



Elasticity and Taxes

What is the Difference between tax-free income and a 0% tax rate on income?

- ▶ **Tax Free Income-** Income that is not included as taxable
 - ▶ Examples: Child support payments, some types of inheritance, life insurance money, some Roth IRA payments
- ▶ **0% tax rate income-** Income that is still considered 'taxable' but it taxed at a 0% rate until the threshold has been passed
 - ▶ In 2025, the first \$15,750 dollars a single filer under 65 makes is taxed at 0%
 - ▶ For Married couples filing jointly, the first \$31,500 are taxed at 0%
- ▶ **0% tax rate and tax-free income are not the same thing (This is important for homework 2)**



Average Tax Rate (ATR)

- ▶ $ATR = \frac{\text{Tax liability}}{\text{Taxable Income}}$
- ▶ The Percentage of your taxable income you paid in taxes
- ▶ Does not include **tax-free income**, does include taxable income with a 0% rate

Marginal Tax Rate (MTR)

- ▶ $MTR = \frac{\text{Change in Tax Liability}}{\text{Change in taxable income}}$
- ▶ If I increase my income by a dollar, how much of that dollar am I going to pay in income tax?
- ▶ So, when you read about tax rates at certain income brackets, that tax rate is the 'marginal' tax rate for money made in that tax bracket

Types of Taxes

- ▶ **Progressive Tax-** A tax in which the average tax rate rises with income. People with higher incomes pay more
- ▶ **Proportional Tax-** A tax in which the average tax rate remains the same for all levels of income
- ▶ **Regressive Tax-** A tax in which the average tax rate falls with income. People with lower incomes pay more
- ▶ American income tax is incredibly progressive
- ▶ If the top 50% of Americans paid their '**fair share**,' they would pay **less**

Table 1. Summary of Federal Income Tax Data, Tax Year 2022							
	Top 1%	Top 5%	Top 10%	Top 25%	Top 50%	Bottom 50%	All Taxpayers
Number of Returns	1,538,014	7,690,070	15,380,140	38,450,349	76,900,699	76,900,699	153,801,397
Average Tax Rate	26.1%	23.1%	21.1%	18.1%	15.9%	3.7%	14.5%
Average Income Taxes Paid	\$561,523	\$169,466	\$99,971	\$48,433	\$26,959	\$822	\$13,890
Adjusted Gross Income (\$ millions)	3,309,589	5,647,825	7,282,111	10,310,488	13,060,814	1,691,006	14,751,820
Share of Total Adjusted Gross Income	22.4%	38.3%	49.4%	69.9%	88.5%	11.5%	
Income Taxes Paid (\$ millions)	863,631	1,303,206	1,537,563	1,862,269	2,073,129	63,203	2,136,333
Share of Total Income Taxes Paid	40.4%	61.0%	72.0%	87.2%	97.0%	3.0%	
Income Split Point	\$663,164	\$261,591	\$178,611	\$99,857	\$50,339	\$50,339	

Note: Table does not include dependent filers. "Income split point" is the minimum AGI for taxpayers to fall into each group with. Total income taxes are \$2.1 billion.

Why does this matter to you?

1

Most of you, especially early in your career, will benefit massively from this system

2

Be careful with the idea of paying 'fair shares' because often the truth isn't convenient

3

If you are ever curious about your own tax rate, relative to that paid by others, you can now calculate it yourself.

