How Markets Work: Lessons for Workers Compensation

Presented by:

Dr. Harry Shuford
Chief Economist

CAS RPM Seminar
April 1, 2014
Washington, DC

How Markets Work: Lessons for Workers Compensation

- The Standard Economic Model of a Market
- Lessons for Workers Compensation (WC)
- The Balloon Theory of the WC Market

The Standard Economic Model of a Market

How Markets Work: Lessons for Workers Compensation

What Makes a Market a "Market"?

- An environment where a good or service is traded
- Typically:
  - Multiple sellers—the supply side
  - Multiple buyers—the demand side
- No set of either buyers or sellers is able to set prices or control the quantity either supplied (e.g., duopoly) or demanded (e.g., monopsony)

How Markets Work: Lessons for Workers Compensation

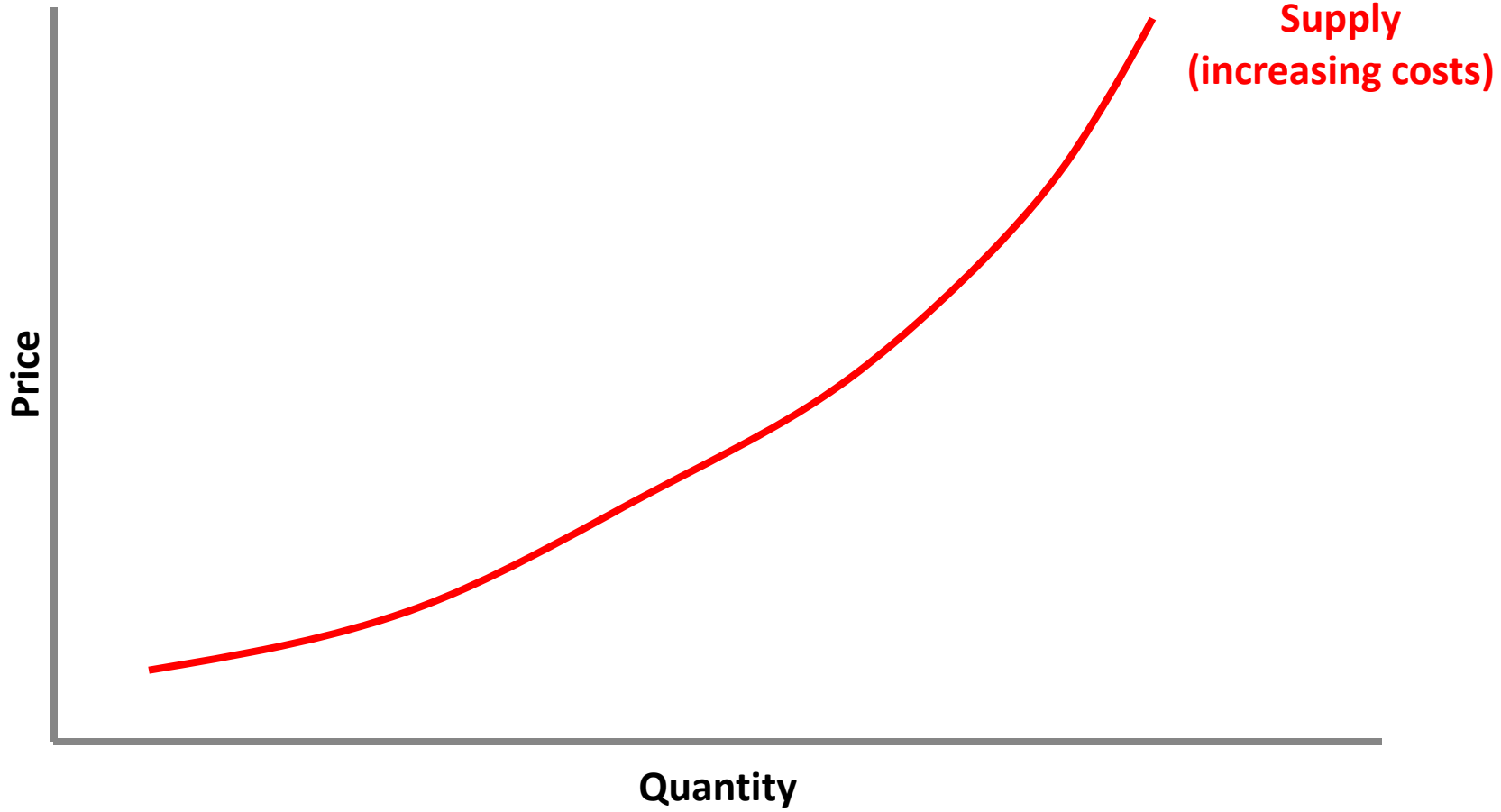
What Makes a "Market" Competitive?

Sellers and the Supply Curve

- The supply curve is derived from the cost function that underlies the production of the good or service
- The supply curve in a competitive market is upward sloping, reflecting the observation that:
  - At least over short time periods, it costs more to produce more due to decreasing economies of scale
    - Referred to as increasing marginal costs of production
- This means that the price must increase to get an increase in the amount supplied

At low levels of production, the cost curve typically is downward sloping due to increasing returns to scale. This typically is not part of the supply curve because it is unstable; the average cost is declining; the marginal cost is negative.

