

## Problem Set 2: Economics 404W

Due March 23, 2006

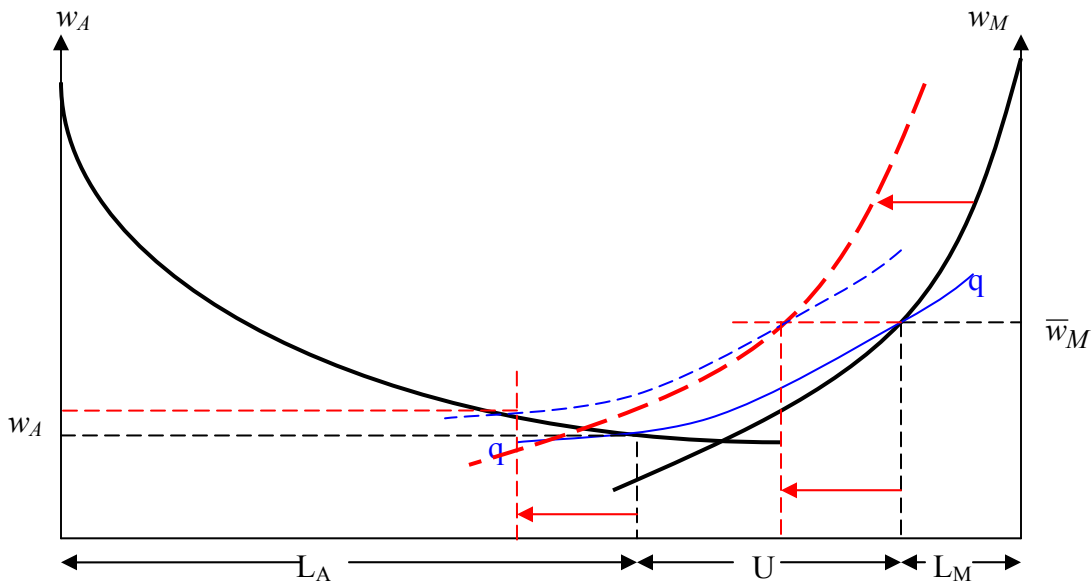
Prof. Tybout

- 1) (15 points) Suppose the assumptions of the standard Harris-Todaro model hold. If 40 percent of the urban labor force is unemployed, and the urban modern sector wage is institutionally fixed at  $\bar{w}_m = \$0.50$  per hour, and, what is the agricultural wage?  $w_A =$  0.30. (Show your work.)

If 40 percent of the urban labor force is unemployed, the fraction that is employed must be 0.6. Substituting this into the basic Harris-Todaro equation yields:

$$w_A = \left( \frac{L_m}{L_m + U} \right) \cdot \bar{w}_m = 0.6 \cdot \bar{w}_m$$

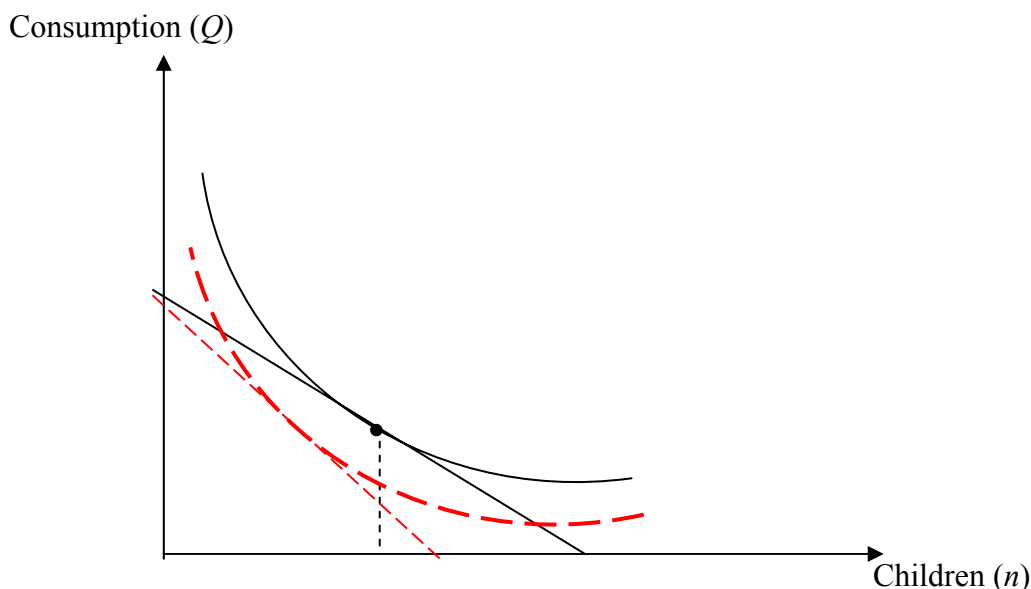
- 2) (25 points) Modify the Harris-Todaro diagram below to show the effect of the creation of new modern sector jobs, perhaps due to the expansion of a government agency.