Tax Evasion is Also a Crime

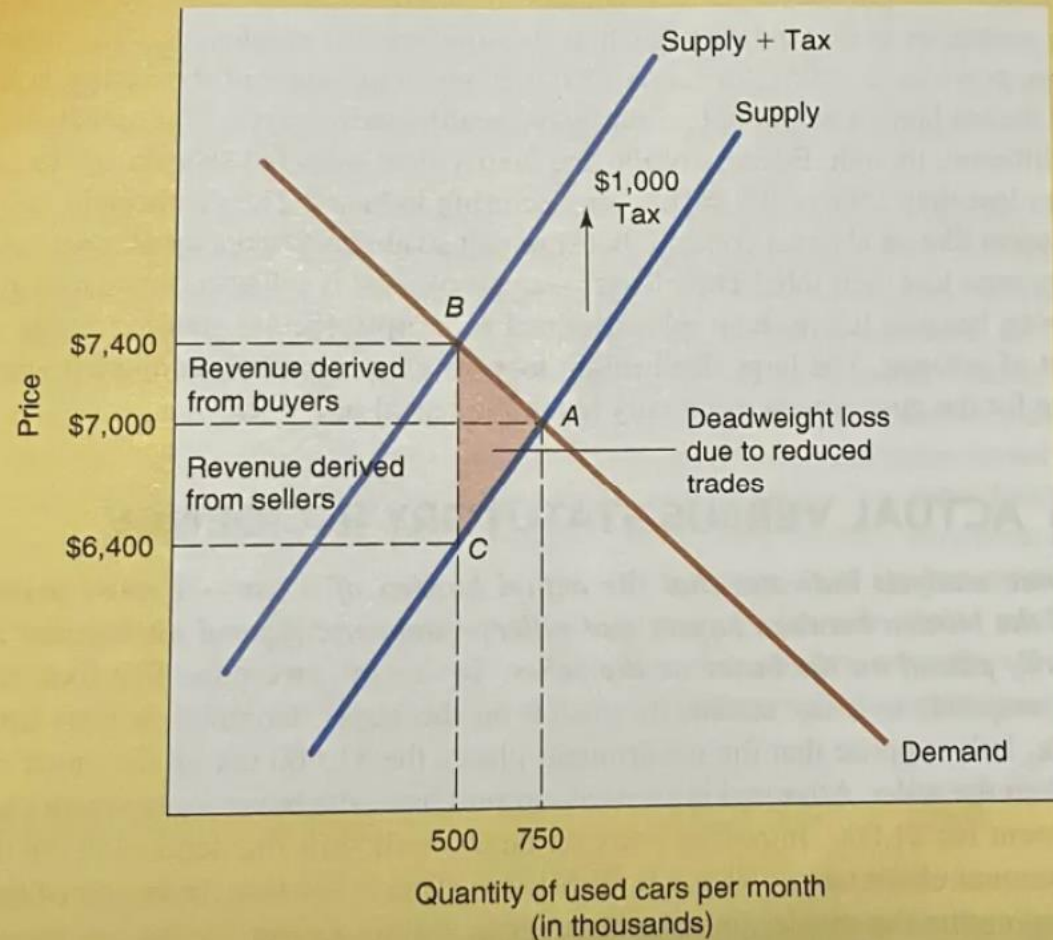
- ▶ No matter where you live on Earth, the US government will want your money if you are a citizen
- ▶ Paying taxes is one of the cornerstones of adulthood
- ▶ As my Chicago Grandfather always said, "Don't mess with the IRS."



Rumelia Taxation Class Activity

Tax Income rates	Single/Married Filing Separately	Married Filing Joint
0%	All income below \$12,000	All Income below \$30,000
10%	\$12,000.01-\$30,000	\$30,000.01-\$45,000
20%	\$30,000.01-\$45,000	\$45,000.01-\$150,000
30%	\$45,000.01-\$135,000	\$150,000.01-\$250,000
40%	\$135,000.01-\$500,000	\$250,000.01-\$3,000,000
50%	All income above \$500,000	All Income above \$3,000,000