The Supply Curve Reflects the Increasing Costs of Producing More



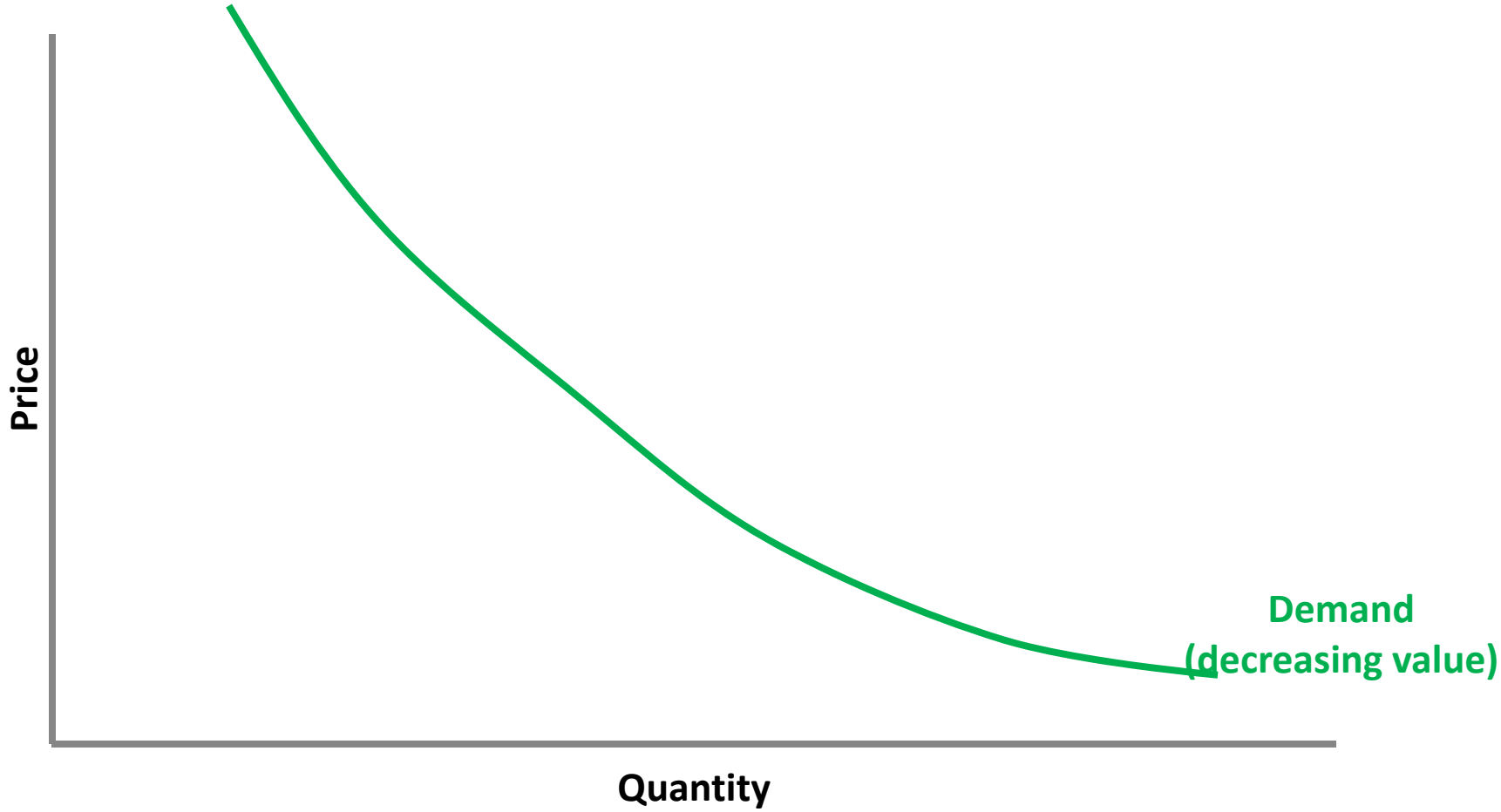
How Markets Work: Lessons for Workers Compensation

What Makes a “Market” Competitive?

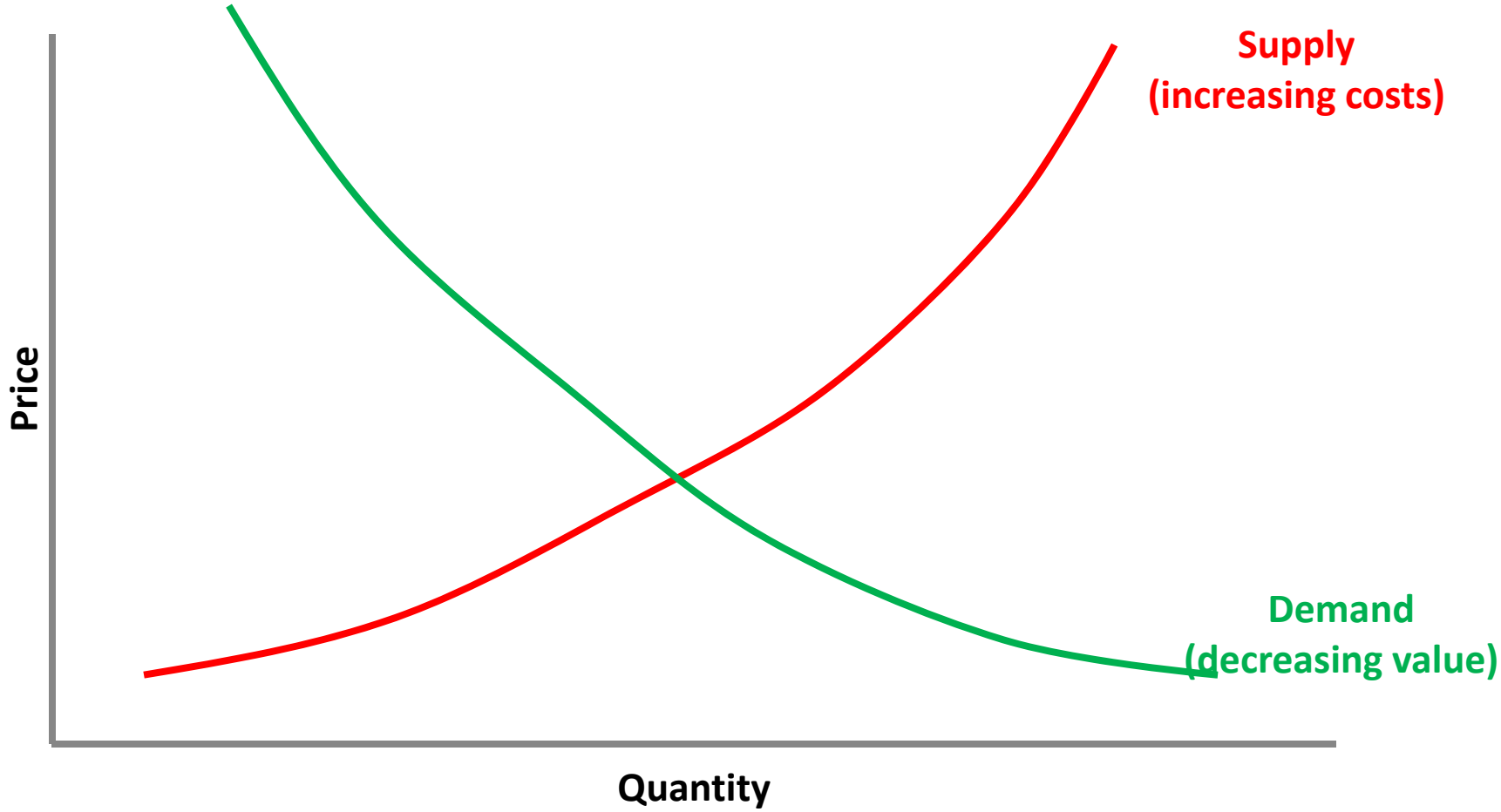
Buyers and the Demand Curve

- The demand curve is derived from the utility function and the relative value that buyers place on the good or service
- The demand curve in a competitive market is downward sloping, reflecting the observation that
  - At least over short time periods, increased consumption of most goods and services is linked to declining marginal utility, or
  - Some buyers place a higher value than others on the good or service
- This means that the price must decrease to get an increase in the amount bought

The Demand Curve Reflects the Decreasing Value Placed on Consuming More



Market Equilibrium: Supply Equals Demand at Market Price



How Markets Work: Lessons for Workers Compensation

What's to Like About Competitive Markets?

