

MICROECONOMICS CHARTS

Consumer Choice		
Marginal Utility =	$\frac{\text{Change in total utility}}{\text{Change in number of Units consumed}}$	$\frac{\Delta TU}{\Delta Q}$
Maximizing Rule =	$\frac{\text{Marginal Utility of X}}{\text{Price of X}} =$	$\frac{\text{Marginal Utility of y}}{\text{Price of Y}}$ For all goods X and Y
Consumer Equilibrium =	$\frac{MU_A}{P_A} = \frac{MU_B}{P_B} = \frac{MU_C}{P_C} = \dots = \frac{MU_Z}{P_Z}$	Marginal Utility Analysis
Income =	$P_X(X) + P_Y(Y)$	Budget Constraint
Consumer Equilibrium	$\frac{MU_Y}{P_Y} = \frac{MU_X}{P_X}$	Indifference Curve Analysis
Total Utility =	TU	ΣMU
Marginal Rate of Substitution =	$\frac{MU_X}{MU_Y}$	Budget Constraint Tangent to an Indifference Curve

Money Chart	
Reserves = Bank Deposits at the Fed + Vault Cash	
r = Required Reserve Ratio RR = Required Reserves CD = Checkable Deposits $RR = r * CD$ or $RR / r = CD$ or $RR / CD * 100 = r$	
Excess Reserves = Reserves - Required Reserves OR Reserves = Required Reserves + Excess Reserves	
Bank Capital [Net Worth] = Assets - Liabilities	
Insolvency = Liabilities > Assets	
M1 = Currency held outside banks + coins + checkable deposits + traveler's checks	
M2 = M1 + Savings Deposits + Small Time Deposits + Money Market Mutual Funds	

Money Expansion Chart	
Δ Checkable Deposits (money supply)	= $1/r \times \Delta$ Reserves
$r \downarrow \rightarrow 1/r \uparrow \rightarrow$	Money Supply \uparrow
$r \uparrow \rightarrow 1/r \downarrow \rightarrow$	Money Supply \downarrow
Fed sets discount rate below Federal Funds rate \rightarrow Banks borrow from Fed \rightarrow Banks have more reserves \rightarrow Banks may make more loans and checkable deposits \rightarrow Money Supply Rises \uparrow	
Fed sets discount rate above Federal Funds rate \rightarrow Banks do not borrow from Fed, and banks repay past discount loans \rightarrow Banks have fewer reserves \rightarrow Money Supply Declines \downarrow	
Open Market Operations \rightarrow Open Market Purchase \rightarrow Money Supply Rises \uparrow	
Open Market Operations \rightarrow Open Market Sale \rightarrow Money Supply Falls \downarrow	

Elasticity Chart		
Coefficient of Price elasticity of demand (E_d)	Percentage Change in quantity demanded / Percentage change in price	$\frac{\% \Delta Q_d}{\% \Delta P}$
Midpoint Formula	Expanded Formula	$\frac{(Q_2 - Q_1) / [(Q_1 + Q_2) / 2]}{(P_2 - P_1) / [(P_1 + P_2) / 2]}$
Elastic Demand	$E_d > 1$	$\% \Delta Q_d > \% \Delta P$
Inelastic Demand	$E_d < 1$	$\% \Delta Q_d < \% \Delta P$
Unit elastic Demand	$E_d = 1$	$\% \Delta Q_d = \% \Delta P$
Perfectly elastic Demand	$E_d = \infty$	Perfectly elastic
Perfectly inelastic Demand	$E_d = 0$	Perfectly inelastic
Total Revenue	TR	Price * Quantity sold
Elastic Demand	$E_d > 1$	$P \uparrow \rightarrow TR \downarrow$
Elastic Demand	$E_d > 1$	$P \downarrow \rightarrow TR \uparrow$
Inelastic Demand	$E_d < 1$	$P \uparrow \rightarrow TR \uparrow$
Inelastic Demand	$E_d < 1$	$P \downarrow \rightarrow TR \downarrow$
Unit Elastic Demand	$E_d = 1$	$P \uparrow \rightarrow TR$
Unit Elastic Demand	$E_d = 1$	$P \downarrow \rightarrow TR$
Cross Elasticity	E_c	$\% \Delta Q_x / \% \Delta P_y$
Goods are substitutes	$E_c > 0$	$\% \Delta Q_x / \% \Delta P_y$
Goods are complements	$E_c < 0$	$\% \Delta Q_x / \% \Delta P_y$
Income Elasticity	E_y	$\% \Delta Q_d / \% \Delta Inc$
Income Elasticity	$E_y > 0$	Normal Good
Income Elasticity	$E_y < 0$	Inferior Good
Income Elastic	$E_y > 1$	
Income Inelastic	$E_y < 1$	
Income Unit Elastic	$E_y = 1$	
Elastic Supply	E_s	$\% \Delta Q_s / \% \Delta P$
Elastic Supply	$E_s > 1$	
Inelastic Supply	$E_s < 1$	
Unit Elastic Supply	$E_s = 1$	