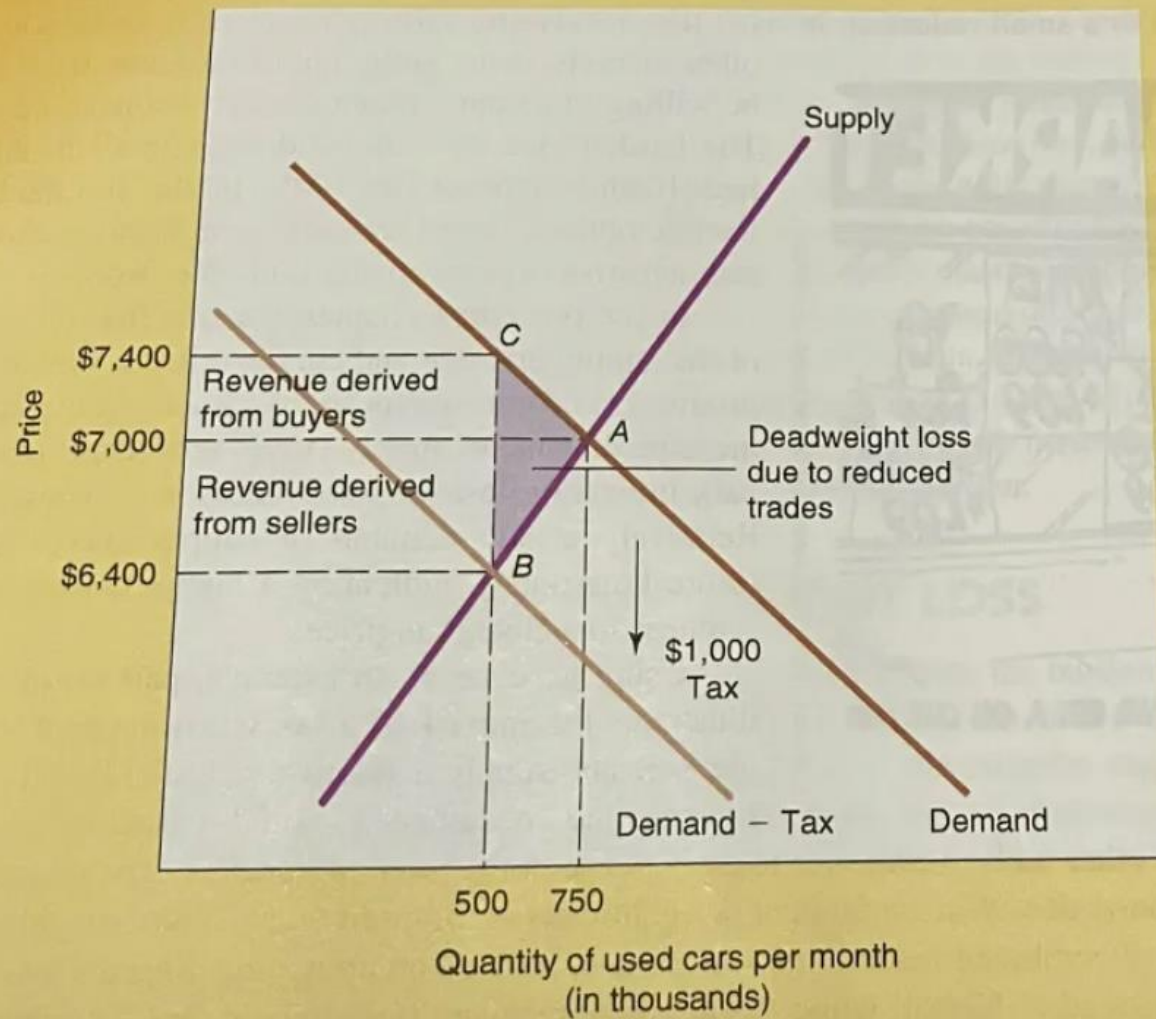
EXHIBIT 5



The Impact of a Tax Imposed on Sellers

When a \$1,000 tax is imposed statutorily on the sellers of used cars, the supply curve shifts vertically upward by the amount of the tax. The price of used cars to buyers rises from \$7,000 to \$7,400, resulting in buyers bearing \$400 of the burden of this tax. The price received by a seller falls from \$7,000 to \$6,400 (\$7,400 minus the \$1,000 tax), resulting in sellers bearing \$600 of the burden.