- In general competitive markets are efficient in the sense that resources are used where they create the most value
  - The supply curve is derived from the cost function that underlies the creation and delivery of the good or service; the costs include a "normal profit" to cover the cost of capital
  - The demand curve is derived from the utility function that reflects the relative value that each successive potential buyer places on the good or service
  - When supply equals demand at the market price, the value of the resources (as reflected in production costs) required to produce the good or service is equal to the value that the buyers place on consuming the good or service
- For this reason economists argue that competitive markets typically allocate resources efficiently

Market Equilibrium: Supply Equals Demand at Market Price

How Markets Work: Lessons for Workers Compensation

What's to Like about Competitive Markets?

- The market price is a critically important economic measure

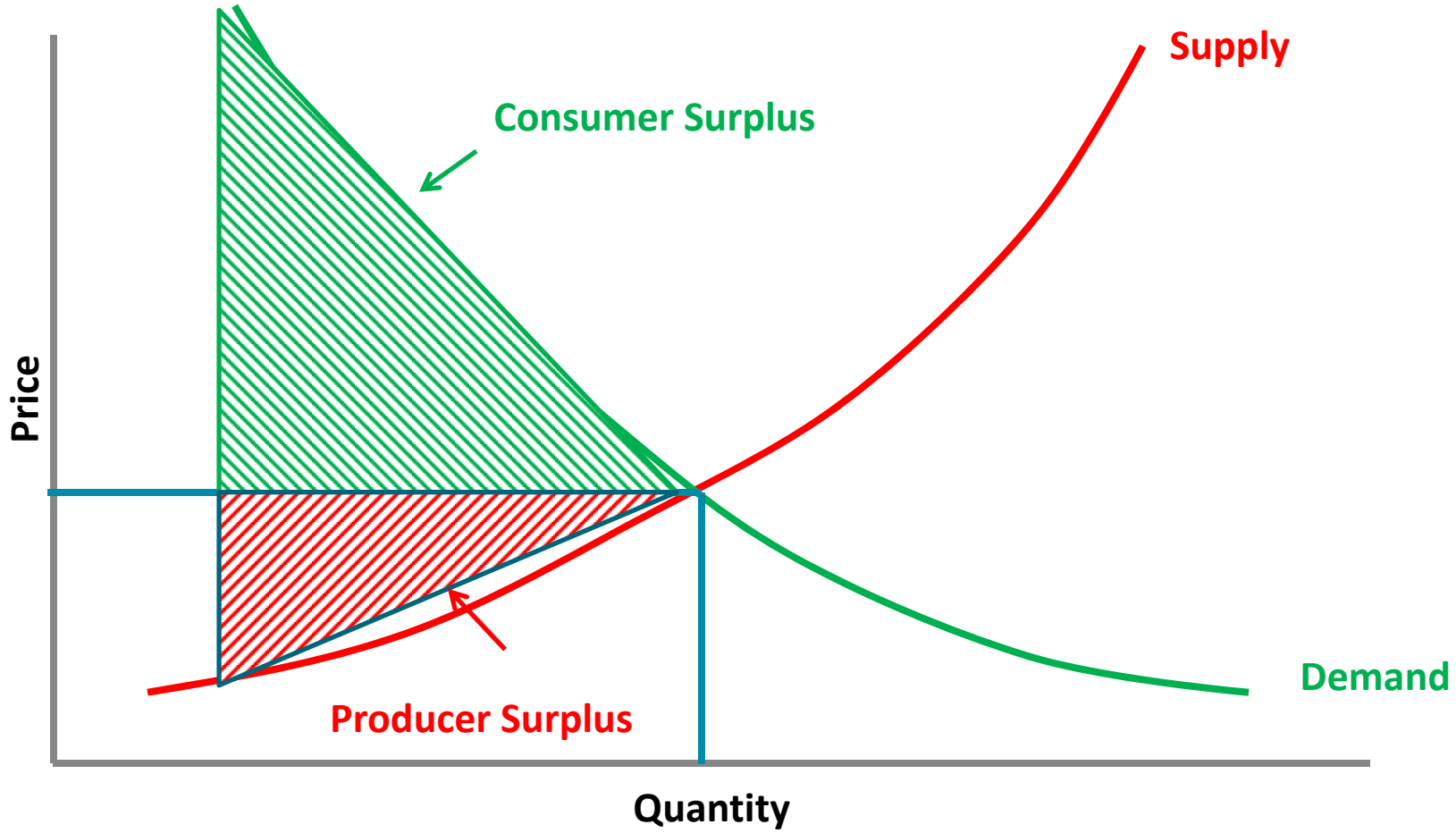
- It is a single number that captures and equates the resource cost and the consumption value

How Markets Work: Lessons for Workers Compensation

One Implication of the Competitive Market Equilibrium

- There is a single price for all buyers and for all sellers
  - All but the last buyer would have paid more than the market price
  - All but the last item produced cost less than the market price
- Most buyers get more value than they paid for—a "surplus"
- Most goods sold cost less than what they sold for—a "profit"
  - This could be termed a favorable return because the underlying costs include a "normal" profit

Market Equilibrium: Supply Equals Demand at Market Price



How Markets Work: Lessons for Workers Compensation

What's to Like about Competitive Markets?

