



MIAMI HERBERT
BUSINESS SCHOOL



ECO212 Principles of Macroeconomics

Chapter 3

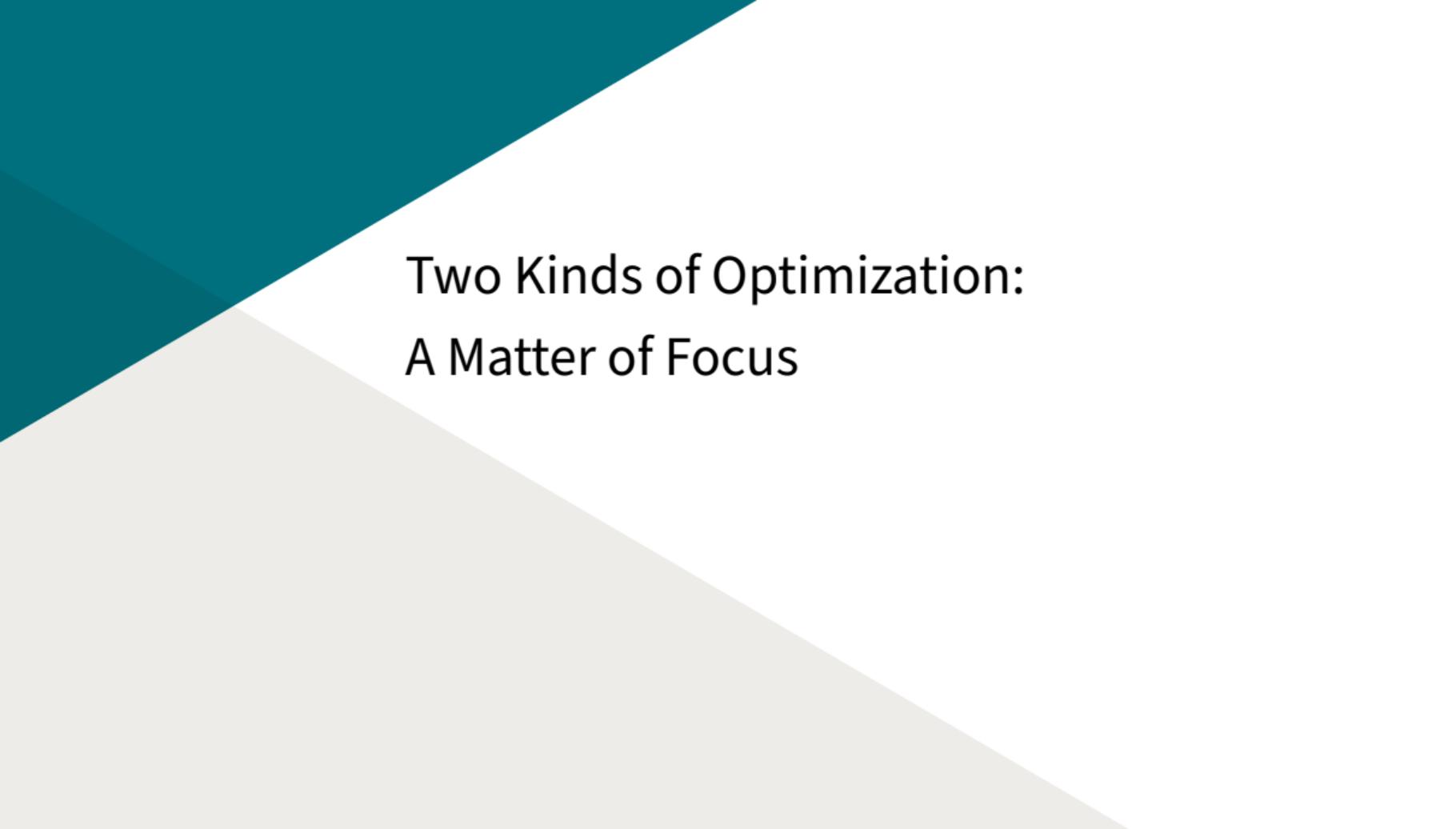
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August 27, 2022



Overview

1. Two Kinds of Optimization:
A Matter of Focus
2. Optimization in Levels

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Two Kinds of Optimization: A Matter of Focus