Place X's in the appropriate boxes below to indicate the effects of this expansion on each of the following variables:

	Increase	Decrease	No change	Ambiguous change
Agricultural wage ( $w_A$ )	X			
Agric. employment ( $L_A$ )		X		
Urban unemployed (U)		X	or	X
Urban employed ( $L_M$ )	X			

- 3) (20 points) The diagram below represents a couple's choice of family size (number of children), given its budget constraint:  $Q = w(L - \lambda \cdot n) + \pi - d \cdot n$



Variables that appear in the household budget constraint are:

$Q$  = goods consumed by the couple (the price of goods is normalized to 1)

$n$  = number of children

$w$  = market wage for mother's labor

$L$  = total hours available to mother (to be divided between child-rearing and income generation)

$\lambda$  = hours needed to care for one child

$\pi$  = father's earnings

$d$  = direct cost of children (food, clothing, health care, etc.)

Modify the diagram to show how an increase in the direct cost of children affects this couple's choice of consumption and number of children. (The increase in direct costs might be due, for example, to a move to the city, where childcare is more costly.)

Briefly explain your analysis.

An increase in the direct cost of children doesn't affect the intercept of the budget constraint ( $wL + \pi$ ) because people without children can still consume the same volume of goods. But it does increase the slope of the constraint,  $-(\lambda w + d)$ , because each child now means more foregone consumption. This inward pivot of the constraint causes an income effect and a substitution effect, both of which act to discourage couples from having large families.

- 4) (20 points) The following table shows the possible net earnings outcomes from two one-period investment projects that are available to investors.

	earnings outcome 1 (probability = $\frac{1}{2}$ )	earnings outcome 2 (probability = $\frac{1}{2}$ )
Project A	-\$4	\$12
Project B	-\$9	\$21

What is the expected earning from each project? That is, if each project were repeated many times, how much would it earn on average? Project A \$4 Project B \$6

$$0.5 \cdot (-4) + 0.5 \cdot (12) = 4$$

$$0.5 \cdot (-9) + 0.5 \cdot (21) = 6$$

If investors' preferences are characterized by the utility function  $U = \ln(X)$ , and each investor begins with \$10, what is the expected utility associated level achieved by investors in each project? Expected utility for investors in project A 2.44 Expected utility for investors in project B. 1.72 (Note: an investor who chooses project A will end up with  $\$10 - \$4 = \$6$  with probability  $\frac{1}{2}$ , and he will end up with  $\$10 + \$12 = \$22$  with probability  $\frac{1}{2}$ . Analogous comments apply for investment B.) Briefly explain the economic intuition behind the difference in your two answers.

$$0.5 \cdot \ln(10 - 4) + 0.5 \cdot \ln(10 + 12) = 2.44$$

$$0.5 \cdot \ln(10 - 9) + 0.5 \cdot \ln(10 + 21) = 1.72$$

Even though project B yields higher returns, on average, it is less attractive to investors than project A. The reason is that their preferences reflect diminishing marginal utility. (If you graph  $\ln(X)$  against  $X$ , you will see that its slope becomes increasingly flat as  $X$  rises.) Thus the large downside losses that can occur with project B are very unattractive, and more than offset the large upside gains that can occur.

Continue to assume that all investors' preferences are characterized by the utility function  $U = \ln(X)$ , and each investor begins with \$10. If projects like A are the only projects available in country A, will investors commit to them, or will they simply hang on to their \$10? (invest in A, hang on to \$10) invest in A. If projects like B are the only projects available in country B, will investors commit to them, or will they simply hang on to their \$10? (invest in B, hang on to \$10) hang on to \$10.

Hanging on to \$10 yields investor a certain utility of  $\ln(10) = 2.30$ . This is less than the expected utility associated with project A (2.44), but more than the expected utility associated with project B (1.72).

- 5) (20 points) For the country you have chosen to specialize in, respond to each of the following questions. (You are encouraged to work with other members of your country team.) For some countries, some of the questions below may prove difficult to answer. If you cannot find the information requested, simply explain the research strategy you have followed and list the sources you have consulted. You will not be graded down if you have made a reasonable effort to find the answers.

Country name \_\_\_\_\_

- a) Does your country have a reputation for heavy regulation of industry? You may wish to consult: <http://rru.worldbank.org/DoingBusiness/default.aspx>
- b) Is corruption a major problem in your country? (You may wish to consult: <http://www.transparency.org/cpi/2003/dnld/framework.pdf> )
- c) How easy is it to enforce contracts in your country? (You may wish to consult: <http://rru.worldbank.org/DoingBusiness/default.aspx> )
- d) How volatile have macro conditions been recently in your country? Calculate standard deviations for inflation rates, GDP growth, and real exchange rates, then assess their magnitude. Note: one good source for macro data is the IMF's International Financial Statistics:  
<http://www.lias.psu.edu/scripts/linkliias.exe?Where=Go+There&What=IFSONLINE>