- In general, in competitive markets the market will "clear" in the sense that the quantities supplied and purchased will be equal at the market price
- A key feature of "perfect" competition is full information
  - That is, all buyers and sellers have the same information
  - Generally there is no uncertainty
- Perfect information is not a feature of most real-world markets

Deviations From the Standard Market Model

How Markets Work: Lessons for Workers Compensation

Deviations from the Standard Market Model

- Supply Is Constrained
  - Supply is less than demand at the prevailing price
  - An indication of market inefficiency
    - The value placed by potential buyers exceeds the costs of additional production
- Price Is Constrained
  - Actual supply exceeds the amount that would be offered at the prevailing price
  - An indication of market inefficiency
    - The costs of the added production exceed the value indicated by the price

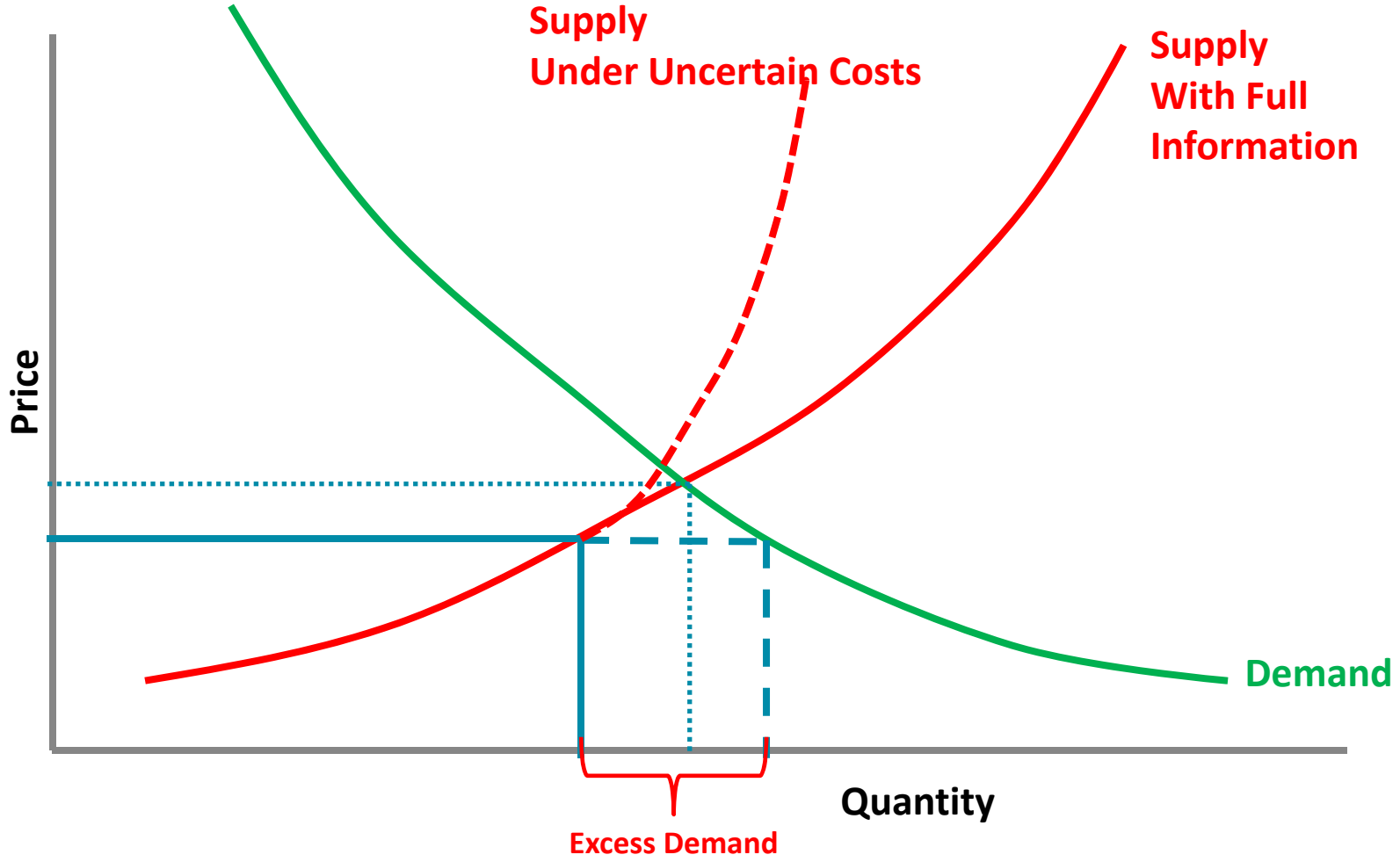
How Markets Work: Lessons for Workers Compensation

When Markets Don't Clear – Supply Is Constrained

- Quantity supplied at the market price is less than the quantity demanded
- In a competitive environment, the "excess" demand should cause the price to increase to bring the market into balance
- Why might markets not clear?—lack of full information
  - "Asymmetric information"
  - Moral hazard and/or adverse selection
  - Uncertainty

Market Equilibrium: Supply Equals Demand at Market Price

Market Fails to Clear: Demand Exceeds Supply at Market Price



How Markets Work: Lessons for Workers Compensation

When Markets Don't Clear

Examples:

- Credit rationing—Stiglitz and Weiss
  - Excess demand for bank loans at prevailing loan rates
  - A willingness to pay high rates is a signal that borrower may be prepared to assume excessive risk

- Insurance contractual constraints on multiple policies for the same risk—Stiglitz and Rothschild
  - Results in an excess demand for insurance at prevailing premium rates
  - A desire to purchase multiple coverages is a signal of adverse selection

