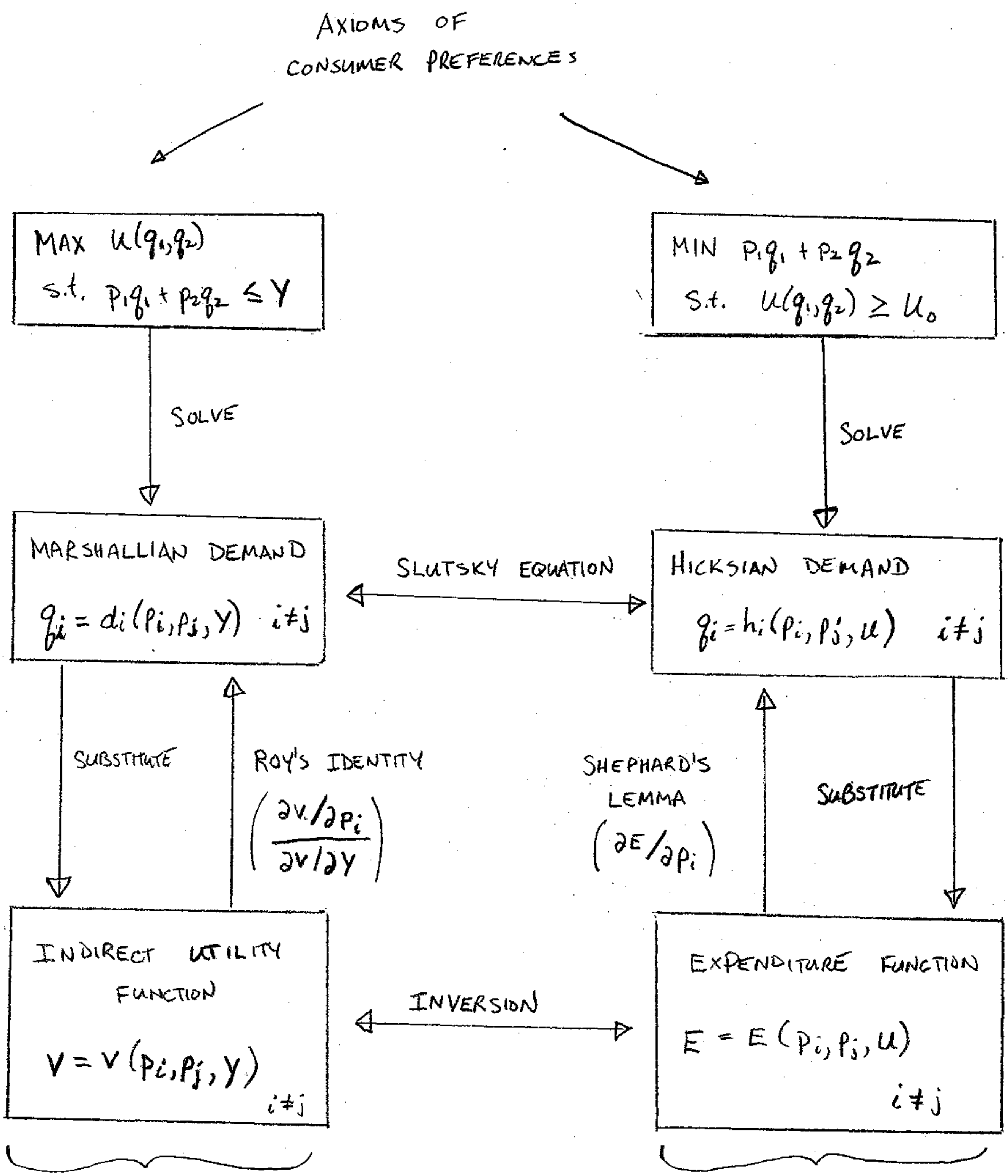
SUMMARY OF CONSUMER THEORY



- Prices and Income are <u>OBSERVABLE</u>
- UTILITY IS <u>NOT</u> <u>OBSERVABLE</u>

- Prices and Expenditure <u>OBSERVABLE</u>
- UTILITY <u>NOT</u> <u>OBSERVABLE</u>.

