

Algorithmic Price Discrimination

Oren Bar-Gill
Harvard Law School

Introduction

- ❑ Price discrimination can be very profitable for sellers.
- ❑ To price discriminate, sellers need to know the WTP of different buyers.
- ❑ In the past, sellers could only discriminate between (often large) groups of buyers, e.g., businesses vs. consumers.

Introduction

- Algorithmic analysis of Big Data provides WTP information at the individual level.
- This opens the door to a qualitative jump in the incidence and intensity of price discrimination.
 - Limits on price discrimination
 - Arbitrage
 - Fairness concerns

Introduction

- Examples of Algorithmic Price Discrimination
 - Price discrimination based on credit reports and credit scores. [Julie Brill]
 - TSYS and FICO recently teamed up to create a new data analytics tool, helping credit card issuers “put the data into action...”

Introduction

- Examples of Algorithmic Price Discrimination
 - Interview with senior managers at TSYS and FICO (PYMNTS.com, Dec. 30, 2014)
 - “we are touching about 5 petabytes of data at any one point in time.”
 - Objective: “to take transactional data to combine it with other data, and then put it against [issuers’] strategy from a business perspective and execute against it.”
 - “One of the areas that we are addressing at the moment is how we can shift weekly and daily batch feeds of data into real transactional, real-time campaign effectiveness.”

Introduction

- Examples of Algorithmic Price Discrimination
 - TSYS-FICO Interview (cont.)
 - “We are seeing instances where if we add weather data or traffic pattern data into the mix, we start to see a different potential engagement model with the end consumer based on their spending habits. You can then develop a different campaign at any particular point in time. **That’s going to get a different engagement effect with a particular consumer based on what frame of mind they’re in at that point in time.**”

Introduction

- Examples of Algorithmic Price Discrimination
 - Airlines!
 - Home Depot [Hannak et al; mentioned by Christian]
 - Amazon's dynamic pricing
 - Gambling Industry [Natasha Schull] – uses algorithms in "dynamically responsive" ways:
 - "We'll be able to learn an individual customer's tolerance for loss and understand their sweet spots – each of us has a different spectrum and this technology will let us deliver bonuses at exactly the right moment."