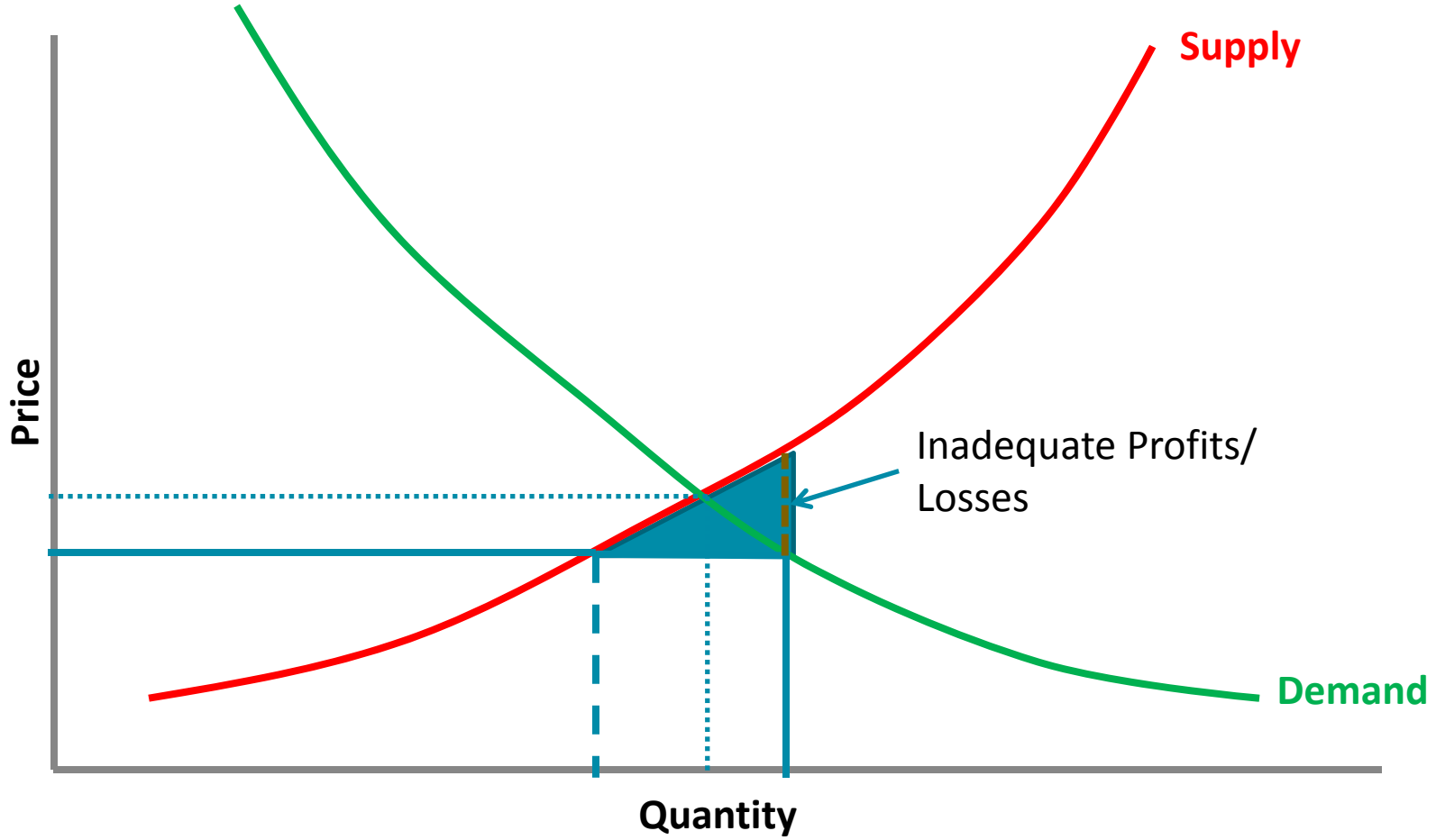
How Markets Work: Lessons for Workers Compensation

When There is Excess Supply at the Prevailing Price

Examples:

- Regulation that limits the price and requires all production to be sold at that price; typically to the government
- Export controls on, e.g., rice

Market Coercion: Quantity Supplied Exceeds Supply at Market Price



How Markets Work: Lessons for Workers Compensation

Deviations From the Standard Market Model

An Indication of Market Inefficiency

Examples:

- Limited supply—e.g., Rationing
  - Incomplete information: bank lending to small business
  - Market manipulation: diamonds
- Limited price—e.g., a “Taking”
  - Export controls on rice
  - Market manipulation: Web browsers

Lessons for the Workers Compensation Market

How Markets Work: Lessons for Workers Compensation

Lessons for the Workers Compensation Market

- A Model for the Workers Compensation Market
- Using the Model to Understand Pricing Environments
- Some Initial Analysis to Test the Workers Compensation Model

How Markets Work: Lessons for Workers Compensation

Supply in Workers Compensation Market—ASOP 30

The "total financial needs model" is a standard concept used to develop the underwriting profit provision in actuarial ratemaking.

Source: Treatment of Profit and Contingency Provisions and the Cost of Capital in Property/Casualty Insurance Ratemaking, Actuarial Standard of Practice No. 30, Actuarial Standards Board, July 1997, page 8.

How Markets Work: Lessons for Workers Compensation

The "total financial needs model":

- "the sum of underwriting profit,
- miscellaneous (non-investment) income,
- investment income from insurance operations, and
- investment income on capital,
- after income taxes,
- will equal the cost of capital."

Source: Treatment of Profit and Contingency Provisions and the Cost of Capital in Property/Casualty Insurance Ratemaking, Actuarial Standard of Practice No. 30, Actuarial Standards Board, July 1997, page 8.

How Markets Work: Lessons for Workers Compensation

The “total financial needs model”:

- Underwriting Profit and Cash Flows
  - Loss costs
- Investment Income From Insurance Operations
  - Projected loss payouts and reserves
  - Interest rates
- Surplus and the Cost of Capital
  - Surplus to reserves
  - Cost of capital

How Markets Work: Lessons for Workers Compensation

The "total financial needs model":

Comparable to the Internal Rate of Return analysis that NCCI does for full rate situations:

$$P = (X+L) + \{[(\gamma * RES)*(R_C - R_T)] - [(RES)* R_T]\}/(1+ R_T)\}$$

$$P/W = \{(X+L) + \{[(\gamma * RES)*(R_C - R_T)] - [(RES)* R_T]\}/(1+ R_T)\}\}/W$$