EXHIBIT 6



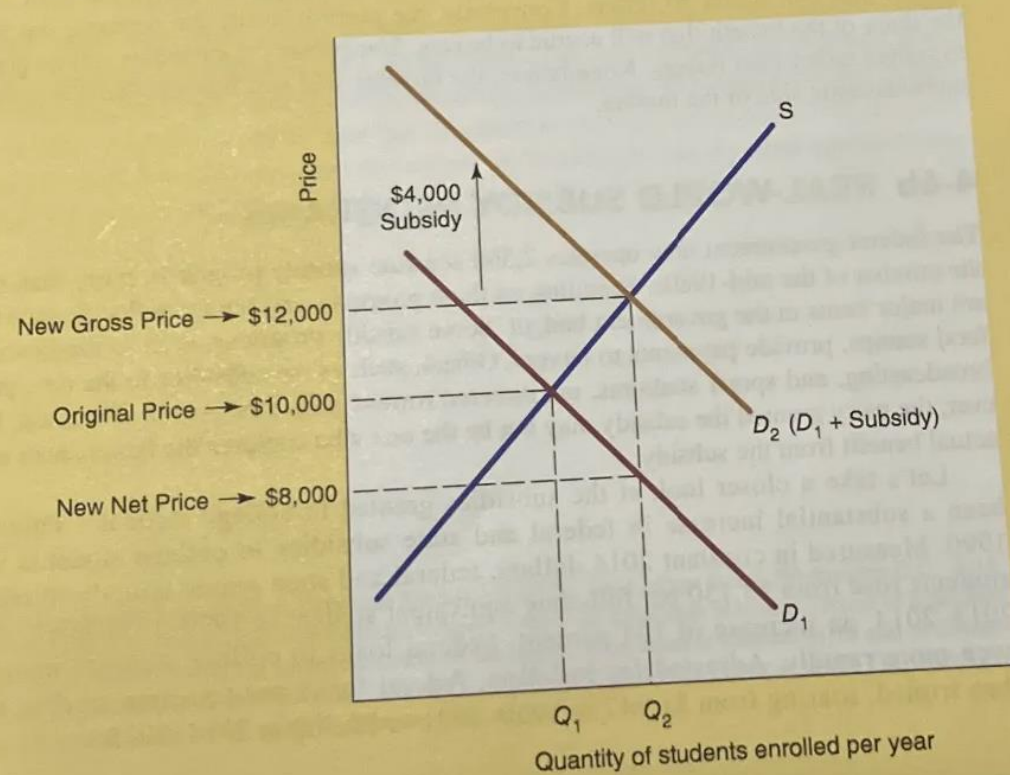
The Impact of a Tax Imposed on Buyers

When a \$1,000 tax is imposed statutorily on the buyers of used cars, the demand curve shifts vertically downward by the amount of the tax. The price of used cars falls from \$7,000 to \$6,400, resulting in sellers bearing \$600 of the burden. The buyer's total cost of purchasing the car rises from \$7,000 to \$7,400 (\$6,400 plus the \$1,000 tax), resulting in buyers bearing \$400 of the burden of this tax. The incidence of this tax on used cars is the same regardless of whether it is statutorily imposed on buyers or sellers.

The Impact of a Subsidy Granted to Buyers

Here we illustrate how a \$4,000 subsidy granted to full-time college students would impact the price and quantity of a year of college education. Prior to the subsidy, the equilibrium price of a year of college was \$10,000 and Q_1 students attended college. The subsidy to students would cause demand to shift from D_1 to D_2 , pushing the equilibrium price of a year of college

to \$12,000. Students would gain \$2,000 in the form of a lower net cost of a year of college (the new net price after the subsidy is \$8,000), but the suppliers would also gain \$2,000 in the form of higher prices for their services. If the supply curve was more inelastic relative to the demand curve, the gains of the students would be smaller and those of the suppliers larger.



