

MICROECONOMICS

Principles and Analysis

CONSUMER: AGGREGATION

USE OF CONSUMER MODELS IS OFTEN SIMPLIFIED...

- ✘ (1) We usually suppose that a many-dimensional commodity space can be represented appropriately in terms of just a few commodities.
 - + Requires *aggregation over goods*
- ✘ (2) We often assume that there is a “representative consumer.”
 - + Requires *aggregation over consumers*
- ✘ We can use economic analysis to see whether and when these two simplifications are appropriate

AGGREGATION OVER GOODS: THE ISSUE

- ✗ Why n goods?
- ✗ What determines the boundaries between goods?
- ✗ Diagrams all with 2 goods.
 - + Is this valid?
 - + What assumptions are we making?
- ✗ Is it legitimate to simplify the n -commodity problem to, say, a 2-commodity problem?

AGGREGATION OVER GOODS: THE MODEL

- ✘ Use the standard preference model with n goods.
- ✘ Find an aggregate \bar{x} and a function $\bar{U}(x_1, \bar{x})$ that yield the same behaviour as $U(x_1, x_2, x_3, \dots, x_n)$
- ✘ Then we can say that $\bar{U}(\cdot, \cdot)$ also exactly represents the consumer's preferences.
- ✘ The aggregation problem is then solved.

AGGREGATION OVER GOODS: RESULT

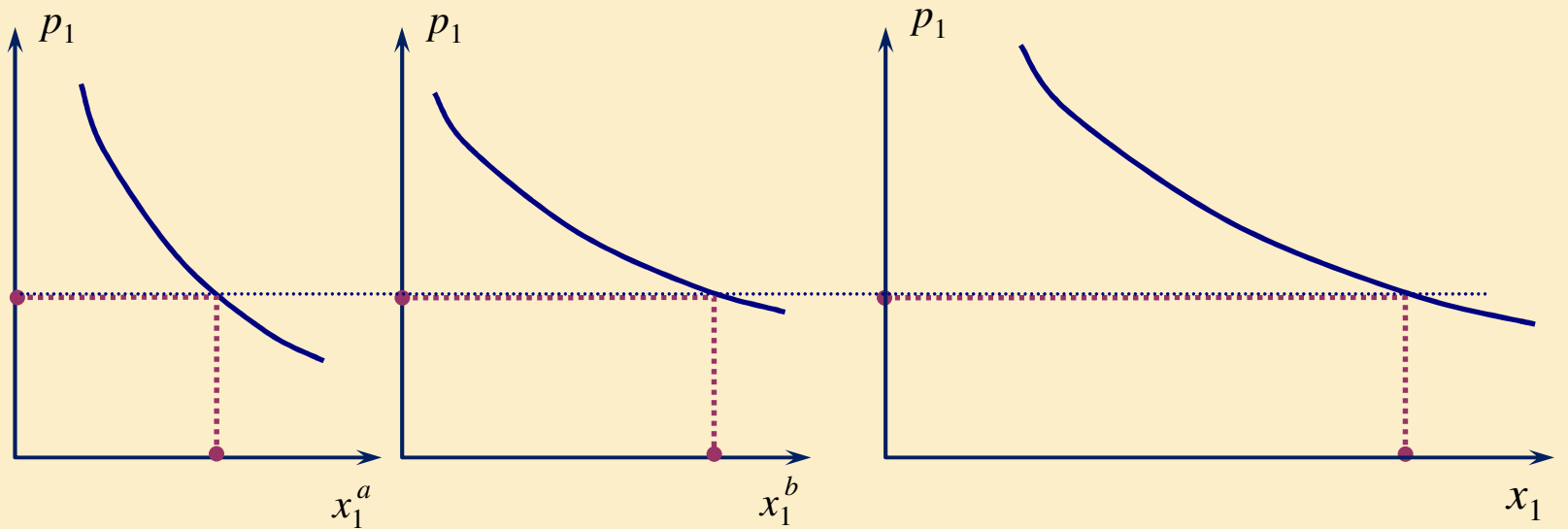
- ✘ The “composite commodity” theorem:
- ✘ You can always aggregate over goods $2, 3, \dots, n$ if relative prices of goods $2, 3, \dots, n$ stay constant.
 - + $U(\cdot, \cdot, \dots, \cdot)$ and $\bar{U}(\cdot, \cdot)$ then represent the same preferences
- ✘ Clearly this can be done for any arbitrary group of commodities.
 - + You just need the condition on relative prices

AGGREGATION OVER CONSUMERS

- ✘ We need to model the behaviour of n_h consumers.
- ✘ Consumer h has utility function U^h and income y^h .
- ✘ From this get demand for good i in usual way, given prices p .
 - + $D^{hi}(p, y^h)$.
- ✘ If all goods are “private” we can easily get total demand for i .
 - + Just add up over the D^{hi}
- ✘ Let’s look at the simple mechanics.

