

**Question 1**

Go to Trade in Value Added (TiVA) website.

[http://stats.oecd.org/Index.aspx?DataSetCode=TIVA2015\\_C1](http://stats.oecd.org/Index.aspx?DataSetCode=TIVA2015_C1)

Look at CONS\_VASH: Value Added Share of Total Consumption, by Source Country and Industry

→ Indicator	CONS_VASH: Value added share of total consumption, by source country and industry
→ Industry	CTOTAL: TOTAL
→ Partner	USA: United States
Unit	Percentage

1.1) What percent of final consumption in the US is value added with the U.S. as the source country in 1995 and 2011?

	1995	2011
US Value Added Share for US Final Consumption	91.21	87.67

1.2) What percent of U.S. final consumption is value added with China as the source country in 1995 and 2011?

	1995	2011
China Value Added Share for US Final Consumption	0.30	1.63

1.3) What percent of U.S. final consumption in textiles is value added with China as the source country in 1995 and 2011?

	1995	2011
China Value Added Share for US Final Consumption in Textiles	3.84	27.46

1.4) Suppose the trade elasticity is 3 (the previous elasticity estimates we used were based on only manufacturing goods, which high higher elasticities). Compute welfare changes with your data from 1.1:

$$\Delta \text{Welfare} = \left( \frac{\text{Domestic Expenditure Share in 2011}}{\text{Domestic Expenditure Share in 1995}} \right)^{\frac{-1}{\text{Trade Elasticity}}}$$

How much did welfare increase/decrease according to trade from this simple measure?

$$\Delta \text{Welfare} = \left( \frac{87.67}{91.21} \right)^{\frac{-1}{3}} = 1.013$$

So welfare increased by 1.3% according to our estimate.

1.5) Suppose that instead of using value added we just used exports/GDP. Exports/GDP went from 10.6% of GDP to 13.6% of GDP over 1995 to 2011. What is the change in welfare if we say domestic expenditure share is 1-Exports/GDP?

$$\Delta \text{Welfare} = \left( \frac{100-13.6}{100-10.6} \right)^{\frac{-1}{3}} = \left( \frac{86.4}{89.4} \right)^{\frac{-1}{3}} = 1.011$$

So welfare increased by 1.1% according to our estimate.

In this particular case it doesn't seem like using value added shares versus exports/GDP matters that much. In general, it will matter more when we look at the gains from trade with a specific country. We're also always going to get relatively small welfare estimates when we look at aggregate trade. A lot of the gains from trade are due to specific goods with relatively low elasticities, for example oil.

## Question 2

Now, go to bea.gov website and navigate to the NIPA tables. [BEA -> Interactive Data -> Begin Using the Data -> Domestic Product and Income]

For each part below I will give the table that we are looking at. We will be downloading data for 1995 and 2011. [To see the data for those years, select Modify -> Annual -> First Year = 1995 and Last Year = 2011 -> Refresh Table]. Look at the Personal Consumption Expenditures Line

2.1) Go to **Table 1.1.5 Gross Domestic Product**. Look at the **Personal Consumption Expenditures Line**. What was the value of personal consumption expenditures in 1995 and 2011 in billions of dollars?

	1995	2011
Personal Consumption Expenditures In Billions of USD (current prices)	4894.2	10689.3

2.2) Go to **Table 1.10 Gross Domestic Product by Types of Income**. Look at the **Compensation of employees, paid** line. What was the value of consumption paid to employees in 1995 and 2011 in billions of dollars?

	1995	2011
Compensation of Employees, paid, In Billions of USD (current prices)	4206.7	8227.1

2.3) Go to **Table 1.1.4. Price Indexes for Gross Domestic Product**. Look at the Index on the lines for Personal consumption expenditures. What was the value of the PCE Price Index in 1995 and 2011?

	1995	2011
Price Index (2009 = 100) for Personal Consumption Expenditures	76.356	104.149

2.4) Lastly, Use this table to get median usual earnings for workers in the U.S. ages 16 and over in 1995 and 2011 <https://research.stlouisfed.org/fred2/release/tables?rid=332&eid=46626&od=2011-01-01#>

	1995	2011
Weekly Wages of Median Worker in the United States, Age 16+	479	756

2.5) Compute Welfare change for “average” person in U.S. between 1995 and 2011 using the income and price indices for 2011 and 1995.

$$\Delta \text{Welfare} = \left( \frac{\text{Income in 2011}}{\text{CPI in 2011}} \right) / \left( \frac{\text{Income in 1995}}{\text{CPI in 1995}} \right)$$

$$\Delta \text{Welfare Avg Consumption} = \left( \frac{10689.3}{104.149} \right) / \left( \frac{4894.2}{76.356} \right) = 1.60 \Rightarrow 60\% \text{ increase}$$

$$\Delta \text{Welfare Avg Compensation} = \left( \frac{8227.1}{104.149} \right) / \left( \frac{4206.7}{76.356} \right) = 1.43 \Rightarrow 43\% \text{ increase}$$

$$\Delta \text{Welfare Median Wages} = \left( \frac{756}{104.149} \right) / \left( \frac{479}{76.356} \right) = 1.16 \Rightarrow 16\% \text{ increase}$$

For which group does welfare increase the most? Does any group experience a decrease in welfare?

No groups experienced a decrease. Welfare increased the least for the median worker. This indicates that gains in welfare disproportionately went to the top, since the mean welfare gain is much higher than the median welfare gain.

2.6) Now suppose that we expect technological progress to lead to a 2% average increase in welfare per year for the whole economy. How much would we expect welfare to grow between 2011 and 1995?

There are 16 years between 1995 and 2011. Therefore expected growth in welfare would be

$$\Delta \text{Welfare Expected} = (1.02)^{16} = 1.37 \Rightarrow 37\% \text{ increase}$$

2.7) What is the ratio of “actual welfare change” from 2.5 to “expected welfare change” from 2.6. Did any groups experience less welfare growth than expected?

$$\frac{\Delta \text{Welfare Avg Consumption}}{\Delta \text{Welfare Expected}} = \frac{1.60}{1.37} = 1.16 \Rightarrow 16\% \text{ more than expected}$$

$$\frac{\Delta \text{Welfare Avg Compensation}}{\Delta \text{Welfare Expected}} = \frac{1.43}{1.37} = 1.04 \Rightarrow 4\% \text{ more than expected}$$

$$\frac{\Delta \text{Welfare Median Wages}}{\Delta \text{Welfare Expected}} = \frac{1.16}{1.37} = 0.84 \Rightarrow 16\% \text{ less than expected}$$