WELFARE EVALUATION

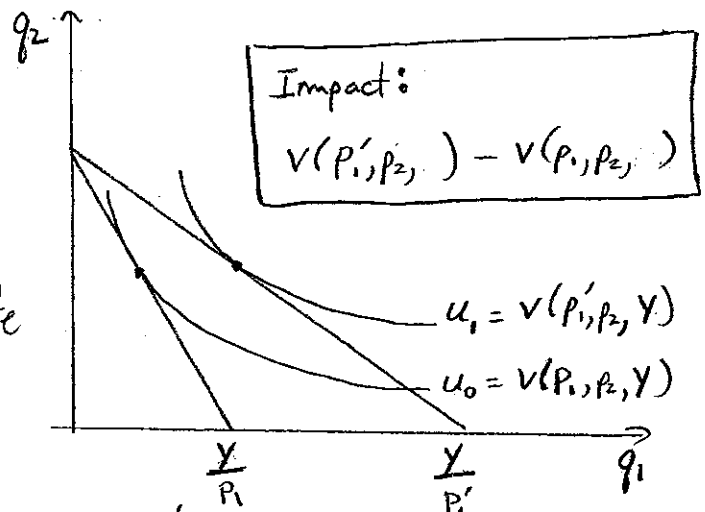
Underlying our approach to consumer theory has been the goal of developing a tool for the welfare evaluation of policy changes.

Recall that:

1/ The utility Max problem gives $q_i = d_i(p_i, p_j, Y)$ and $V(p_i, p_j, Y)$ which are <u>observable</u> (at least, in principle)

↳ Consider Δp_1 from p_1 to p_1'. What's the impact?

- Change in Demand is <u>observable</u>
- One way to measure impact is to use the solutions under <u>old</u> and <u>new</u> prices to compute the change in utility.



* But this measure is essentially <u>useless</u>!

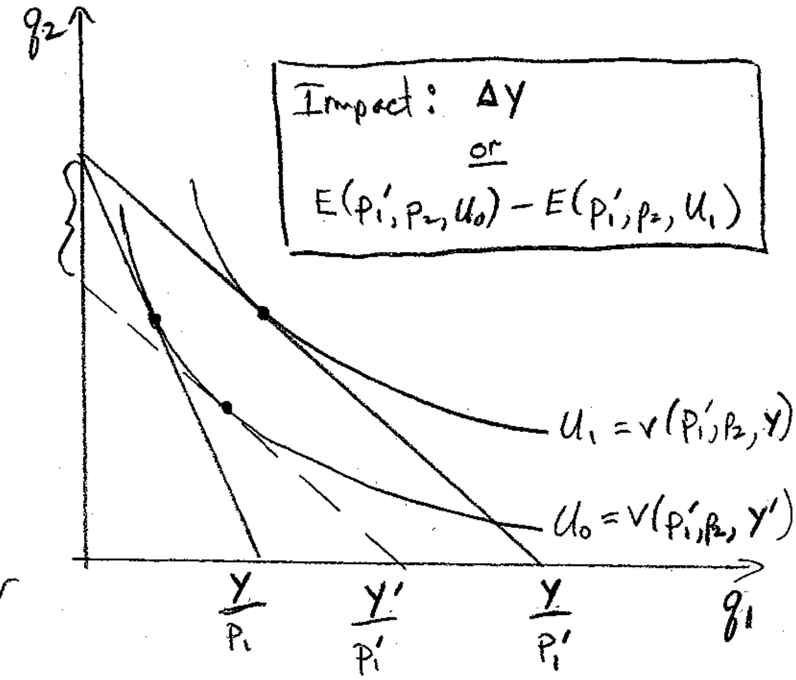
↳ utility is ordinal, not cardinal. So $V(p_1', Y) - V(p_1, Y)$ does not tell us anything.

