Measuring Ex-Ante Welfare in Insurance Markets

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Measuring Welfare in Insurance Markets

- Insurance markets with adverse selection can be inefficient
  - People may be willing to pay their cost of insurance
  - But equilibrium prices reflect average costs (Akerlof 1970)
  - Generates deadweight loss (DWL) from foregone efficient trades

- Recent literature quantifies these inefficiencies
  - Einav, Finkelstein, and Cullen (2010), Hackman, Kolstad, and Kowalski (2015), Handel, Kolstad, and Spinnewijn (2016), Cabral and Cullen (2016), Mahoney and Weyl (Forthcoming)

- Proposes comparing demand and cost curves (DWL) for thinking about optimal policy (e.g. subsidies/mandates)

But DWL is Not the Only Measure of Welfare

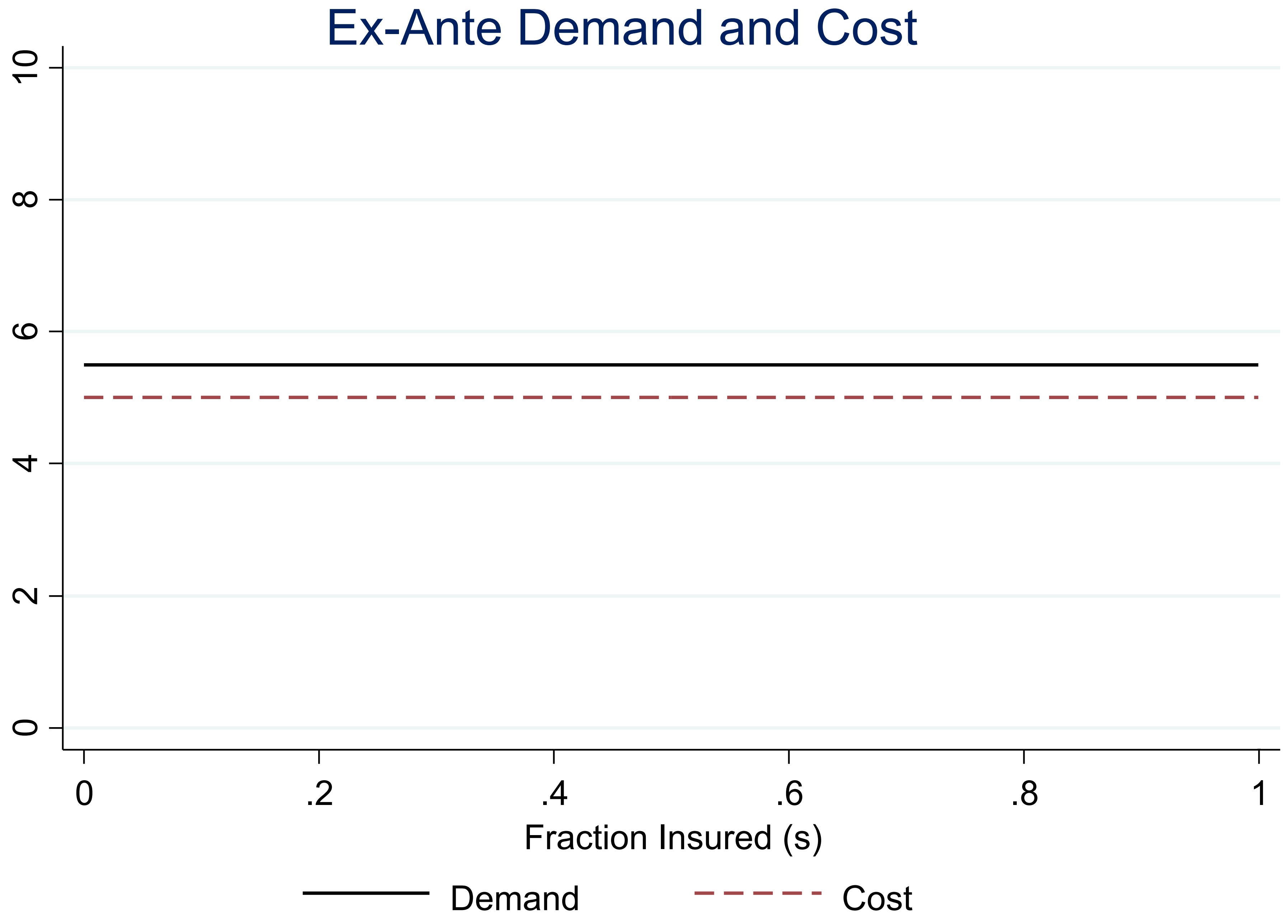
- Insurance demand depends on knowledge/beliefs of risk

- Individuals often have some knowledge about risk when measuring demand, generating adverse selection
  - LTC, Disability, Life insurance (Hendren, 2013)
  - Dental Insurance (Cabral, forthcoming)
  - Unemployment insurance (Hendren, 2016)
  - Health insurance (Cardon and Hendel, 2001; Handel, 2013; Handel, Hendel, and Whinston, 2015)

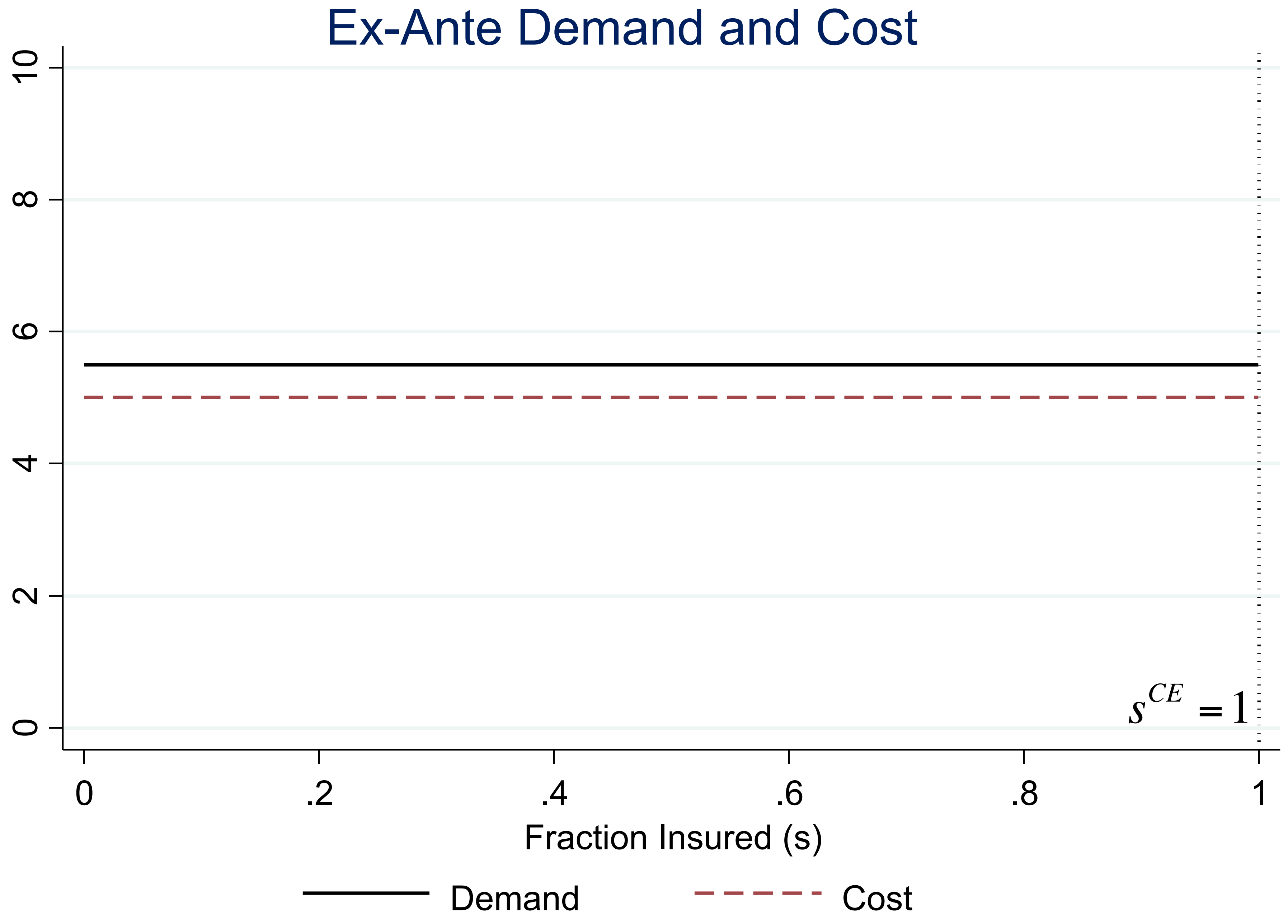
- DWL is unstable measure of welfare (Hirshleifer, 1971)
  - Value of foregone trades can be misleading for optimal policy analysis

Motivating Example

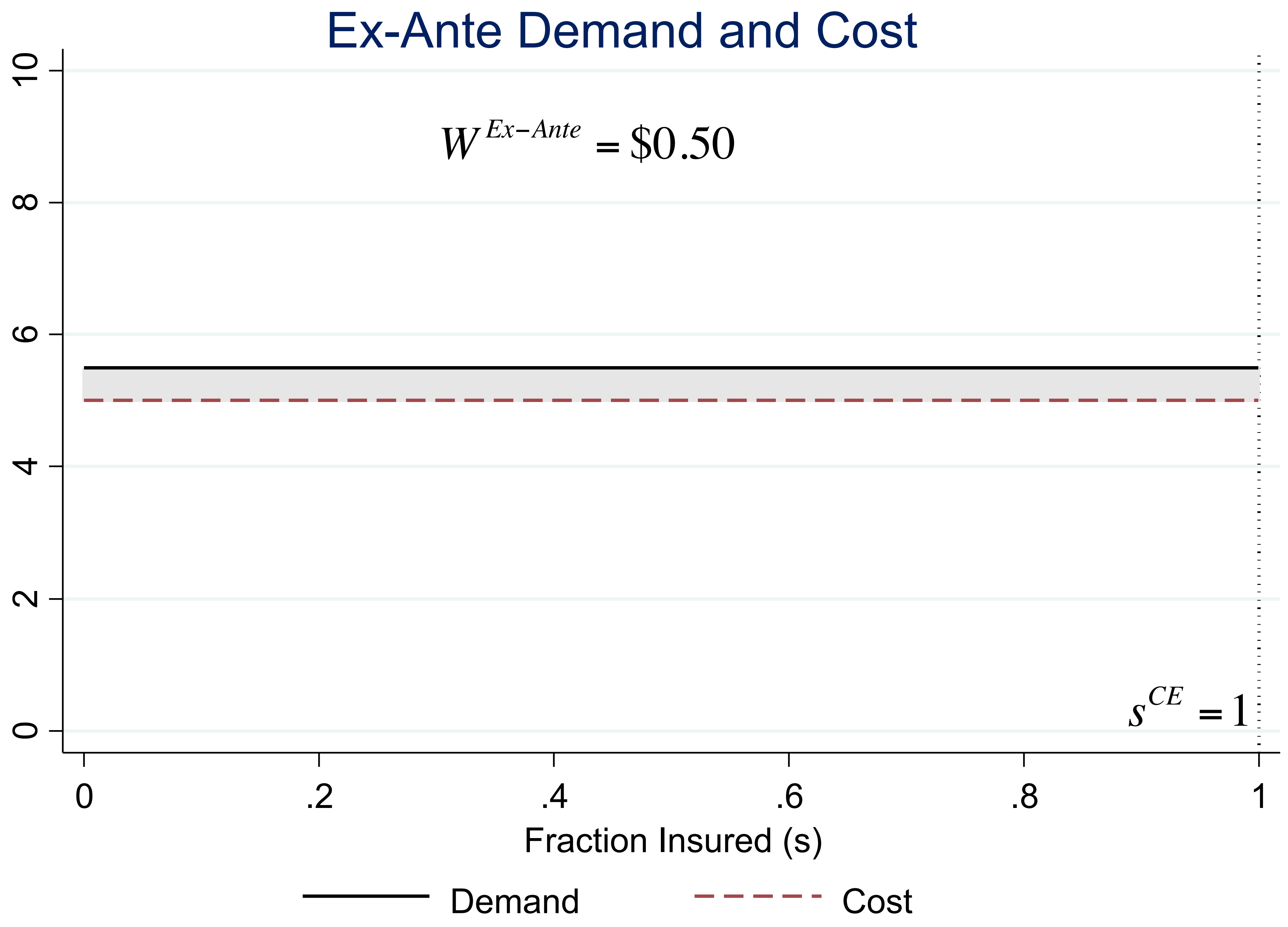
- Begin with simple example to illustrate issue and a solution
- Individuals have $30
- Face a risk of losing $m, uniformly distributed between 0 and 10
- Willing to pay $0.50 markup for full insurance if CRRA is 3
  - Indifferent between roughly $24.50 versus uniformly distributed consumption on [20 , 30]
  - Would be “efficient” for everyone to have $25 with certainty
    - Value of insurance market is $0.50
- How does this map to demand and cost curves?



Ex-Ante Demand and Cost
10
8
6
4
2
0
0
.2
.4
.6
.8
1
Fraction Insured (s)
Demand
Cost



Ex-Ante Demand and Cost
0
2
4
6
8
10
0
.2
.4
.6
.8
1
Fraction Insured (s)
$s^{CE} = 1$
Demand
Cost

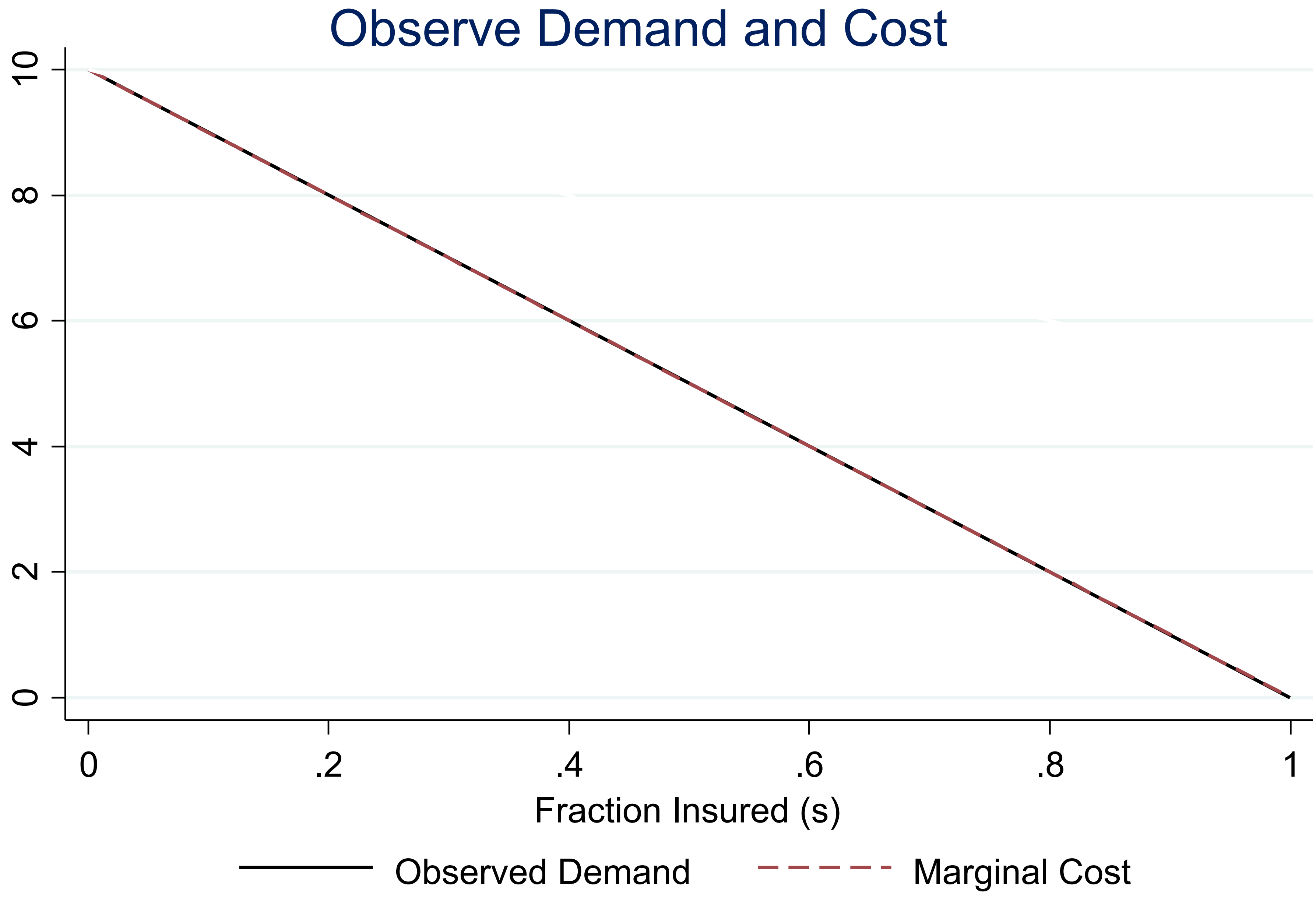

Ex-Ante Demand and Cost
$W^{Ex-Ante} = \$0.50$
$s^{CE} = 1$
0
2
4
6
8
10
0
.2
.4
.6
.8
1
Fraction Insured (s)
Demand
Cost

Motivating Example

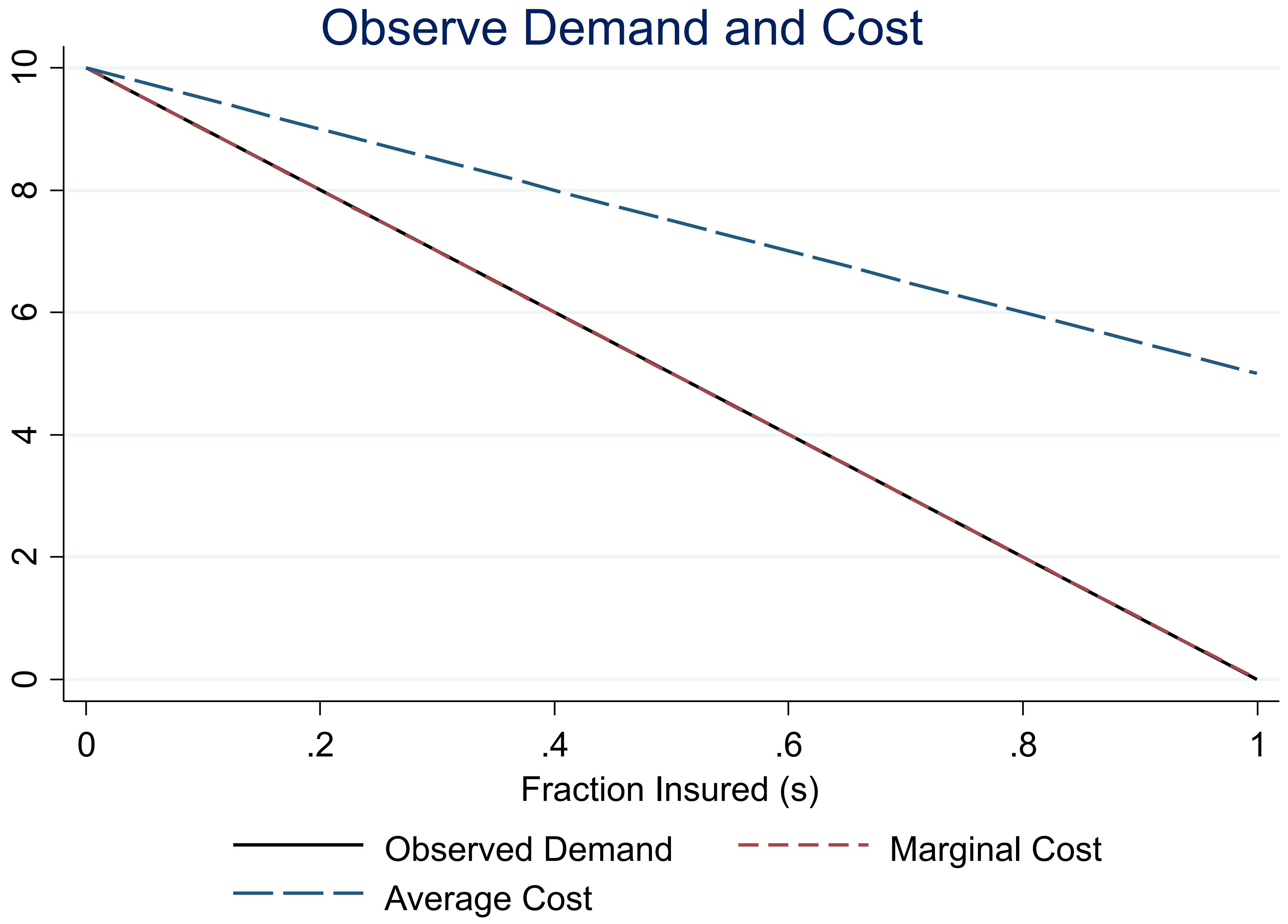
- What if people have information about their risk when we measure demand?

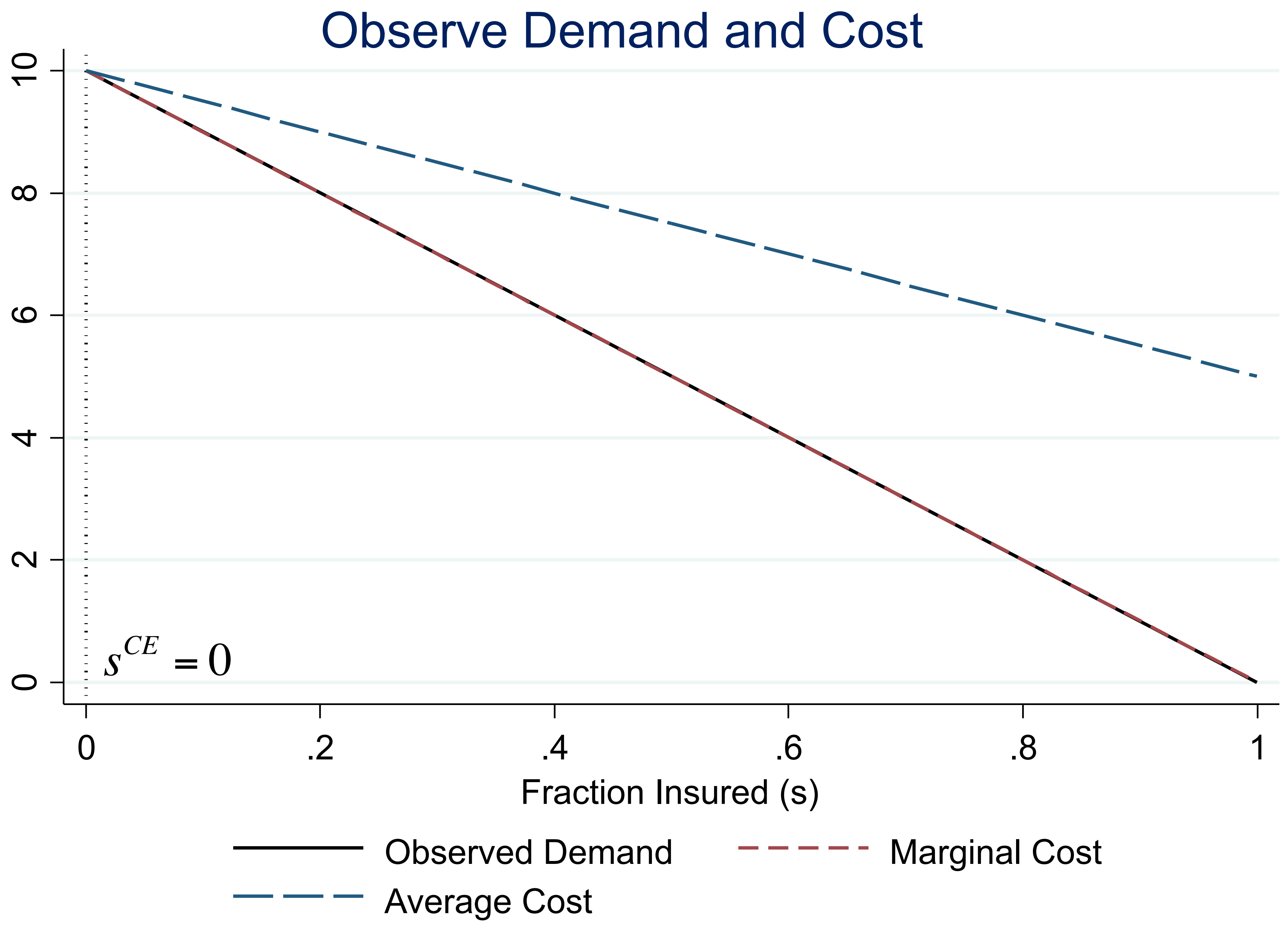
- Begin with extreme case: suppose individuals learn their loss

  - Willingness to pay equals cost, $D(s)=m(s)$

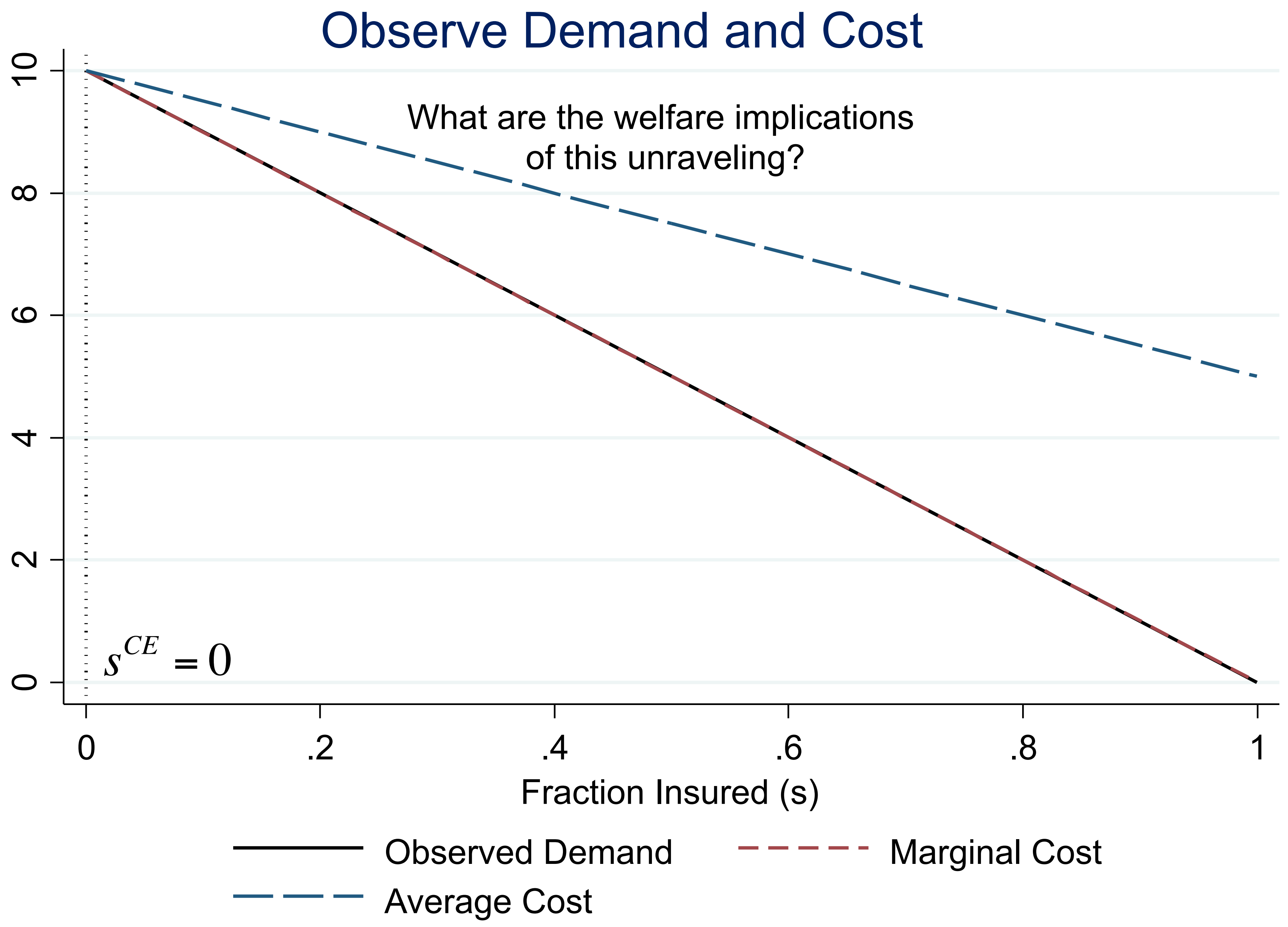


Observe Demand and Cost
10
8
6
4
2
0
0
.2
.4
.6
.8
1
Fraction Insured (s)
Observed Demand
Marginal Cost


Observe Demand and Cost
10
8
6
4
2
0
0
.2
.4
.6
.8
1
Fraction Insured (s)
Observed Demand
Marginal Cost
Average Cost

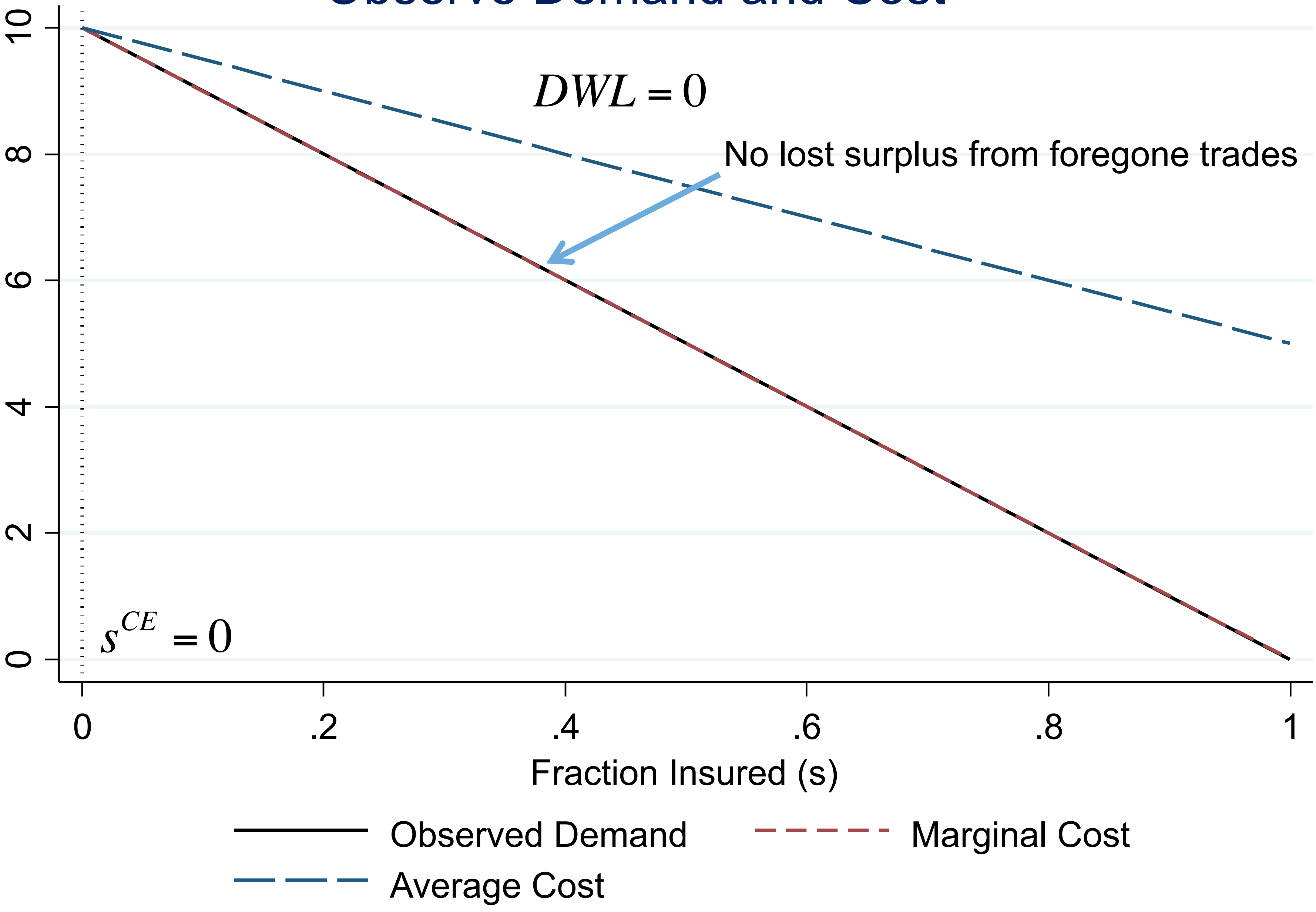


Observe Demand and Cost
10
8
6
4
2
0
$s^{CE} = 0$
0
.2
.4
.6
.8
1
Fraction Insured (s)
Observed Demand
Marginal Cost
Average Cost



Observe Demand and Cost
What are the welfare implications
of this unraveling?
$s^{CE} = 0$
0
2
4
6
8
10
0
.2
.4
.6
.8
1
Fraction Insured (s)
Observed Demand
Marginal Cost
Average Cost

Observe Demand and Cost



Motivating Example

- Observed demand does not capture the value of insurance against learning about your risk prior to demand measurement
  - Adverse selection implies a divergence between DWL and Ex-Ante Welfare

Motivating Example

- Observed demand does not capture the value of insurance against learning about your risk prior to demand measurement
  - Adverse selection implies a divergence between DWL and Ex-Ante Welfare
- **This paper:** Derive new "ex-ante" demand curve to facilitate welfare analysis from behind the veil of ignorance
  - Combine Einav, Finkelstein, and Cullen (2010) with Baily-Chetty

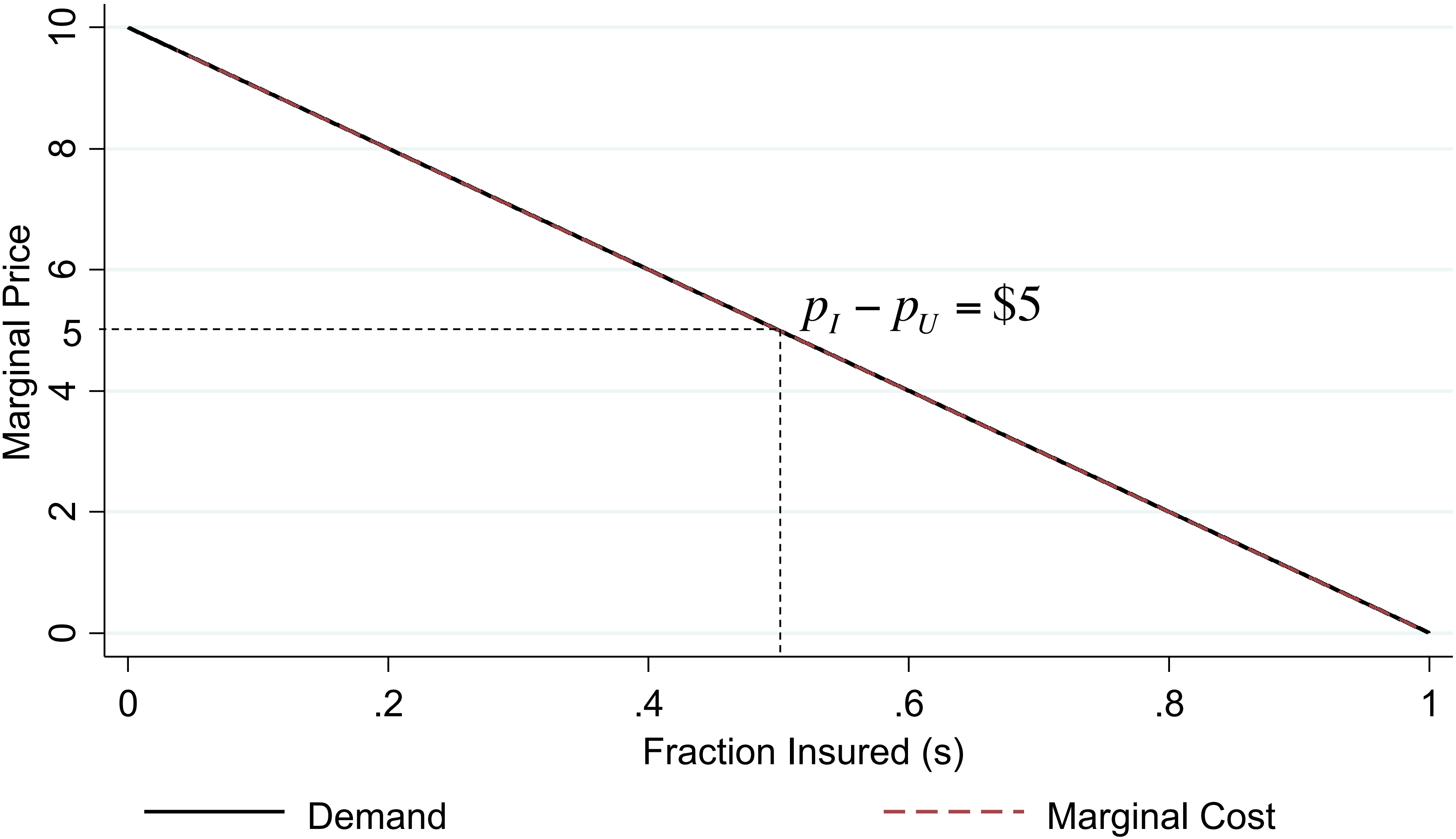
Motivating Example

- Dual philosophical motivation for using ex-ante demand:
  - **Ex-ante welfare** behind the veil of ignorance
  - **Ex-post welfare** using utilitarian aggregation
- Condition on any ex-ante known X if don't want redistribution across X
- Paper is primarily about ensuring that we have a consistent measure of welfare that is stable w.r.t. the amount of information people have when measuring demand