AGGREGATION OF CONSUMER DEMAND

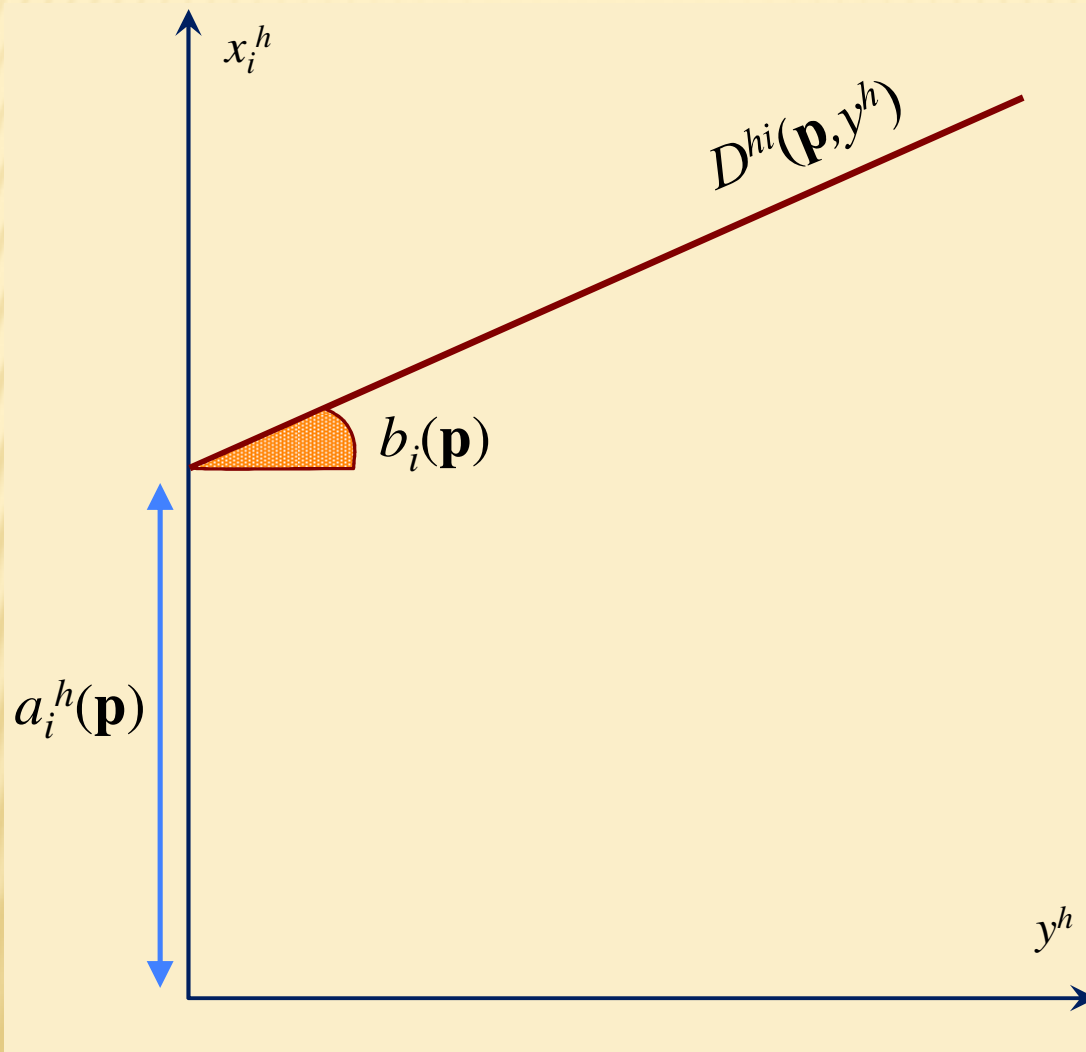
- *Alf's demand curve for good 1.*
- *Bill's demand curve for good 1.*
- *Pick any price*
- *Sum of consumers' demand*
- *Repeat to get the market demand curve*