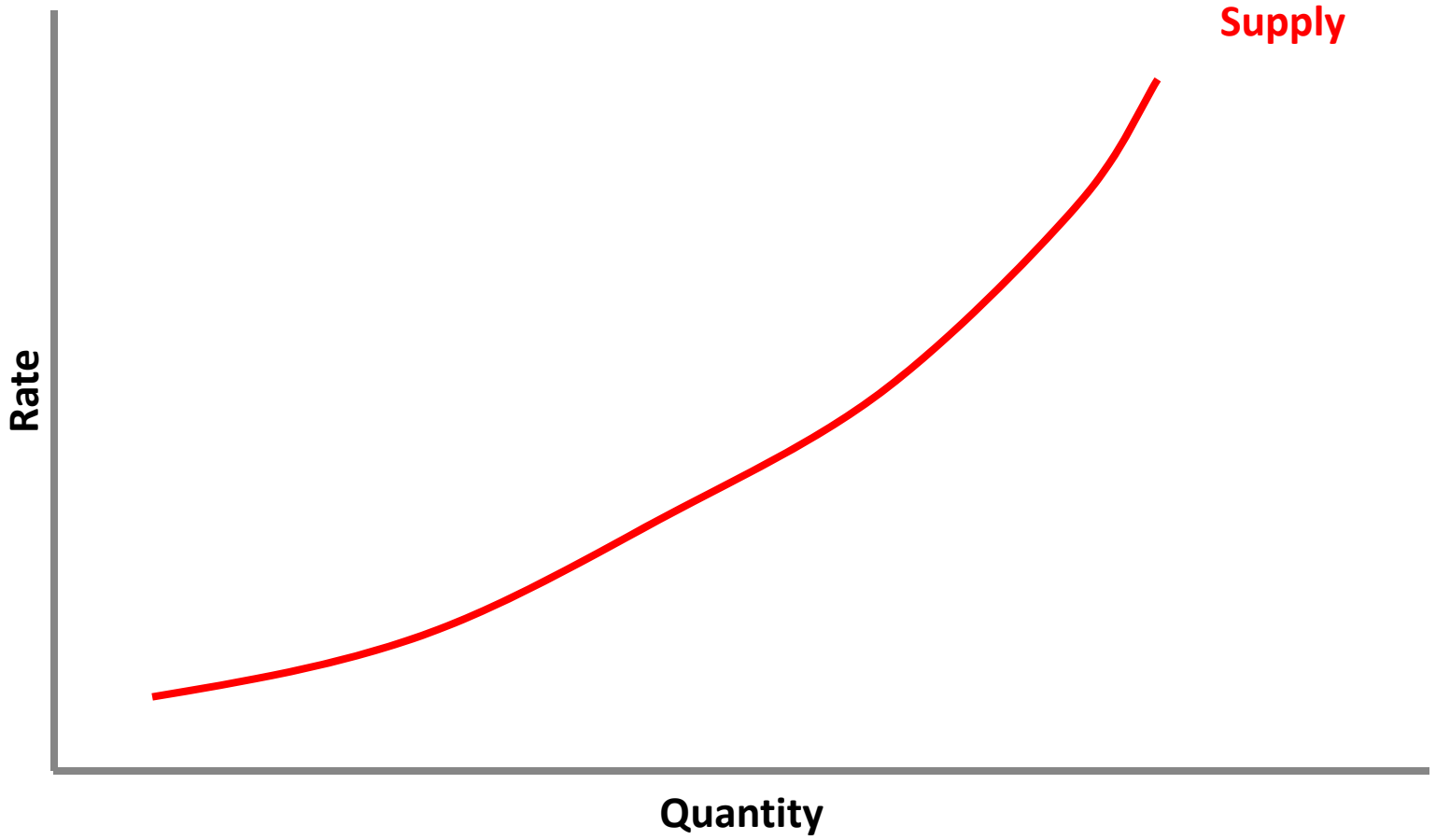
P/W – the Price Component of the Supply Curve for WC Insurance

How Markets Work: Lessons for Workers Compensation

- At any point in time, most key supply factors will be determined:
  - Cost of capital
  - Interest rates
  - Target reserve to surplus
  - Expected cash flow patterns

- Therefore, at any point in time, the shape of the supply curve will be linked to the expected losses of individual employers