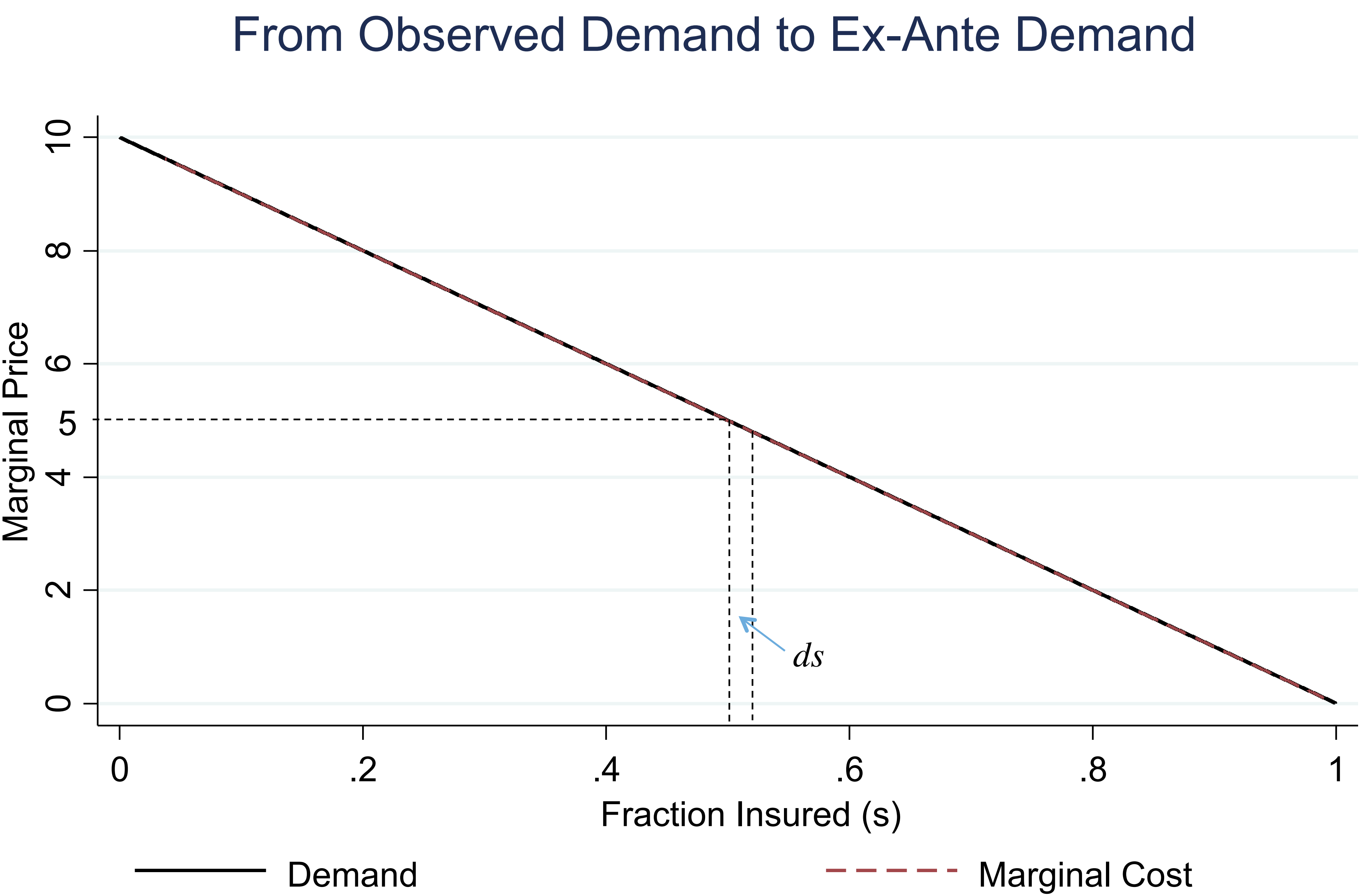
Deriving the Ex-Ante Demand Curve

- Return to example in which D(s)=m(s)
- Suppose $s = 50\%$ of the population has insurance
- Obtained by setting prices subject to a resource constraint:
  - Price of insurance, p_I
  - Price/penalty of being uninsured, p_U
  - Set so that $sp_I + (1-s)p_U = sAC(s)$

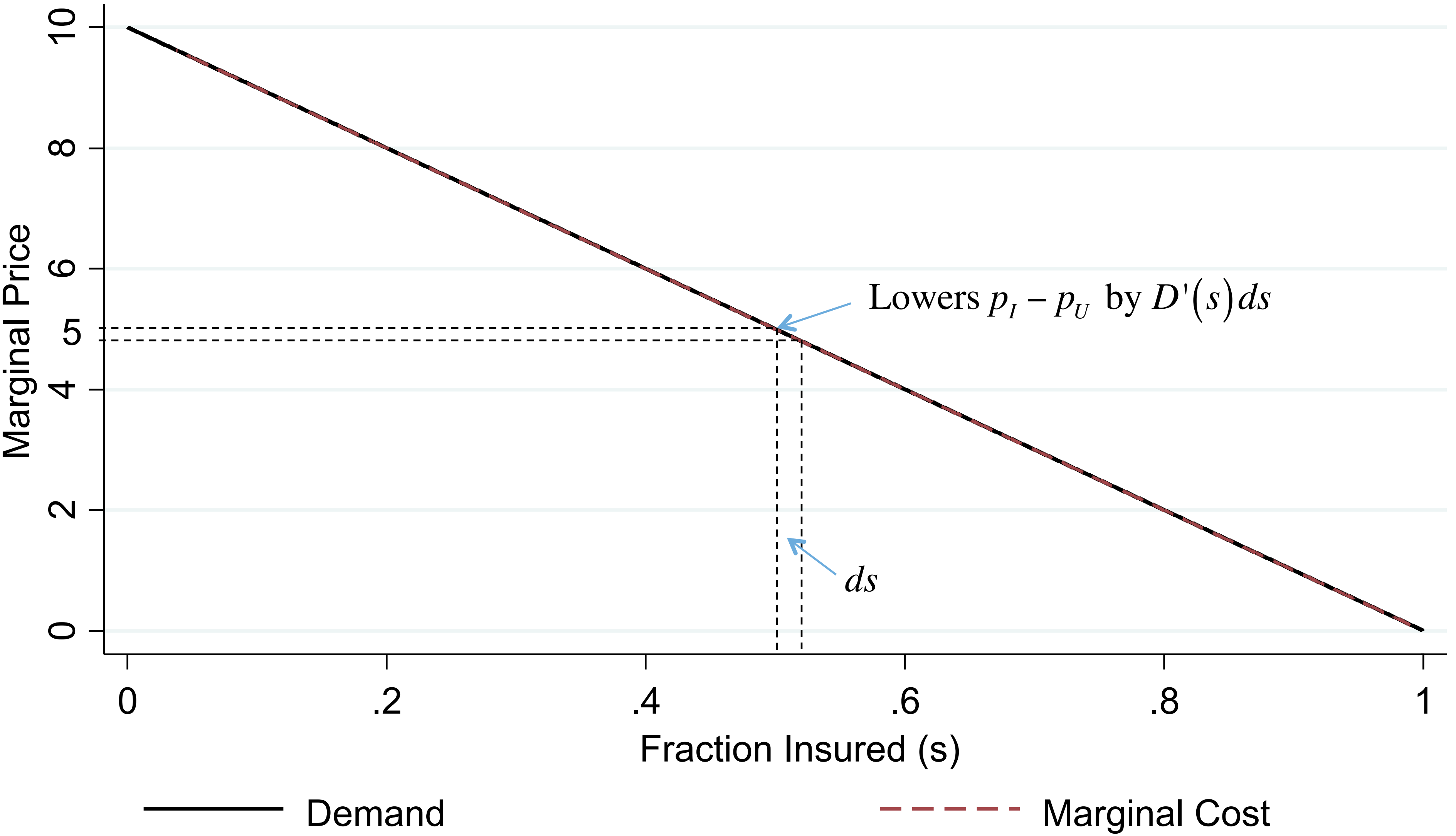
From Observed Demand to Ex-Ante Demand



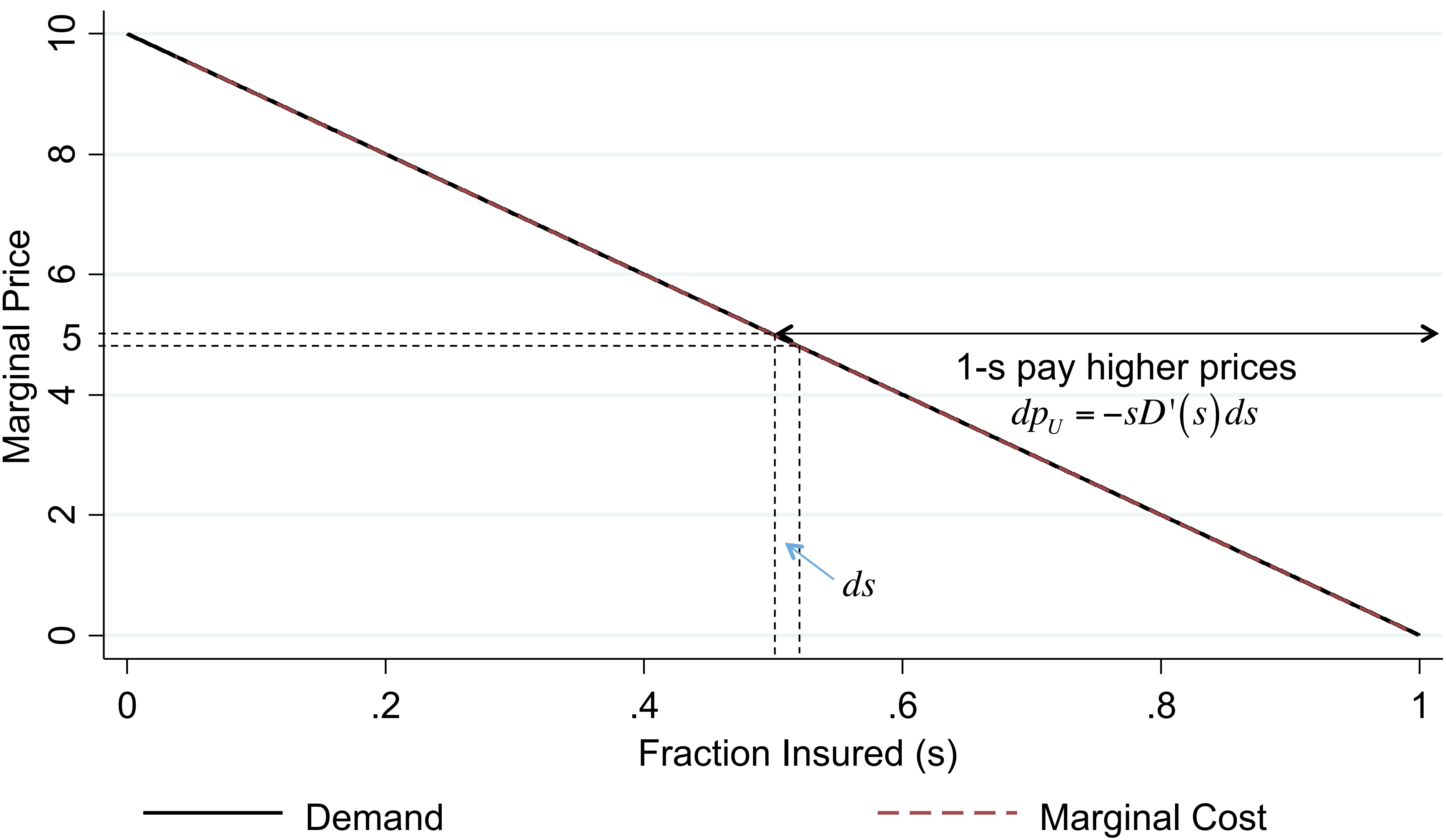
Price Calculation


From Observed Demand to Ex-Ante Demand
Marginal Price
10
8
6
5
4
2
0
0
.2
.4
.6
.8
1
Fraction Insured (s)
ds
Demand
Marginal Cost