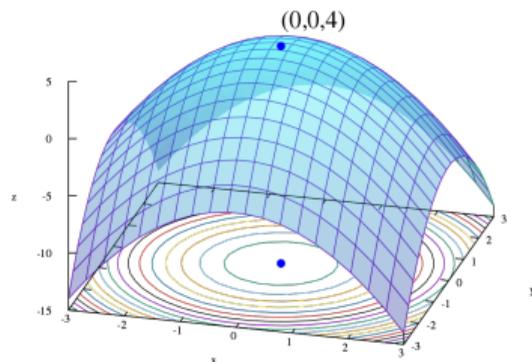
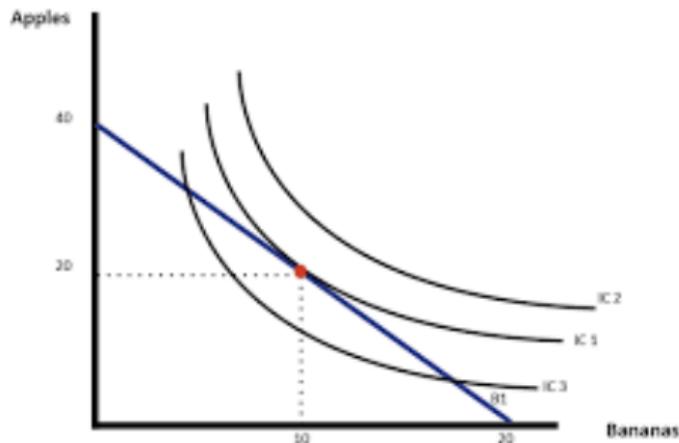


Recall the Scarcity

Budget Constraint

Two agents' problem

- ▶ **Households** - Maximize utility with a budget constraint.
- ▶ **Firms** - maximize the profit.



Optimization



Economists believe people try to optimize and usually do a pretty good job with whatever information they have.

- ▶ This is an assumption.
- ▶ Some of our economic research aims at detecting and solving the non-optimization situation.

Optimization



Think of: How does location affect the rental cost of housing?

Do you always make the best choice?

Optimization is difficult because:

- ★ Limited information
- ★ Sorting through information can be complicated
- ★ Inexperience



Optimization



Two techniques to reach optimization:

- ▶ **Optimization in levels:** calculates the total net benefit of different alternatives, and then chooses the best alternatives.

Optimization in levels = look at total benefit – total cost

- ▶ **Optimization in differences:** calculates the change in net benefits when a person switches from one alternative to another and then uses these marginal comparisons to choose the best alternative.

Optimization in differences =
look at the change in the net benefit of option 1 – ...option 2

Optimization



Optimization in levels:



Optimization



Optimization in differences:





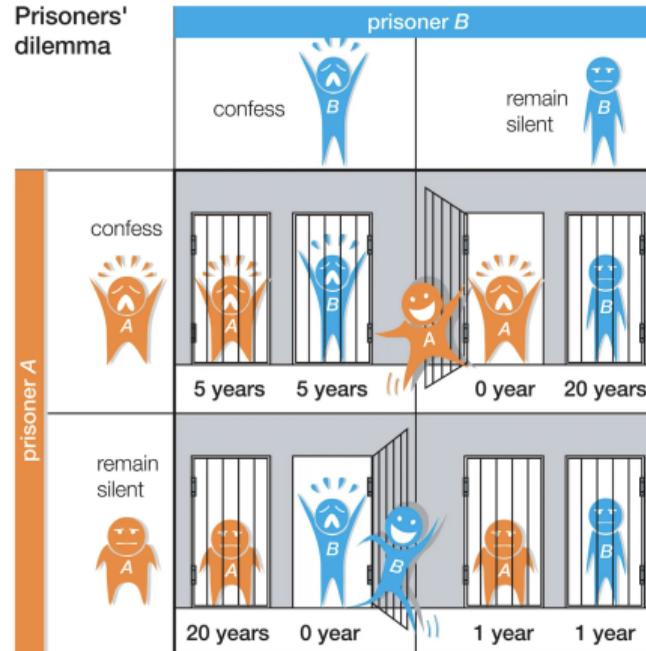
Optimization - why failure could happen?

Economists don't assume people always successfully optimize.

Market Failure:

The individual incentives for rational behavior do not lead to rational outcomes for the group.

Example 4: Sub-optimal case Prisoners' dilemma



Optimization



Related field:

Behavioral economics identifies the specific situations in which people fail to optimize.

- ▶ Self-control problem.
Show the addicted demand graph here
- ▶ Lack of information or inexperience.