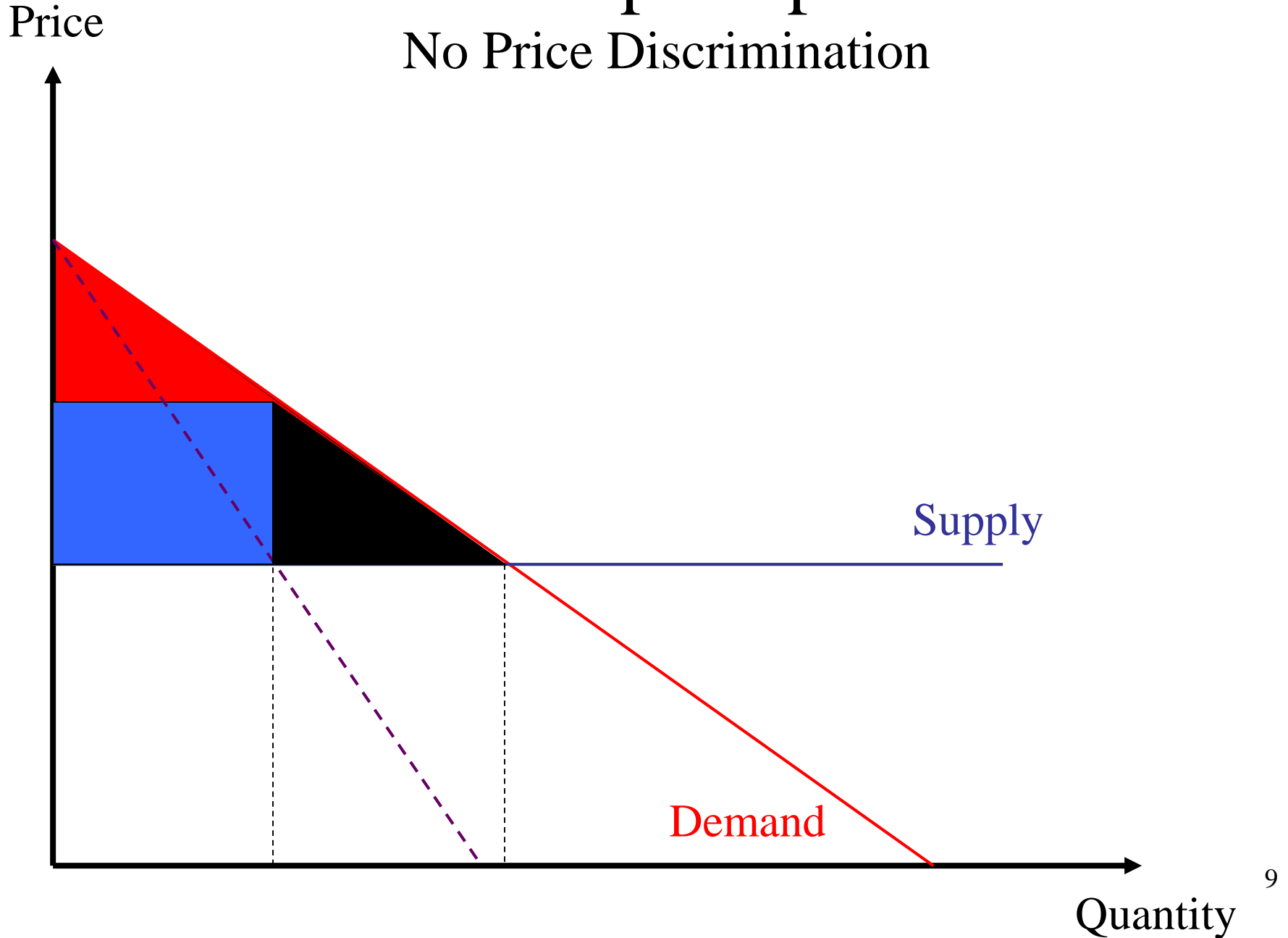
Introduction

- Normative questions:
 - Is this new level of price discrimination good or bad for consumers?