AGGREGATION OVER CONSUMERS: THE ISSUES

- ✗ Demand for good i by each consumer h depends on prices p and income y^h .
- ✗ Aggregation problems could arise as with firms.
- ✗ But main issue is: will the mass of consumers behave in the same way as a single consumer?
- ✗ In general market demand will depend on the *distribution* of incomes y^h .
- ✗ Can we write average demand as $\bar{D}^i(p, \bar{y})$, say?
 - + For example \bar{y} could be average income in the market.
 - + Just take the mean over the consumers
- ✗ We can do this only in special cases...

AGGREGABLE DEMAND FUNCTIONS



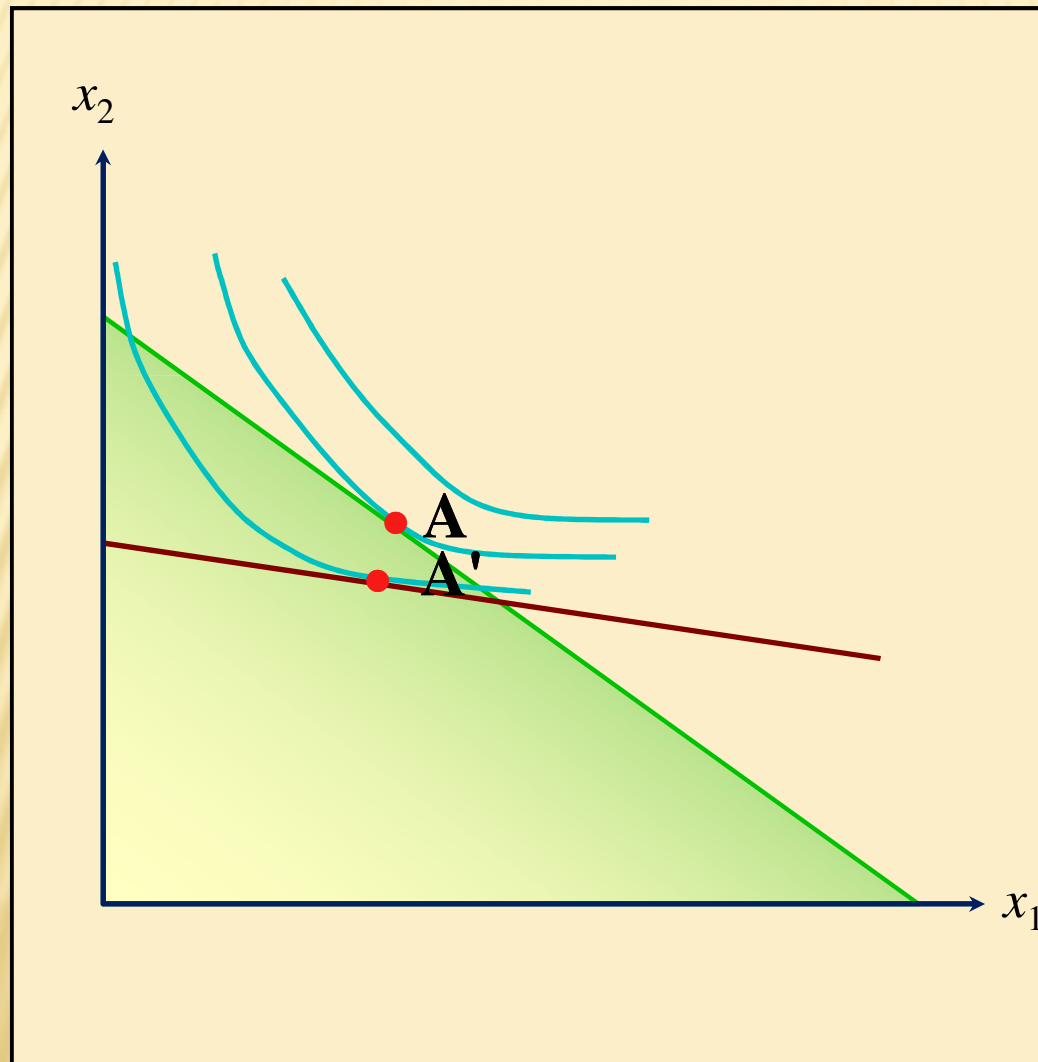
- Plot demand against income.
- h 's demand for good i .
- "subsistence minimum" demand
- Relation of demand to income

- Must be linear in income.
- Intercept could differ amongst the h .
- Slope must be the same for all h .