↳ Even more meaningless when comparing <u>across</u> <u>people</u>.

2/ The EXP. MIN problem gives us $q_i = h_i(p_i, p_j, u)$ and $E(p_i, p_j, u)$ which are based in part on unobservables.

↳ Consider Δp_1 from p_1 to p_1'. What's the impact?

- A good measure is the <u>change in income</u> necessary to make consumer as well off as before the price change.



- By how much does Y have to change so that consumer is **indifferent** btw (p_1', p_2, Y) and (p_1', p_2, Y')?

↳ For what value ΔY does $V(p_1', p_2, Y) = V(p_1', p_2, Y')$?

* $\Delta Y = Y' - Y$ gives a <u>monetary</u> <u>value</u> for impact of Δp_1!

↳ This measure is better b/c it's comparable (observable).

↳ We can elicit amount of \$ people need to be "compensated" for a change in policy (through <u>experiments</u>, <u>surveys</u>, <u>estimation</u>)

** But this approach suffers from a problem; it too depends on utility!

SUMMARY

① $q = d(p, y)$ and $V(p, y)$ depend on observable concepts (prices and income) but cannot be used for welfare comparisons.

② $q = h(p, u)$ and $E(p, u)$ can be used for welfare comparisons but are based on unobservable concepts (utility).

SOLUTION: To somehow derive $q = h(p,u)$ from $q = d(p, y)$

** Fortunately, we are able to do exactly that! We use the Slutsky Equation to provide the link.

$$\underbrace{\frac{\partial d_i}{\partial p_i}}_{(-\text{ or }+)} = \underbrace{\frac{\partial h_i}{\partial p_i}}_{(-)} - \underbrace{\frac{\partial d_i}{\partial y}}_{(-\text{ or }+)} q_i \quad \text{or} \quad \underbrace{\frac{\partial h_i}{\partial p_i}}_{\text{unobservable but ultimately useful for welfare}} = \underbrace{\frac{\partial d_i}{\partial p_i} + \frac{\partial d_i}{\partial y} q_i}_{\text{observable measures but not useful for welfare}}$$

SLUTSKY provides a link btw observable concepts and useful concepts for welfare.

Cost / Benefit Analysis

We've seen how individuals respond to price changes:

- $q = d(p, y)$
- IE and SE
- ordinary vs. Giffen Goods
- Etc...

How much do price changes hurt / help consumers?

↳ We would like a monetary measure.

↳ Fortunately, we have one - the expenditure function.

Ex: Pain killer

Initial Price = \$1/pill and I consume 4/week

New Price = \$2/pill and I consume 3/week

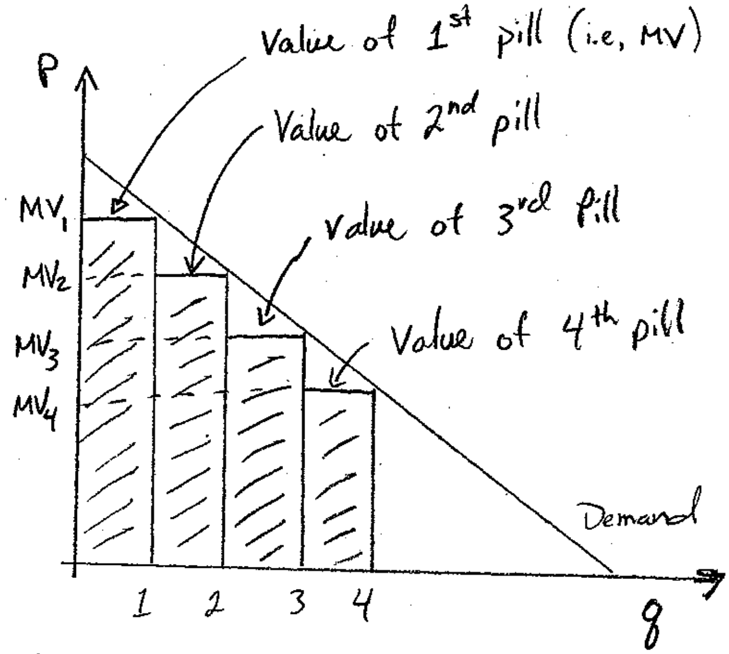
Total Income = \$20/week

How much worse off am I?

