

**Stern School of Business  
New York University**

**Microeconomics**  
B01.1303

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**Problem Set 3**

1. Norm and Sheila consume only meat pies and beer. Meat pies used to cost \$2.00 each and beer was \$1.00 per can. Their income used to be \$60.00 per week, but they had to pay income tax of \$10.00. Draw their budget constraint in red ink.

(a) They used to buy 30 cans of beer per week and spent the rest of their money on meat pies. How many meat pies did they buy?

(b) The government decided to eliminate the income tax and to put a sales tax of \$1.00 per can of beer, raising its price to \$2.00 per can. Draw their new budget constraint in blue ink.

(c) The sales tax on beer induced Norm and Sheila to reduce their consumption of beer to 20 cans per week. What happened to their consumption of pies?

(d) How much revenue did this tax raise from Norm and Sheila?

(e) Suppose that instead of just taxing beer, the government had decided to tax both beer and meat pies at the same percentage rate in such a way that it would raise the same revenue from Norm and Sheila as the tax on beer alone described above. Assuming that the prices of beer and meat pies goes up by the full amount of the tax, use black ink to draw the new budget line on the graph.

(f) Are Norm and Sheila better off when they have only beer taxed or when both beer and meat pies are taxed, if both taxes raise the same revenue?

2. You are managing a \$300,000 city budget in which monies are spent on schools and public safety only. You are about to receive aid from the federal government to support a special anti-drug law enforcement program. Two available programs are: (1) a \$100,000 grant that must be spent on law enforcement; and (2) a 100 percent matching grant, in which each dollar of local spending on law enforcement is matched by a dollar of federal money. The federal matching program limits its payment to each city to \$100,000.

(a) Complete the table below with the amounts available for safety

Schools	SAFETY No govt. assistance	SAFETY Program (1)	SAFETY Program (2)
\$0			
\$50,000			
\$100,000			
\$150,000			
\$200,000			
\$250,000			
\$300,000			

(b) Which program would you (the manager) choose if you wish to maximize the satisfaction of

your citizens if you allocate \$50,000 of the \$300,000 to schools? What about \$250,000?

(c) Draw the budget constraints for the three options: no aid, program (1), or program (2).

3. Suppose that George's utility of income is given by  $U(I) = \sqrt{I}$ , i.e.,  $U(I) = I^{0.5}$ , where  $I$  represents income.

(a) Is George risk-averse, risk-neutral or risk-loving?

(b) George currently has a job that pays \$100,000. He has no other income. He is offered a chance to change jobs. With probability 1/2 he gets a new “good” job that pays \$160,000, and with probability 1/2 he gets a new “bad” job that pays \$40,000. What is the *certainty equivalent* of the new job lottery? Should he leave the old job?

(c) How high/low does the income of the low paying alternative have to be (which is at \$40,000 in part (b)) so that George is indifferent between the old job and the new job lottery?