AGGREGABILITY

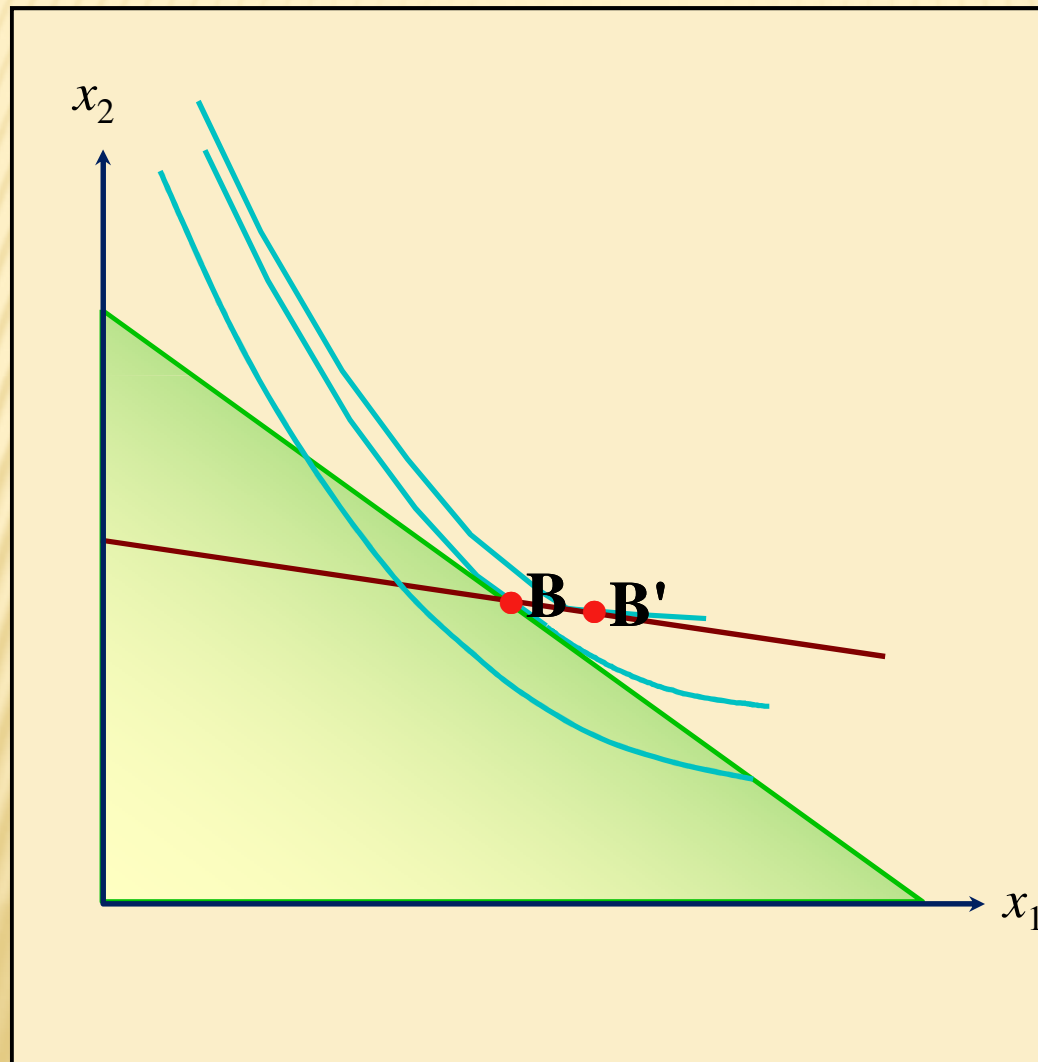
- ✘ Aggregable demands require restrictions on income effects.
 - + In our case average demand depends on average income.
 - + Must have demand that is linear in income, with the same slope for all.
- ✘ Implies restrictions on preferences
- ✘ But what could happen if this condition were not satisfied?
- ✘ Let's consider an example...