 - Does it increase or decrease social welfare?

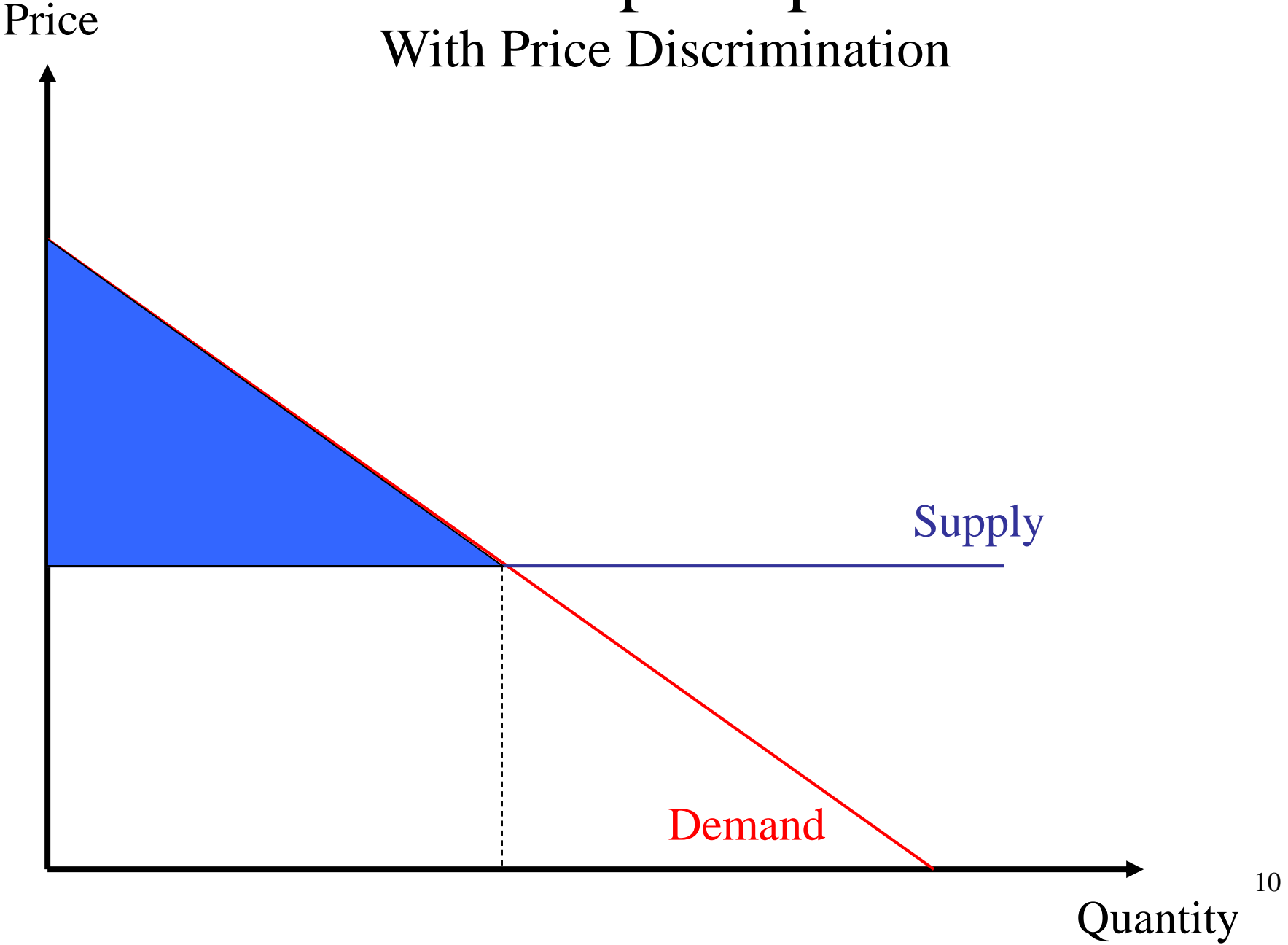
- Depends on the different components of consumers' WTP:
 - Preferences
 - Misperceptions