Taxes on Buyers Vs Sellers

Assume a tax is on a seller,
unless I make it pretty
clear that the tax is on the
buyer

Most textbooks don't get
into the differences on
taxes or subsidies on
buyers vs sellers because it
results in the same effect
the only difference is
which curve you focus on.

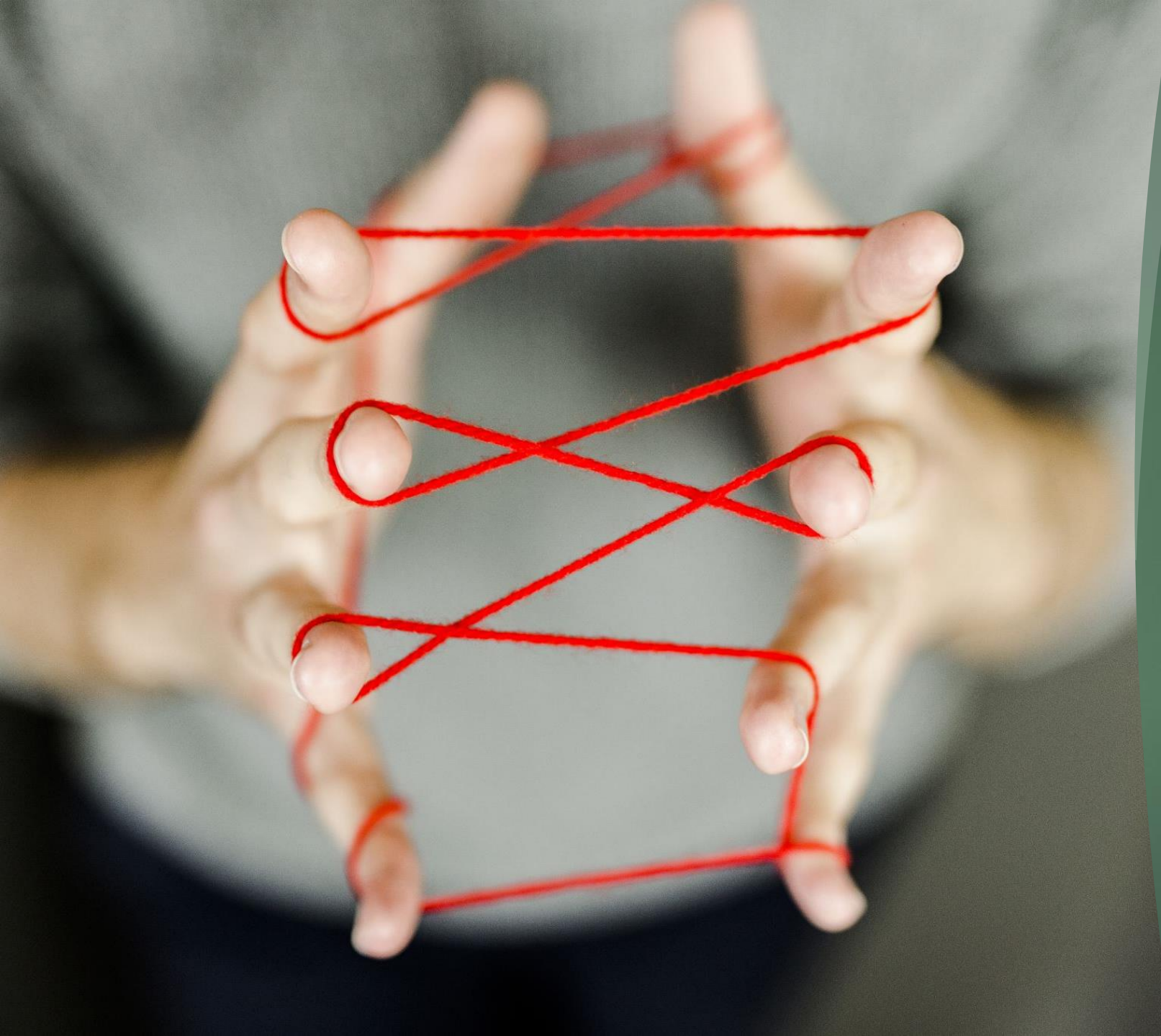
Additionally, the amount
of the tax actually paid by
the buyer/seller and not
passed on to the other
was not determined by
the tax but by the
elasticity

So, pays the tax really? If it doesn't matter who the bill was sent to?