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Optimization in Levels

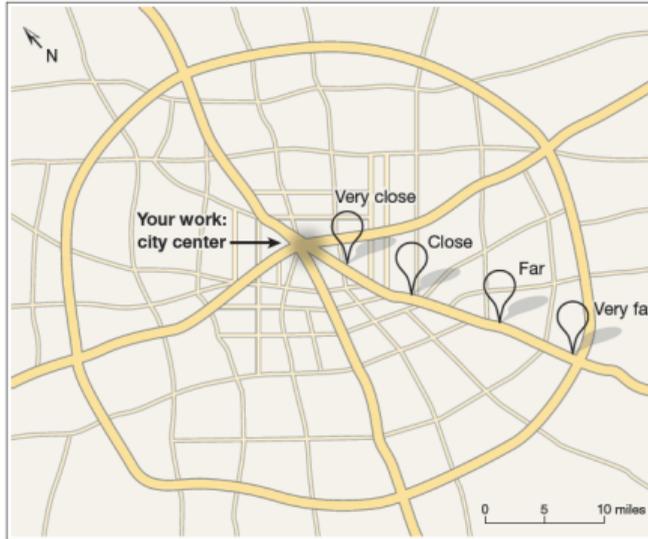
Optimization in Levels



Exhibit 3.1 Apartments on Your Short List, Which Differ Only on Commuting Time and Rent and Are Otherwise Identical

Many cities have a single central business district—which is often referred to as the city center—where lots of employers are concentrated.

In most cities, apartments near the city center cost more to rent than otherwise identical apartments that are far away. Why is this so?



Apartment	Commuting Time (hours per month)	Rent (\$ per month)
Very Close	5 hours	\$1,180
Close	10 hours	\$1,090
Far	15 hours	\$1,030
Very Far	20 hours	\$1,000



Optimization in Levels

What does it cost to commute?

- ▶ Availability of public transportation.
- ▶ Gasoline.
- ▶ Parking.
- ▶ Wear and tear on car.
- ▶ Opportunity cost of time.



Optimization in Levels

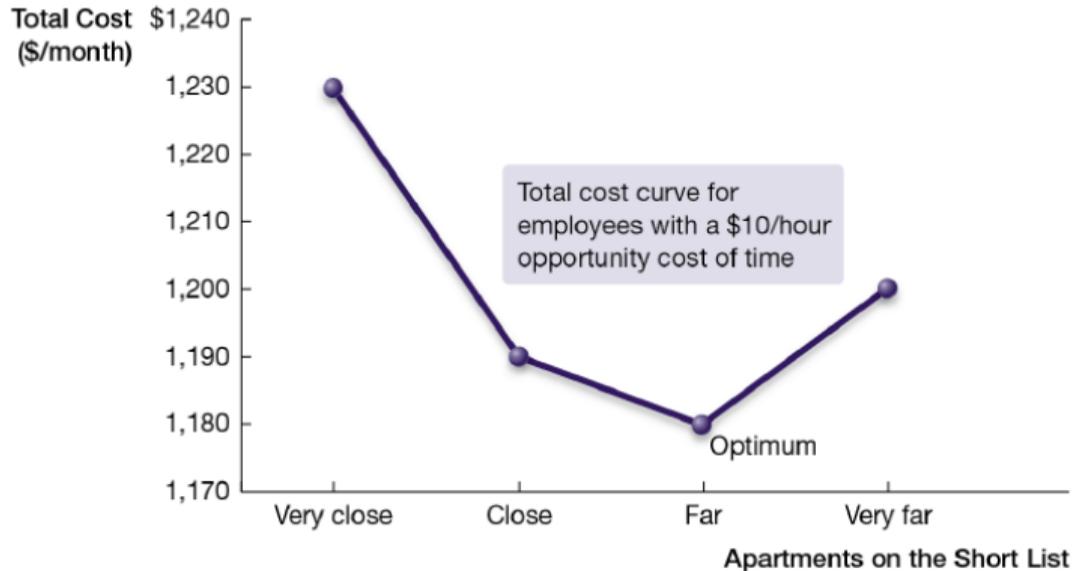
Commuting cost and rental cost expressed in common units,
assuming an opportunity cost of time of \$10/hour.

Apartment	Commuting Time (hours per month)	Commuting Cost (\$ per month)	Rent (\$ per month)	Total Cost: Rent + Commuting (\$ per month)
<i>Very Close</i>	5 hours	\$50	\$1,180	\$1,230
<i>Close</i>	10 hours	\$100	\$1,090	\$1,190
<i>Far</i>	15 hours	\$150	\$1,030	\$1,180
<i>Very Far</i>	20 hours	\$200	\$1,000	\$1,200



Optimization in Levels

Total cost including both rent and commuting cost,
assuming an opportunity cost of time \$10/hour.





Optimization in Levels

Comparative Statics: What if the opportunity cost of commuting changes?