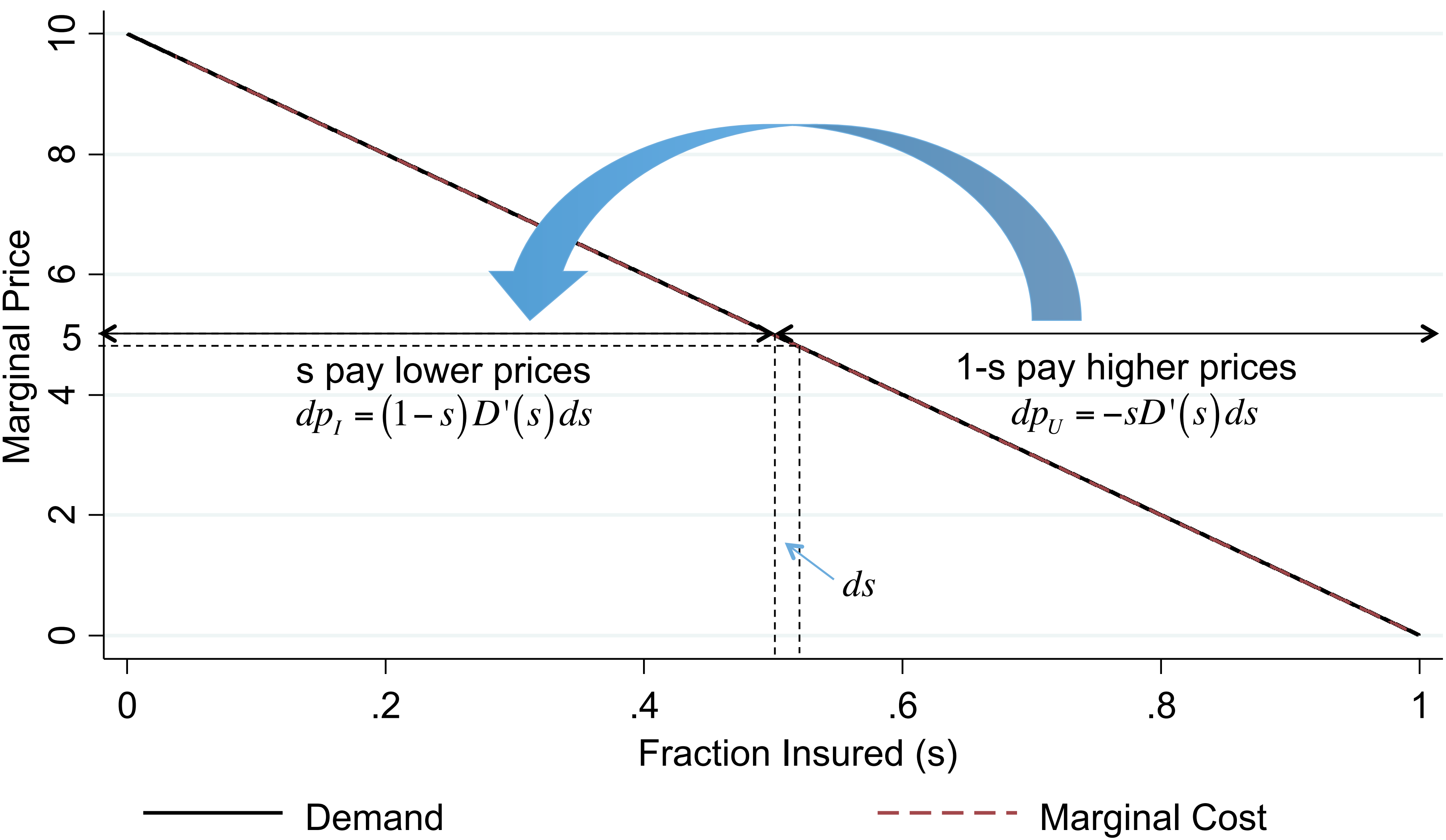
From Observed Demand to Ex-Ante Demand



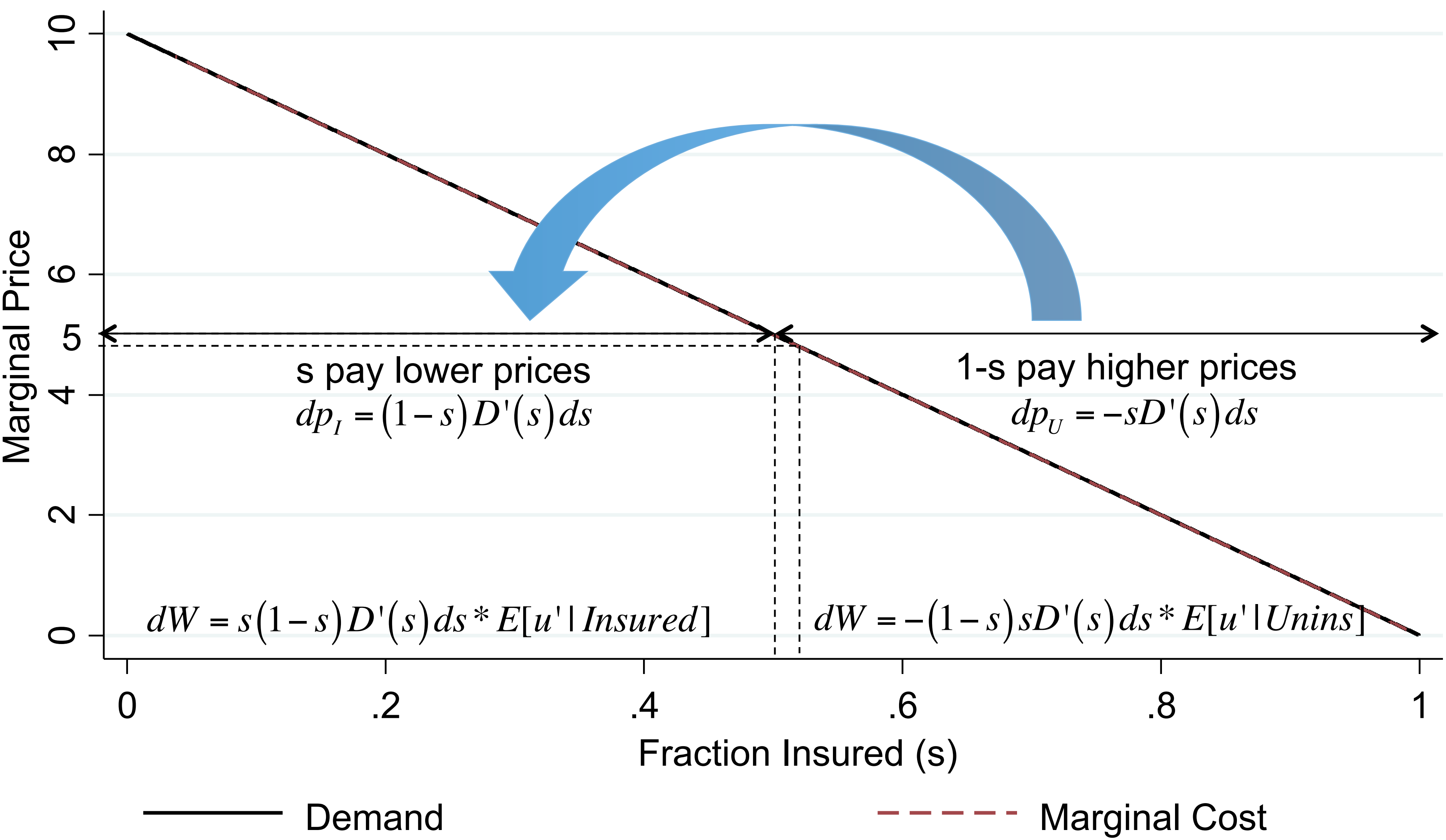
From Observed Demand to Ex-Ante Demand



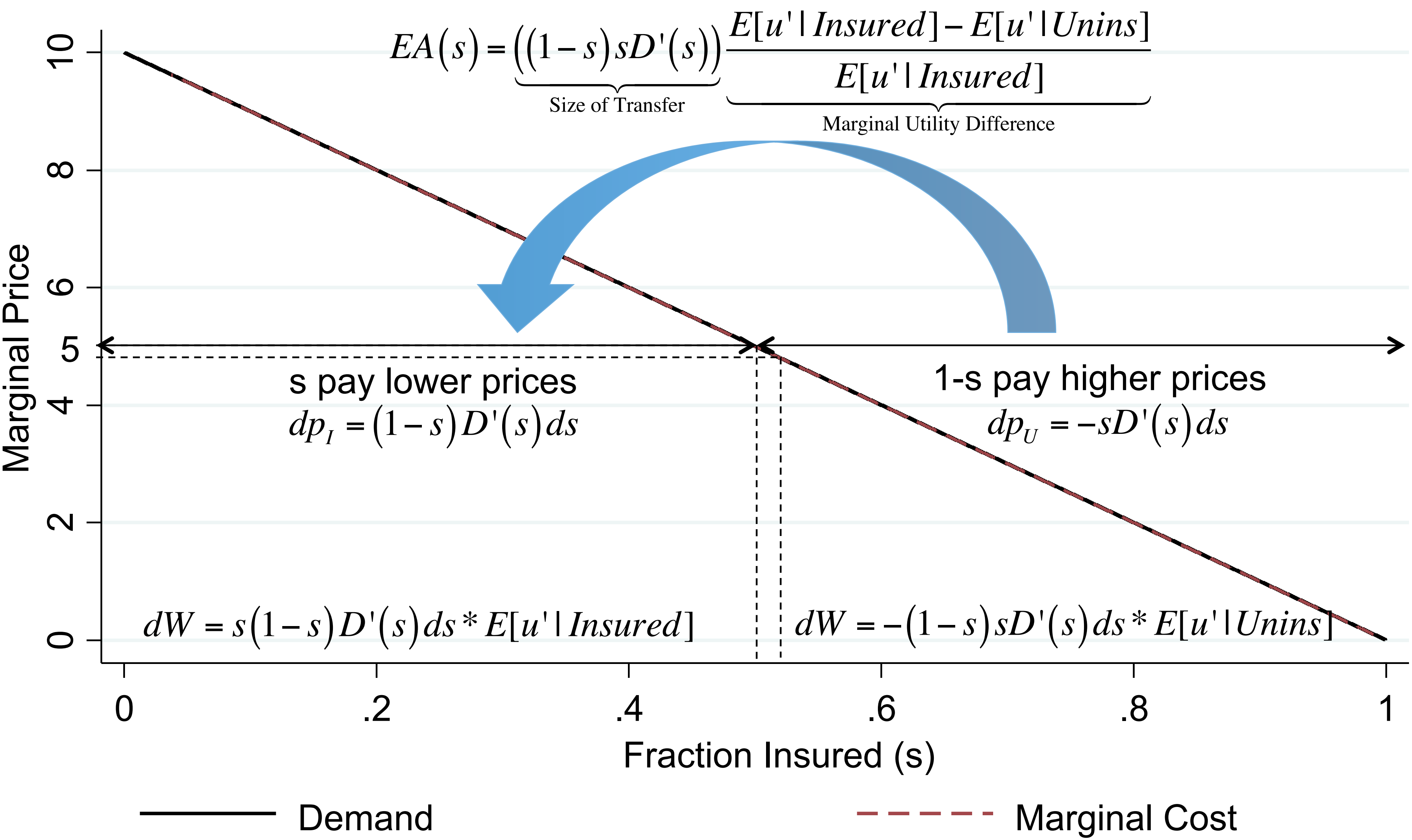
From Observed Demand to Ex-Ante Demand



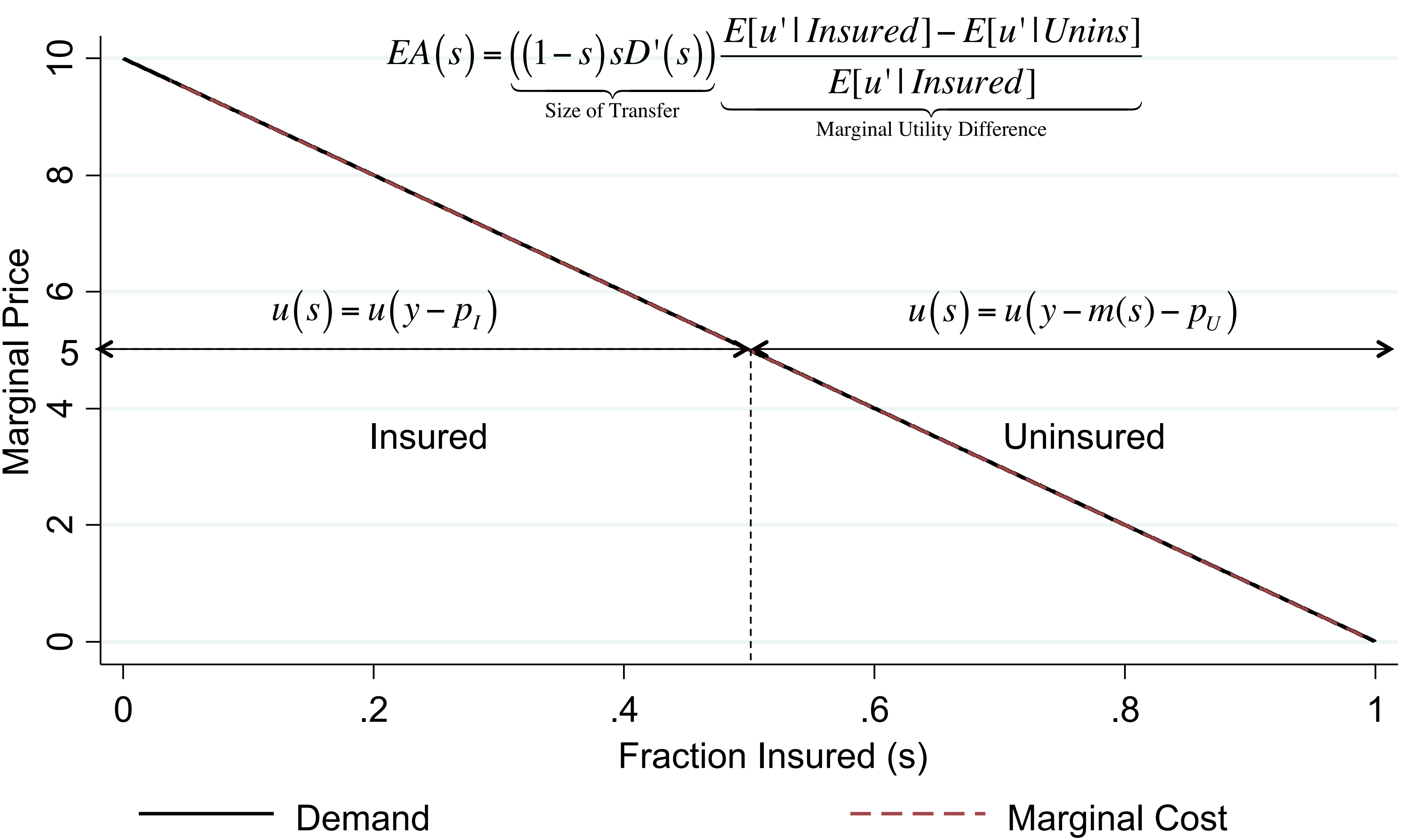
From Observed Demand to Ex-Ante Demand



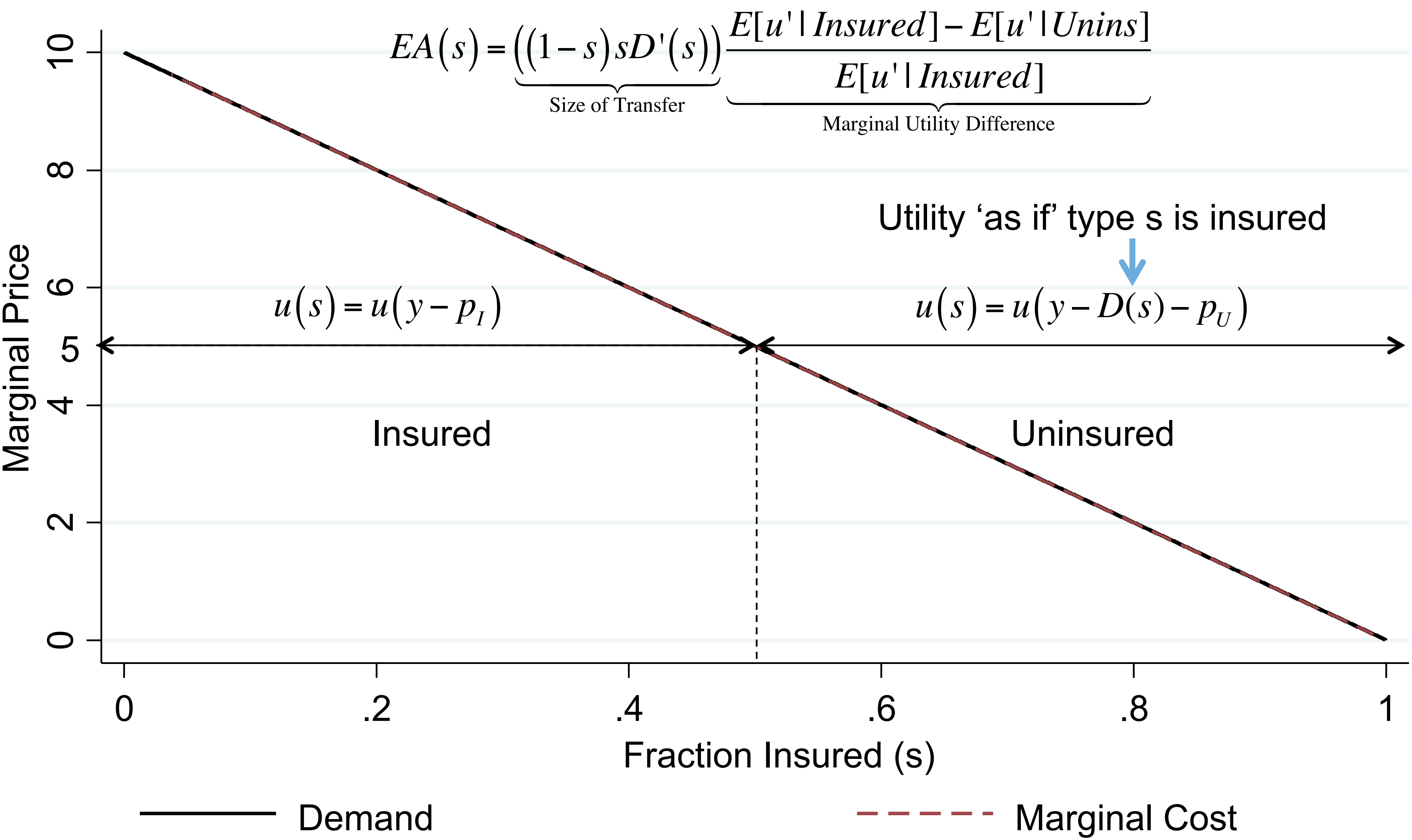
From Observed Demand to Ex-Ante Demand



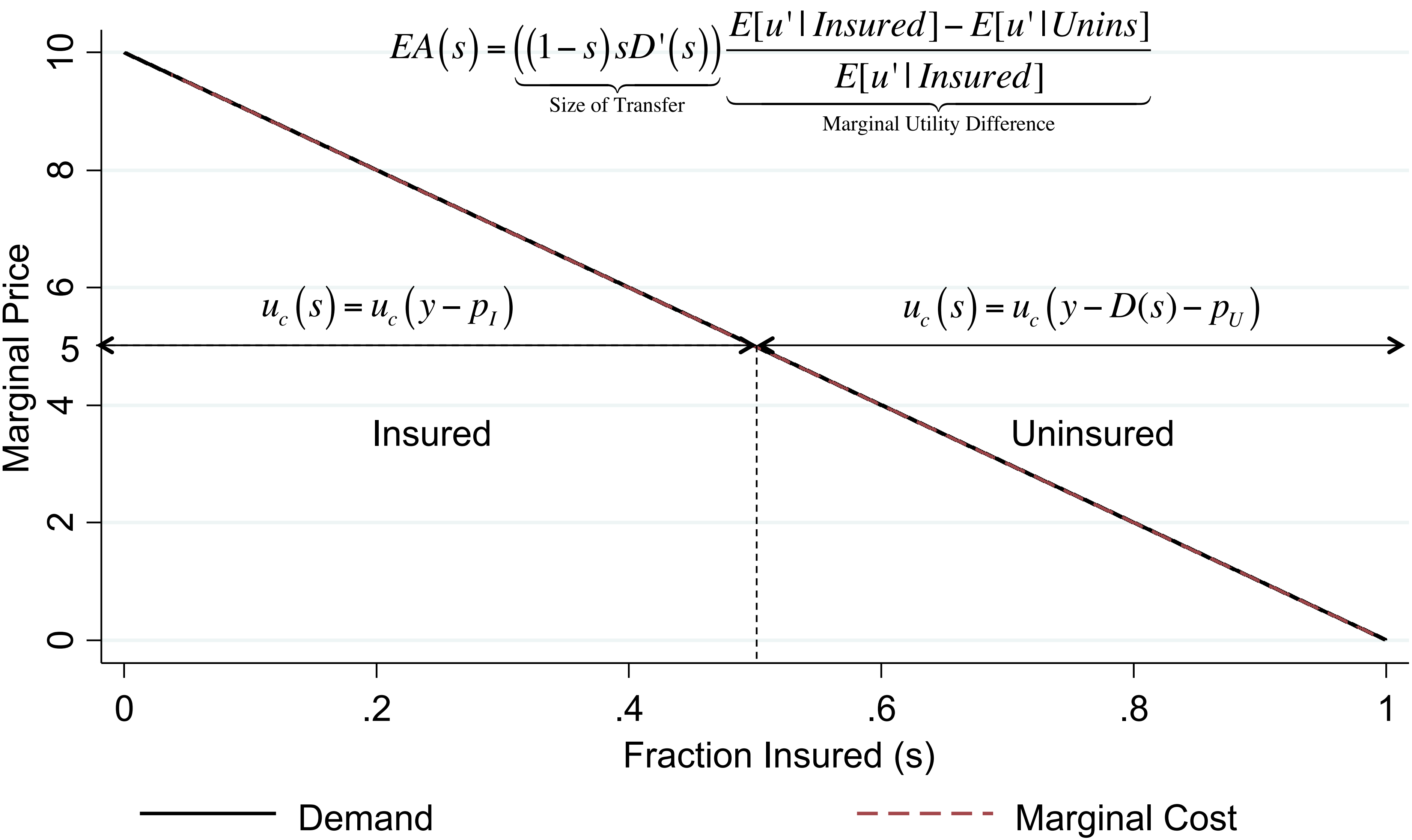
From Observed Demand to Ex-Ante Demand



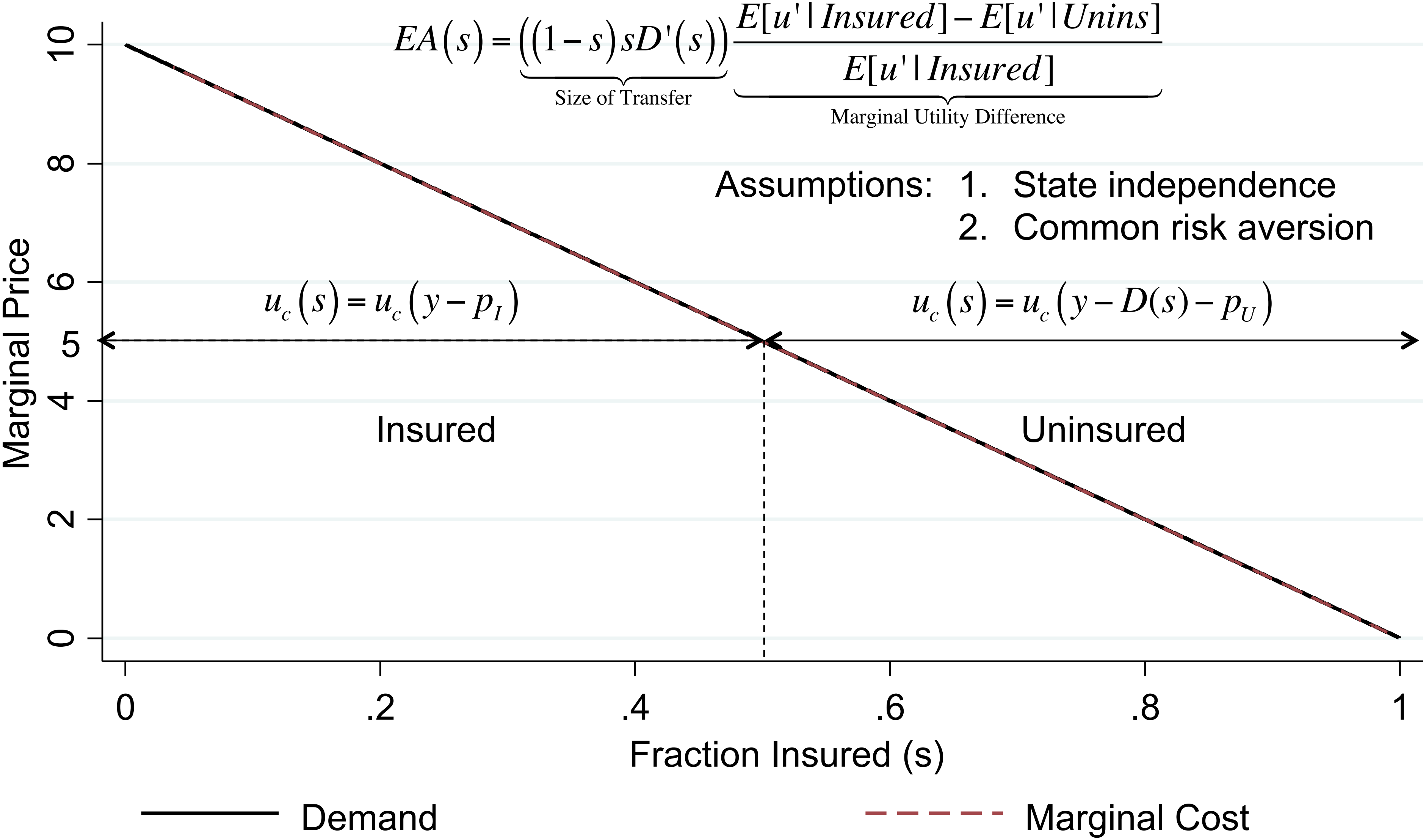
From Observed Demand to Ex-Ante Demand



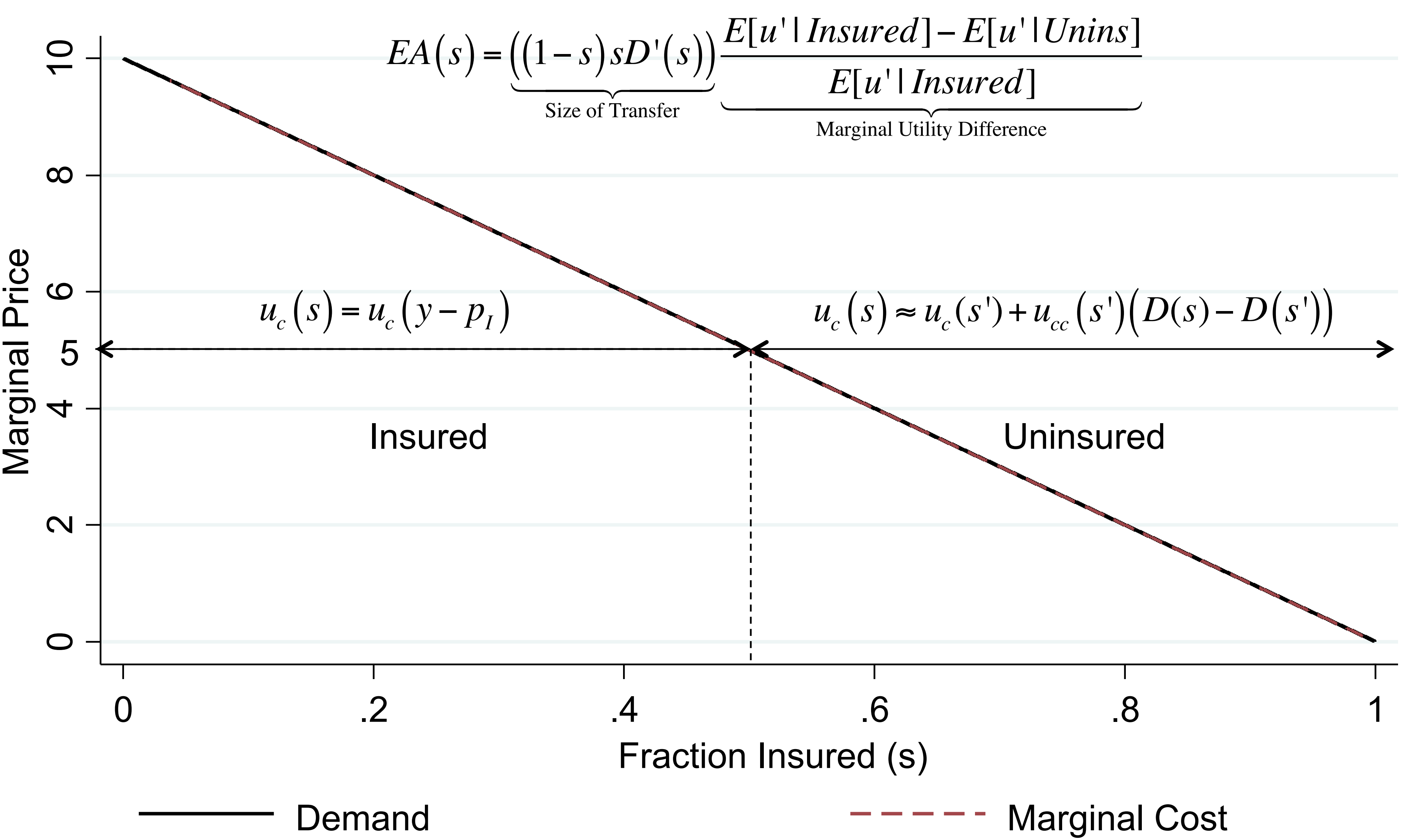
From Observed Demand to Ex-Ante Demand

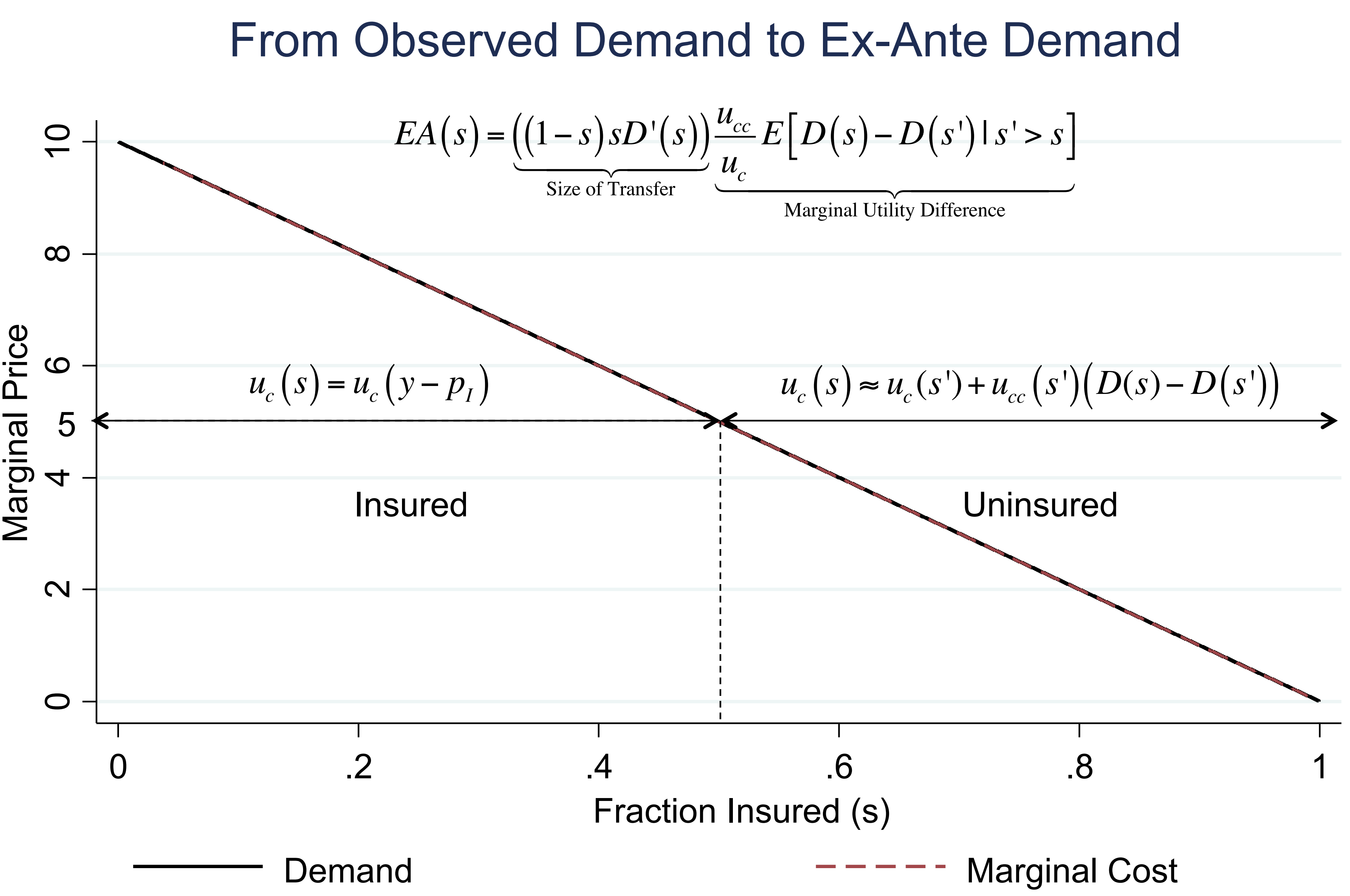


From Observed Demand to Ex-Ante Demand

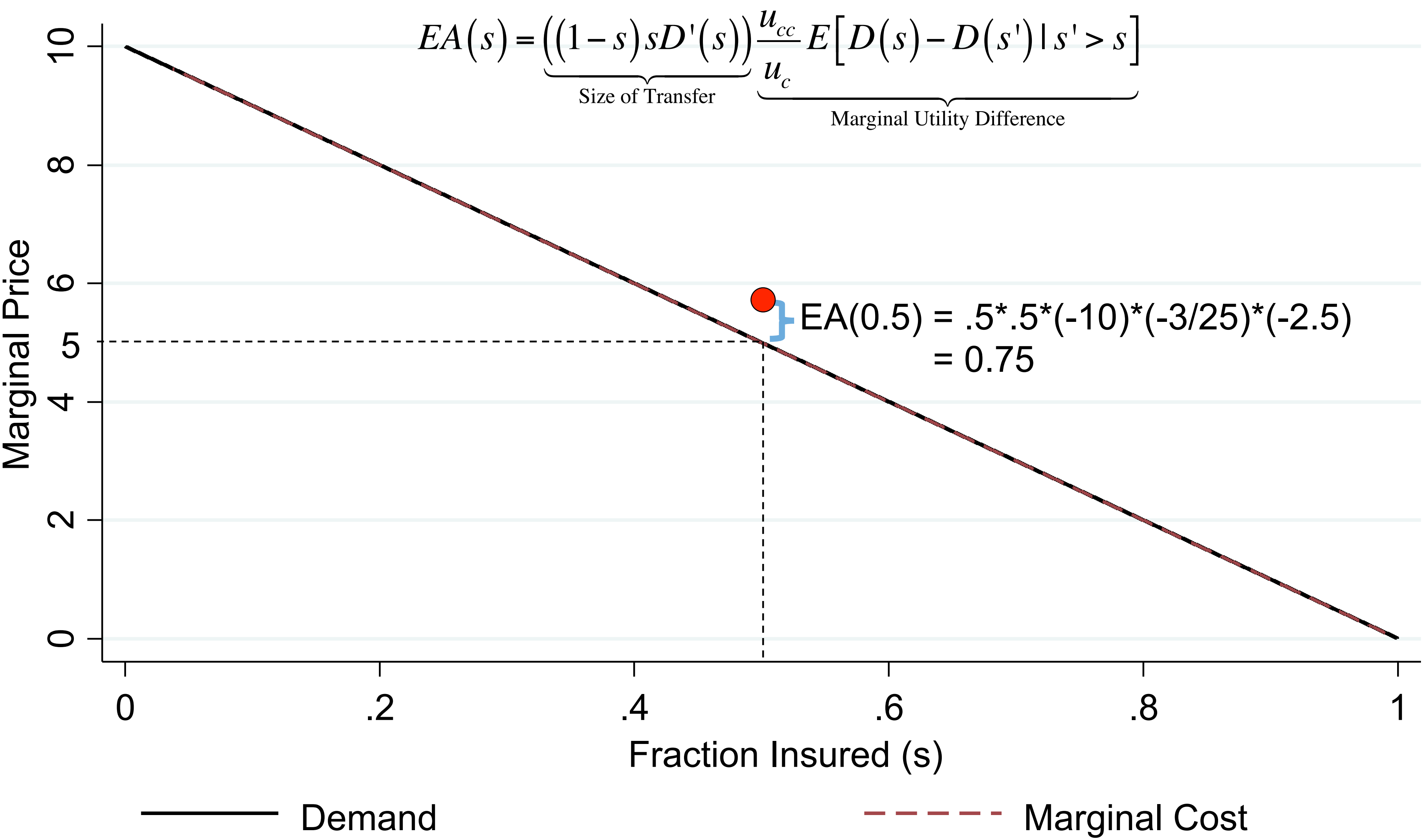


From Observed Demand to Ex-Ante Demand

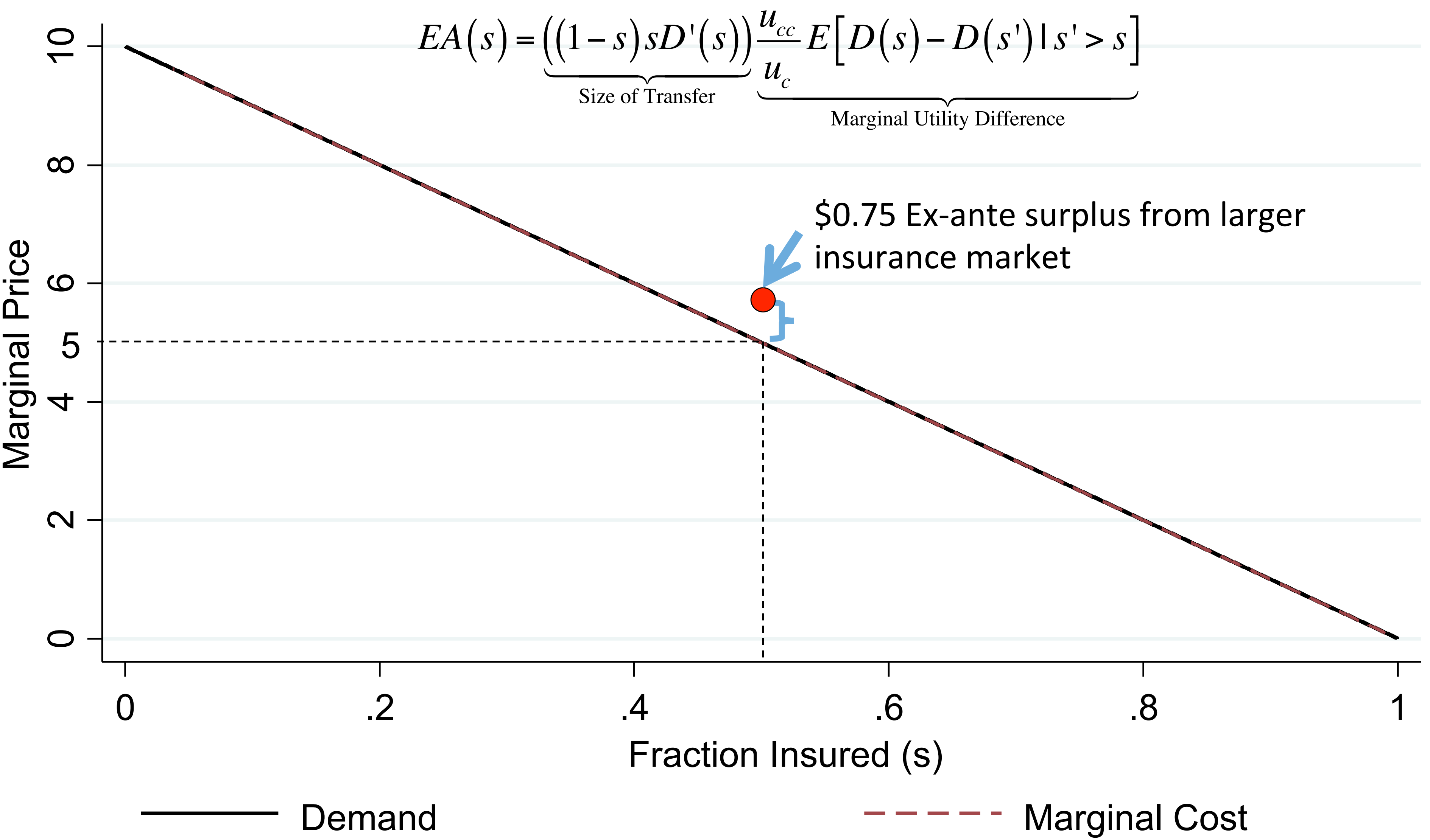


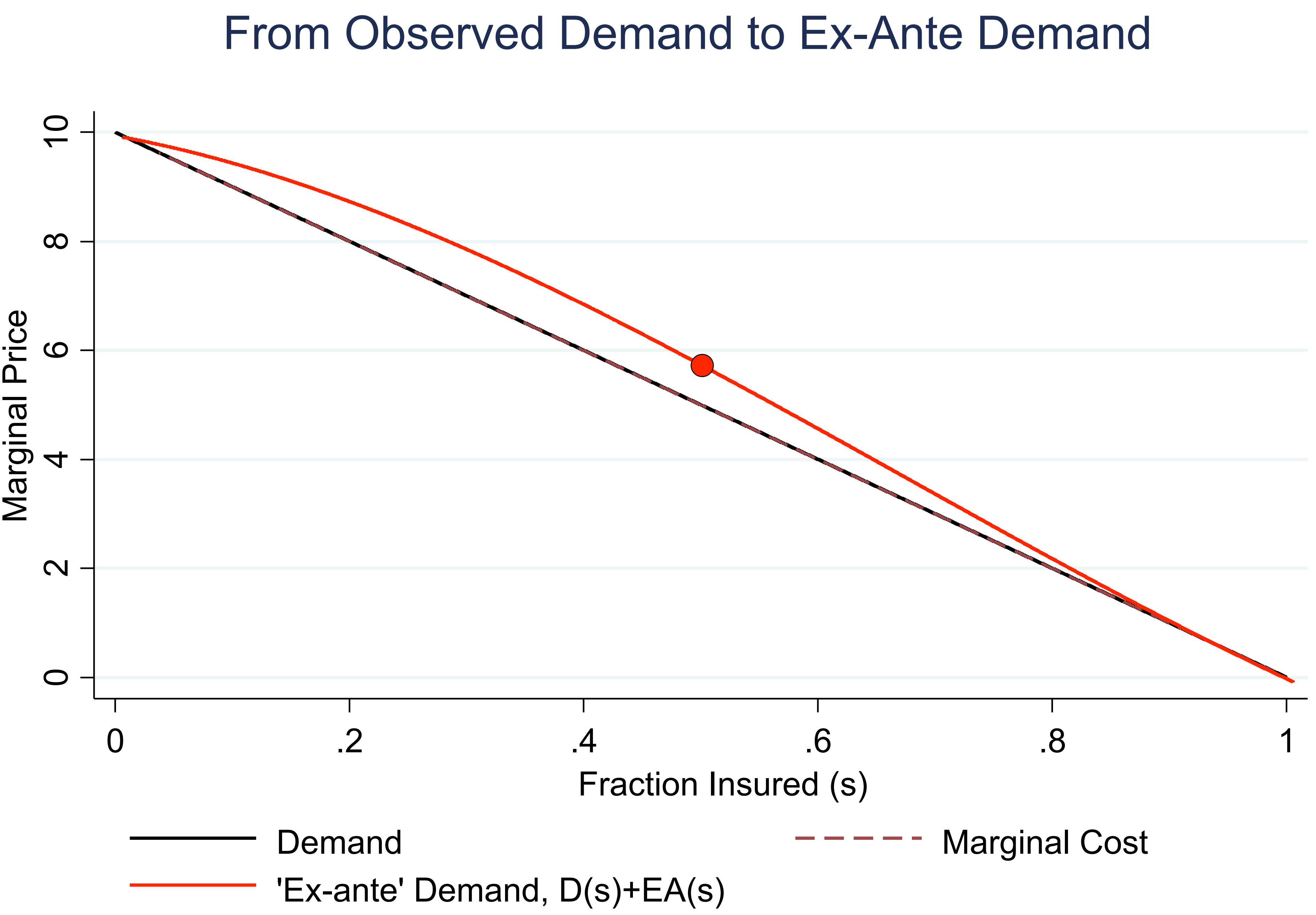

From Observed Demand to Ex-Ante Demand
$EA(s) = ((1-s)sD'(s)) \frac{u_{cc}}{u_c} E[D(s) - D(s') | s' > s]$
Size of Transfer
Marginal Utility Difference
$u_c(s) = u_c(y - p_I)$
$u_c(s) \approx u_c(s') + u_{cc}(s')(D(s) - D(s'))$
Insured
Uninsured
Marginal Price
Fraction Insured (s)
Demand
Marginal Cost

From Observed Demand to Ex-Ante Demand

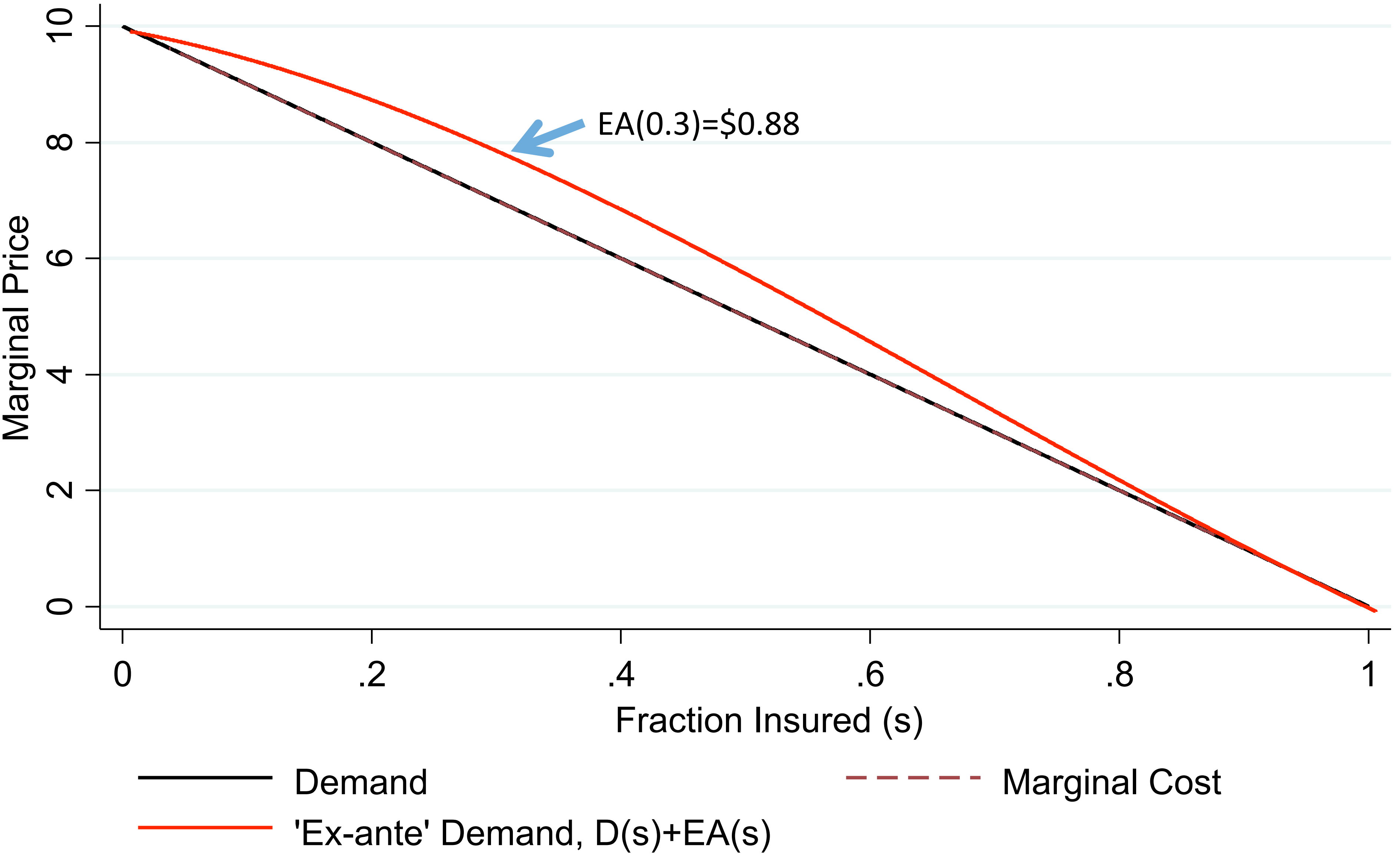


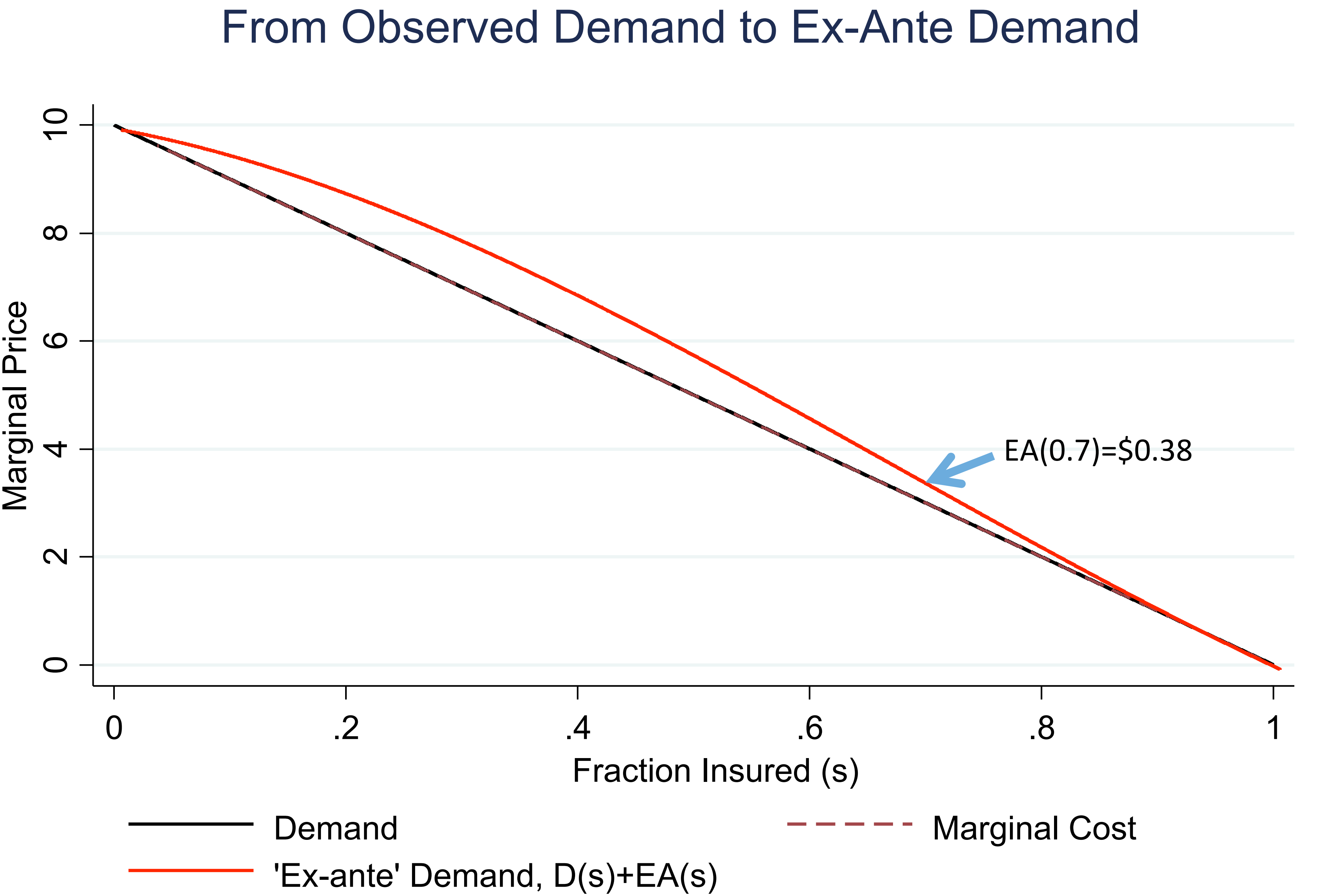
From Observed Demand to Ex-Ante Demand

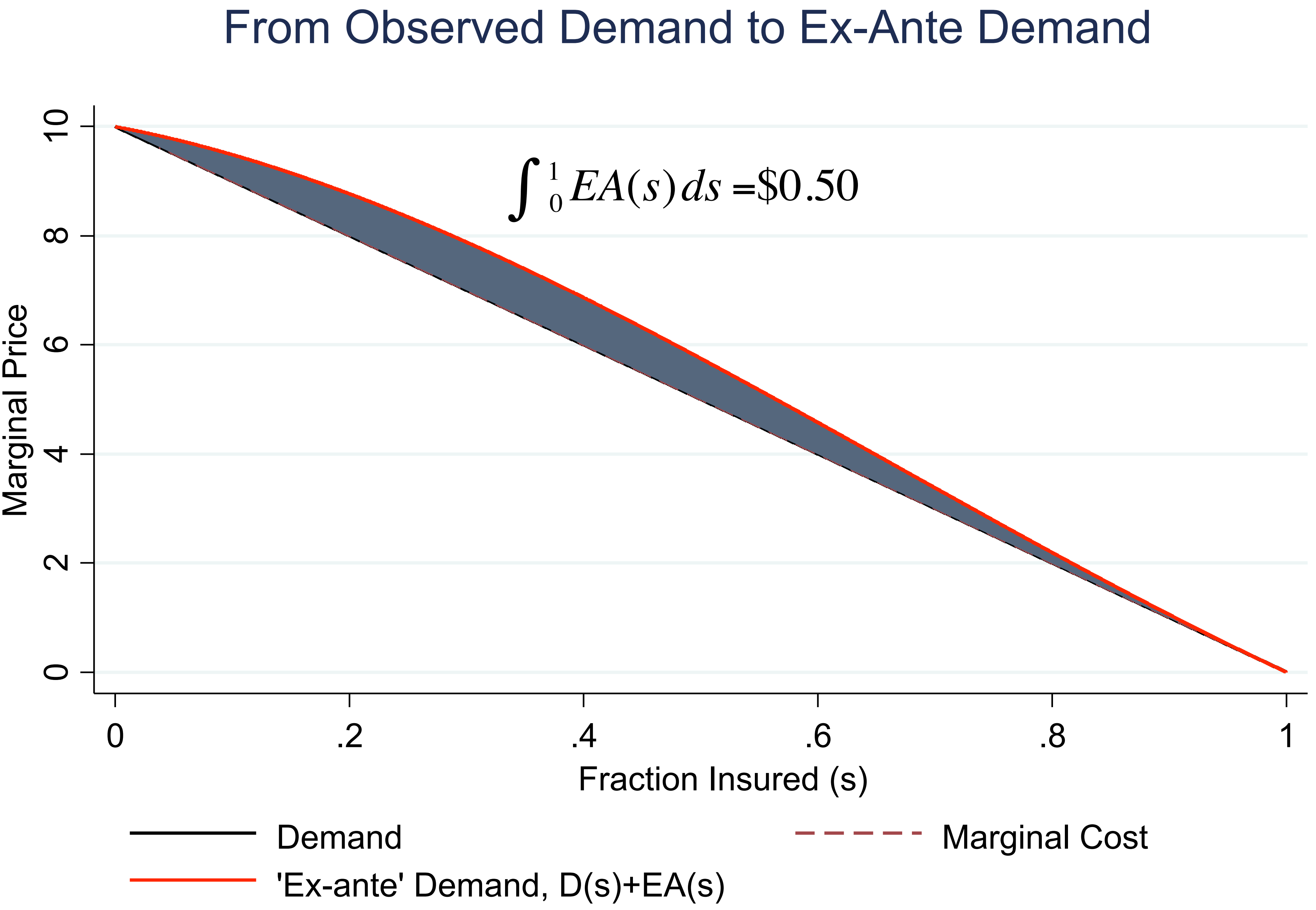


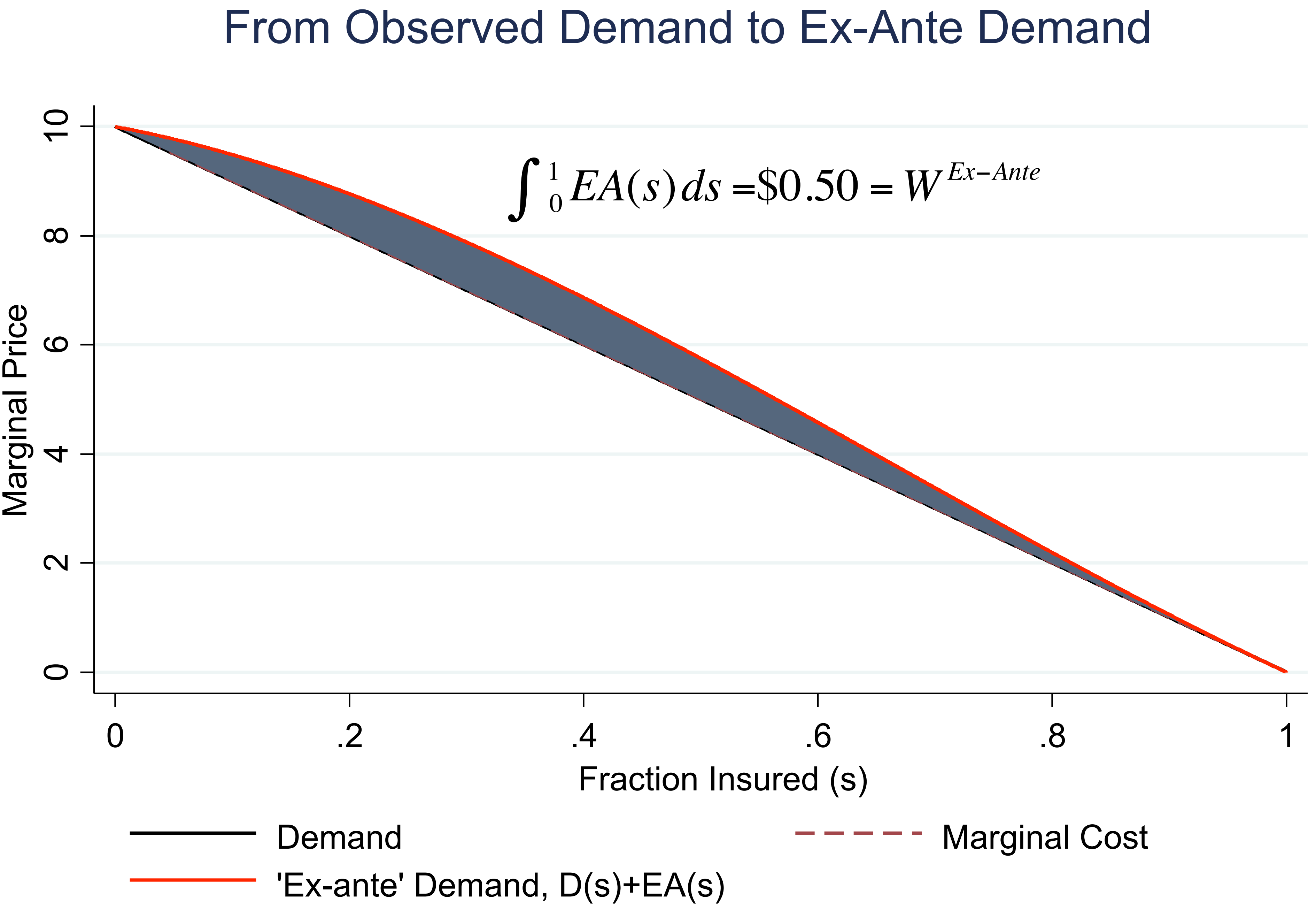

From Observed Demand to Ex-Ante Demand
Marginal Price
0
2
4
6
8
10
0
.2
.4
.6
.8
1
Fraction Insured (s)
Demand
Marginal Cost
'Ex-ante' Demand, D(s)+EA(s)