- ▶ When demand is **relatively inelastic** or **supply is relatively elastic**, **buyers** will bear the larger share of the tax burden
- ▶ When demand is **relatively elastic** or supply is **relatively inelastic**, **sellers** (including resource suppliers) will bear the larger share of the tax burden
- ▶ In the end, **it doesn't matter who the IRS gives the bill to directly**; both buyers and sellers end up paying for it!

Me finally having a job
and earning some paper
The IRS





Elasticity

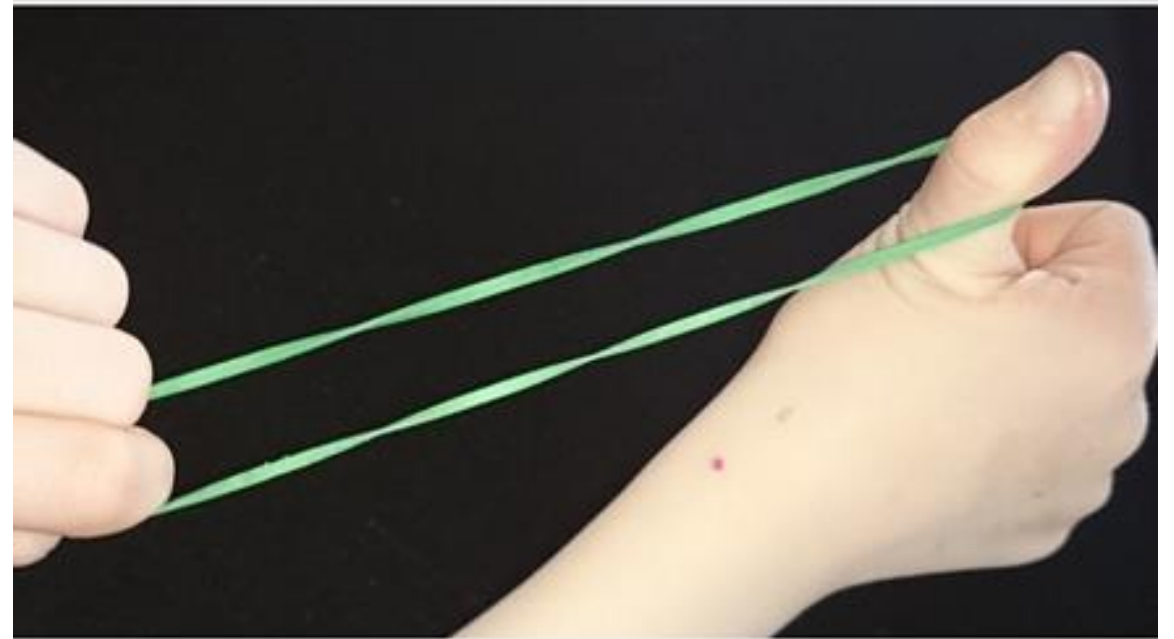
Law of Supply and Demand

Review

- ▶ **Law of Demand**- Price is inversely related to the quantity demanded. If the price goes down, the quantity demanded goes up (EX: The Macy's Sale)
- ▶ **Law of Supply**- Price is directly related to quantity supplied; if the price goes down, the quantity supplied also goes down.
- ▶ **Elasticity** tells how **responsive** things are in response to changing prices