Story from Principles Class

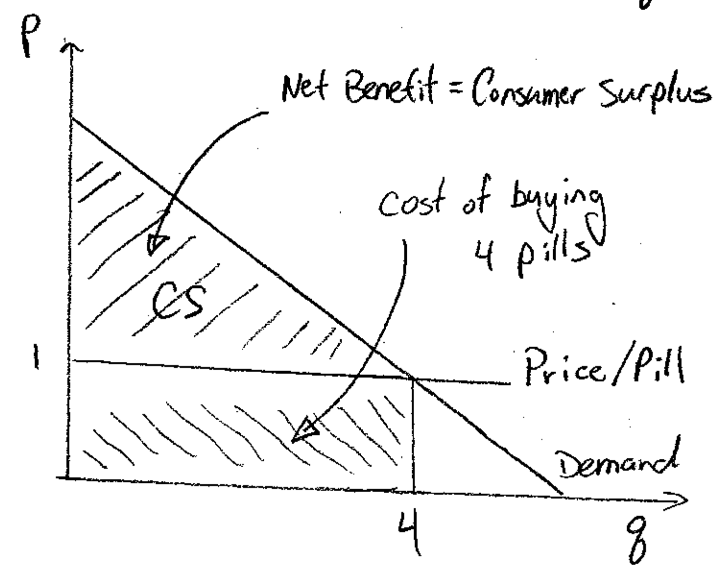
Total Value of 4 pills is the entire shaded area

↳ Sum of Marginal Values (MV)



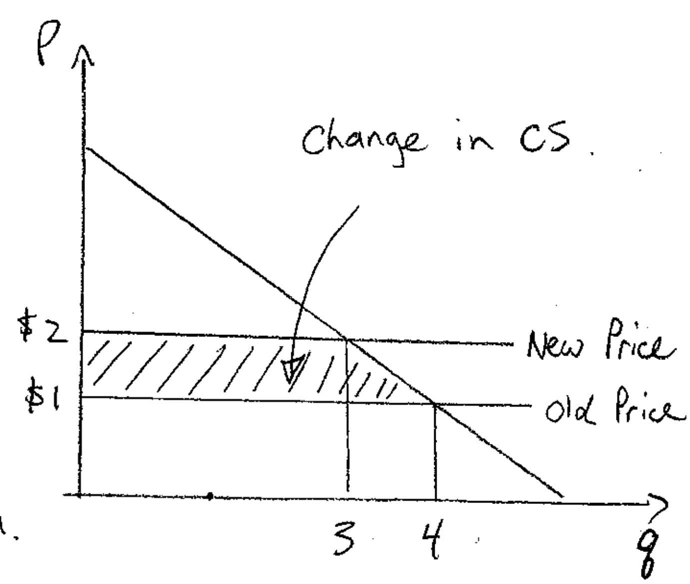
** Demand refers to Marshallian Demand

Total Value minus Total cost of buying 4 units is Net Benefit or Consumer Surplus.



When price increases from \$1 to \$2, Qty demanded falls from 4 units to 3 units.

↳ Change in CS is shaded area.



EQUIVALENT AND COMPENSATING VARIATION

Change in CS is a crude approximation to the change in consumer welfare.