From Observed Demand to Ex-Ante Demand




From Observed Demand to Ex-Ante Demand
Marginal Price
0
2
4
6
8
10
0
.2
.4
.6
.8
1
Fraction Insured (s)
EA(0.7)=$0.38
Demand
Marginal Cost
'Ex-ante' Demand, D(s)+EA(s)


From Observed Demand to Ex-Ante Demand
$\int_0^1 EA(s)\,ds = \$0.50$
Marginal Price
10
8
6
4
2
0
0
.2
.4
.6
.8
1
Fraction Insured (s)
Demand
Marginal Cost
'Ex-ante' Demand, D(s)+EA(s)



From Observed Demand to Ex-Ante Demand
$\int_0^1 EA(s)\,ds = \$0.50 = W^{Ex-Ante}$
Marginal Price
10
8
6
4
2
0
0
.2
.4
.6
.8
1
Fraction Insured (s)
Demand
Marginal Cost
'Ex-ante' Demand, D(s)+EA(s)

DWL versus Ex-Ante WTP

- Ex-ante demand curve facilitates ex-ante/utilitarian welfare analysis
  - Even though demand is measured after information is revealed

- Ex-ante (ex-post utilitarian) surplus can lead to different conclusions about the value of insurance
  - Ex-ante efficient to have full insurance
  - No value to insurance market after info is revealed
    - (Strictly positive DWL if there was moral hazard)

Outline

- Simple Example
- General Model
- Illustration with Optimal Health Insurance
- Optimal open enrollment periods

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General Model

- Goal: Nest demand and cost curves into general utility setup
- Use underlying utility function structure to derive sufficient statistics to measure ex-ante/utilitarian value of insurance
- Use language of health insurance
  - Paper illustrates how to nest into other settings (e.g. UI)

General Model

- Individuals choose consumption, c, and medical spending, m
  - Face (health) shock, θ
  - Income, y (potentially dependent on θ)
  - Utility $u(c,m;\theta)$
- Insurance product allows payment of x(m) instead of m
  - Prices p_I and p_U of being insured and uninsured s.t. resource constraint
  - Learn signal about θ at time of measuring demand
  - Let s denote fraction purchasing insurance
  - Fraction insured solves: $D(s) = p_I - p_U$
- Average Cost: $AC(s) = E\left[m(s';\theta) - x(m(s';\theta)) \mid s' \geq s = D^{-1}(p_I - p_U)\right]$
- Marginal Cost: $MC(s) = \frac{d}{ds}\left[sAC(s)\right] = AC(s) + sAC'(s)$

General Model

- Ex-ante/Utilitarian welfare when fraction s has insurance

$$W(s) = E\left[u(c\left(s;\theta\right),m\left(s;\theta\right);\theta)\right]$$

General Model

- Ex-ante/Utilitarian welfare when fraction s has insurance

$$W(s) = E\left[u(c(s;\theta), m(s;\theta);\theta)\right]$$

- Ex-ante WTP for larger insurance market:

$$\frac{W'(s)}{E[u' \mid Insured]} = \underbrace{D(s) - MC(s)}_{\text{Ex-Post Surplus}} + EA(s)$$

where

$$EA(s) = \underbrace{(1-s)\left(MDWL(s) - s\frac{\partial D}{\partial s}\right)}_{\text{Size of Transfer}} \underbrace{\frac{E\left[u'(s) \mid Insured\right] - E\left[u'(s) \mid Uninsured\right]}{E\left[u'(s) \mid Insured\right]}}_{\text{Marginal Utility Difference}}$$

  - Adjust size of transfer for MDWL=MC(s)-D(s)

Implementation

- Use common assumptions to approximate difference in marginal utilities between insured and uninsured
  - State independence: u_c only depends on c
  - Income doesn't vary with s
  - Common risk aversion (Andrews and Miller, 2013)
- Implies:

$$EA(s) = \underbrace{(1-s)\left(MDWL(s) - s\frac{\partial D}{\partial s}\right)}_{\text{Size of Transfer}}\underbrace{\left(\frac{-u_{cc}}{u_c}\right)E\left[D(s) - D(s') \mid s' > s\right]}_{\text{Marginal Utility Difference}}$$

- Ex-ante component increasing with the square of demand/cost
  - $D(s) \to aD(s)$ implies $EA(s) \to a^2 EA(s)$

Risk Aversion

- Measuring ex-ante demand requires risk aversion
- Can be assumed externally
  - CRRA = 3
  - CARA = $5\text{x}10^{-4}$
- Or can be estimated internally

$$\frac{-u_{cc}}{u_c} \approx 2\frac{\text{Markup}}{\text{Variance Reduction}} \approx 2\frac{D(s)-MC(s)}{\text{var}(m^U)-\text{var}(x^I)}$$

- WTP for insurance against remaining risk reveals can proxy for WTP for insurance against realized risk

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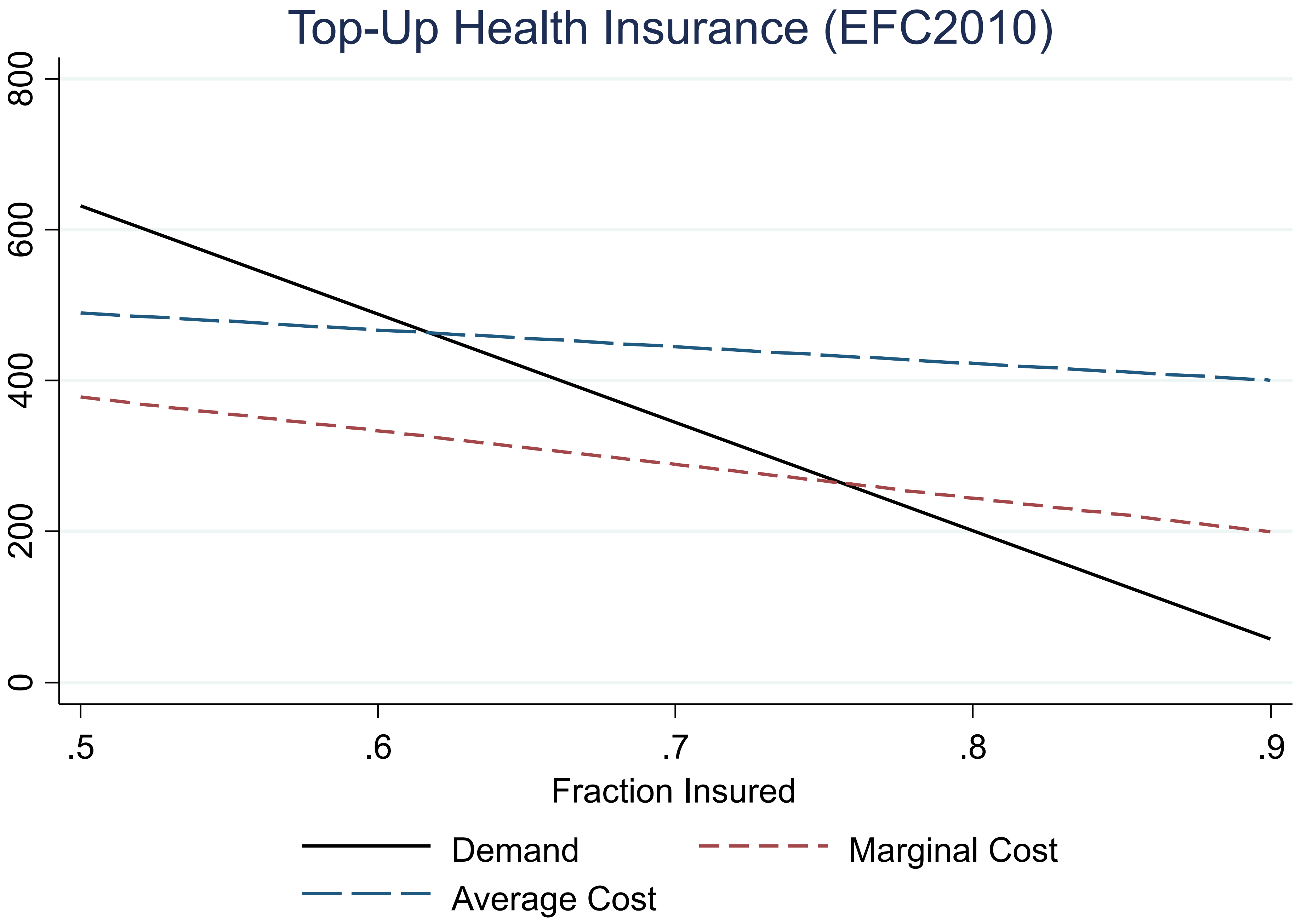
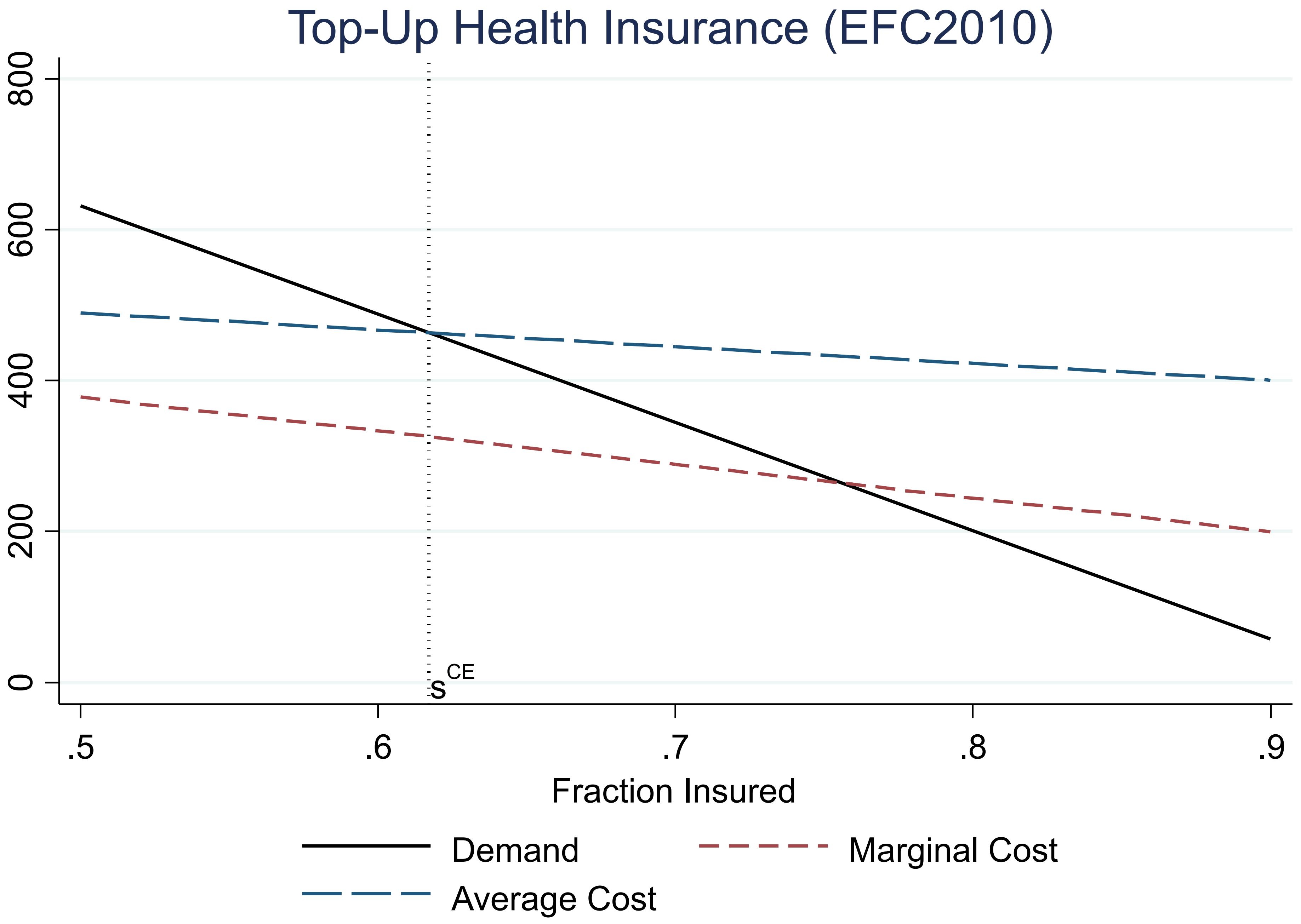
- Optimal open enrollment periods

Illustration with Three Health Insurance Examples

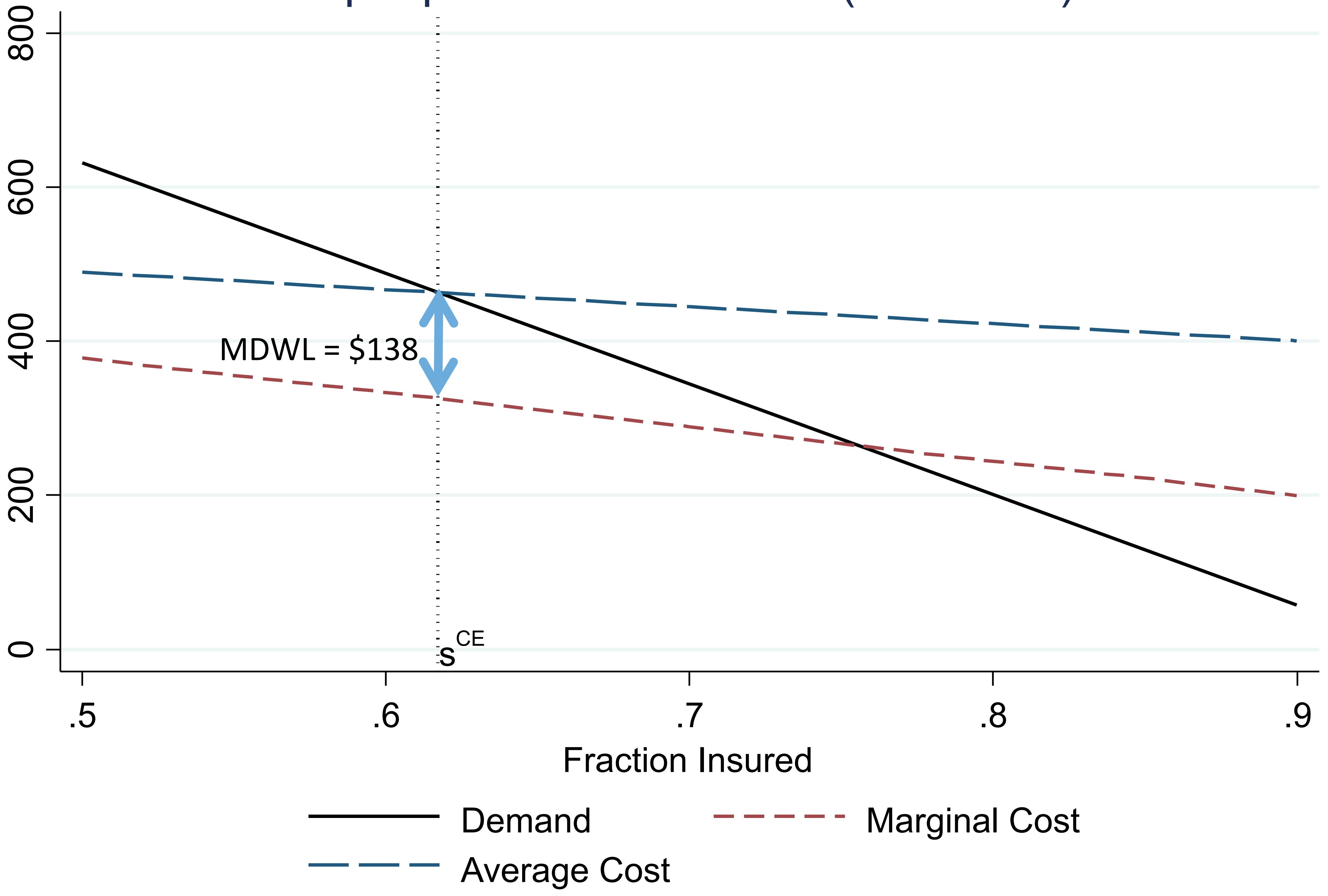
1. Top-up market for more generous PPO coverage in Alcoa
   - Demand and Cost Curves from Einav, Finkelstein, and Cullen (2010)
   - Average annual cost: $500
2. "Medium risk"
   - 4x Demand and Cost curves from Einav, Finkelstein, and Cullen (2010)
   - Average annual cost: $2,000
3. "Large Risk": Conservative approx. to insured vs. uninsured
   - 8x Demand and Cost curves from Einav, Finkelstein, and Cullen (2010)
   - Average annual cost: $4,000
   - Smaller than $5,922 (full vs. no insurance) or $5,270 in MA (Hackman, Kolstad, Kowalski, 2015)

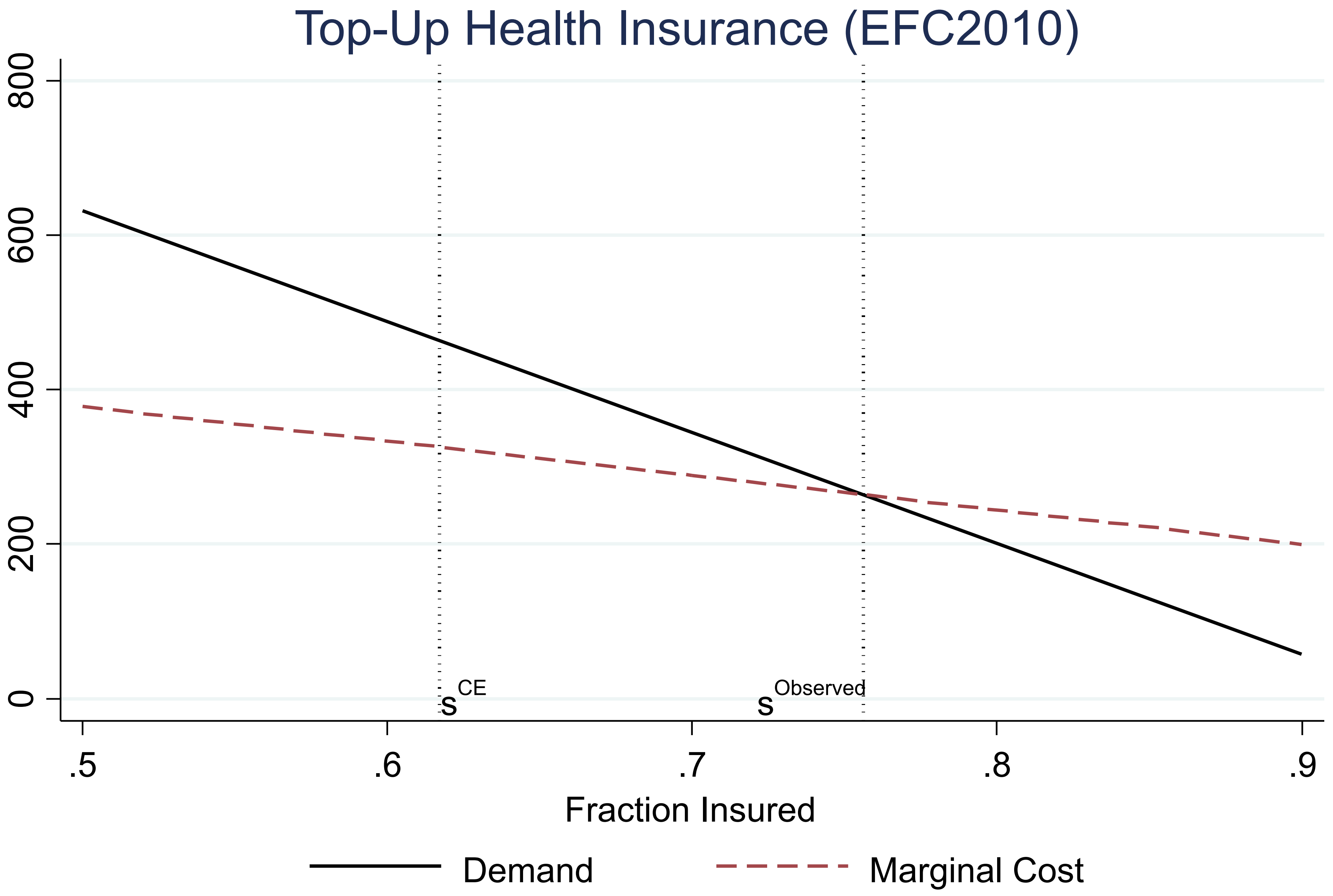
- Briefly: hypothetical market for UI from Hendren (2016)

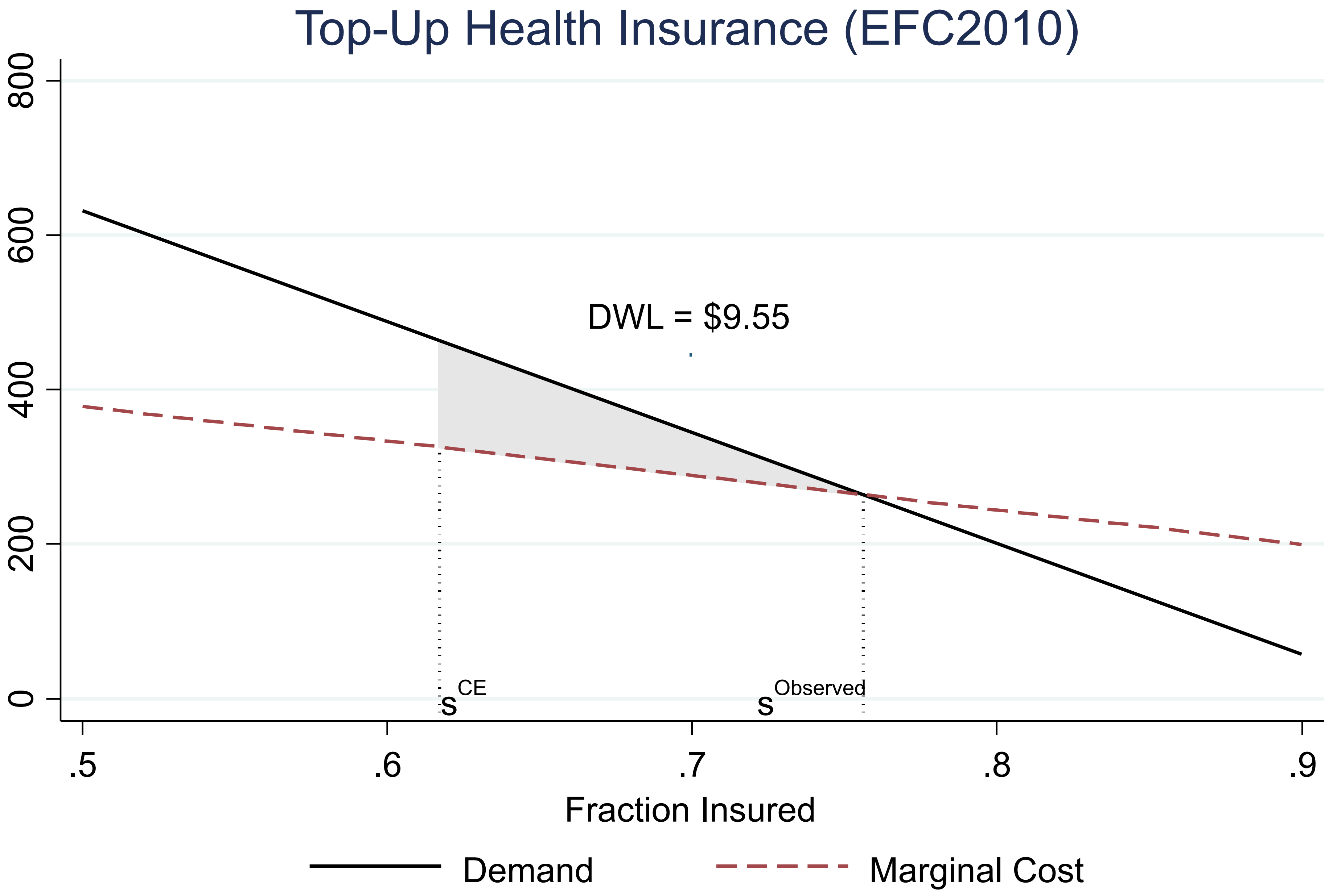

Top-Up Health Insurance (EFC2010)
800
600
400
200
0
.5
.6
.7
.8
.9
Fraction Insured
Demand
Marginal Cost
Average Cost

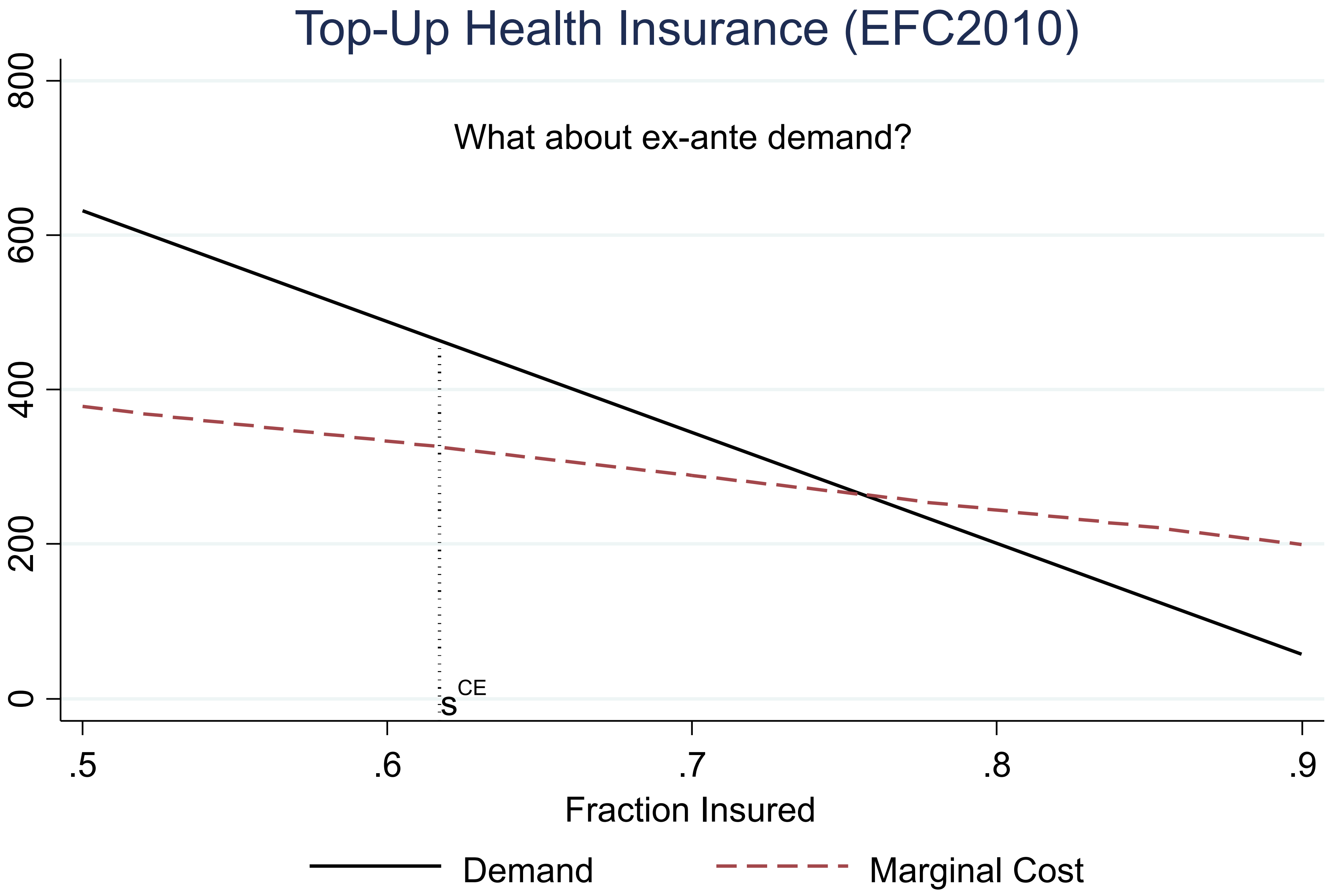

Top-Up Health Insurance (EFC2010)
800
600
400
200
0
s^CE
.5
.6
.7
.8
.9
Fraction Insured
Demand
Marginal Cost
Average Cost

Top-Up Health Insurance (EFC2010)

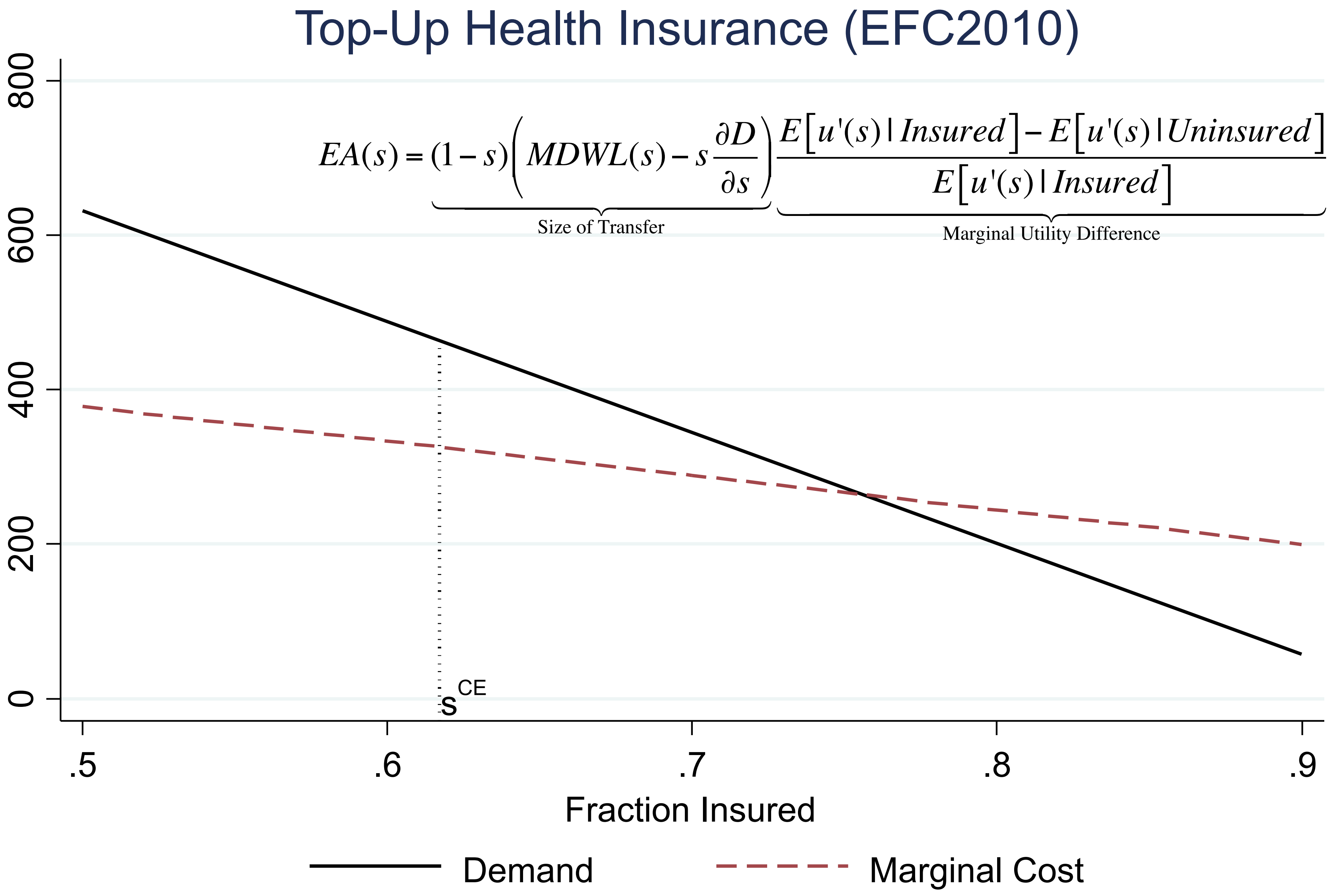



Top-Up Health Insurance (EFC2010)
0
200
400
600
800
.5
.6
.7
.8
.9
Fraction Insured
s^CE
s^Observed
Demand
Marginal Cost

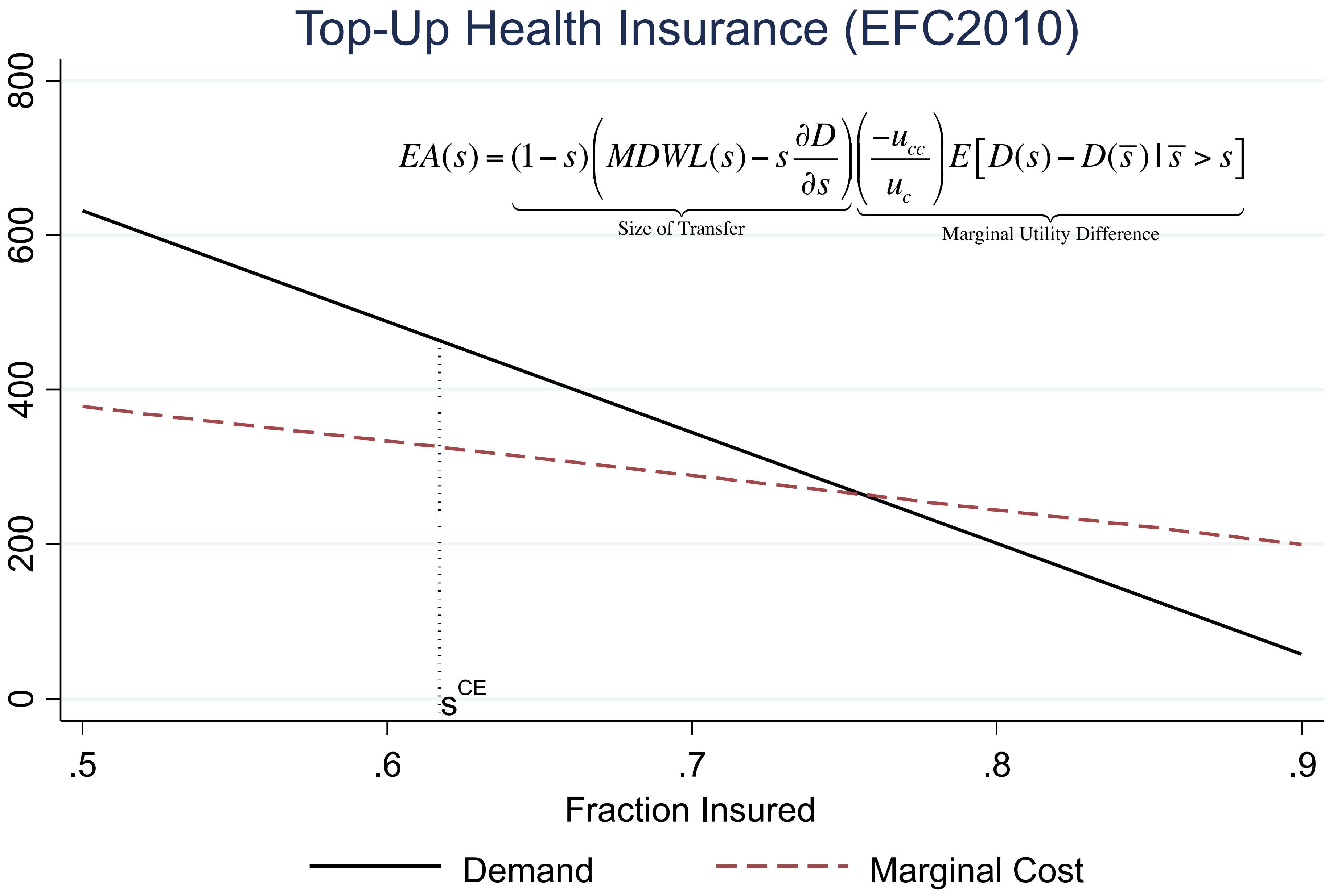

Top-Up Health Insurance (EFC2010)
800
600
400
200
0
DWL = $9.55
s^CE
s^Observed
.5
.6
.7
.8
.9
Fraction Insured
Demand
Marginal Cost