Elasticity rules

- ▶ **Absolute value**- the magnitude of a real number without regard to its sign.
- ▶ **Elastic**- Absolute value greater than 1
- ▶ **Unit Elastic**- numerical value of 1 or -1
- ▶ **Inelastic**- Absolute value between 0 and 1



Elasticity of Demand

- ▶ A demand curve is said to be **elastic** when an increase in price reduces the quantity demanded by a lot (and vice versa)
- ▶ **Price Elasticity of demand** = $\frac{\text{Percentage change in quantity demanded}}{\text{Percentage Change in Price}} = \frac{\% \Delta Q_d}{\% \Delta P}$
- ▶ Example 1: If I **decrease** the price by 10% and the quantity demanded increases by **50%** then the **demand is elastic**
 - ▶ **Price Elasticity of demand** for Example 1 = -5
- ▶ Example 2: If I decrease the price by **10%** and the quantity demanded increases by **5%** then the **demand is inelastic**
 - ▶ **Price Elasticity of demand** for example 2 = -0.5
 - ▶ Elasticity is relative, and so the elasticity of a straight-line demand curve will differ at each point along the curve

$$E_D = \frac{\% \Delta Q_{\text{demanded}}}{\% \Delta P_{\text{rice}}}$$

Class activity

- ▶ Take out your notes and follow me on the board as I calculate an elastic and inelastic demand curve



Determinants of Demand Elasticity

- ▶ 1. Availability of Substitutes
- ▶ 2. Products Share of Consumer Budget
- ▶ 3. Time Horizon



Availability of substitutes

- ▶ When a good has many substitutes, the demand is more elastic because it is easier to replace
 - ▶ If Oranges get more expensive, people switch to Bananas or other foods, **elastic demand**
 - ▶ If Insulin gets more expensive, it is harder to switch to a substitute, especially for the diabetic who needs Insulin in order to live **Inelastic demand**
 - ▶ If I doubled the price of gas tomorrow, you would not cut your driving in half (at least in the short run)

Product's Share of Consumer Budget

- ▶ If spending on a product is small relative to the total budget, then demand will be more inelastic since finding alternatives will not be worth the effort for such a small expense
- ▶ Roman soldiers were not actually paid in salt; they were paid in real money. The 'salarium' was an allowance
- ▶ So, while the word salary comes from salt, it's more complex than you were told



2025

January

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FEBRUARY

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JULY

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AUGUST

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SEPTEMBER

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NOVEMBER

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DECEMBER

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Short Run vs Long Run

- ▶ Everything is more inelastic in the short run
- ▶ In the short run, it is harder to adjust your consumption habits
- ▶ For example, it is easier to change your cost of housing a year from now than it would be a week from now given rental contracts

Income Elasticity

- ▶ **Income Elasticity**- The percentage change in the quantity of a product demanded divided by the percentage change in consumer income that caused the change in quantity demanded
- ▶ Income elasticity measures the responsiveness of the demand for a good to consumer income. **It is positive for normal goods and negative for inferior goods**
- ▶
$$\text{Income Elasticity} = \frac{\text{Percent change in quantity demanded}}{\text{Percent change in income}} = \frac{\% \Delta Q_d}{\% \Delta \text{Income}}$$



About Income Elasticity

- ▶ In general, goods people view as necessities will have low-income elasticities (0 to 1) (normal white rice)
- ▶ In general, goods people view as necessities will have high-income elasticities (greater than one) (private education)



Supply Elasticity

- ▶ **Price Elasticity of Supply** = $\frac{\text{Percentage Change in Qunaity Supplied}}{\text{Percent change in Price}} = \frac{\% \Delta Q_s}{\% \Delta P}$
- ▶ As far as you should be concerned for this class, the price elasticity is always positive those interested in the possible exception can ask during office hours

Homework 2



Please come to the Front to collect Homework 2



It will be due at the start of class on October 8th



You may work in groups so long as each individual person turns in their own assignment in their own handwriting