The Supply Curve in WC Reflects the Increasing Loss Costs of Potential Insureds

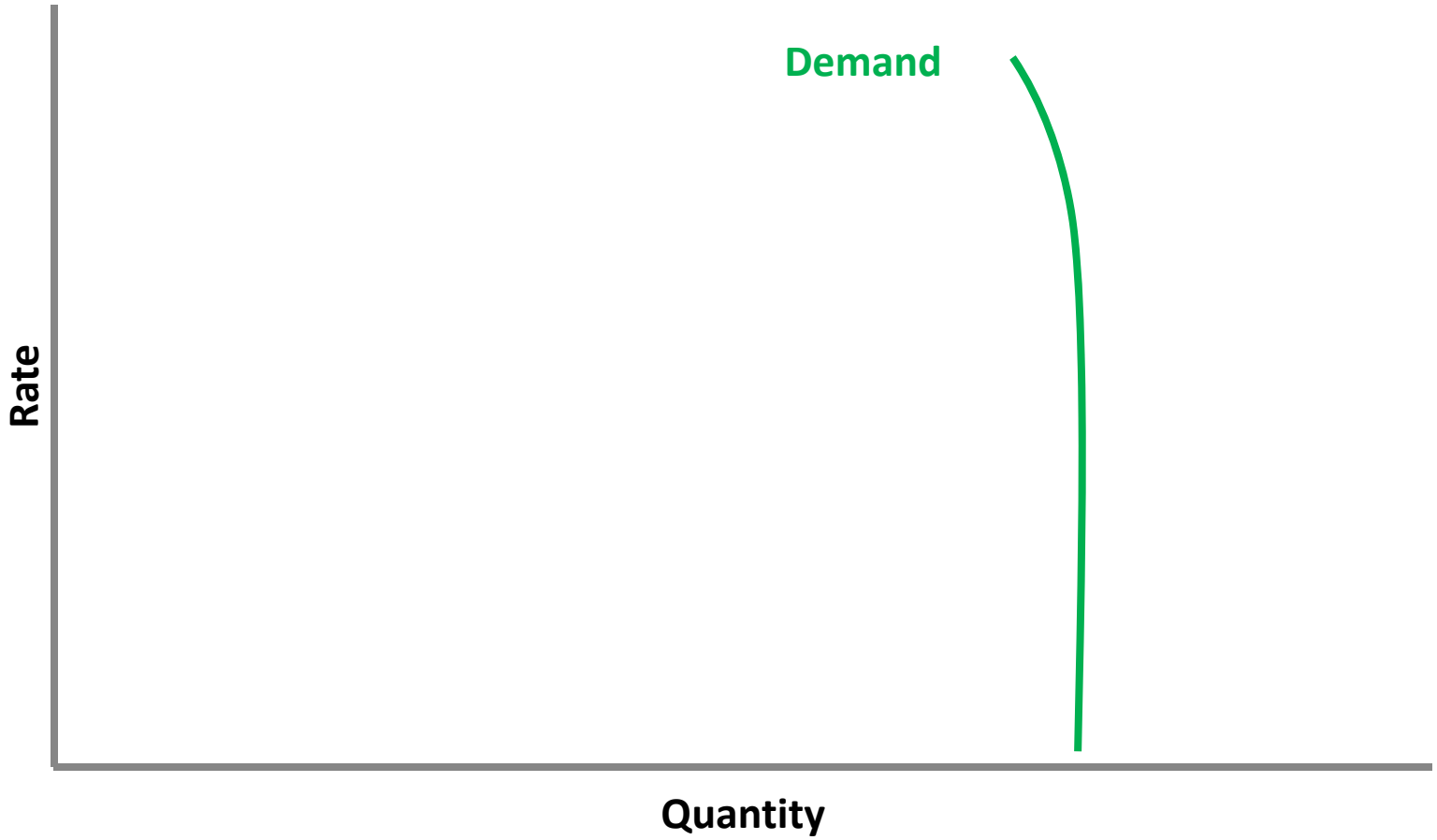


How Markets Work: Lessons for Workers Compensation

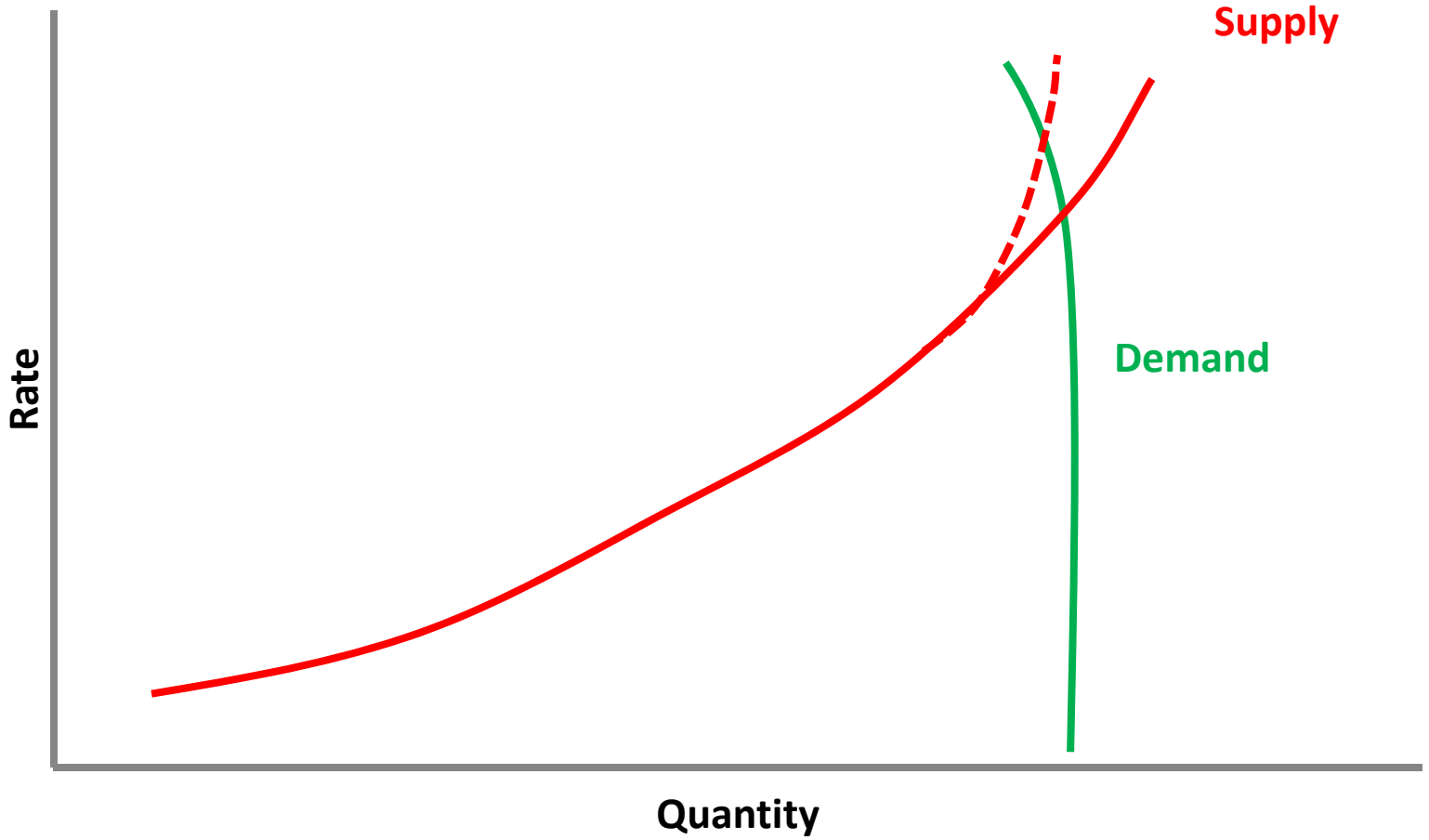
A Model for the Workers Compensation Market

- Demand is different from most other markets
- Because having workers compensation insurance is mandatory, the demand will be largely insensitive to price
  - Demand is “inelastic” over most prices