* There are more precise measures called:

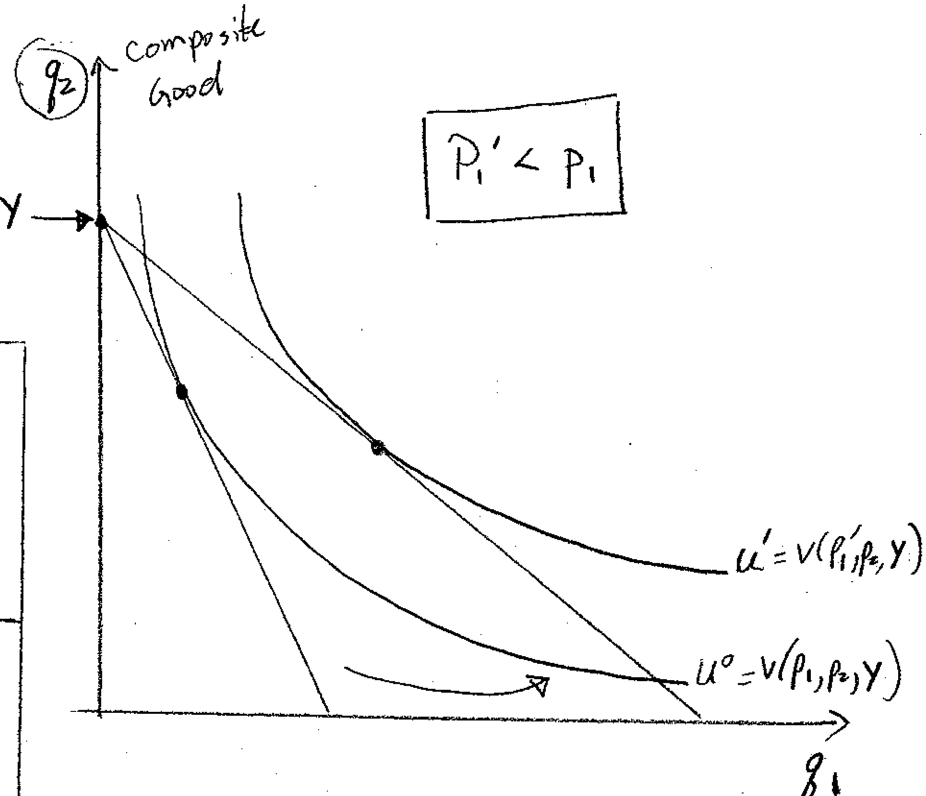
(1) Equivalent Variation (EV)

(2) Compensating Variation (CV)

Initial Prices: $\{P_1, P_2, Y\} \Rightarrow u^0 = V(P_1, P_2, Y)$

New Prices: $\{P_1', P_2, Y\} \Rightarrow u' = V(P_1', P_2, Y)$

$E(P_1, P_2, u^0) = E(P_1', P_2, u') = Y$



The exp. required at old prices (P_1, P_2) to attain u^0 is:

$$E(P_1, P_2, \overbrace{V(P_1, P_2, Y)}^{u^0}) = Y$$

The exp. required at new prices (P_1', P_2) to attain u' is:

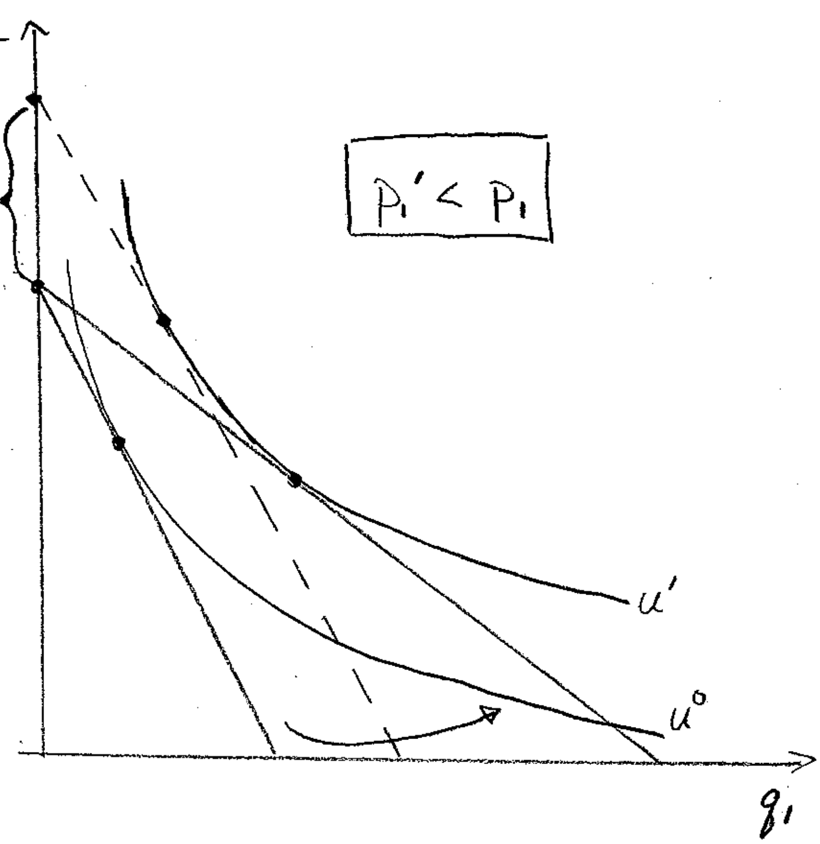
$$E(P_1', P_2, \overbrace{V(P_1', P_2, Y)}^{u'}) = Y$$

We now ask 2 questions.

(1) What is the <u>variation</u> in income that's <u>equivalent</u> to the price change in terms of its welfare impact?

↳ what amount of cash is consumer <u>indifferent</u> about accepting in lieu of the price change?

↳ This is the EV, and the <u>reference price</u> is the <u>old prices</u> b/c it's a change in income producing same change in utility, so its <u>as if</u> the price change never occured.



$$EV = E(p_1, p_2, u') - E(p_1, p_2, u^0)$$

<u>or</u>

$$EV = E(p_1, p_2, u') - y$$

* EV can be seen as a way to measure the "<u>distance</u>" btw indifference curves as if a price change had occured.

(2) What is the variation in income the compensates the consumer for the price change after it occurs.

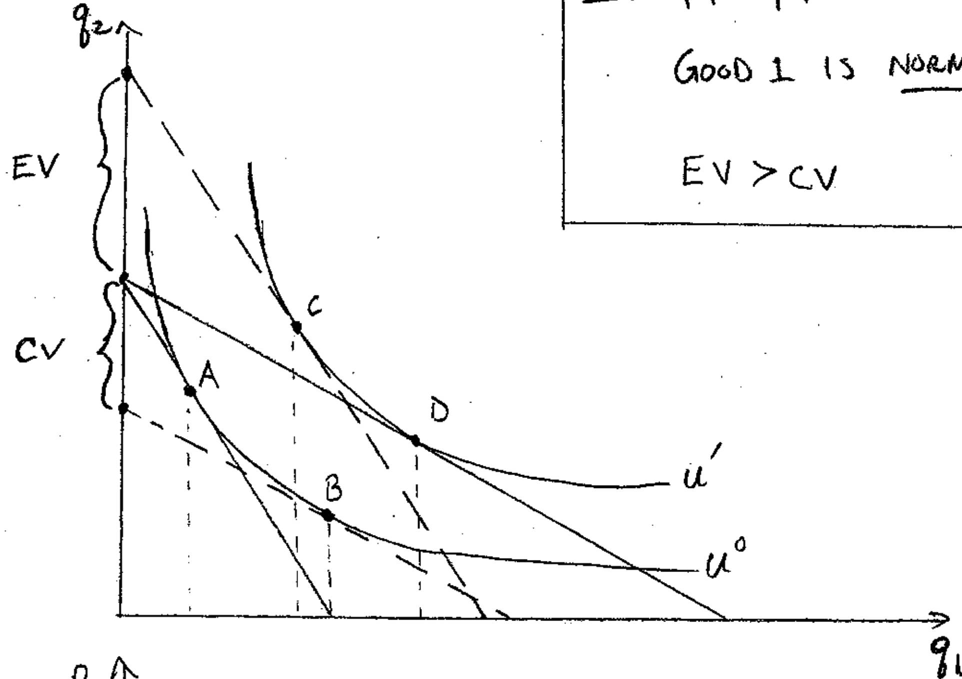
↳ what change in income brings the consumer back to original indifference curve u^0 after the price change occurs.

