Review of the Last Lecture

• began our discussion of the demand for HC

• the demand for HC is a derived demand (from demand for HK)

• discussed the difference between HK (a stock) and HS (a flow)

• began our discussion of the Grossman model of the demand for HK

• today consider a simplified version of the Grossman model Grossman model

The Grossman Model

• The Michael Grossman model (1970) is a constrained utility maximization model

• In this model utility is a function of three variables: HK, consumption of non-HC goods (NHC), and leisure time. L., i.e.,

$$U = U(HK, NHC, L)$$

• We will simplify the model by assuming that that there is a standard work week, i.e., L is fixed (not a choice variable) and therefore drops out of the analysis.

• The simplified utility function is thus U = U(HK, NHC)

• Utility is maximized subject to a consumption-possibilities boundary, CPB.///

The Consumption-Possibilities Boundary in the Simplified Grossman Model

• The consumption-possibilities boundary (**CPB**) in the simplified Grossman model shows a person's maximum possible consumption of NHC goods for each value for HK. (**see blackboard)**

• This boundary starts at some minimum positive values for HK and non-HC goods, rises, reaches a maximum and then declines.

• The CPB shows that there is an initial range where the person can have more of both goods, NHC and HK!

• This is unusual! Normally a person can only get more of one good by giving up units of another good.///

Understanding the Shape of the CPB

• The positive slope of the CPB occurs because in the Grossman model HK is an investment, as well as a consumption, good.

• It is a **consumption good** because it yields satisfaction **directly** through HS

• It is an **investment good** because it yields satisfaction **indirectly.** Healthier people are more productive (less time off sick and higher wage rate) and earn more and can thus consume more.

• The +ve slope of the CPB occurs because initially spending some non-leisure time and money on healthcare increases productivity by so much that both the stock of HK and the consumption of NHC rise. ///

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Example of Why the CPB May Rise Initially

• Suppose that without any time or money spent on HC a person is off work 20 days a year due to ill health and is docked pay for those days.

• Now suppose that over the course of the year this person spends the equivalent of one day's pay on HC and as a result is off work only 5 days per year due to illness.

• by allocating a day's pay to the consumption of HC the person will have both a higher HK (or HS) and a higher consumption of NHC (since earnings are higher).///

The CPB Peaks at Some Point

• As the amount of HC consumed increases the CPB will continue to rise but at a decreasing rate until it peaks.

• **Reason**: Due to the diminishing MPP of HC an outlay in time and money on HC yields ever smaller gains in HK and therefore exerts an ever smaller +ve effect on income and thus on NHC.

• Eventually the CPB reaches a maximum, i.e., the additional income attributable to the improved HK is exactly offset by the cost of the additional HC to achieve the higher HK .

• Higher levels of HK can be achieved, but only by foregoing NHC goods and services.///

Why Is It a Consumption Possibilities **BOUNDARY?**

• The CPB locus is a **boundary** to the set of NHC and HK combinations that are available for consumption.

• Any combination below the boundary is available for consumption

• Any combination on the CPB is also also available for consumption

• Combinations above the CPB are not available for consumption, i.e., they are not consumption possibilities.

• If HK is produced efficiently (i.e., with the lowest cost combination of HC goods and own time) the person will be on the CPB.

• If HK is produced inefficiently the consumption bundle of HK and NHC goods will lie below the CPB. **Explain.** ///

Optimal HK If There Is Only an Investment Demand for HK.

• If there is no consumption demand for HK, only an investment demand, the consumer will choose HK where the consumption of NHC goods is at a maximum.

• This occurs where the CPB reaches its peak., i.e., where the improvement in HK as a result of the last dollar spent on HC causes income to rise by one dollar, and there is thus no change in the ability to purchase NHC goods.

• pursuing HK beyond this point would require spending more on HC than one gets back in additional income and thus would result in a decline in the consumption of NHC.

• It is unlikely that the consumer will choose the HK that maximizes the consumption of NHC goods! **WHY? ///**

Optimal HK When HK Is Both an Investment and a Cons'n Good.

• When there is also a consumption demand for HK the consumer chooses the combination of HK and NHC that maximizes utility.

• This is **not** the (HK, NHC) combination where NHC is a maximum (**see diagram**)

• Rather a higher level of utility can be achieved by trading off some NHC goods for more HK. (**see diagram of indifference curves superimposed on the CPB).**

• Once the utility maximization problem has been solved, the utility maximizing HK is determined. Associated with it is an efficient consumption of HC to sustain it.///

Shifts in the CPB and the Demand for HK: Education

• Suppose the consumer acquires more education but everything else, *including the wage rate*, stays constant. **How will this affect the demand for HK?**

• **KEY POINT:** better educated consumer => more efficient producer of HK (healthier lifestyle, more efficient HC choices)
   => spend less on HC to achieve a given HK
   => spend less on HC to achieve the next unit of HK

• Thus the CPB will: shift up, be steeper, reach a peak at a larger HK, and have a flatter downward sloping arm (**see diagram**). ///

The Income and Price Effects: Education

• Education $\uparrow$ ~> CPB shifts $\uparrow$ ~> income and price effects on the demand for HK

• **The income effect:** better educated => more efficient producer => higher cons'n of NHC goods at any level of HK $\equiv$ larger budget to allocate than before => consume more of all goods => HK is a good => more HK consumed.

• **The Price Effect:** opportunity cost of HK (amount of NHC goods that needs to be given up for one more unit of HK) $\downarrow$, i.e., the price of HK in terms of NHC goods $\downarrow$ ~> consumer selects more HK

• Note: income and price effects work in the same direction.///