Top-Up Health Insurance (EFC2010)
What about ex-ante demand?
800
600
400
200
0
s^CE
.5
.6
.7
.8
.9
Fraction Insured
Demand
Marginal Cost

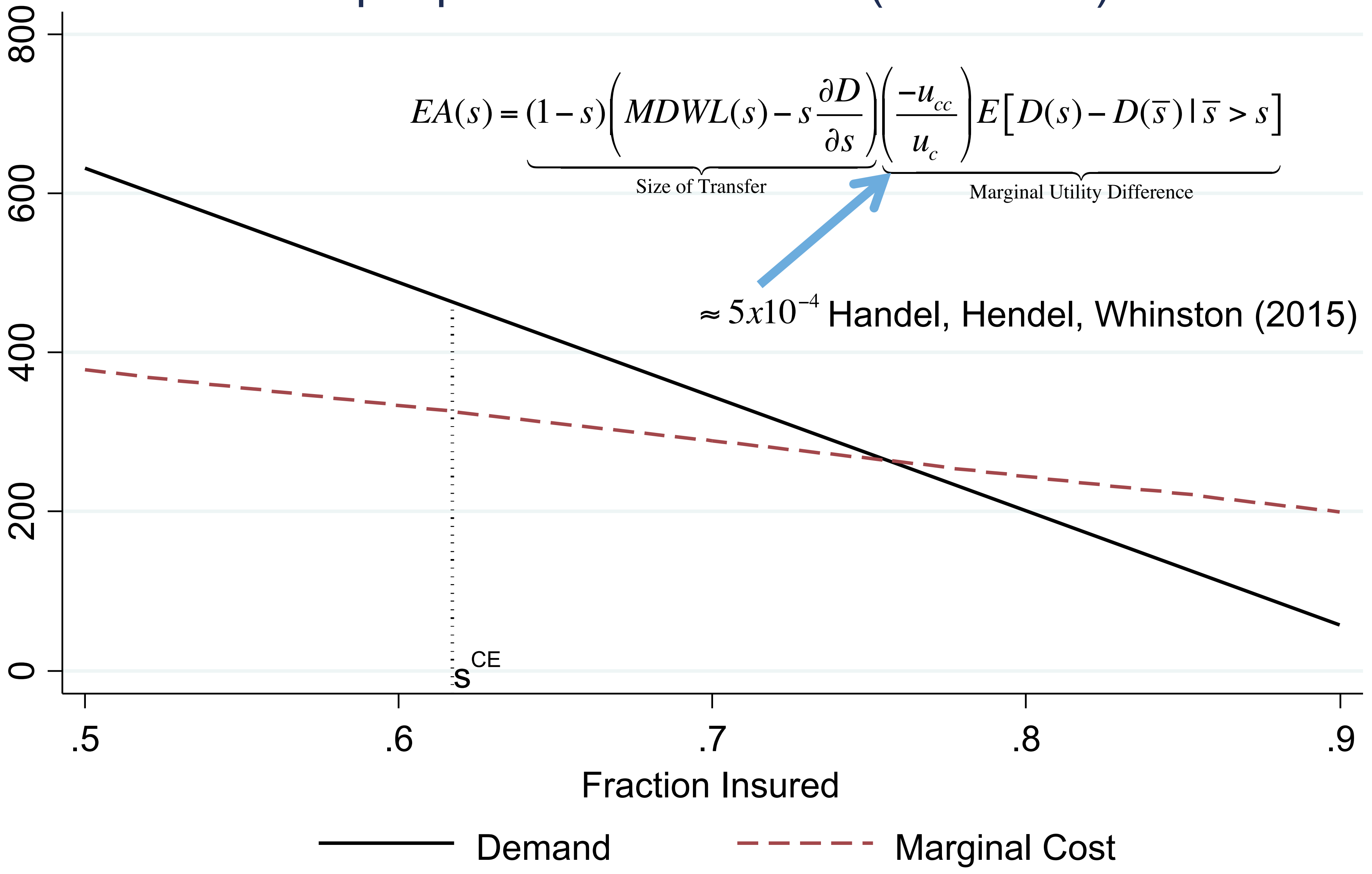


Top-Up Health Insurance (EFC2010)
$EA(s) = \underbrace{(1-s)\left(MDWL(s) - s\frac{\partial D}{\partial s}\right)}_{\text{Size of Transfer}} \underbrace{\frac{E[u'(s)|Insured] - E[u'(s)|Uninsured]}{E[u'(s)|Insured]}}_{\text{Marginal Utility Difference}}$
0
200
400
600
800
s^{CE}
.5
.6
.7
.8
.9
Fraction Insured
Demand
Marginal Cost

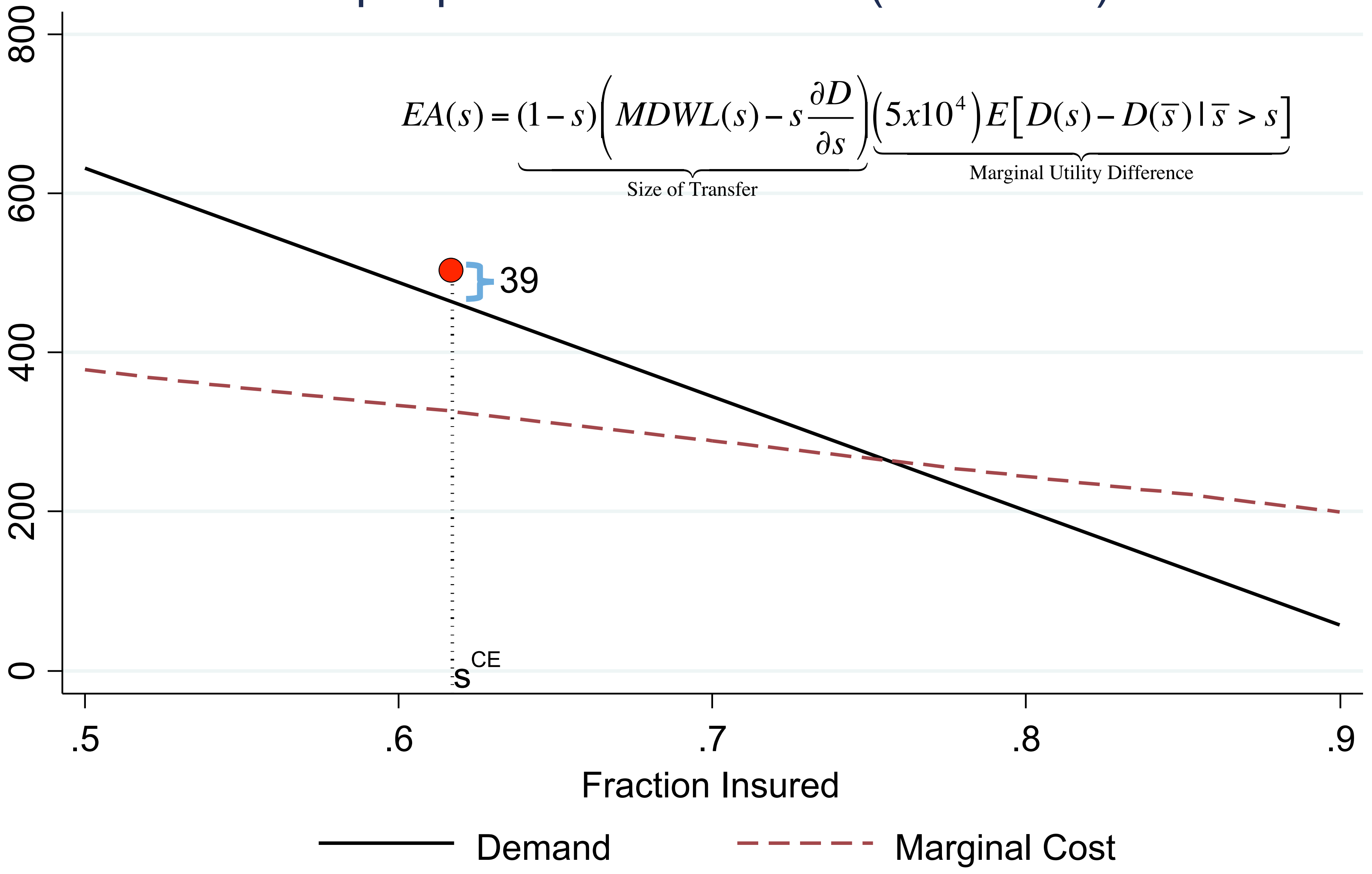


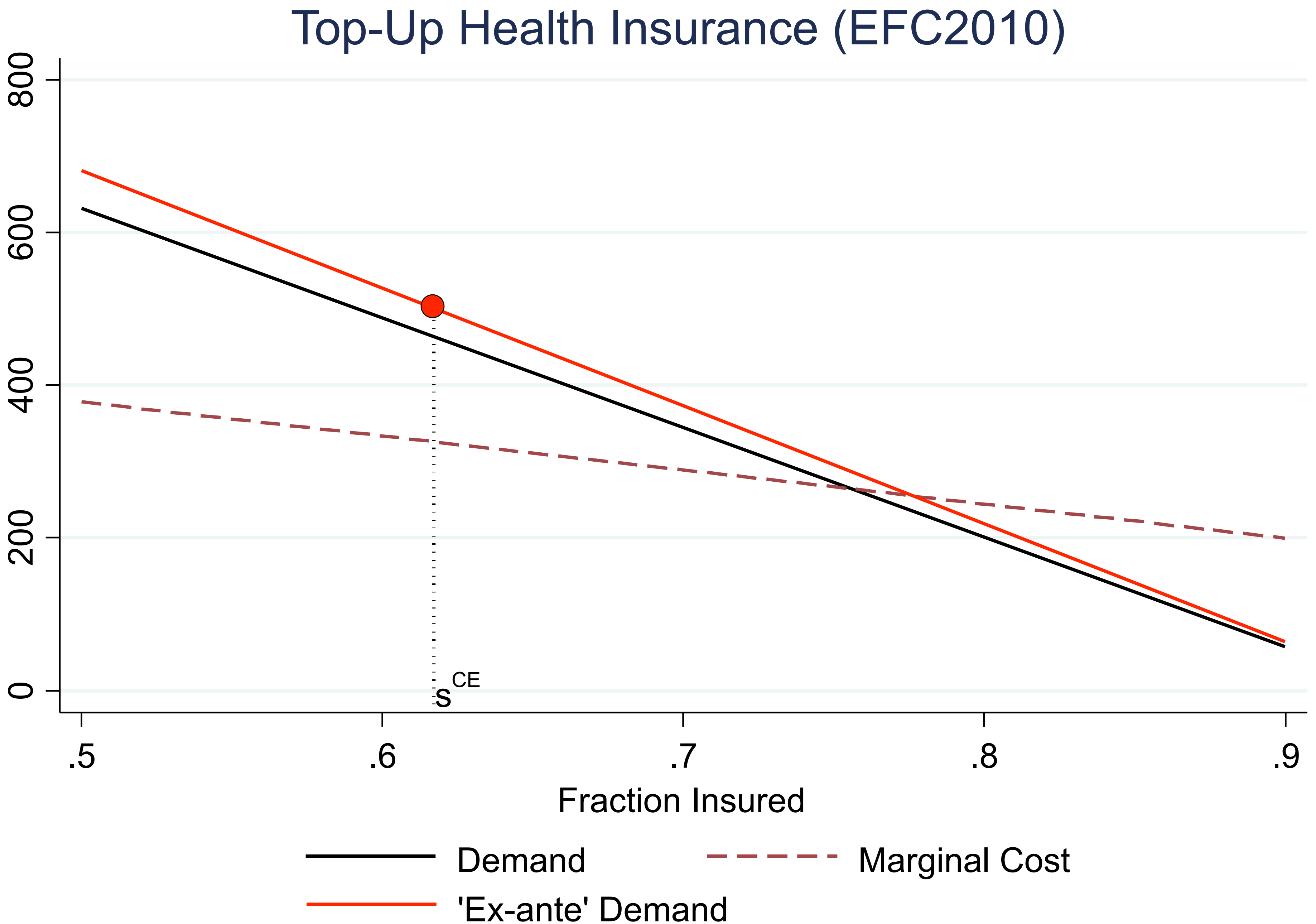
Top-Up Health Insurance (EFC2010)
800
600
400
200
0
$EA(s) = (1-s)\left(MDWL(s) - s\frac{\partial D}{\partial s}\right)\left(\frac{-u_{cc}}{u_c}\right)E\left[D(s) - D(\bar{s}) \mid \bar{s} > s\right]$
Size of Transfer
Marginal Utility Difference
s^{CE}
.5
.6
.7
.8
.9
Fraction Insured
Demand
Marginal Cost

Top-Up Health Insurance (EFC2010)

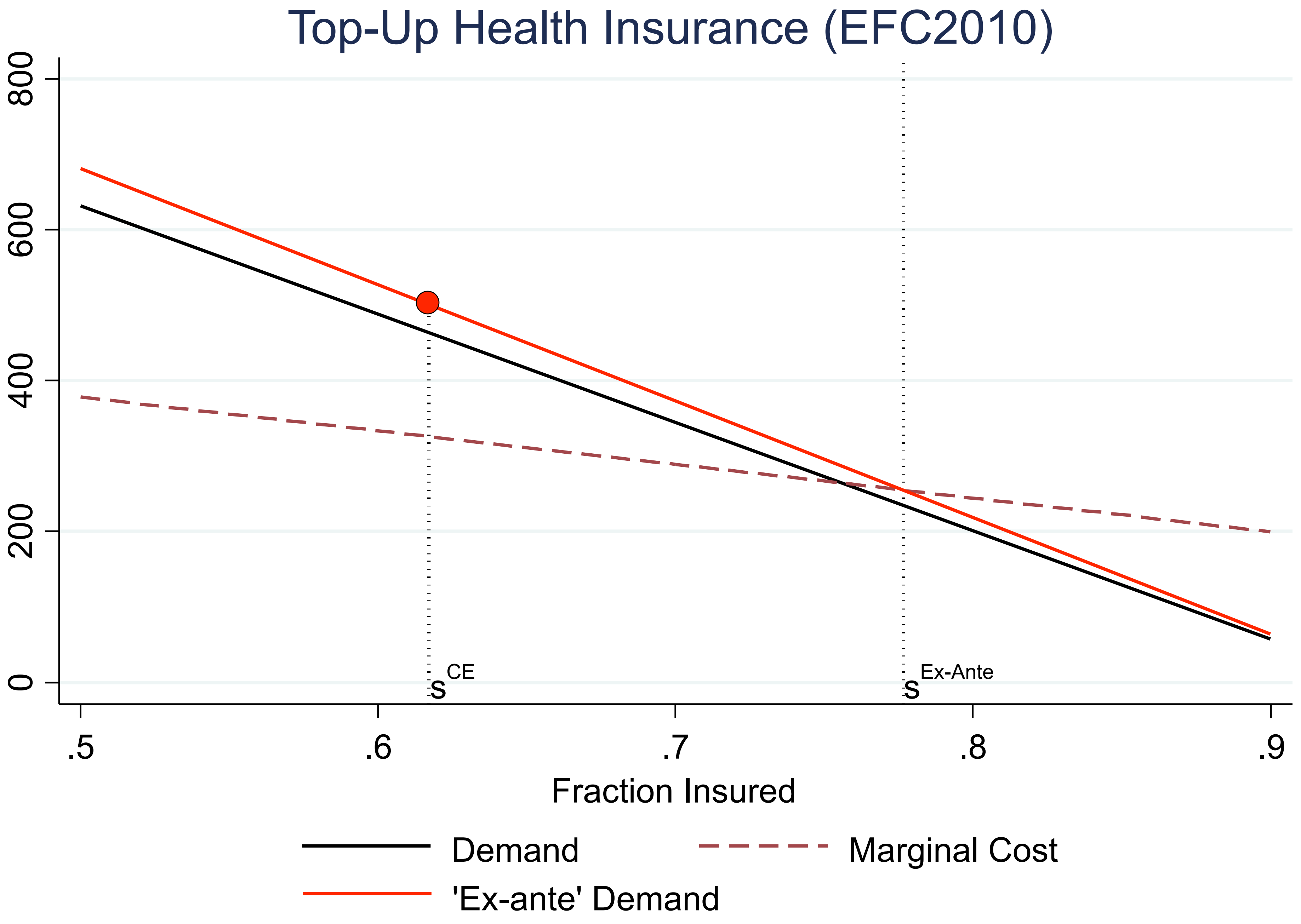


Top-Up Health Insurance (EFC2010)





Top-Up Health Insurance (EFC2010)
800
600
400
200
0
s^CE
.5
.6
.7
.8
.9
Fraction Insured
Demand
Marginal Cost
'Ex-ante' Demand


Top-Up Health Insurance (EFC2010)
800
600
400
200
0
s^CE
s^Ex-Ante
.5
.6
.7
.8
.9
Fraction Insured
Demand
Marginal Cost
'Ex-ante' Demand

Ex-Ante Optimal Insurance Markets Generate DWL

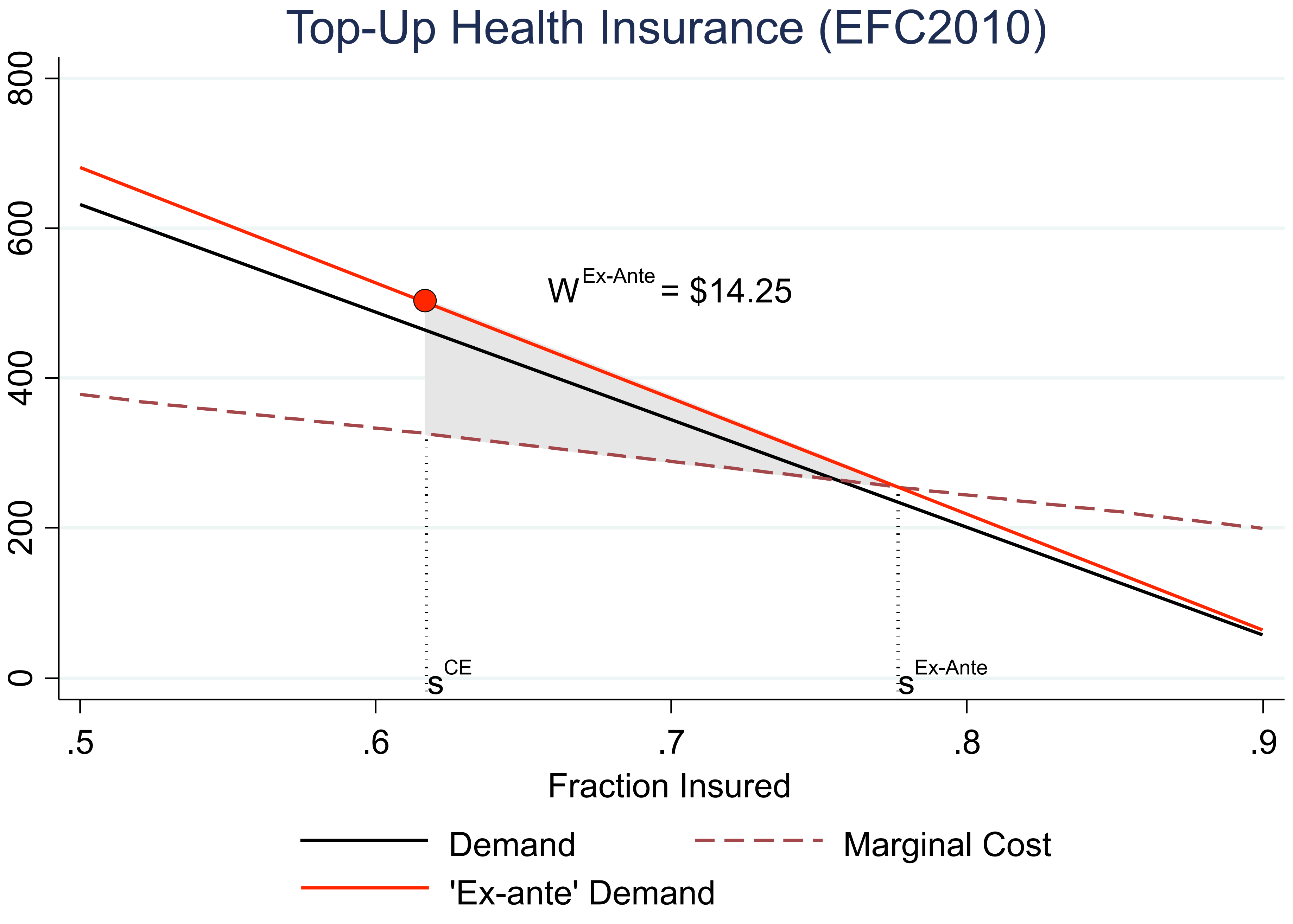
- Ex-ante optimal size of the insurance market solves:

$$\frac{W'(s^{Ex-Ante})}{E\left[u' \mid Insured\right]} = \underbrace{D(s^{Ex-Ante}) - MC(s^{Ex-Ante})}_{\text{Ex-Post Surplus}} + EA(s^{Ex-Ante}) = 0$$

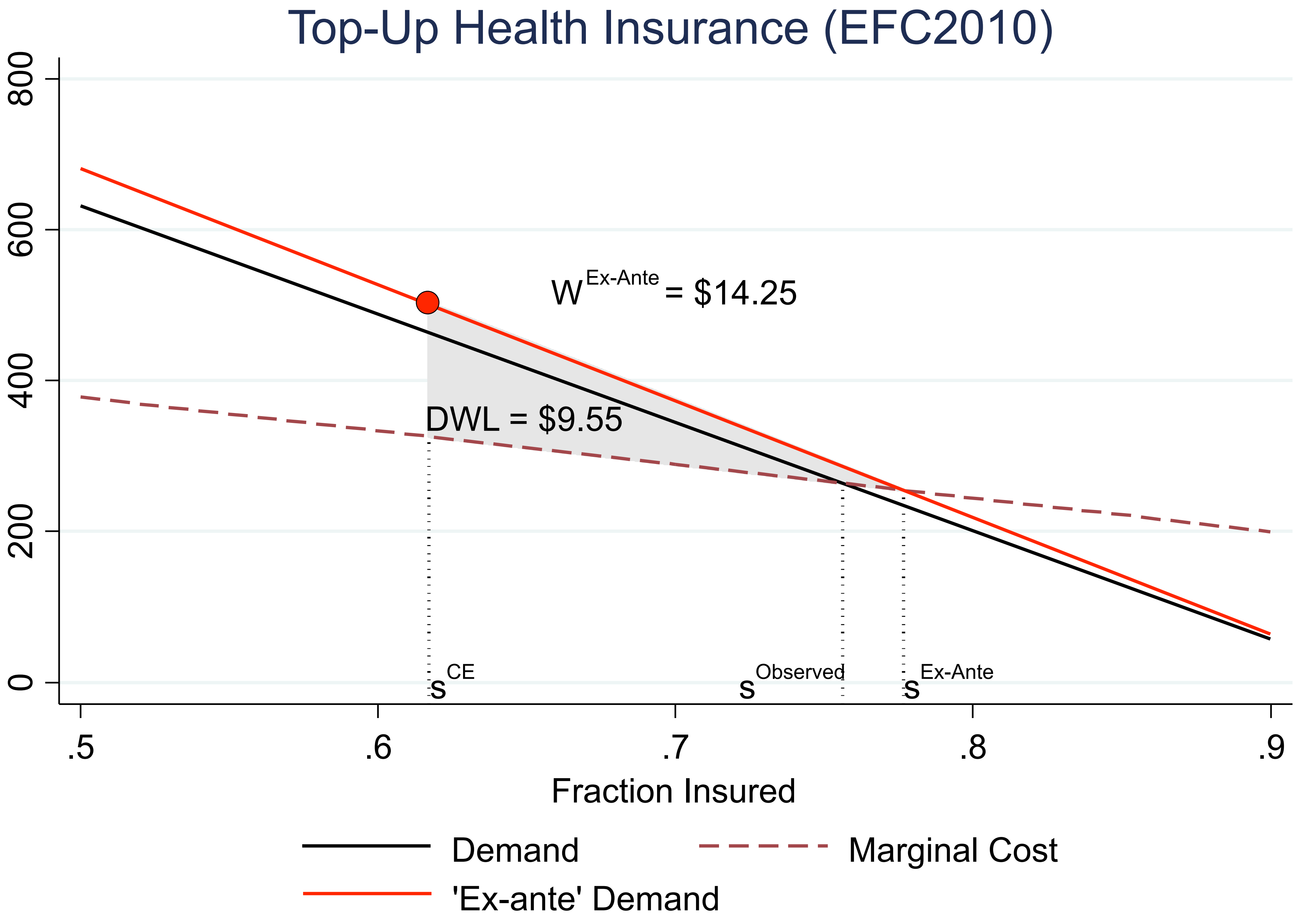
- Yields a "Baily-Chetty" condition:

$$EA(s^{Ex-Ante}) = MDWL(s^{Ex-Ante})$$

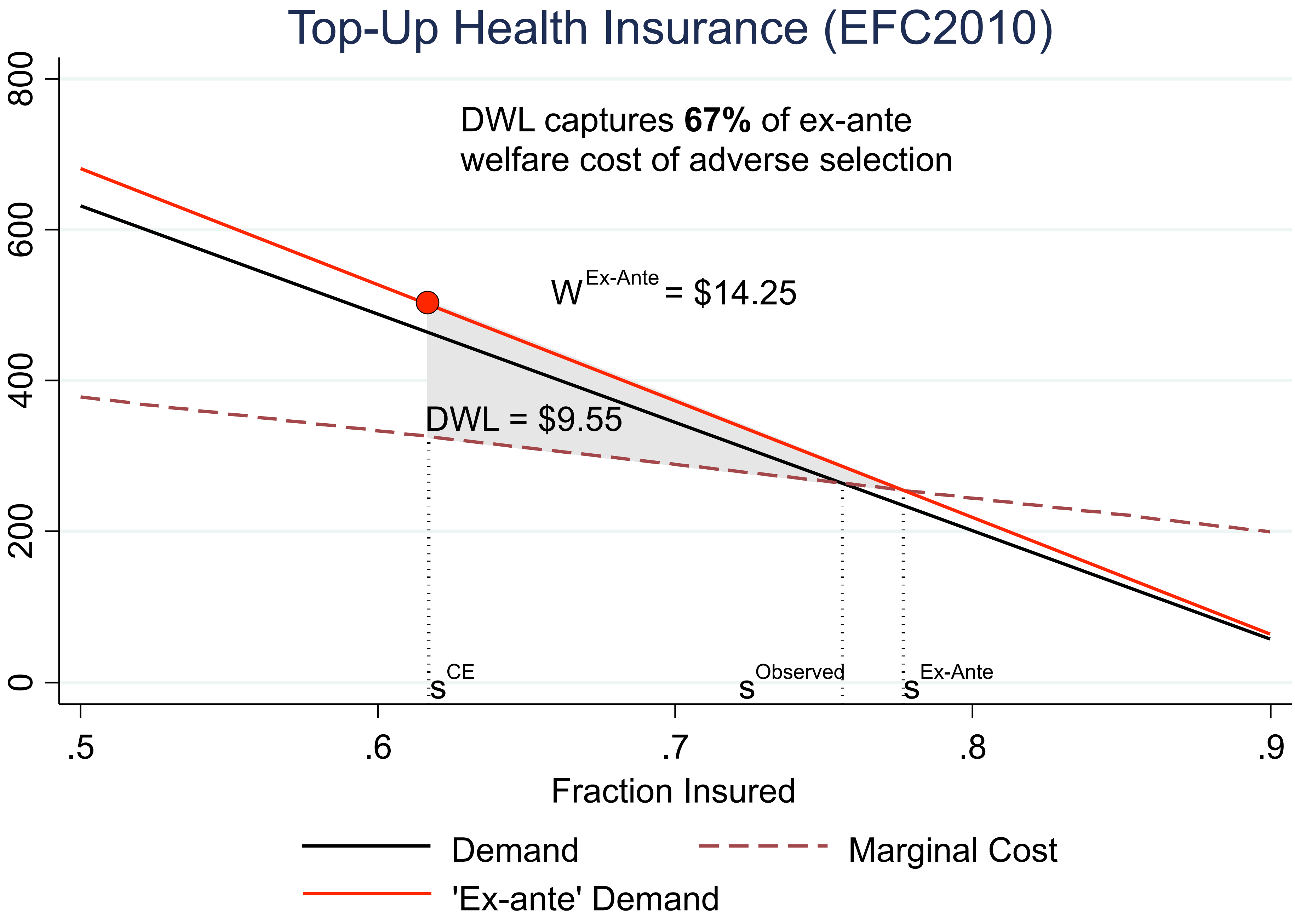
- **Corollary:** The ex-ante optimal allocation generally involves (ex-post) deadweight loss
  - Easy to show that MDWL(s)=0 implies EA(s)>0 whenever marginal utilities are higher for the insured than uninsured
  - MDWL is a cost we're willing to accept for ex-ante insurance



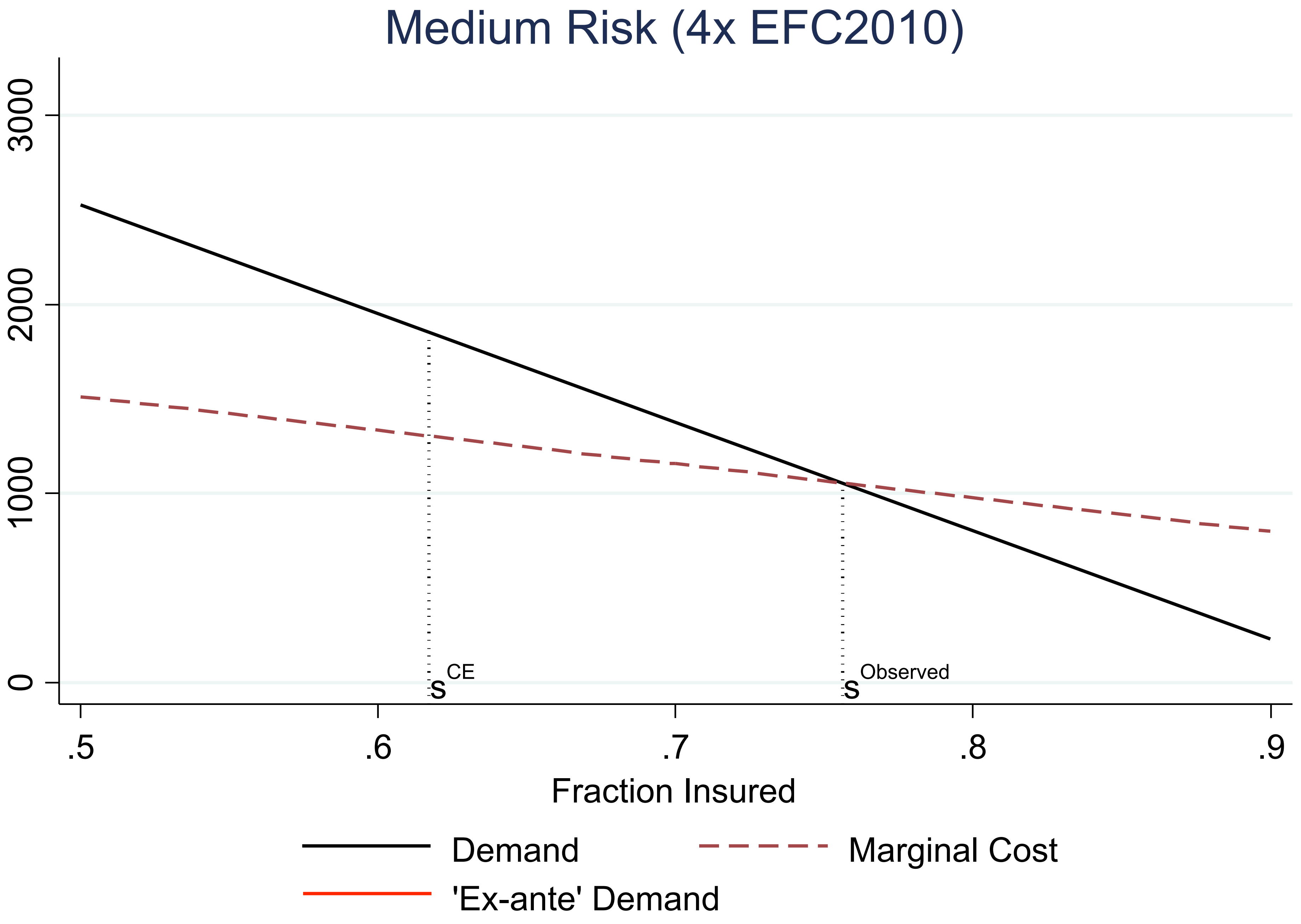
Top-Up Health Insurance (EFC2010)
800
600
400
200
0
$W^{Ex\text{-}Ante}$ = $14.25
s^{CE}
$s^{Ex\text{-}Ante}$
.5
.6
.7
.8
.9
Fraction Insured
Demand
Marginal Cost
'Ex-ante' Demand



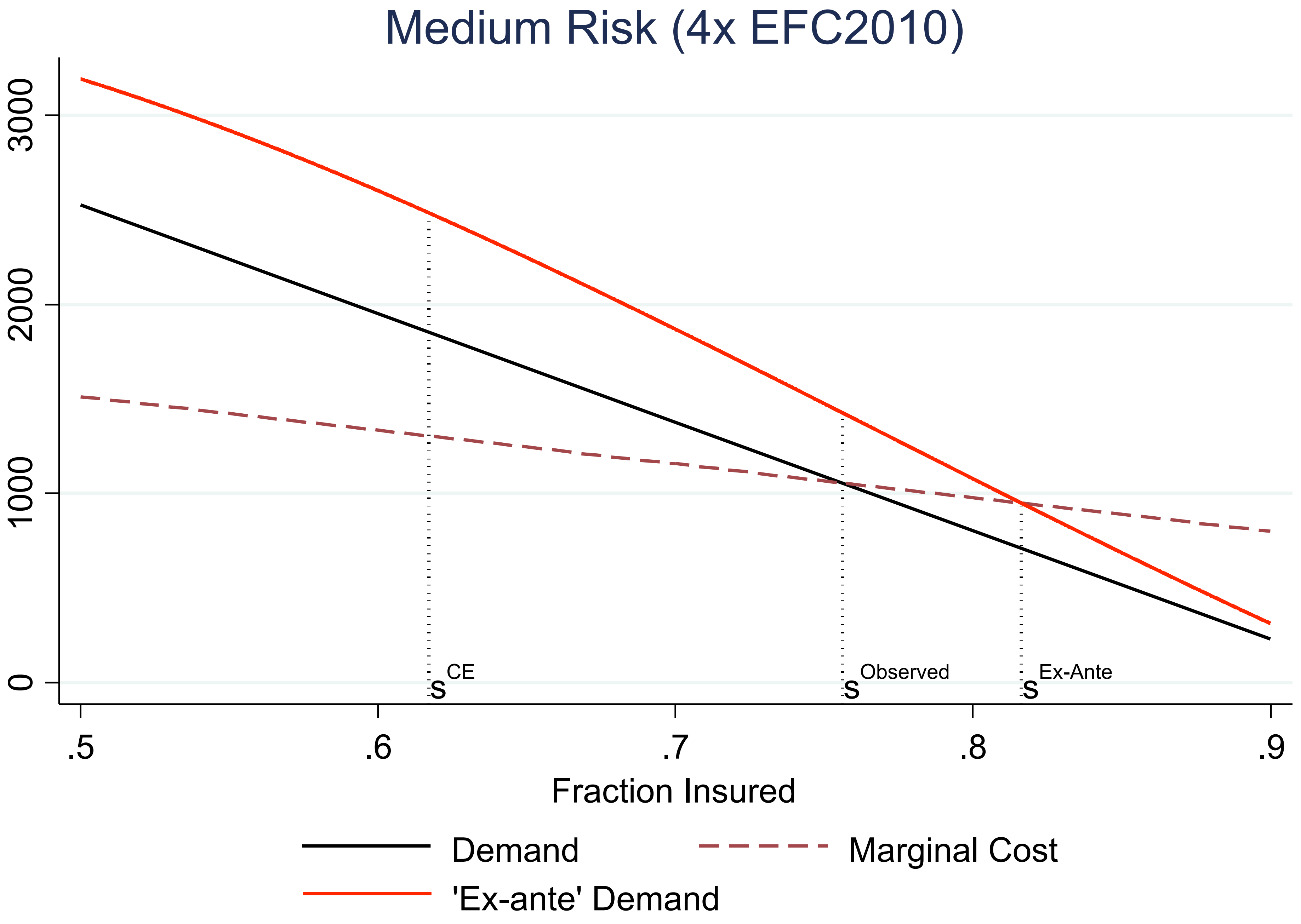
Top-Up Health Insurance (EFC2010)
800
600
400
200
0
W Ex-Ante = $14.25
DWL = $9.55
s CE
s Observed
s Ex-Ante
.5
.6
.7
.8
.9
Fraction Insured
Demand
Marginal Cost
'Ex-ante' Demand