↳ This is CV and the reference prices are new prices b/c it measures the welfare impact after a price change occurs.

$$\boxed{\begin{array}{c} CV = E(p_1', p_2, u') - E(p_1', p_2, u^0) \\ \underline{\text{or}} \\ CV = y - E(p_1', p_2, u^0) \end{array}}$$

* CV can also be seen as a way to measure the "distance" b/tw indifference curves once a price change occurs.

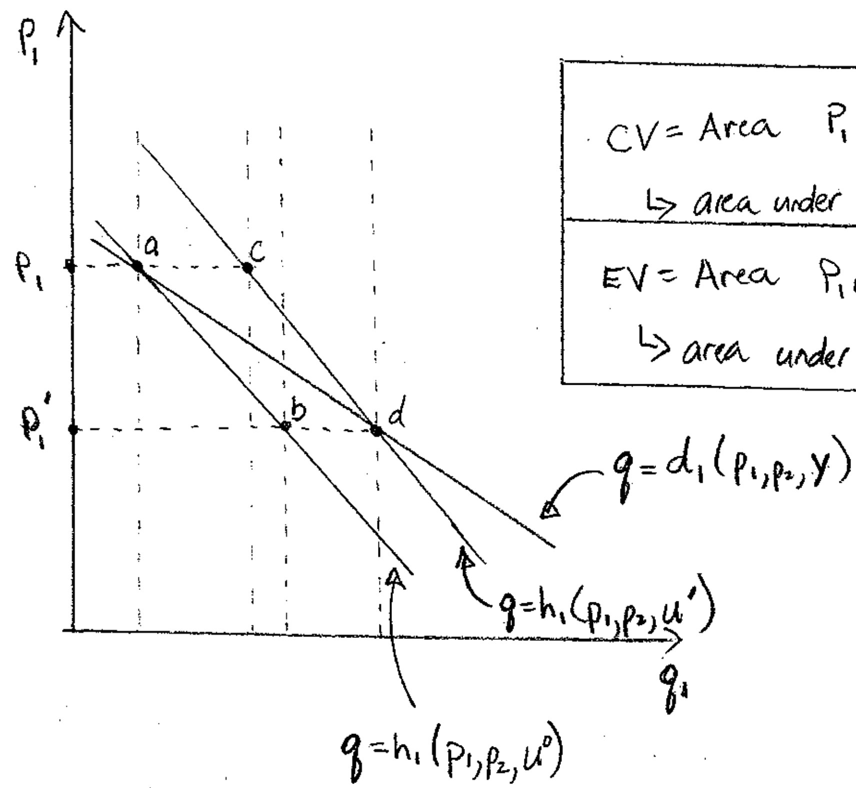
* EV and CV have important representations in terms of the Hicksian or Compensated Demand curves.



EX: $p_1' < p_1$

GOOD 1 IS <u>NORMAL</u>

EV > CV



CV = Area $p_1 a b p_1'$
↳ area under $h_1(p, u^0)$ btw p_1 and p_1'

EV = Area $p_1 c d p_1'$
↳ area under $h_1(p, u')$ btw p_1 and p_1'

CS = Area $p_1 a d p_1'$
↳ area under $d_1(p, y)$ between p_1 and p_1'

NOTE: (1) THIS relation btw EV and CV reverses when good 1 is <u>inferior</u>

(2) If <u>IE = 0</u> ⇒ EV = CV = CS !