Optimization in Levels

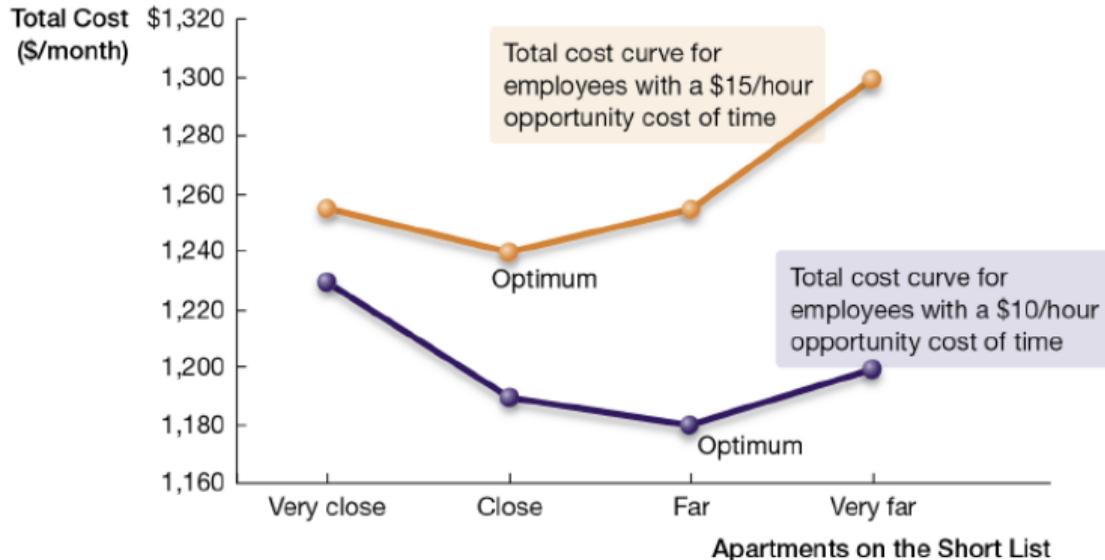
Commuting cost and rental cost expressed in common units, assuming an opportunity cost of time \$15/hour.

Apartment	Commuting Time (hours per month)	Commuting Cost (\$ per month)	Rent (\$ per month)	Total Cost: Rent + Commuting (\$ per month)
<i>Very Close</i>	5 hours	\$75	\$1,180	\$1,255
Close	10 hours	\$150	\$1,090	\$1,240
<i>Far</i>	15 hours	\$225	\$1,030	\$1,255
<i>Very Far</i>	20 hours	\$300	\$1,000	\$1,300

Optimization in Levels



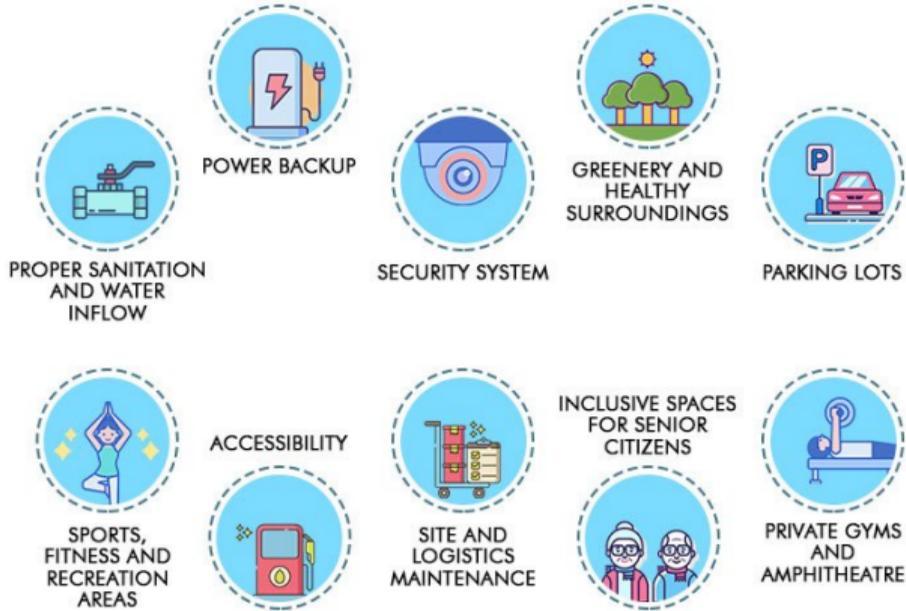
Total cost including both rent and commuting cost,
assuming an opportunity cost of time \$15/hour.



Optimization in Levels



What else are missing?





Optimization in Levels

Wrap up the optimizing in levels

- ▶ Express all costs and benefits in the same unit (\$).
- ▶ Calculate the total net benefit (benefit - cost) for each option.
- ▶ Choose the option with the highest net benefit.