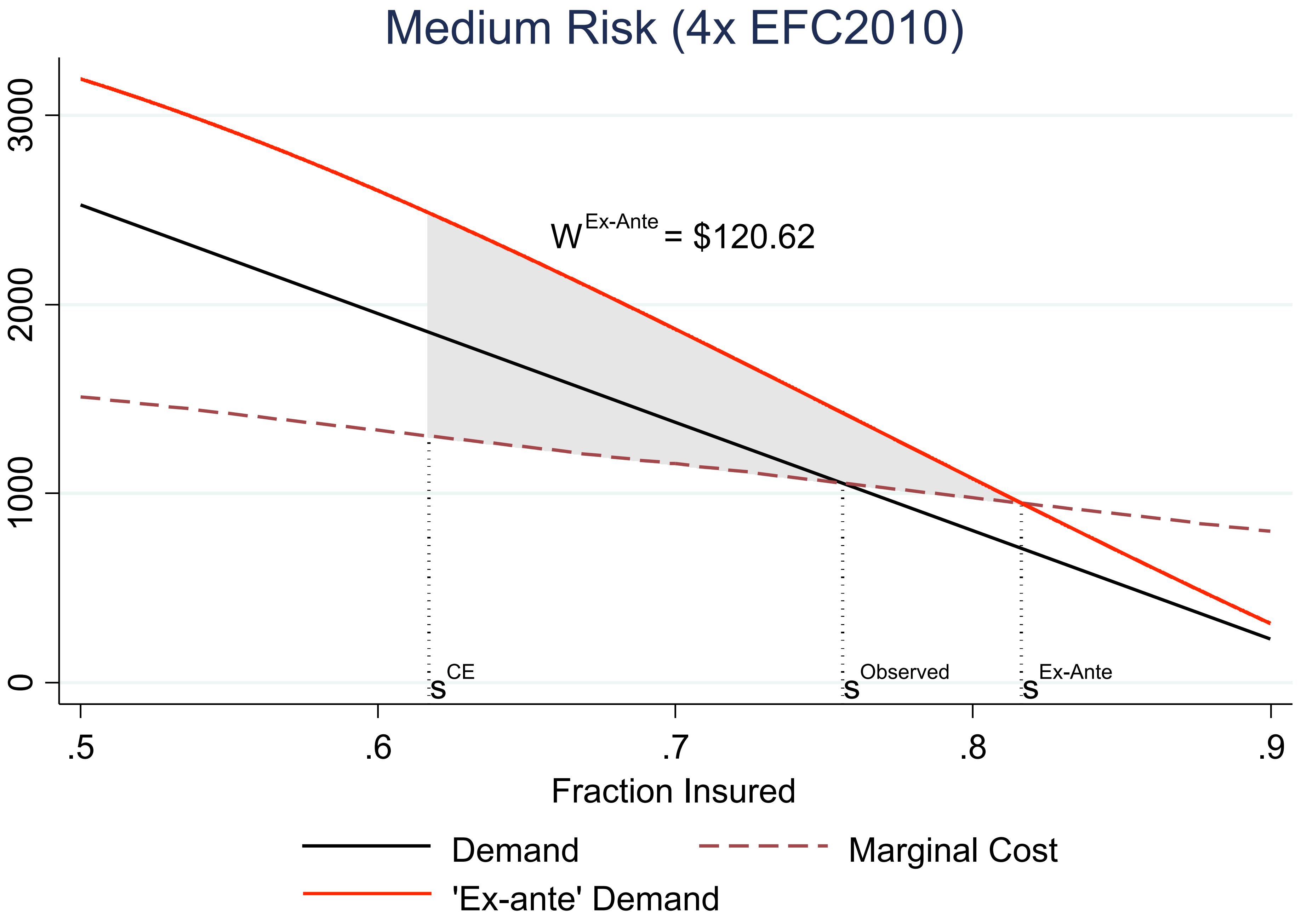
Top-Up Health Insurance (EFC2010)
DWL captures **67%** of ex-ante
welfare cost of adverse selection
W Ex-Ante = $14.25
DWL = $9.55
s CE
s Observed
s Ex-Ante
0
200
400
600
800
.5
.6
.7
.8
.9
Fraction Insured
Demand
Marginal Cost
'Ex-ante' Demand

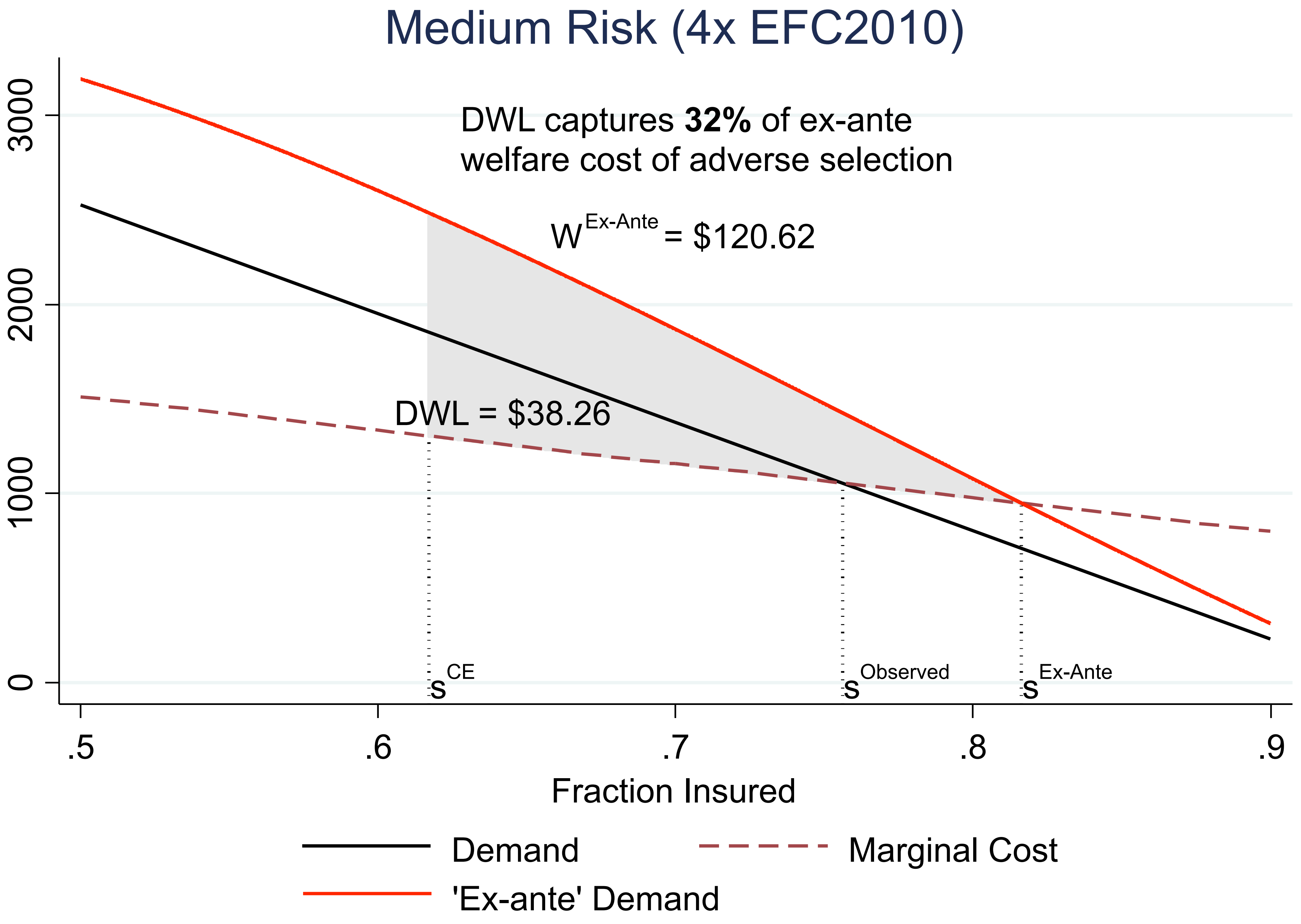


Medium Risk (4x EFC2010)
3000
2000
1000
0
s^{CE}
$s^{Observed}$
.5
.6
.7
.8
.9
Fraction Insured
Demand
Marginal Cost
'Ex-ante' Demand

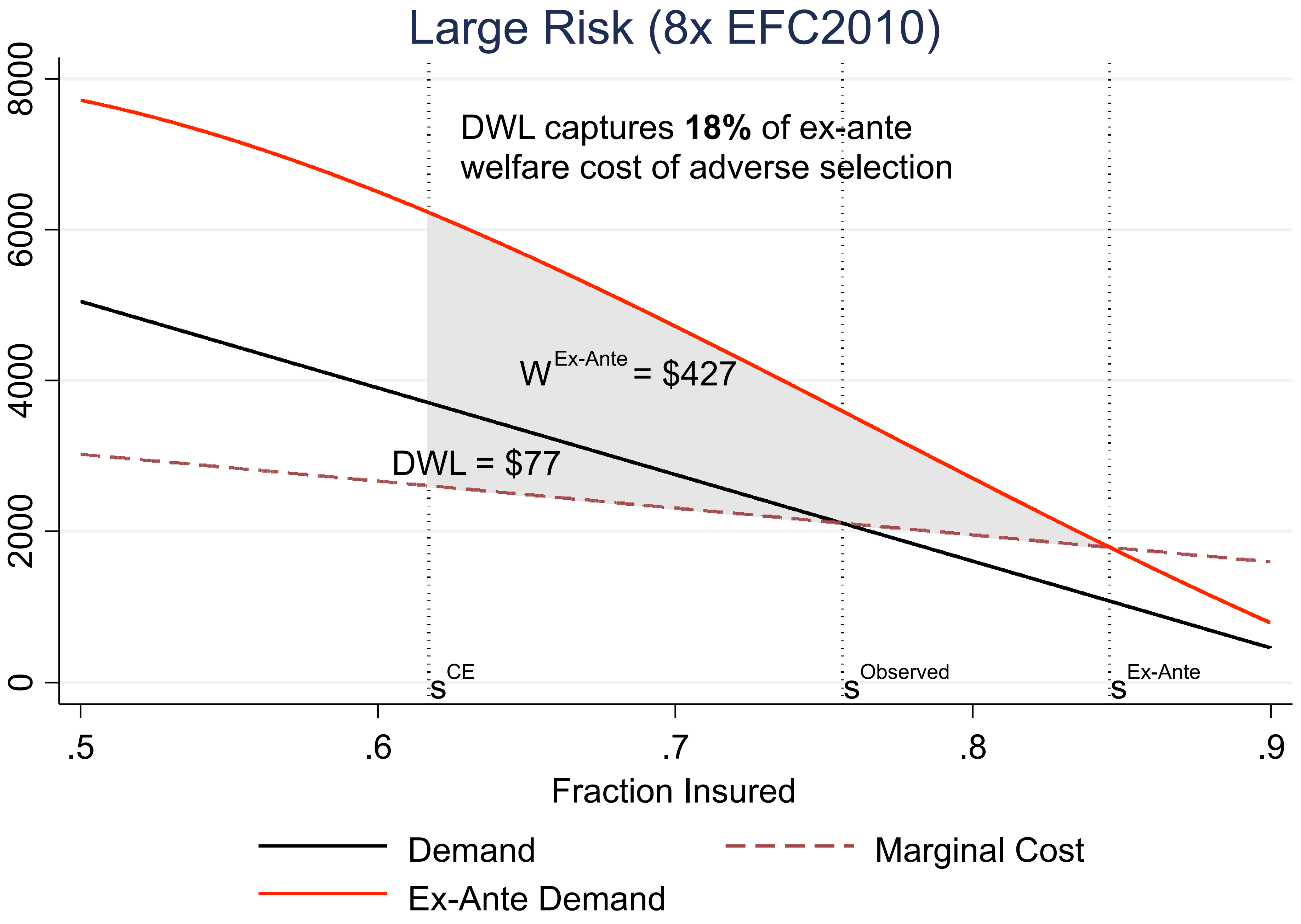


Medium Risk (4x EFC2010)
3000
2000
1000
0
.5
.6
.7
.8
.9
Fraction Insured
s^{CE}
$s^{Observed}$
$s^{Ex-Ante}$
Demand
Marginal Cost
'Ex-ante' Demand


Medium Risk (4x EFC2010)
3000
2000
1000
0
$W^{Ex\text{-}Ante}$ = $120.62
s^{CE}
$s^{Observed}$
$s^{Ex\text{-}Ante}$
.5
.6
.7
.8
.9
Fraction Insured
Demand
Marginal Cost
'Ex-ante' Demand



Medium Risk (4x EFC2010)
DWL captures 32% of ex-ante
welfare cost of adverse selection
W^Ex-Ante = $120.62
DWL = $38.26
s^CE
s^Observed
s^Ex-Ante
0
1000
2000
3000
.5
.6
.7
.8
.9
Fraction Insured
Demand
Marginal Cost
'Ex-ante' Demand



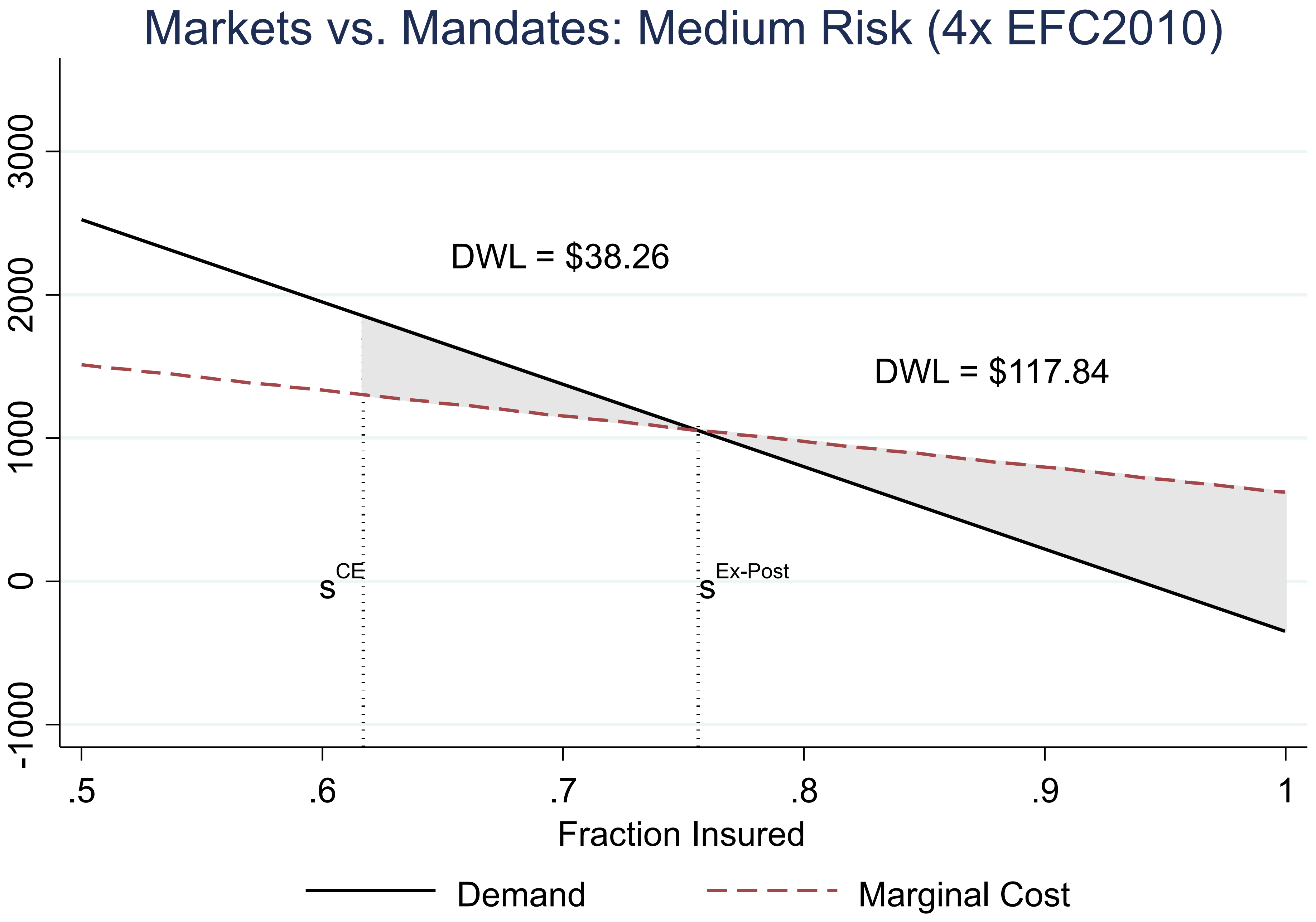
Large Risk (8x EFC2010)
DWL captures **18%** of ex-ante welfare cost of adverse selection
W Ex-Ante = $427
DWL = $77
s CE
s Observed
s Ex-Ante
0
2000
4000
6000
8000
.5
.6
.7
.8
.9
Fraction Insured
Demand
Ex-Ante Demand
Marginal Cost

Ex-ante Insurance Value Increasing in Premium

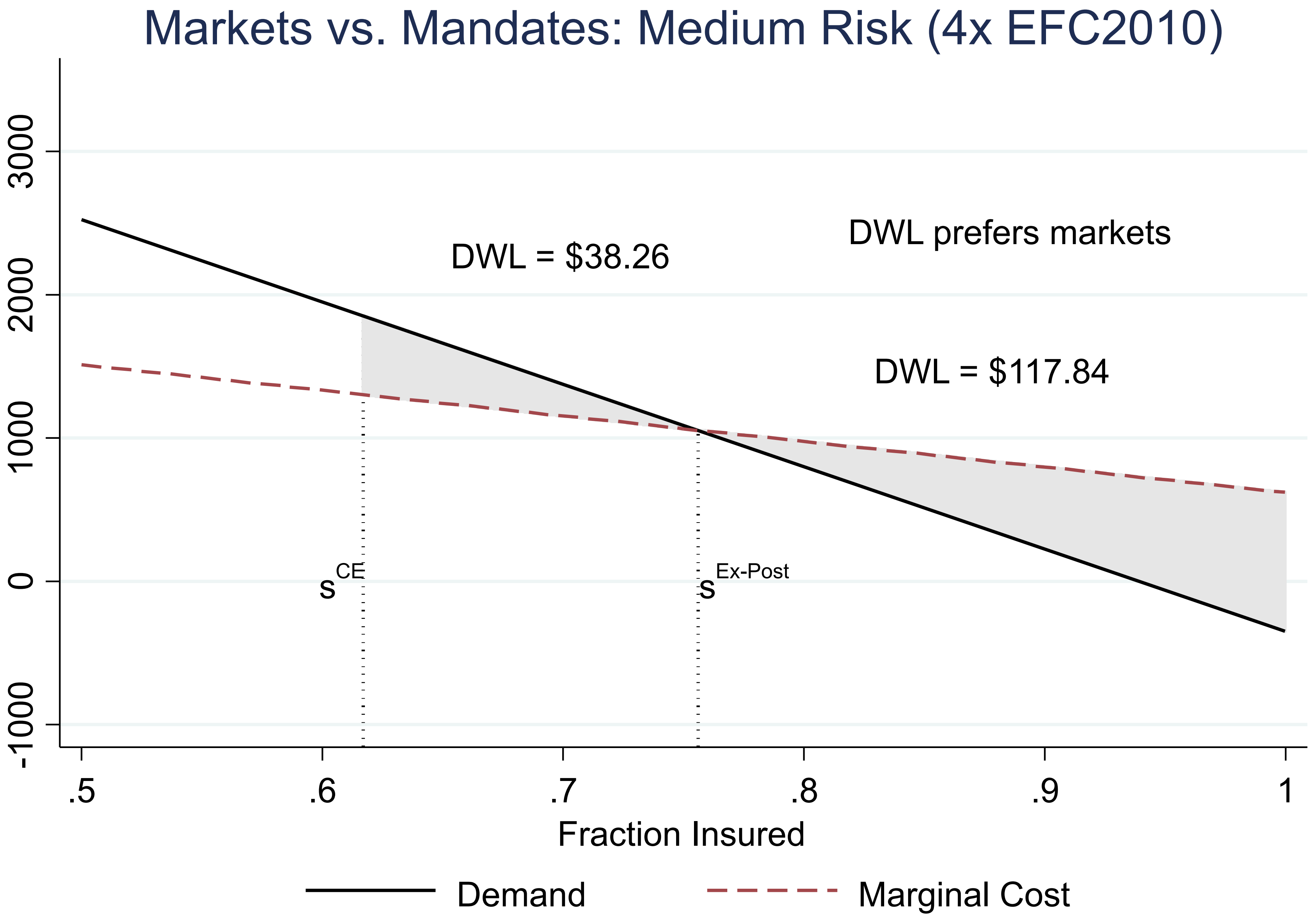
- Divergence between Observed and Ex-ante value of insurance is increasing in the size/importance of the risk
  - DWL captures 67% of the ex-ante welfare cost of adverse selection for baseline specification in Einav, Finkelstein, and Cullen (2010)
  - Only 18% if risks are 8x as large
- More important for risks where the premiums are a significant share of people's incomes
  - Health, life, disability, unemployment insurance
  - Less important for iPhone insurance…

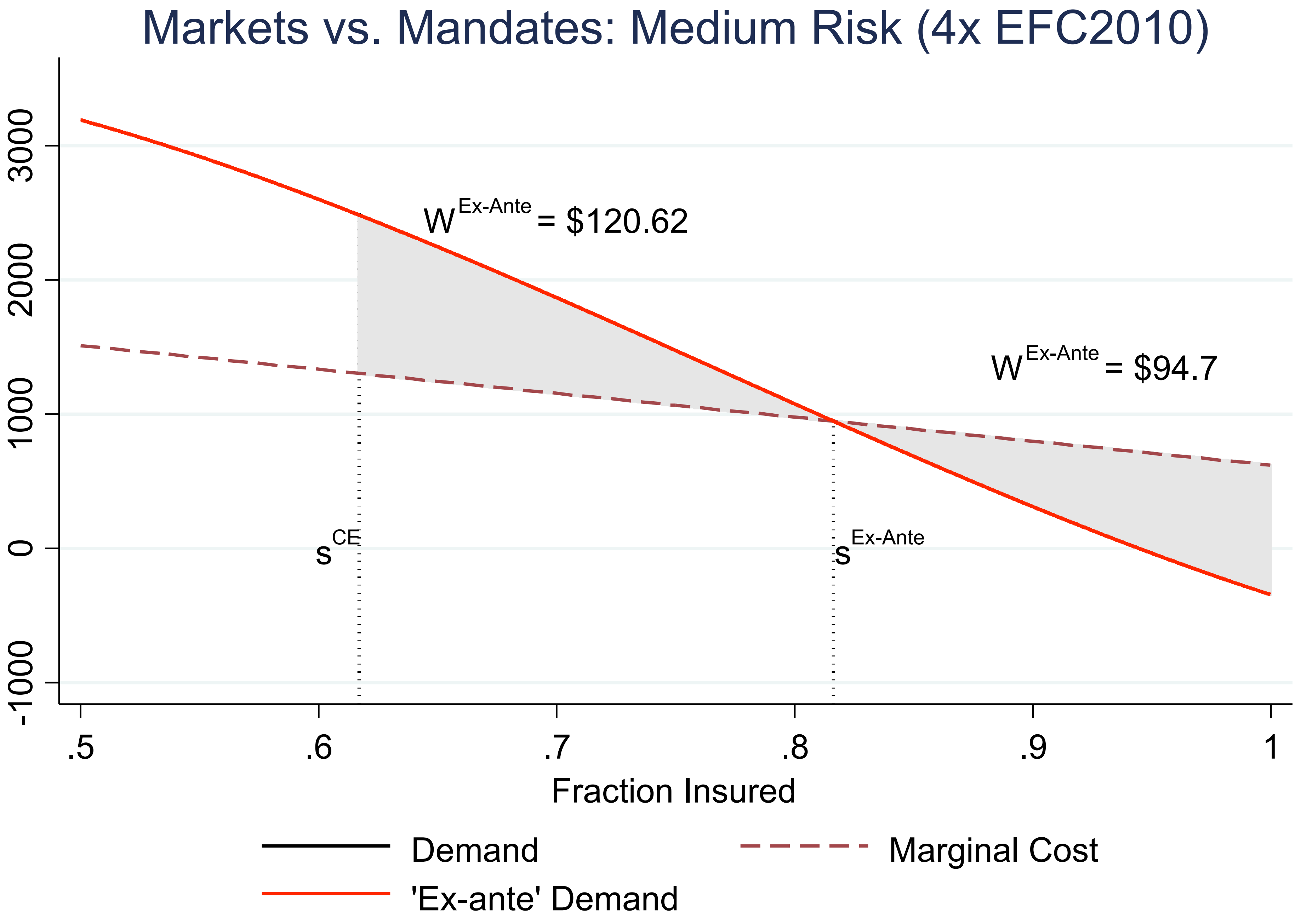
Competitive Markets vs. Mandates

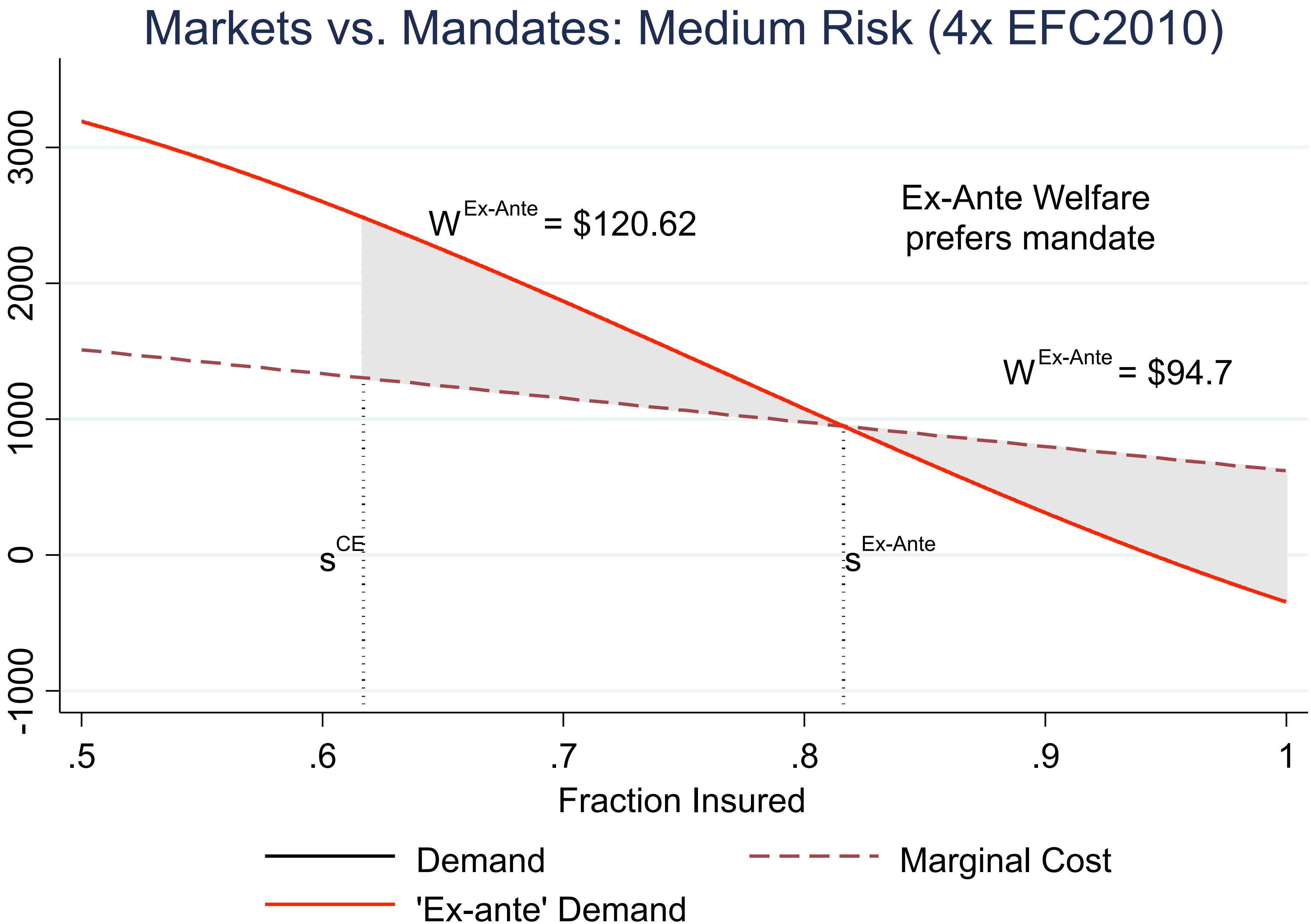
- Are competitive markets better or worse than govt mandates?
  - Competitive markets suffer adverse selection
  - Mandates may require some to buy insurance that don’t want it



Markets vs. Mandates: Medium Risk (4x EFC2010)
DWL = $38.26
DWL = $117.84
3000
2000
1000
0
-1000
s^CE
s^Ex-Post
.5
.6
.7
.8
.9
1
Fraction Insured
Demand
Marginal Cost


Markets vs. Mandates: Medium Risk (4x EFC2010)
DWL prefers markets
DWL = $38.26
DWL = $117.84
3000
2000
1000
0
-1000
s^CE
s^Ex-Post
.5
.6
.7
.8
.9
1
Fraction Insured
Demand
Marginal Cost


Markets vs. Mandates: Medium Risk (4x EFC2010)
W^Ex-Ante = $120.62
W^Ex-Ante = $94.7
s^CE
s^Ex-Ante
3000
2000
1000
0
-1000
.5
.6
.7
.8
.9
1
Fraction Insured
Demand
Marginal Cost
'Ex-ante' Demand


Markets vs. Mandates: Medium Risk (4x EFC2010)
Ex-Ante Welfare
prefers mandate
W^Ex-Ante = $120.62
W^Ex-Ante = $94.7
s^CE
s^Ex-Ante
3000
2000
1000
0
-1000
.5
.6
.7
.8
.9
1
Fraction Insured
Demand
Marginal Cost
'Ex-ante' Demand

DWL vs. Ex-Ante Welfare Lead to Different Conclusions

- For the medium and large risk specifications, ex-ante and ex-post (DWL) welfare measures generate different conclusions
- DWL perspective prefers markets
- Ex-ante/utilitarian perspective prefers mandates

Outline

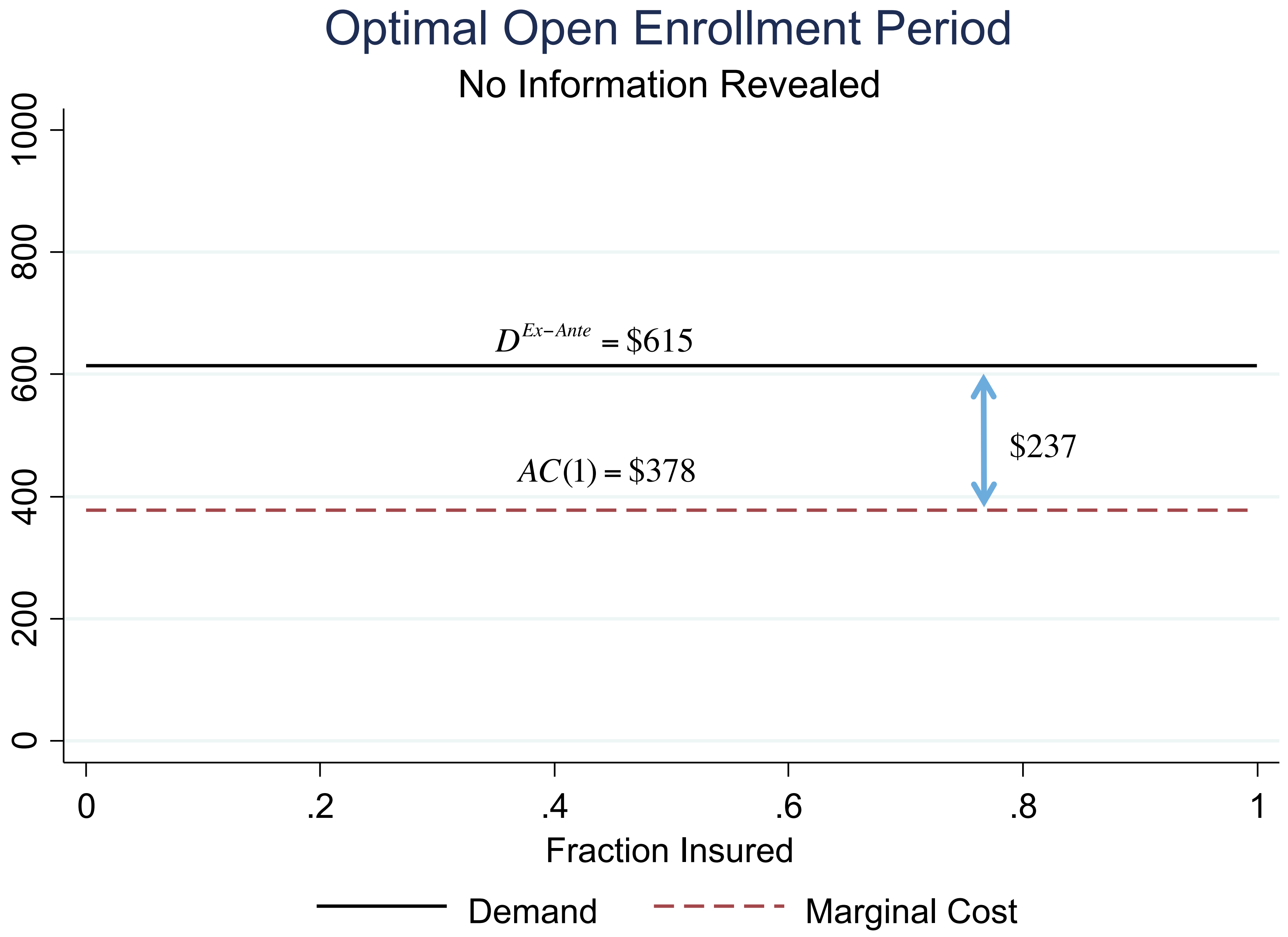
- Simple Example
- General Model
- Illustration with Optimal Health Insurance
- Optimal open enrollment periods

Optimal Open Enrollment Periods

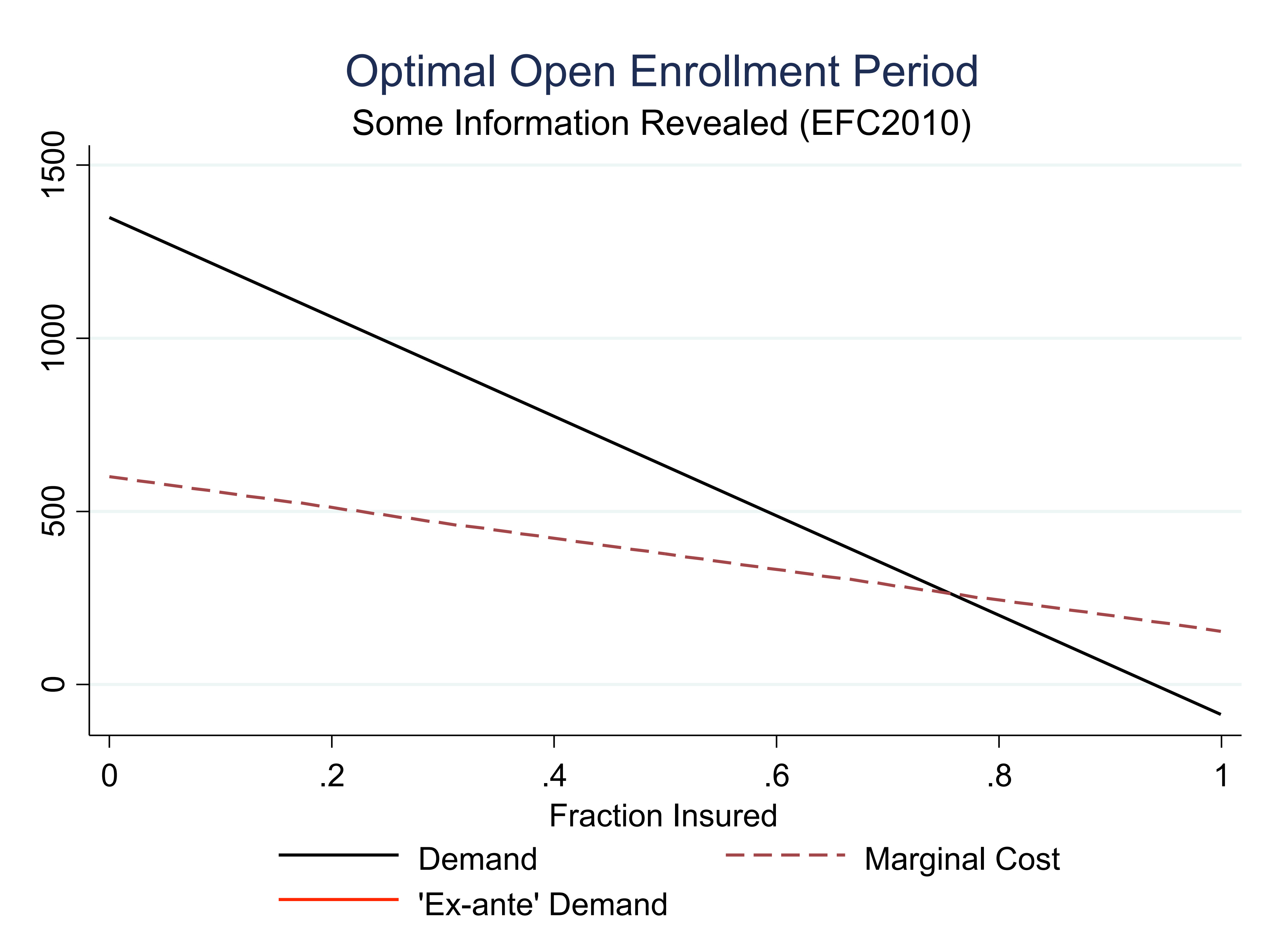
- When should markets exist?
  - E.g. should open enrollment for 2017 ACA coverage be in:
    - September 2016? January 2017? Birth?

