany	$ 7,000
India	$ 9,000
Indonesia	$ 12,500
Italy	$ 6,500
Japan	$ 6,200
Mexico	$ 7,450
Russia	$ 12,000
Saudi Arabia	$ 10,000
South Africa	$ 8,200
South Korea	$ 9,000
Turkey	$ 11,000
United Kingdom	$ 9,000
United States	$ 9,500

Suppose your only criteria for where you work is having the largest real monthly salary. Given the above information and your information on the CPI calculate which country has the highest real monthly salary. Explain how you did this calculation.

SOLUTION:
The bottom line is that we have to get each country's purchasing power in actual dollars in **2005** because it was assumed that the purchasing power of the dollar is same among countries in 2005.
To find the real monthly payment we need to use the following formula:
Real monthly payment = [(Nominal monthly payment in each country in 2015)/(CPI in 2015 in each country with base year 2005)]*(100)

	Nominal Monthly Payment in 2015 Dollars	Real Monthly Payment in 2005 Dollars
Australia	$ 9,700	9700/129.9 *100= $74,700
Brazil	$ 8,700	8700/173.9*100 = $50,000
Canada	$ 8,850	8850/118.3*100 = $74,800
China	$ 5,300	5300/132.6*100 = $40,000
France	$ 5,700	5700/113.9*100 = $50,000
Germany	$ 7,000	7000/115.6*100 = $60,600
India	$ 9,000	9000 /224.5*100 = $40,100
Indonesia	$ 12,500	12500 /192.6*100 = $64,900
Italy	$ 6,500	6500 /118.1*100 = $55,000
Japan	$ 6,200	6200/103.2*100 = $60,100
Mexico	$ 7,450	7450 /148.3*100 = $50,200
Russia	$ 12,000	12000 /246.7*100 = $48,600
Saudi Arabia	$ 10,000	10000 /153.1*100 = $65,300
South Africa	$ 8,200	8200 /181.7*100 = $45,100
South Korea	$ 9,000	9000 /127.4*100 = $70,600
Turkey	$ 11,000	11000 /221.7*100 = $49,600
United Kingdom	$ 9,000	9000 /128.1*100 = $70,300
United States	$ 9,500	9500 /121.3*100 = $78,300

Now that we have the data and have done the calculation we find that the highest real monthly payment is in the United States