No Misperception

No Price Discrimination

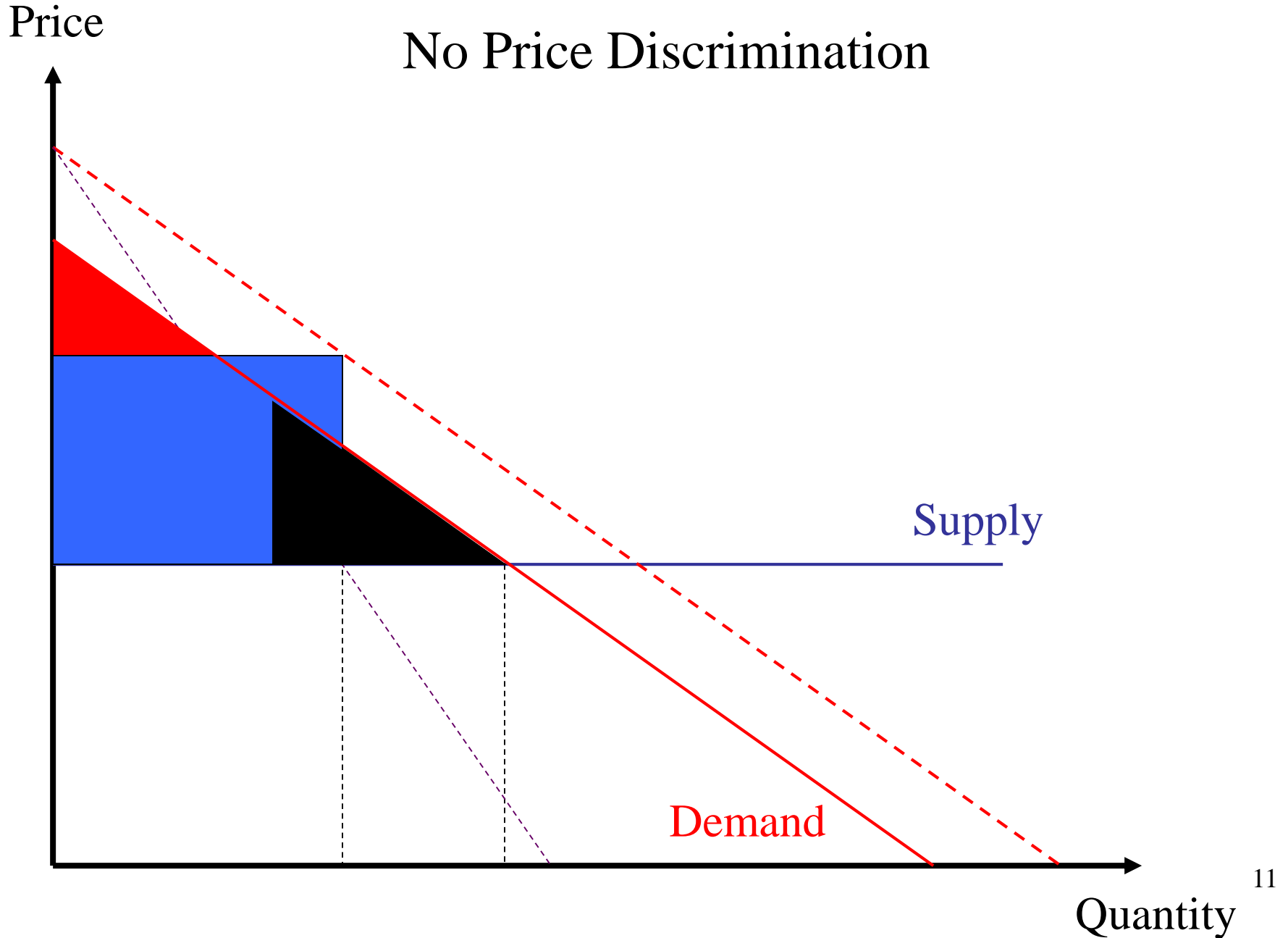


No Misperception With Price Discrimination

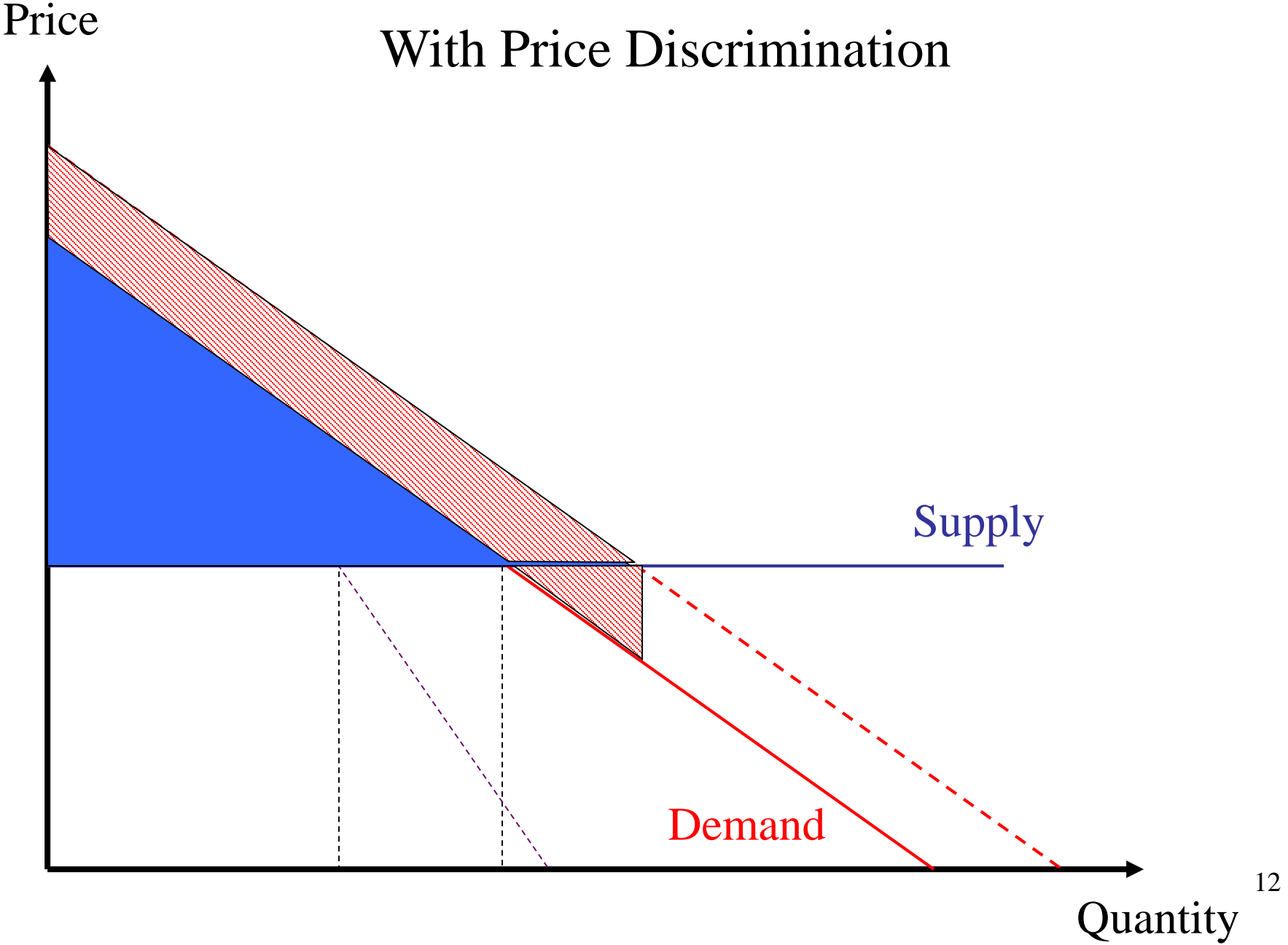


Overestimation

No Price Discrimination

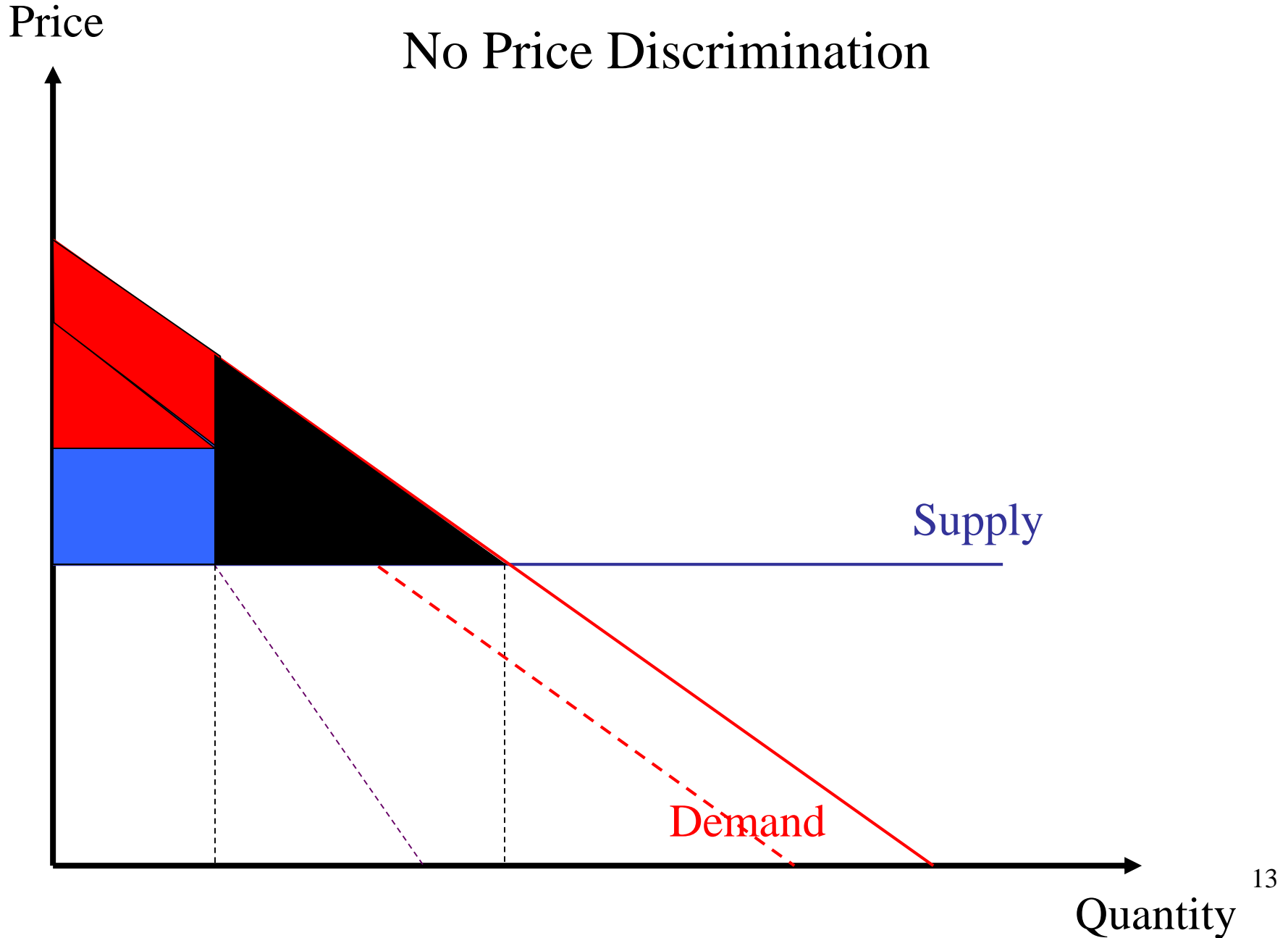


Overestimation With Price Discrimination



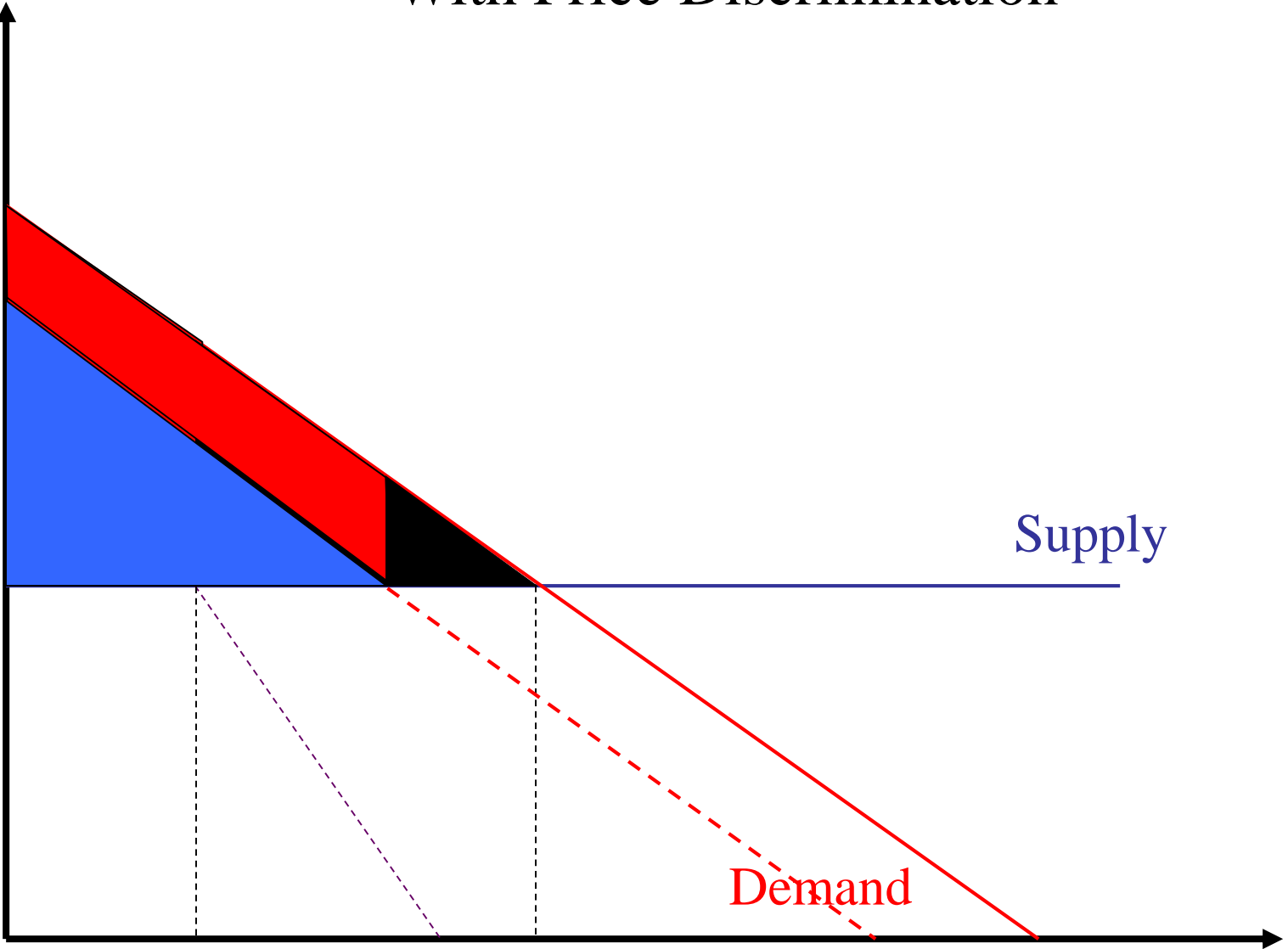
Underestimation

No Price Discrimination



Underestimation With Price Discrimination

Price



Quantity

TBA

- Non-uniform misperceptions
- Price misperception
(in addition to benefit misperception)

(Tentative) Conclusions

- $WTP = \text{Only Preferences}$
 - Price discrimination hurts consumers
 - But increases social welfare

- $WTP = \text{Preferences} + \text{Overestimation}$
 - Price discrimination hurts consumers
 - And may or may not increase social welfare

(Tentative) Conclusions

- $WTP = \text{Preferences} + \text{Underestimation}$
 - Price discrimination may or may not hurt consumers
 - And definitely increases social welfare