- Each of these timing of open enrollment generates different demand/cost curves
  - As information is revealed, demand curve tends to:
    - Rotate
    - Fall in levels

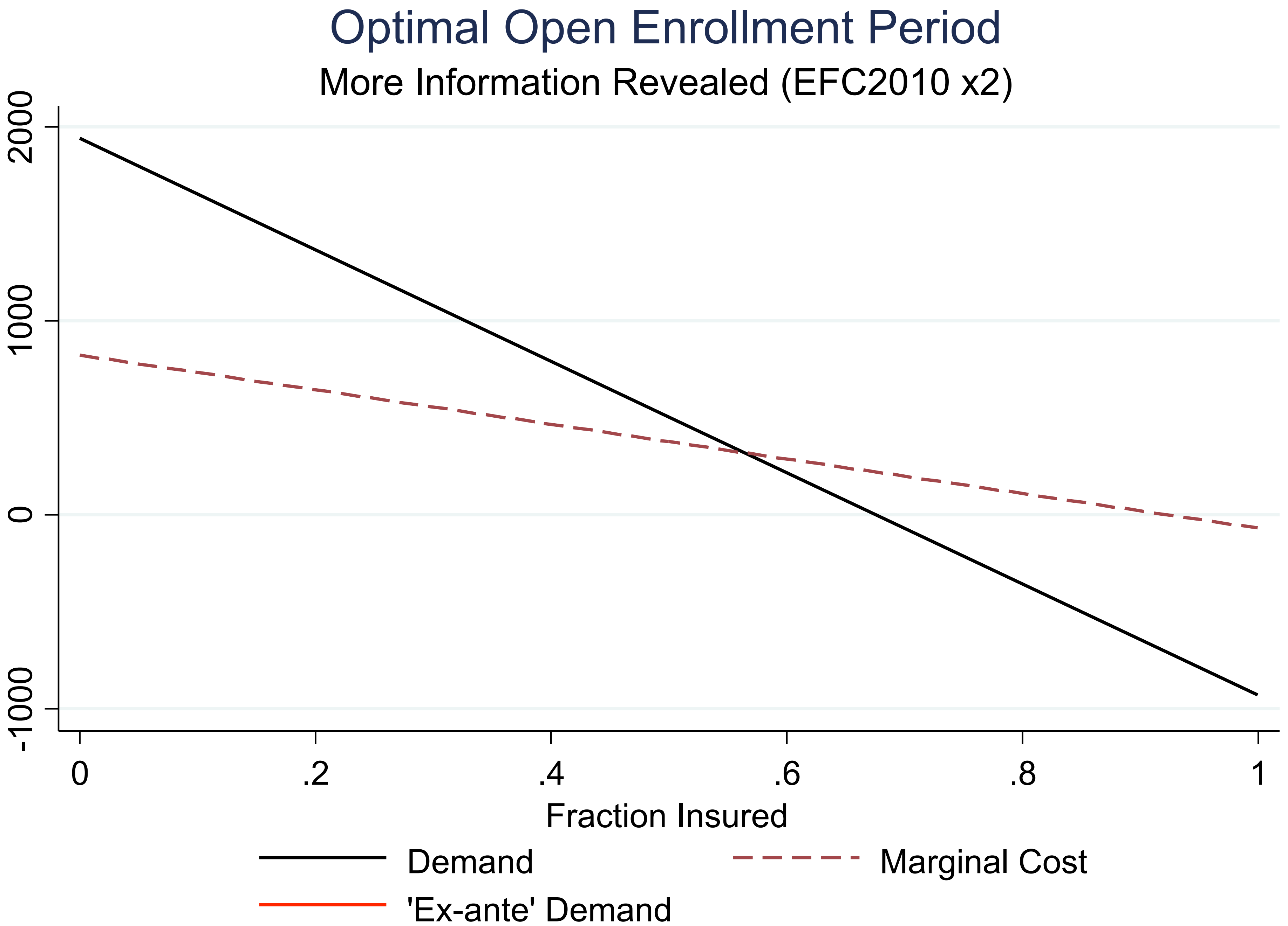
- Can use ex-ante demand curve to characterize optimal open enrollment period
  - Paper provides stylized calibration of this process to the EFC2010 setting



Optimal Open Enrollment Period
No Information Revealed
1000
800
600
400
200
0
$D^{Ex-Ante} = \$615$
$237
$AC(1) = \$378$
0
.2
.4
.6
.8
1
Fraction Insured
Demand
Marginal Cost

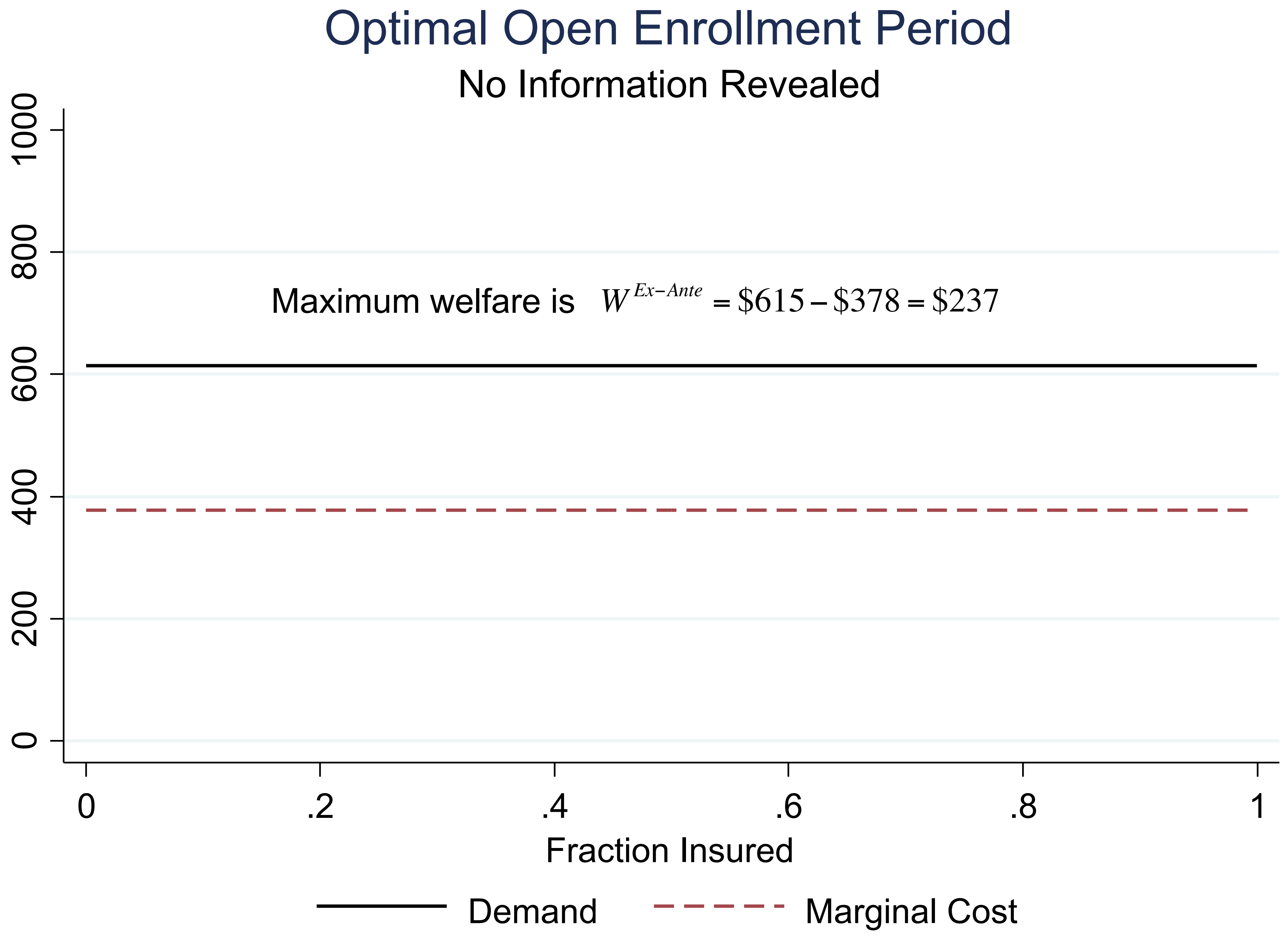


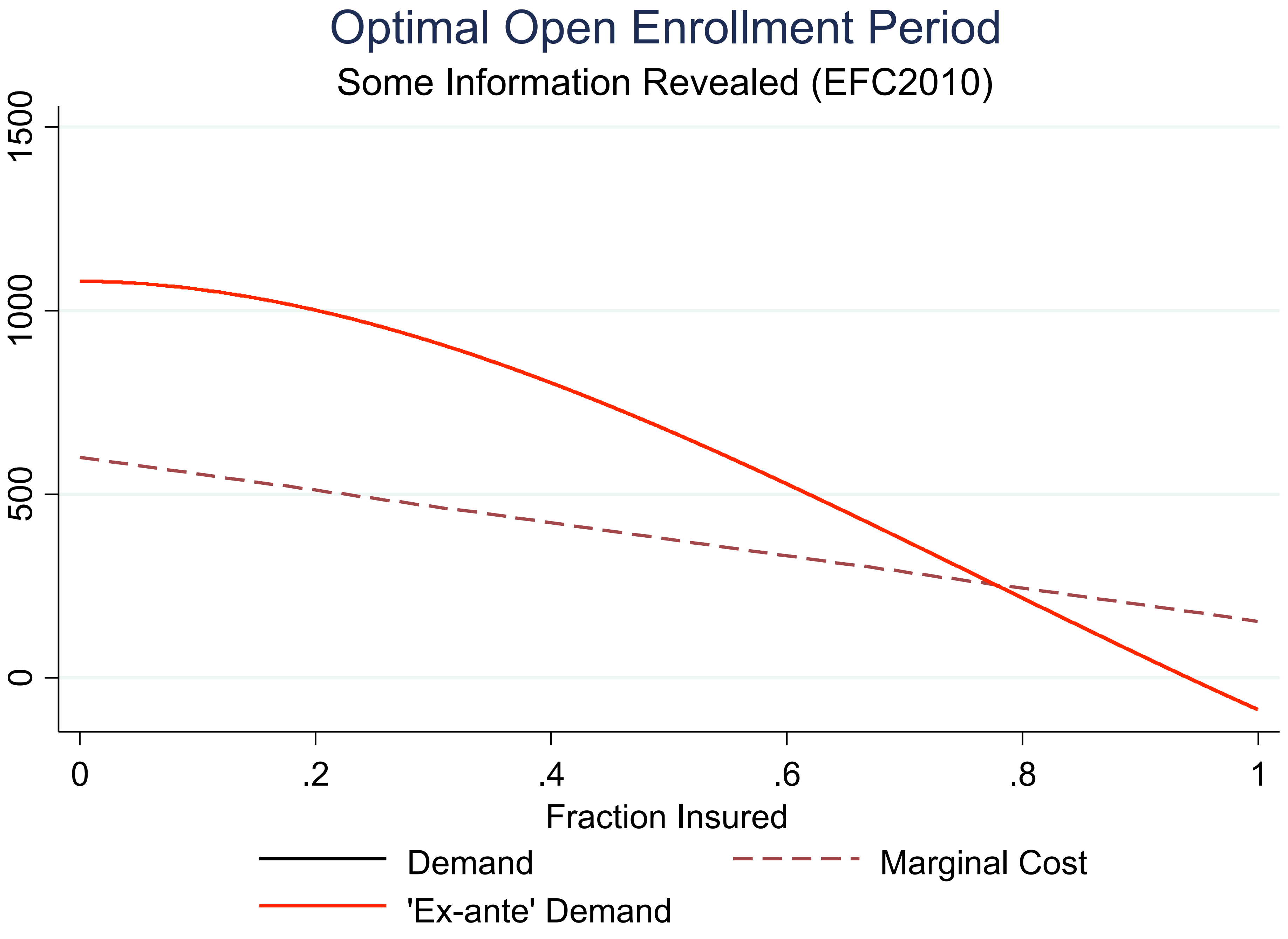
Optimal Open Enrollment Period
Some Information Revealed (EFC2010)
1500
1000
500
0
0
.2
.4
.6
.8
1
Fraction Insured
Demand
Marginal Cost
'Ex-ante' Demand

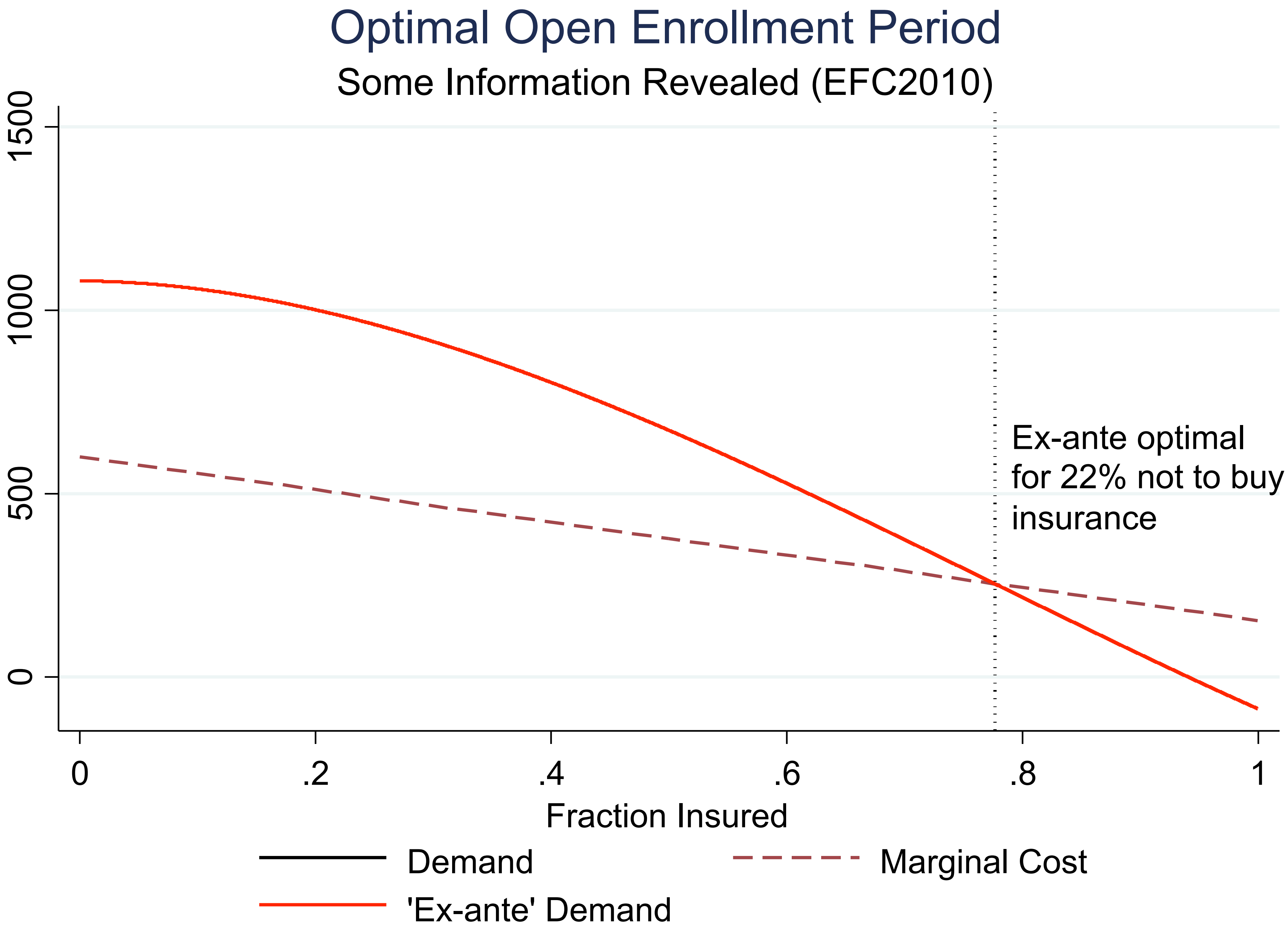

Optimal Open Enrollment Period
More Information Revealed (EFC2010 x2)
2000
1000
0
-1000
0
.2
.4
.6
.8
1
Fraction Insured
Demand
Marginal Cost
'Ex-ante' Demand

Optimal Open Enrollment Periods

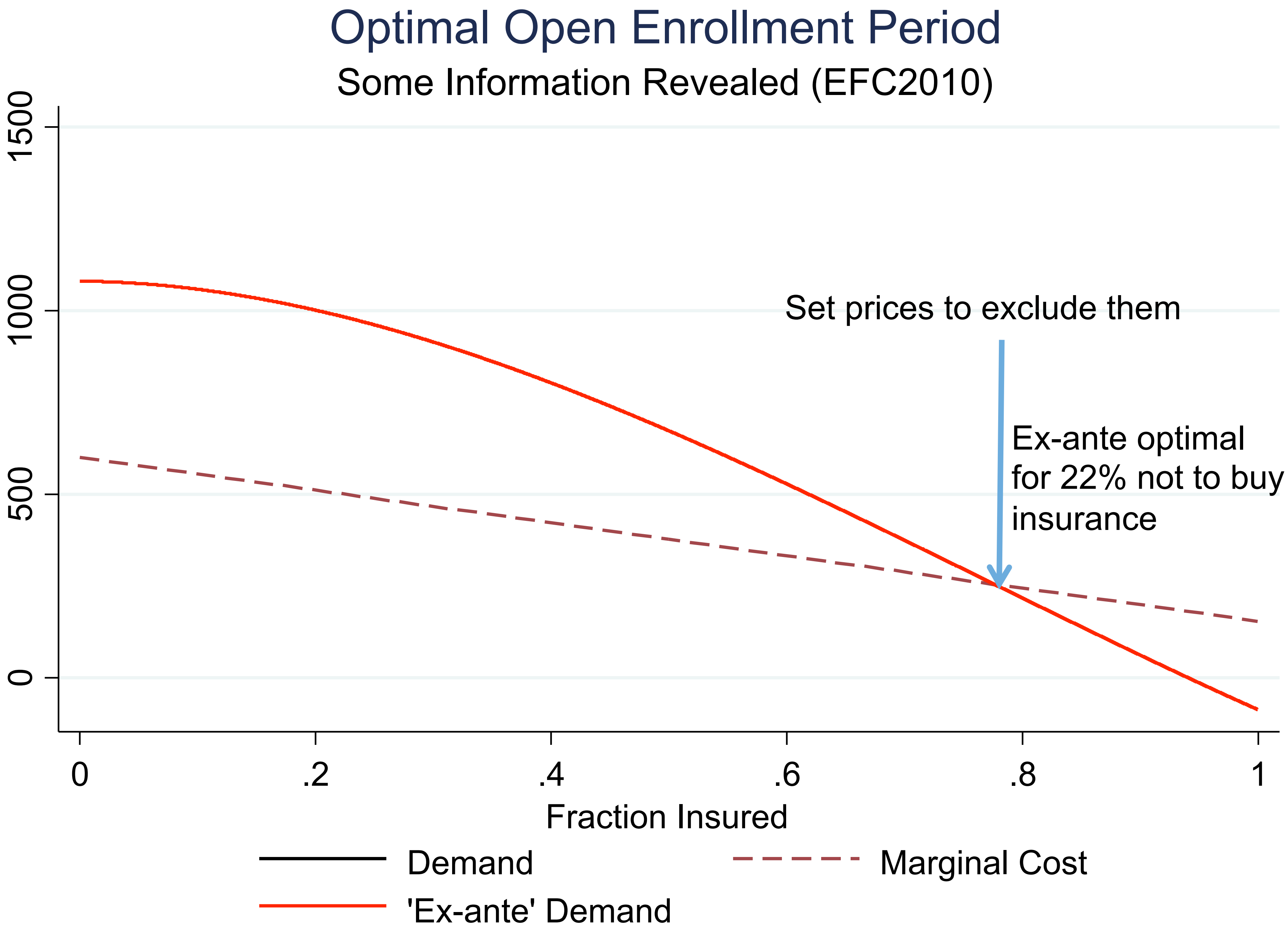
- Choice of optimal open enrollment period is a choice of which demand curve to face
  - Combined with choices of prices/subsidies for insurance
- Key: Average value of ex-ante demand curve is stable

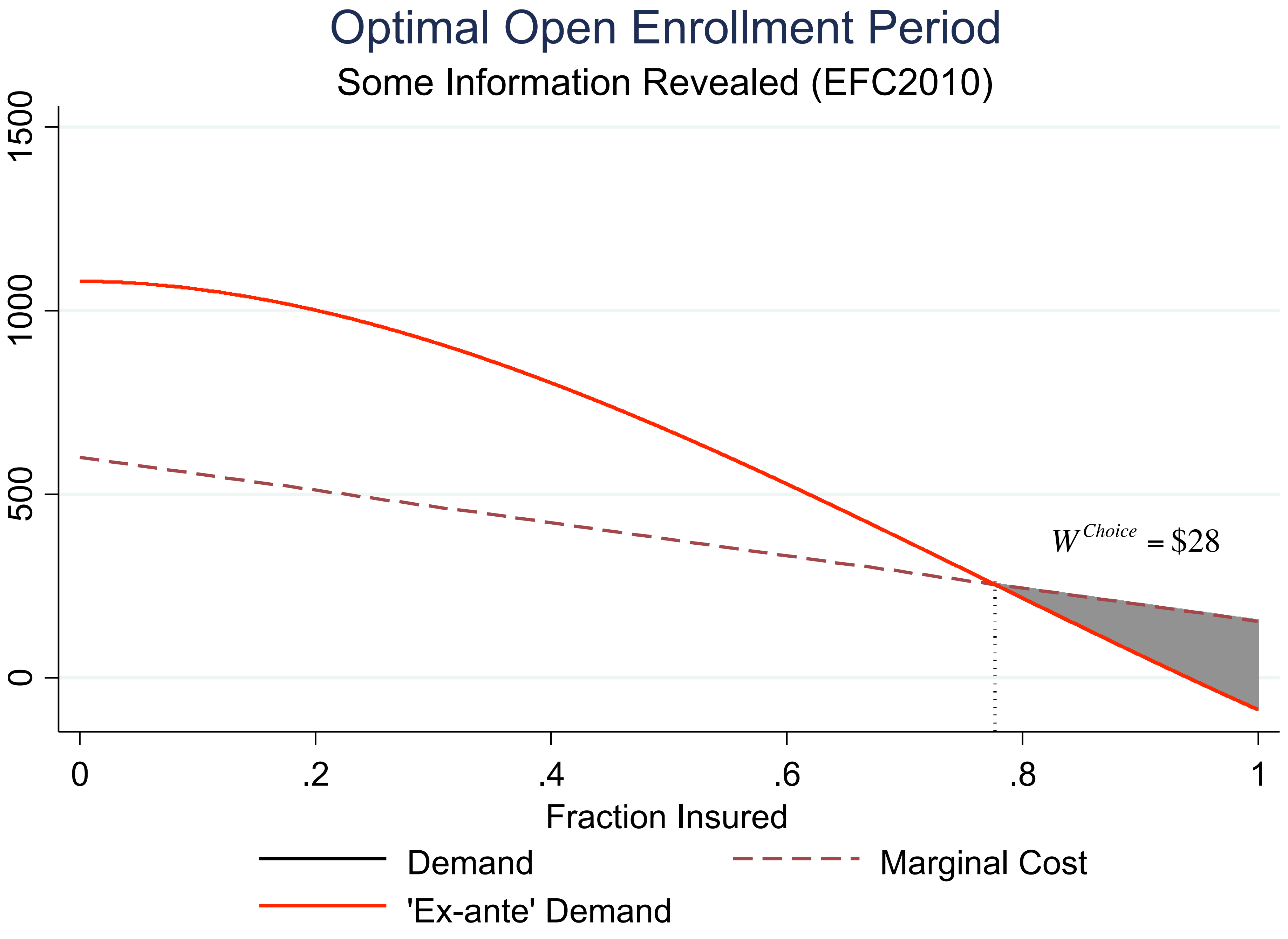

Optimal Open Enrollment Period
No Information Revealed
Maximum welfare is $W^{Ex-Ante} = \$615 - \$378 = \$237$
0
200
400
600
800
1000
0
.2
.4
.6
.8
1
Fraction Insured
Demand
Marginal Cost

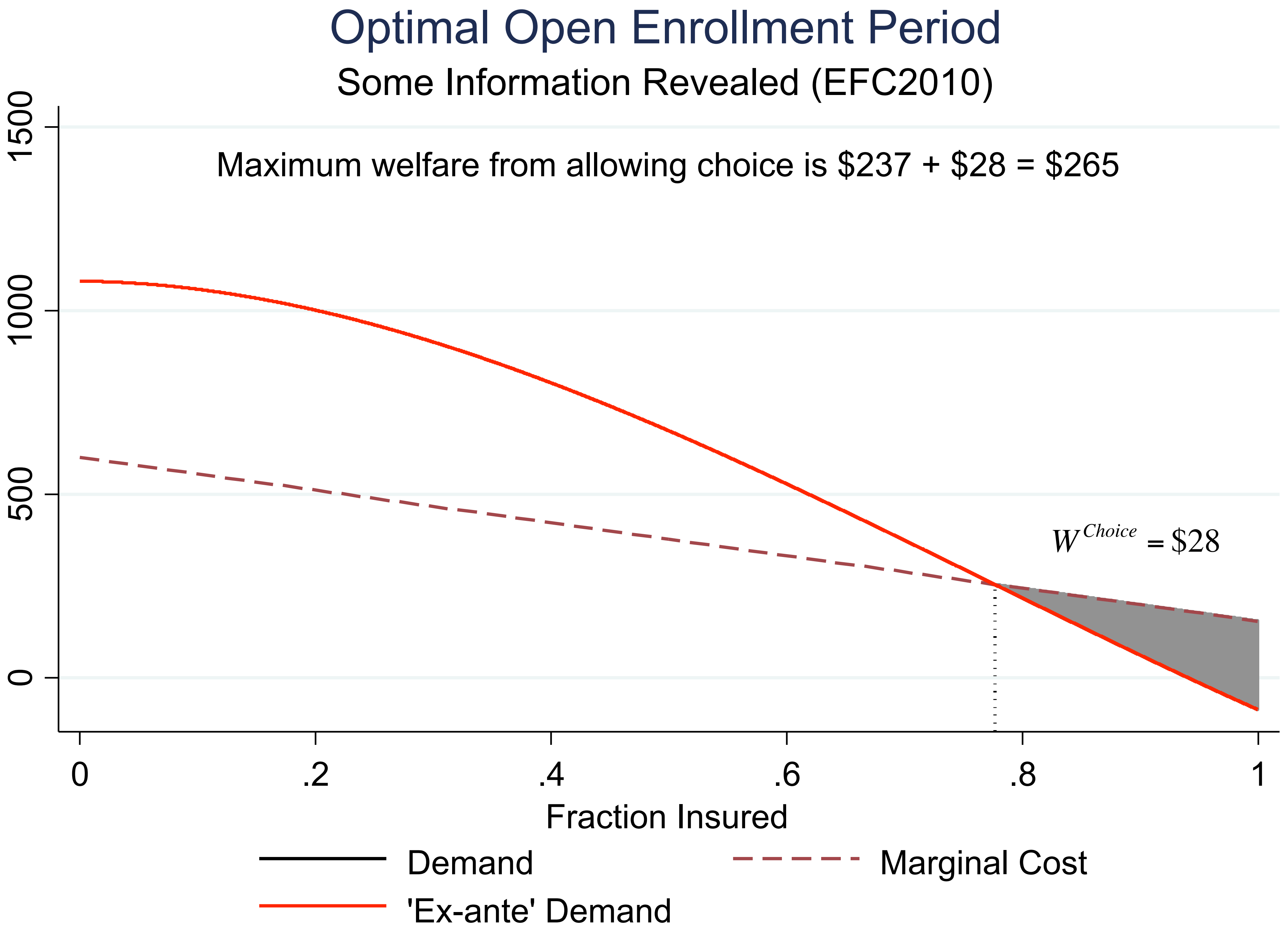

Optimal Open Enrollment Period
Some Information Revealed (EFC2010)
1500
1000
500
0
0
.2
.4
.6
.8
1
Fraction Insured
Demand
Marginal Cost
'Ex-ante' Demand

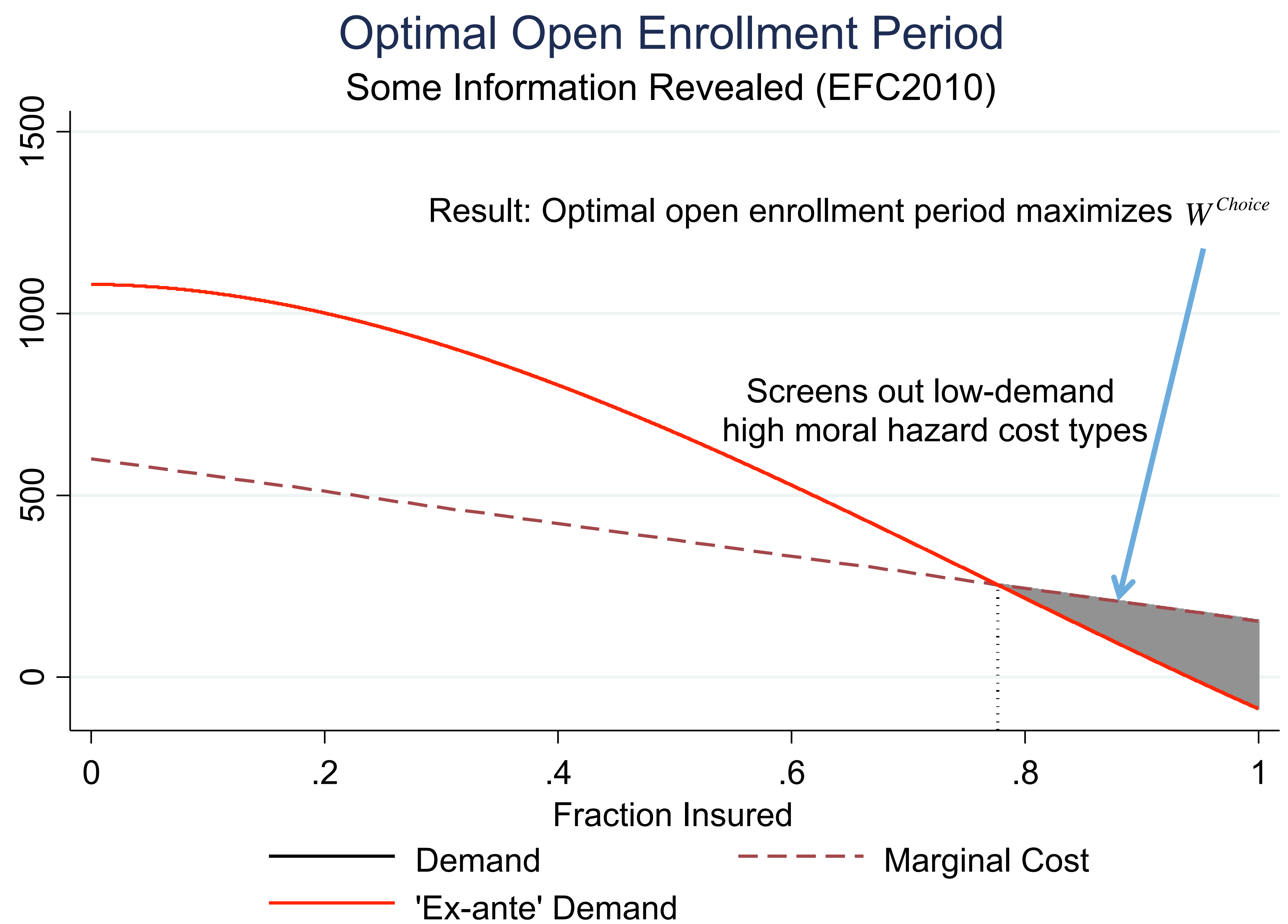


Optimal Open Enrollment Period
Some Information Revealed (EFC2010)
1500
1000
500
0
0
.2
.4
.6
.8
1
Fraction Insured
Ex-ante optimal
for 22% not to buy
insurance
Demand
Marginal Cost
'Ex-ante' Demand