A CONSUMER (ALF)



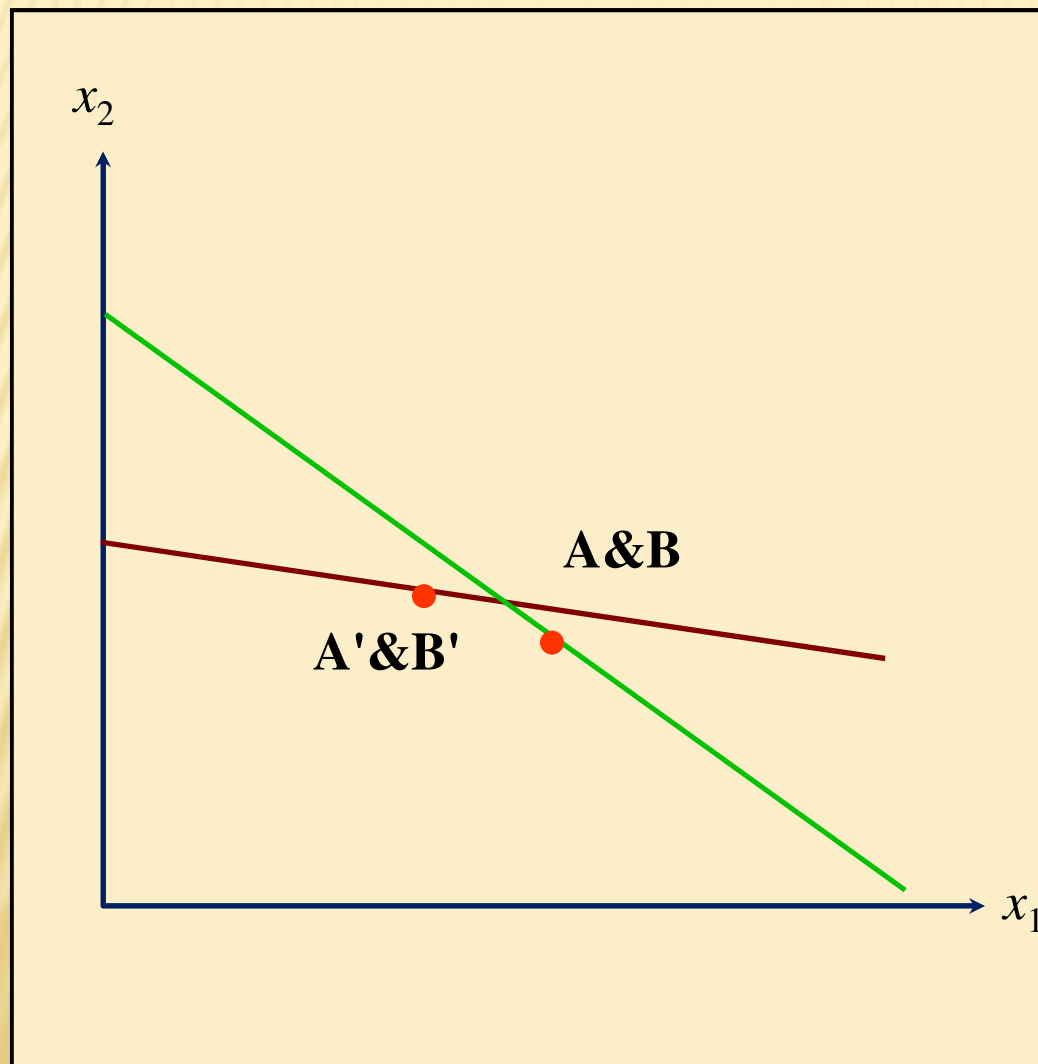
- Preferences look like this.
- Initial prices determine budget constraint.
- Prices then change thus.
- Equilibrium moves from A to A'

ANOTHER CONSUMER (BILL)



- *Different preferences, (and resources) but...*
- *Faces the same initial prices.*
- *Prices then change the same way as for Alf*
- *Equilibrium moves from B to B'*

ALF AND BILL COMBINED



- *Initial equilibrium*
- *New equilibrium.*
- *In the aggregate WARP does not hold (!)*

- *Each consumer's behaviour is conventional.*
- *Each individual satisfies WARP.*
- *But the joint behaviour does not satisfy WARP.*
- *This is because Alf and Bill are "too dissimilar" in their preferences.*

WHAT NEXT?

- ✘ Integrate production and consumption decisions.
- ✘ Examine behaviour in general equilibrium