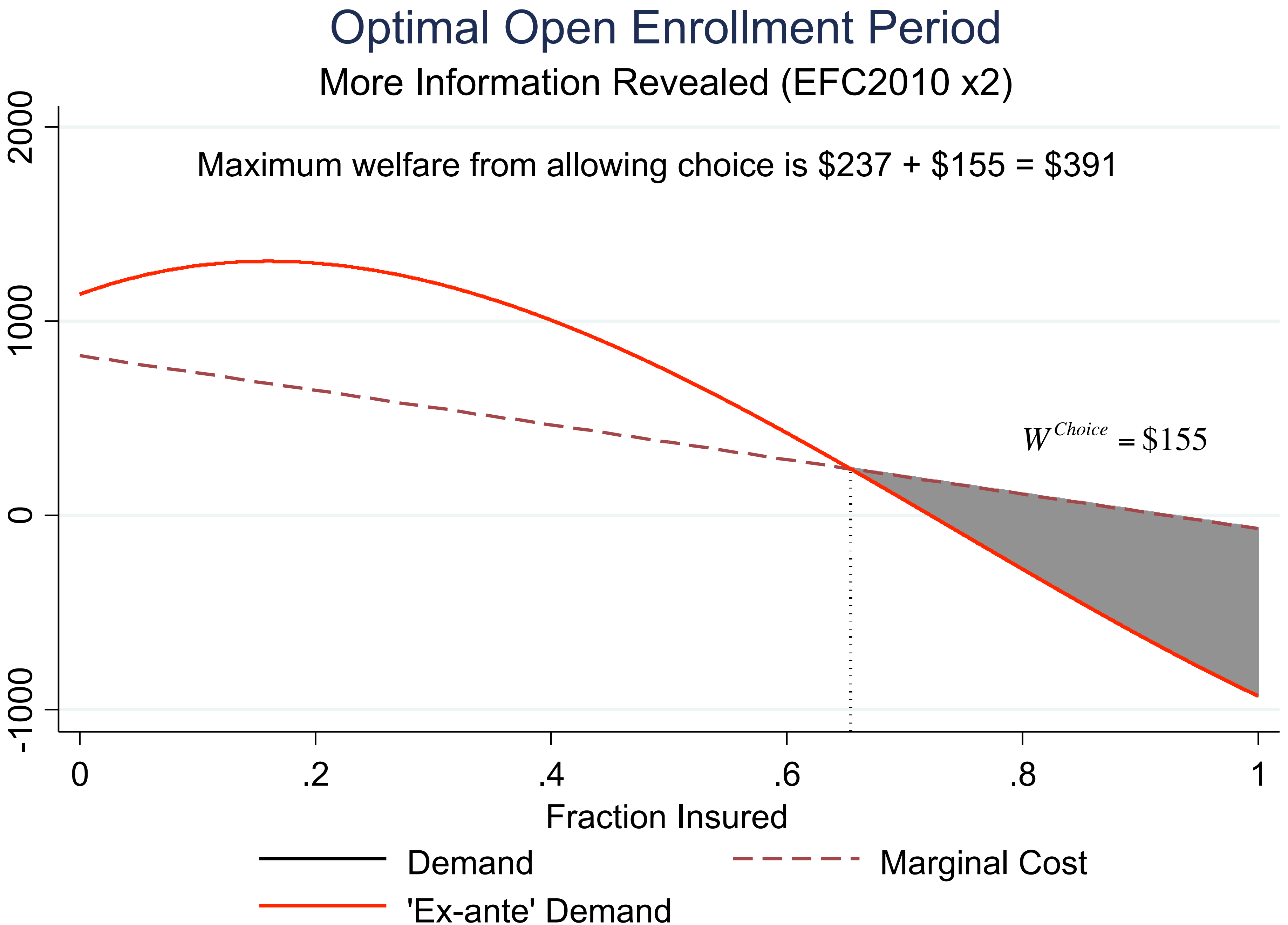

Optimal Open Enrollment Period
Some Information Revealed (EFC2010)
1500
1000
500
0
Set prices to exclude them
Ex-ante optimal
for 22% not to buy
insurance
0
.2
.4
.6
.8
1
Fraction Insured
Demand
Marginal Cost
'Ex-ante' Demand


Optimal Open Enrollment Period
Some Information Revealed (EFC2010)
1500
1000
500
0
$W^{Choice} = \$28$
0
.2
.4
.6
.8
1
Fraction Insured
Demand
Marginal Cost
'Ex-ante' Demand


Optimal Open Enrollment Period
Some Information Revealed (EFC2010)
Maximum welfare from allowing choice is $237 + $28 = $265
W^Choice = $28
1500
1000
500
0
0
.2
.4
.6
.8
1
Fraction Insured
Demand
Marginal Cost
'Ex-ante' Demand



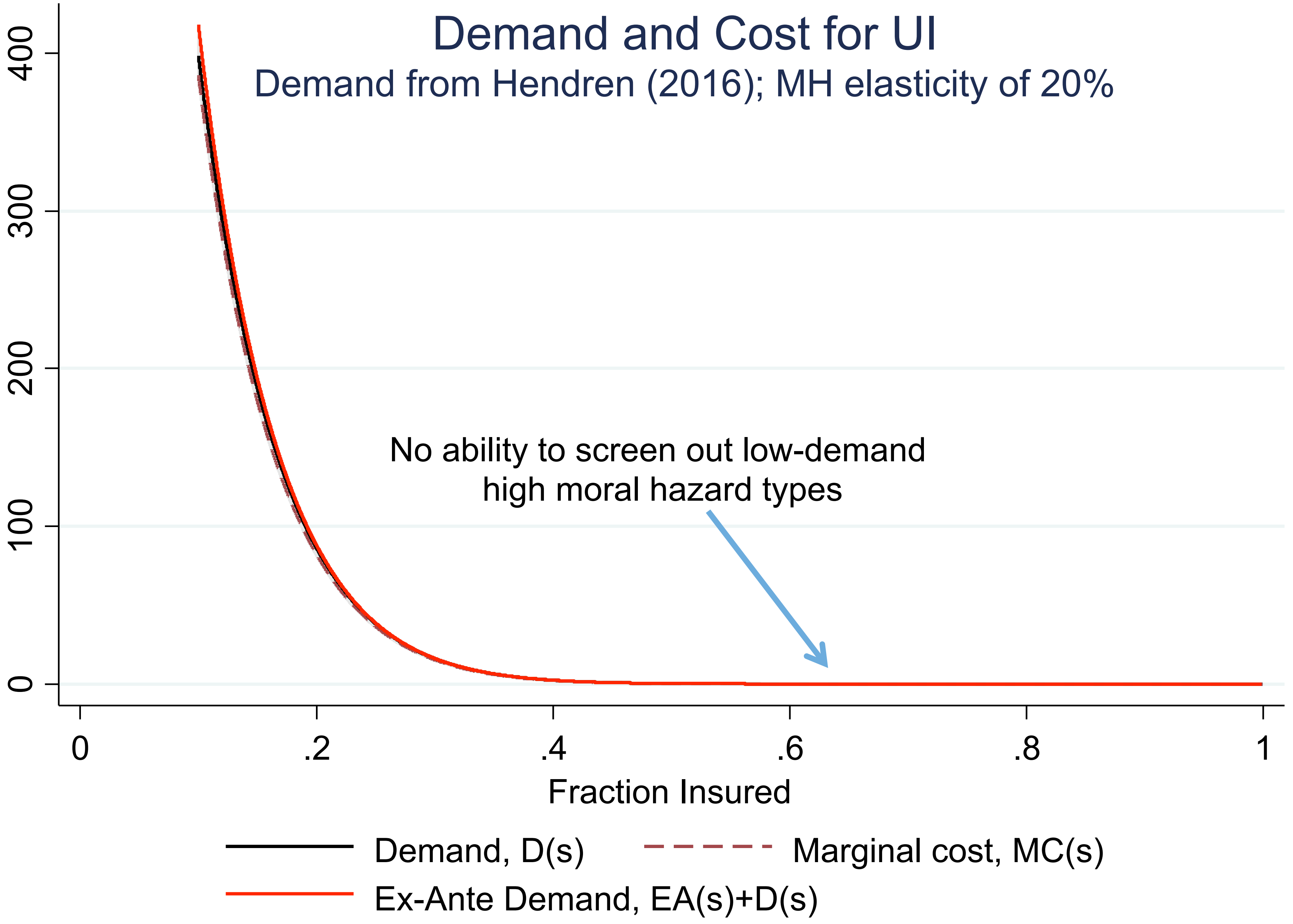
Optimal Open Enrollment Period
Some Information Revealed (EFC2010)
Result: Optimal open enrollment period maximizes W^{Choice}
Screens out low-demand
high moral hazard cost types
1500
1000
500
0
0
.2
.4
.6
.8
1
Fraction Insured
Demand
Marginal Cost
'Ex-ante' Demand



Optimal Open Enrollment Period
More Information Revealed (EFC2010 x2)
Maximum welfare from allowing choice is $237 + $155 = $391
W Choice = $155
-1000
0
1000
2000
0
.2
.4
.6
.8
1
Fraction Insured
Demand
Marginal Cost
'Ex-ante' Demand

Optimal Open Enrollment Periods

- Optimal open enrollment periods maximize quantity of low-demand high moral hazard types
  - Maximize area between marginal cost curve and ex-ante demand curve
  - May be optimal / preferred to allow contracting in presence of adverse selection
- But low-demand high moral hazard types not always present


Demand and Cost for UI
Demand from Hendren (2016); MH elasticity of 20%
0
100
200
300
400
0
.2
.4
.6
.8
1
Fraction Insured
No ability to screen out low-demand
high moral hazard types
Demand, D(s)
Marginal cost, MC(s)
Ex-Ante Demand, EA(s)+D(s)

Mandates versus Subsidized Choice

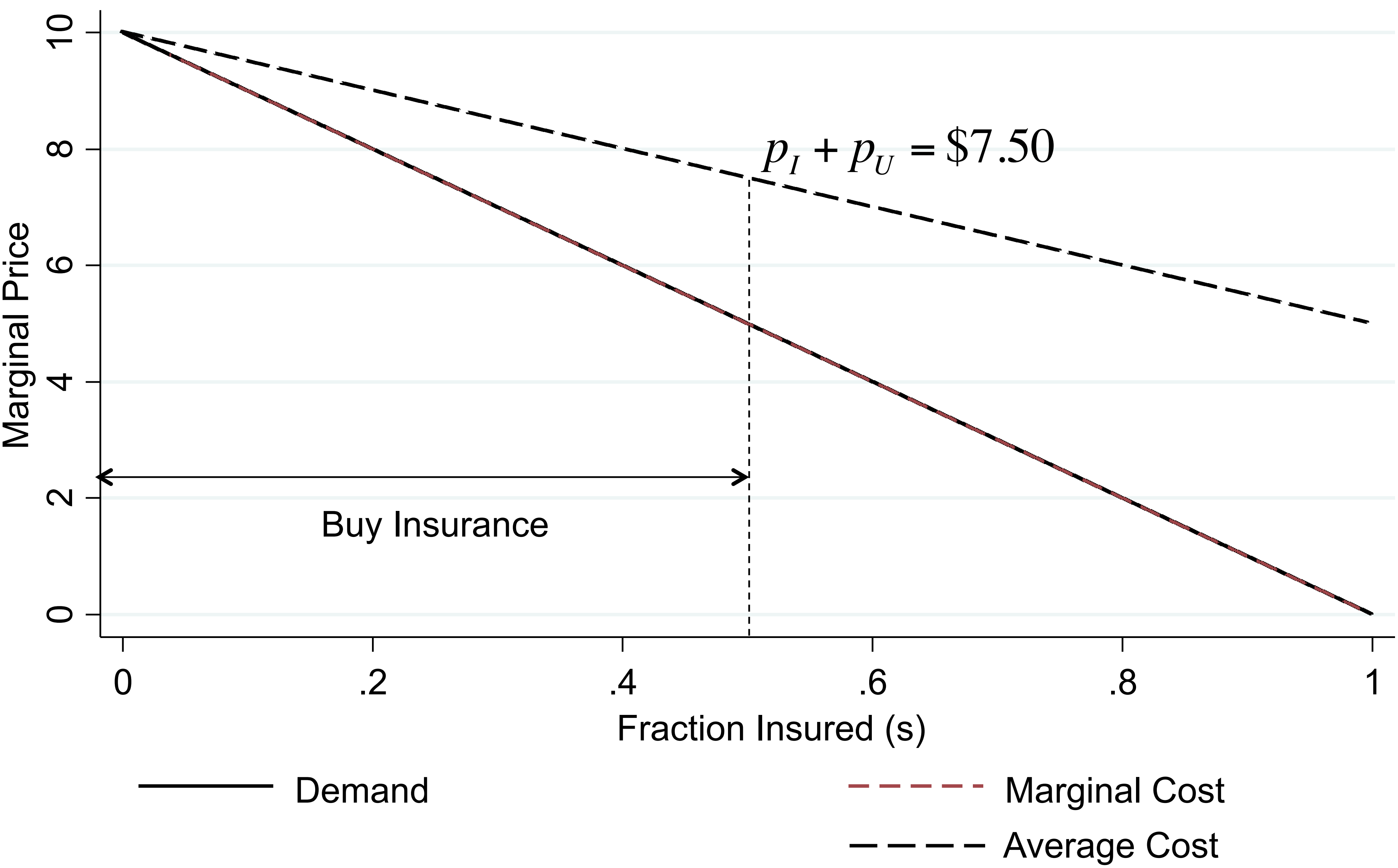
- Rationale for mandated UI but choice in health insurance?
- Are there no “low demand high moral hazard types” in UI?

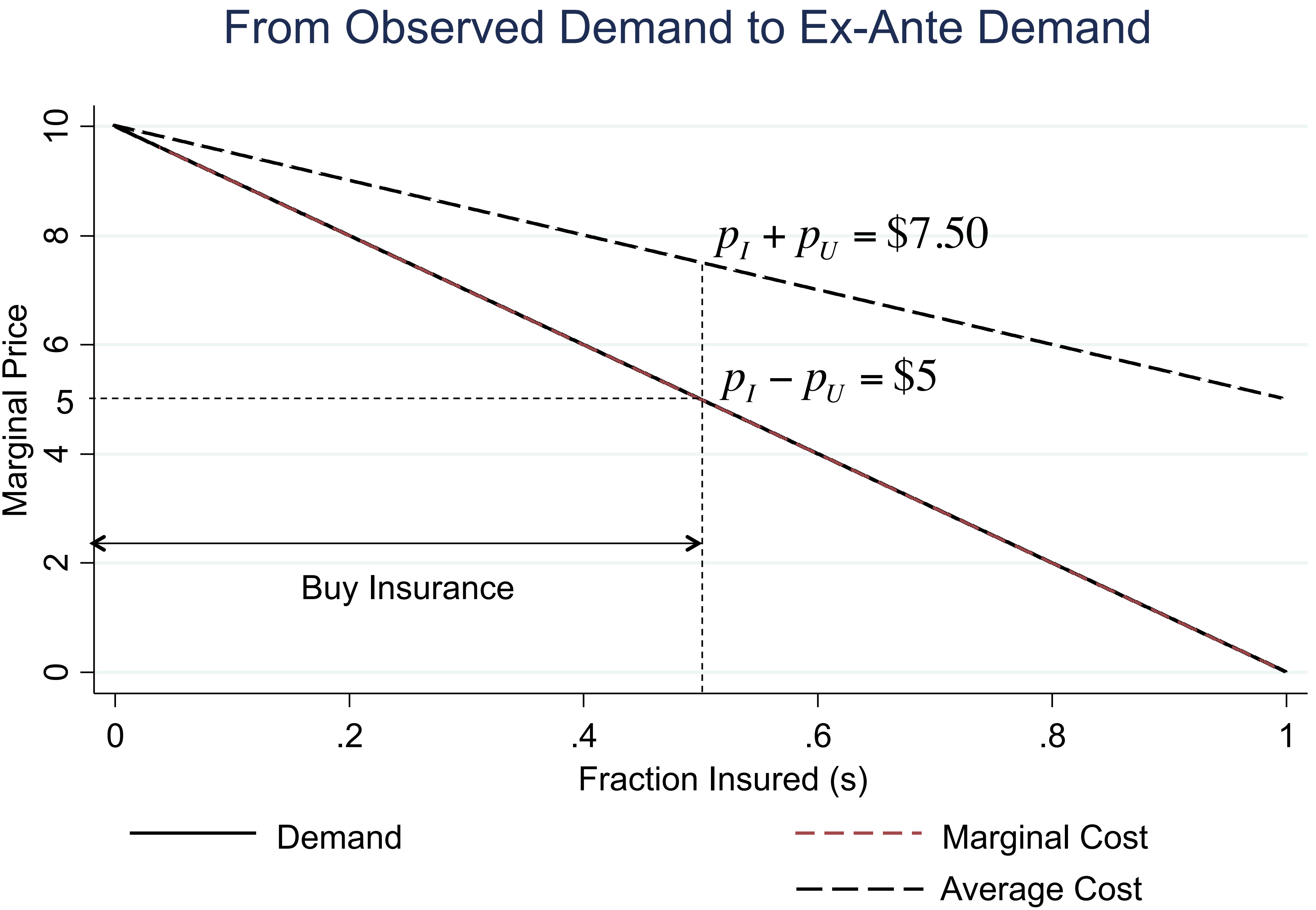
Conclusion

- Insurance insures against the realization of risk
  - Adverse selection implies a divergence between DWL and Ex-ante welfare
- Exploit Baily-Chetty logic to create ex-ante demand curve
  - Conduct utilitarian/ex-ante welfare analysis
- DWL and Ex-ante welfare can differ in conclusions about:
  - Optimal size of insurance market
  - Welfare cost of adverse selection
  - Competitive markets vs. mandates
  - Difference between DWL and Ex-ante welfare increasing in size of risk
- Opens new questions like optimal open-enrollment periods
  - Screen out low-demand high moral hazard types

Appendix

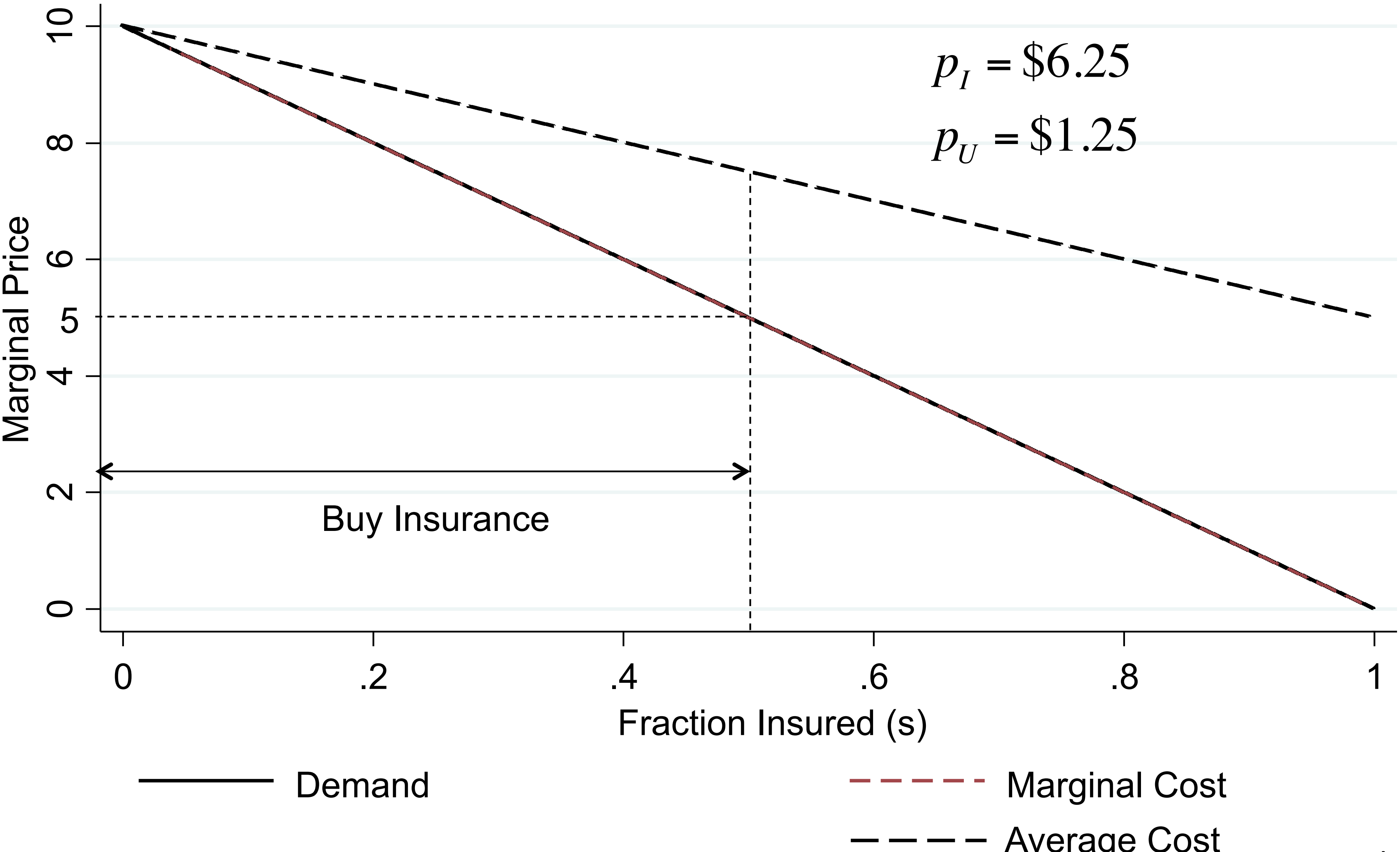
From Observed Demand to Ex-Ante Demand





From Observed Demand to Ex-Ante Demand
Marginal Price
10
8
6
5
4
2
0
$p_I + p_U = \$7.50$
$p_I - p_U = \$5$
Buy Insurance
0
.2
.4
.6
.8
1
Fraction Insured (s)
Demand
Marginal Cost
Average Cost

From Observed Demand to Ex-Ante Demand



Back

Unemployment Insurance

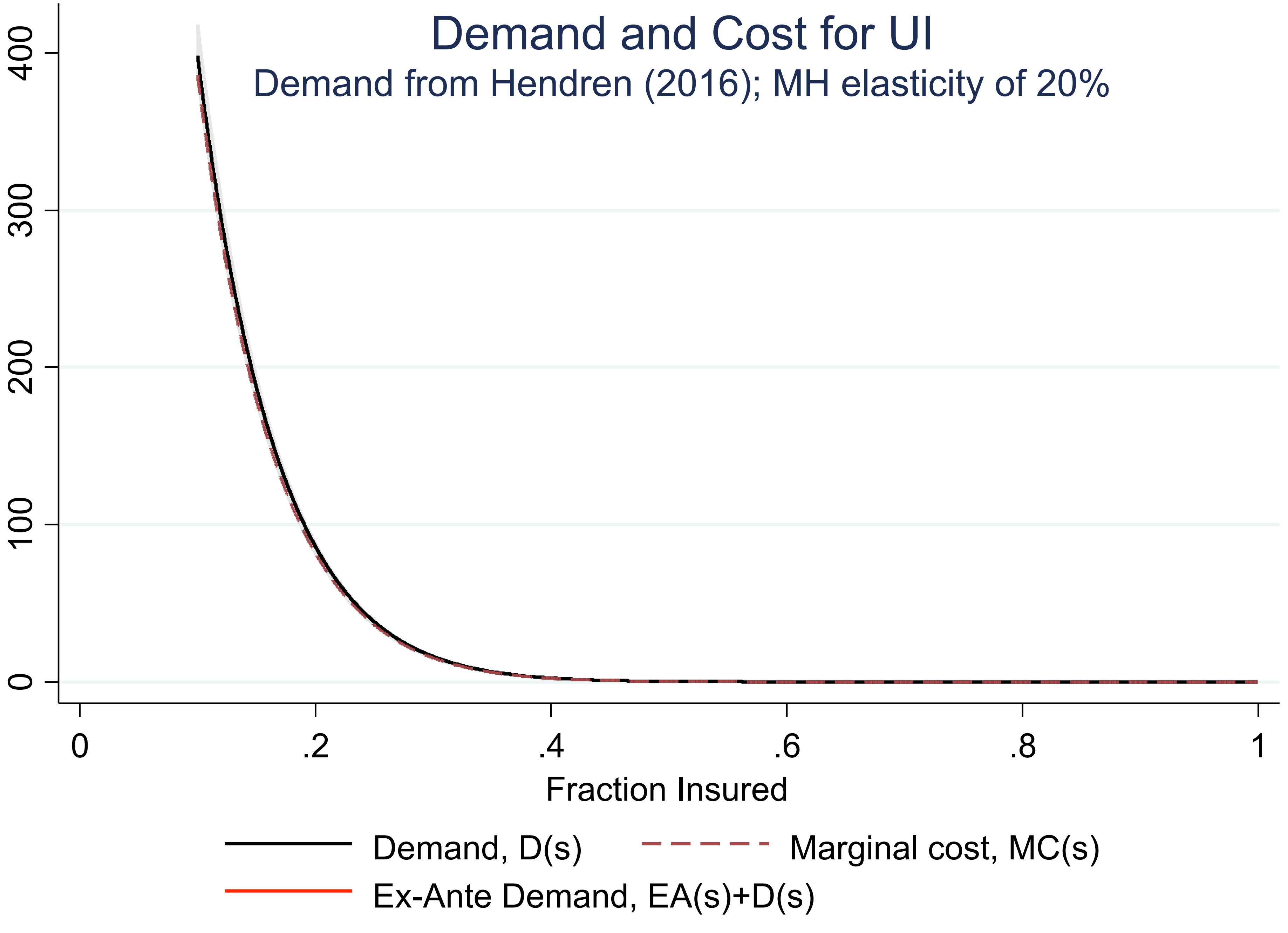
- Ex-ante and observed demand also differ for UI

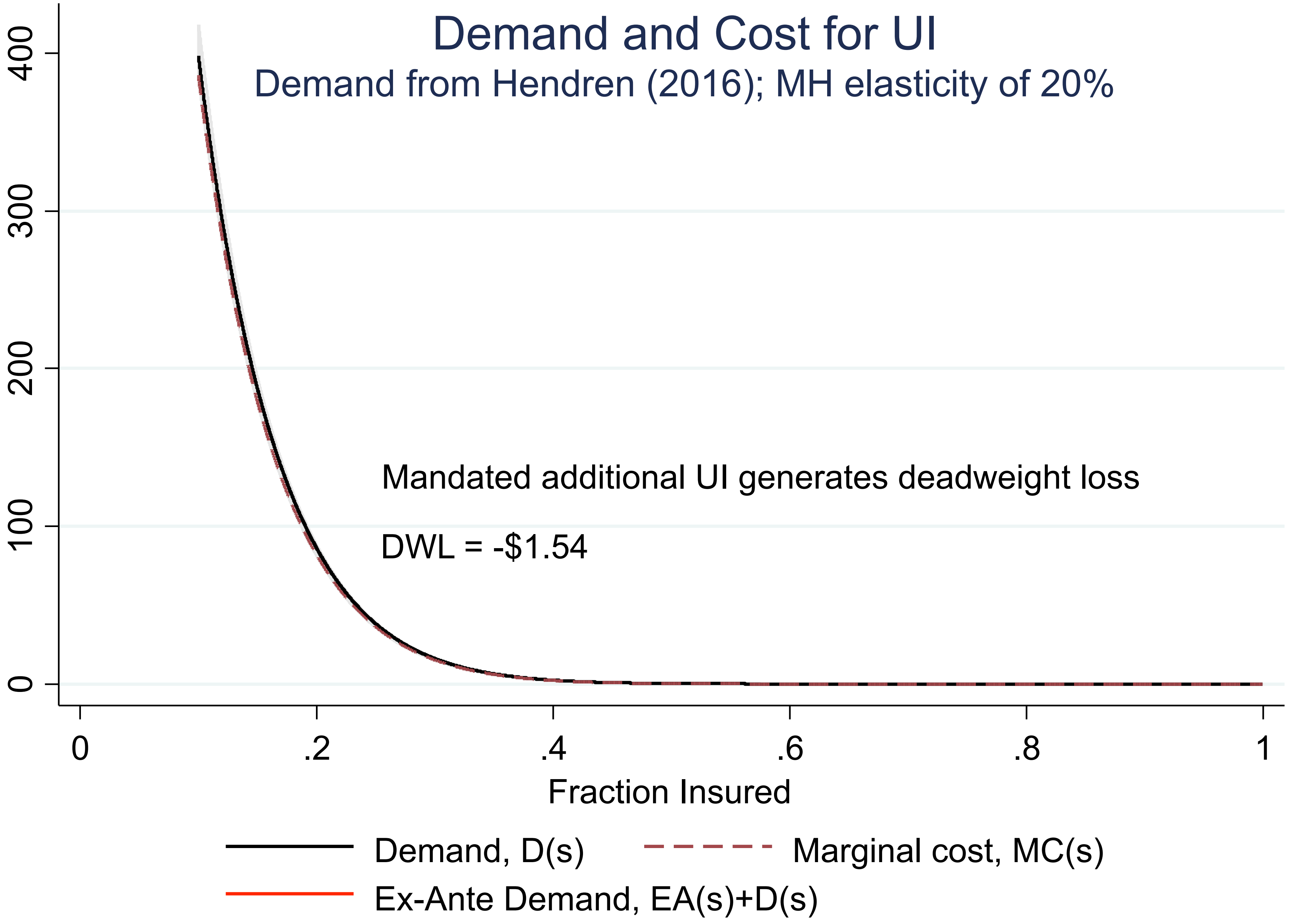
- Consider hypothetical annual contract to replace $2,700 consumption drop if lose job in subsequent 12 months

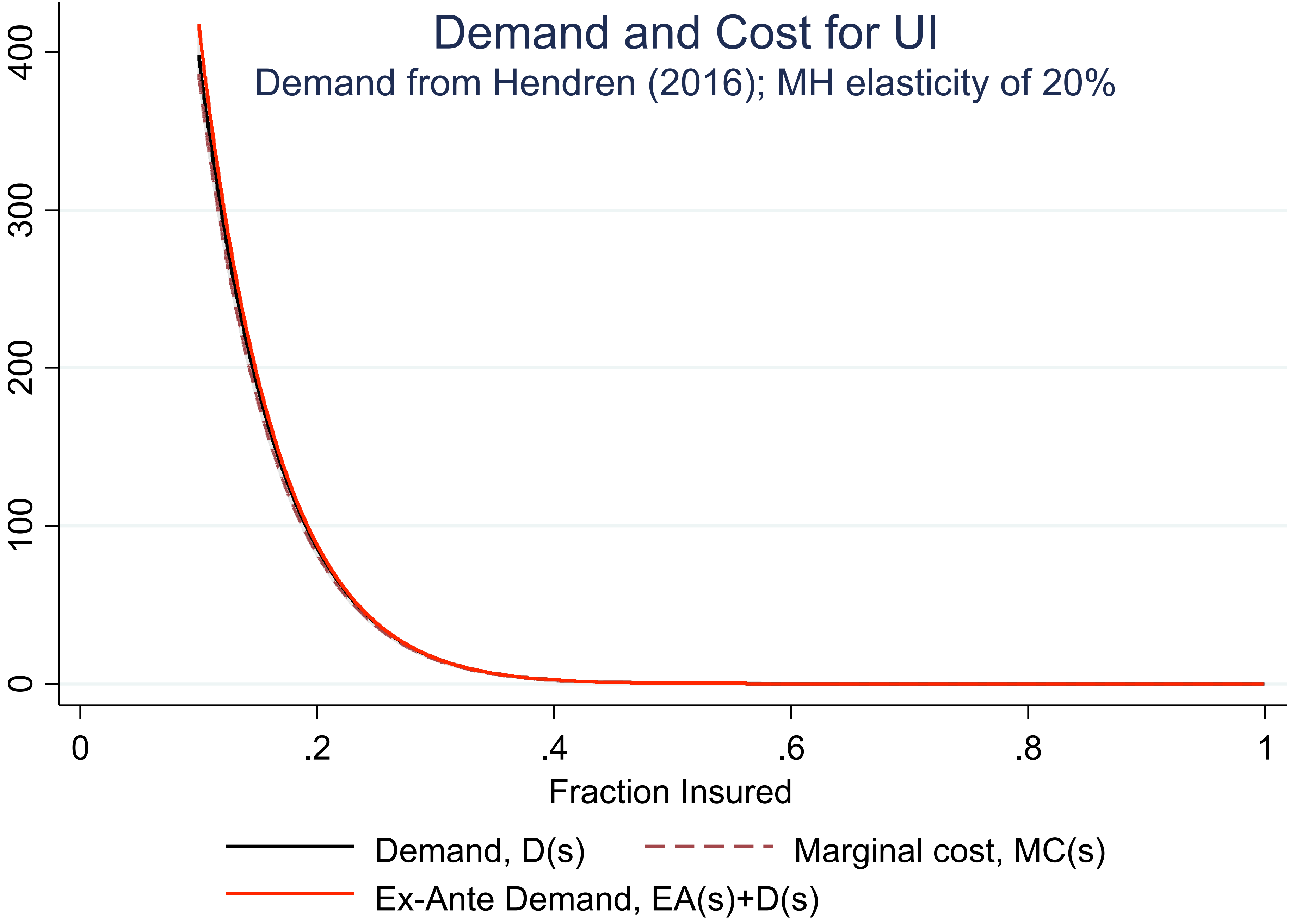
  - Take demand parameters from Hendren (2016) + 20% moral hazard elasticity

  - Private market would unravel

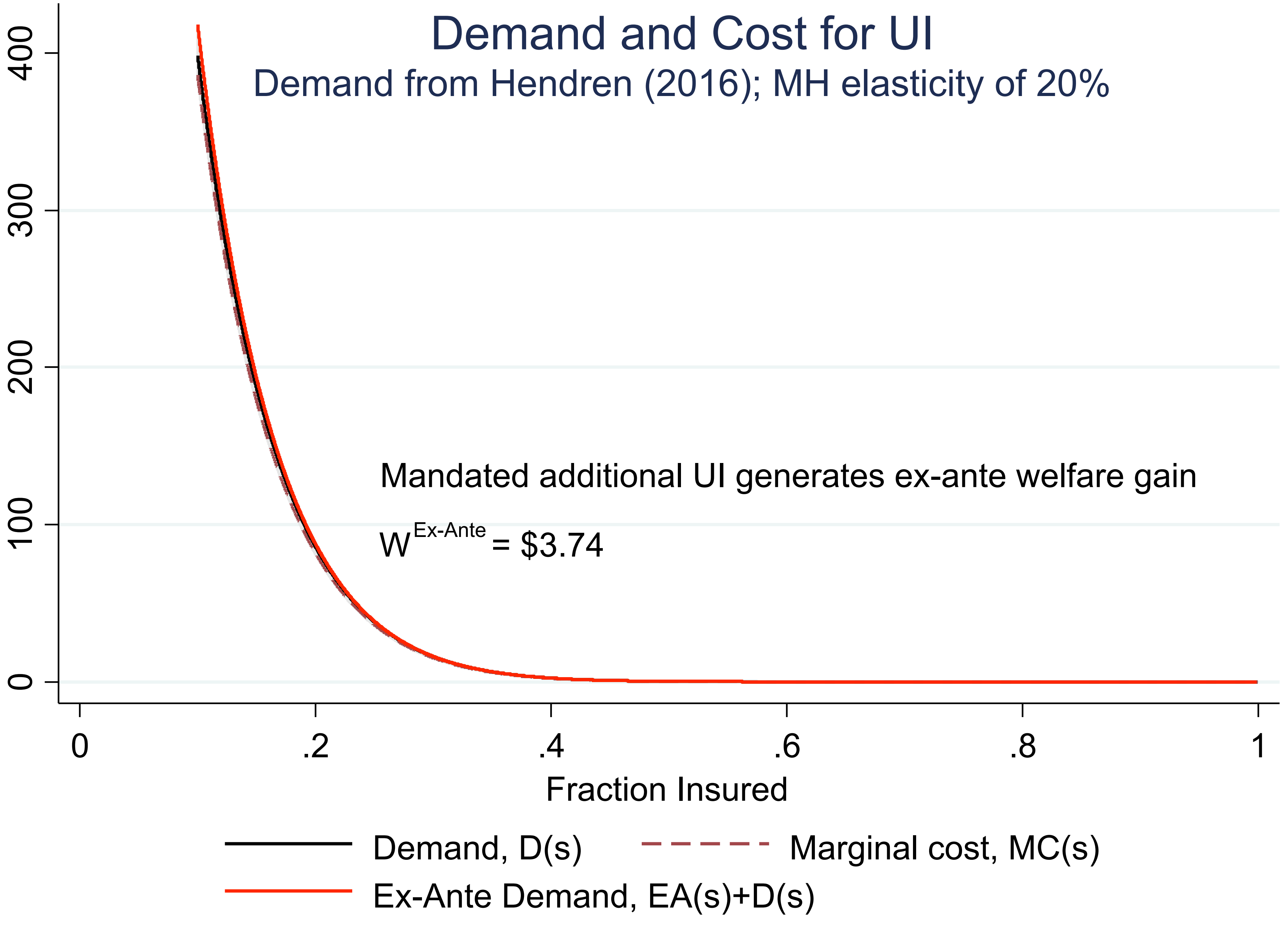
  - Small fraction of market has high risk of losing job


Demand and Cost for UI
Demand from Hendren (2016); MH elasticity of 20%
0
100
200
300
400
0
.2
.4
.6
.8
1
Fraction Insured
Demand, D(s)
Marginal cost, MC(s)
Ex-Ante Demand, EA(s)+D(s)


Demand and Cost for UI
Demand from Hendren (2016); MH elasticity of 20%
0
100
200
300
400
Mandated additional UI generates deadweight loss
DWL = -$1.54
0
.2
.4
.6
.8
1
Fraction Insured
Demand, D(s)
Marginal cost, MC(s)
Ex-Ante Demand, EA(s)+D(s)



Demand and Cost for UI
Demand from Hendren (2016); MH elasticity of 20%
400
300
200
100
0
0
.2
.4
.6
.8
1
Fraction Insured
Demand, D(s)
Marginal cost, MC(s)
Ex-Ante Demand, EA(s)+D(s)



Demand and Cost for UI
Demand from Hendren (2016); MH elasticity of 20%
Mandated additional UI generates ex-ante welfare gain
W^Ex-Ante = $3.74
0
100
200
300
400
0
.2
.4
.6
.8
1
Fraction Insured
Demand, D(s)
Marginal cost, MC(s)
Ex-Ante Demand, EA(s)+D(s)