The Demand Curve in WC Likely Reflects the Mandatory Nature of the Coverage



Regulation Plays a Key Role in the Workers Compensation Market



How Markets Work: Lessons for Workers Compensation

Using the Model to Understand Workers Compensation Market Environments

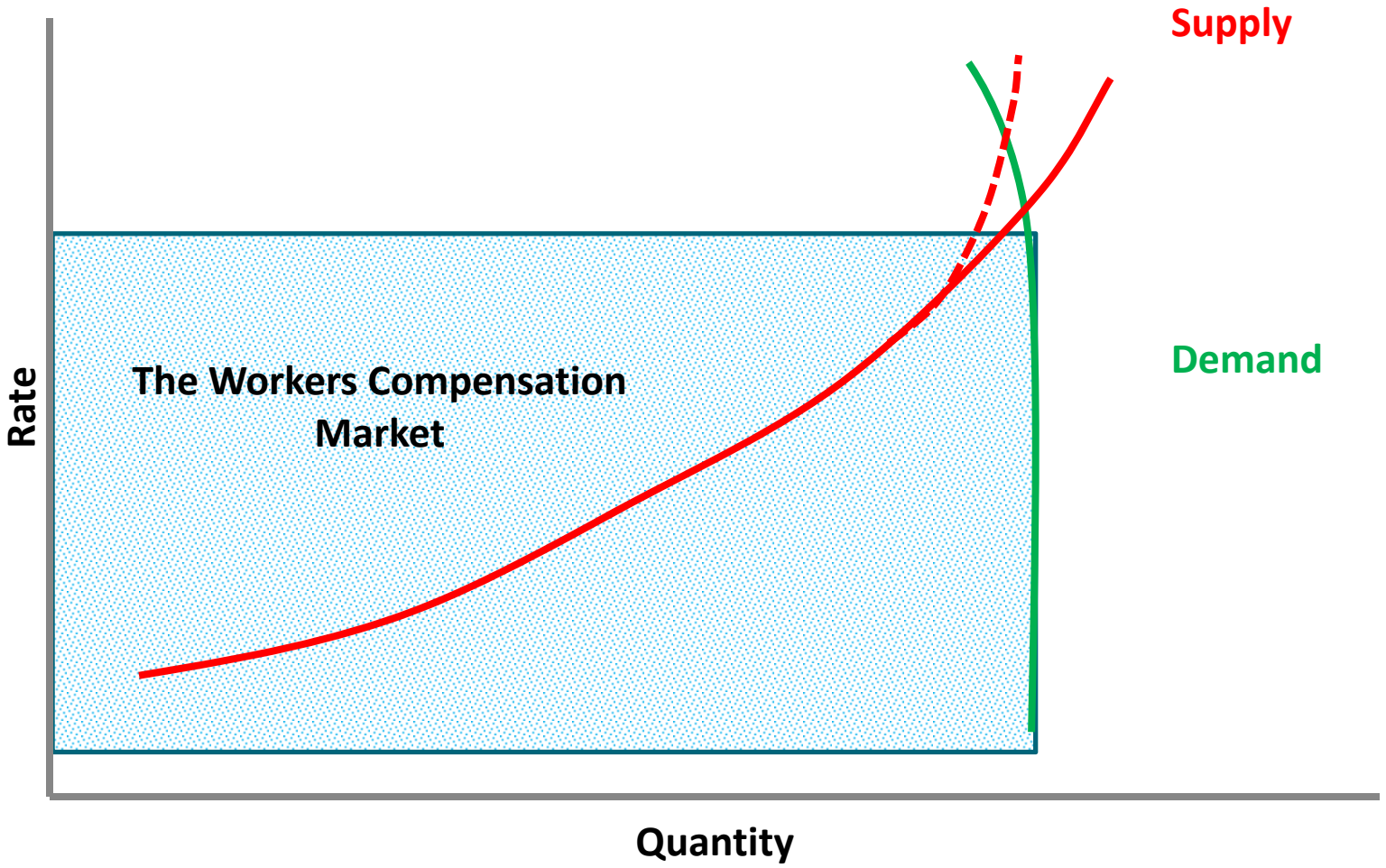
- Administered pricing
- Competitive markets

How Markets Work: Lessons for Workers Compensation

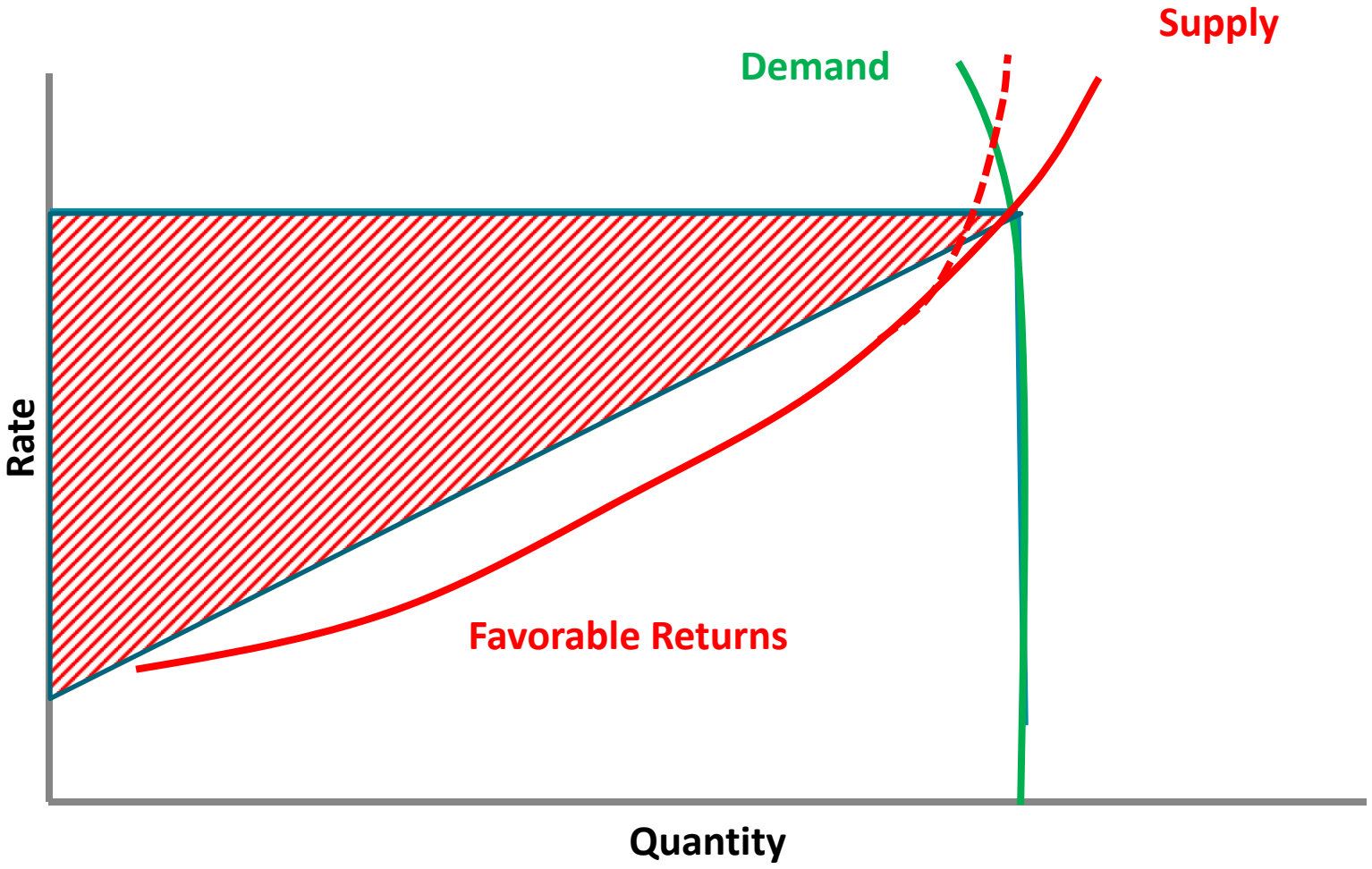
Implications of the Financial Needs Model of Supply in an Administered Pricing Environment

- Insurers have little pricing flexibility
- Insurers are required to charge the same standard premium rate
- Insurers may be required to satisfy excess demand at that rate indirectly
  - Collectively via a residual market pool
  - A state fund may be an alternative arrangement

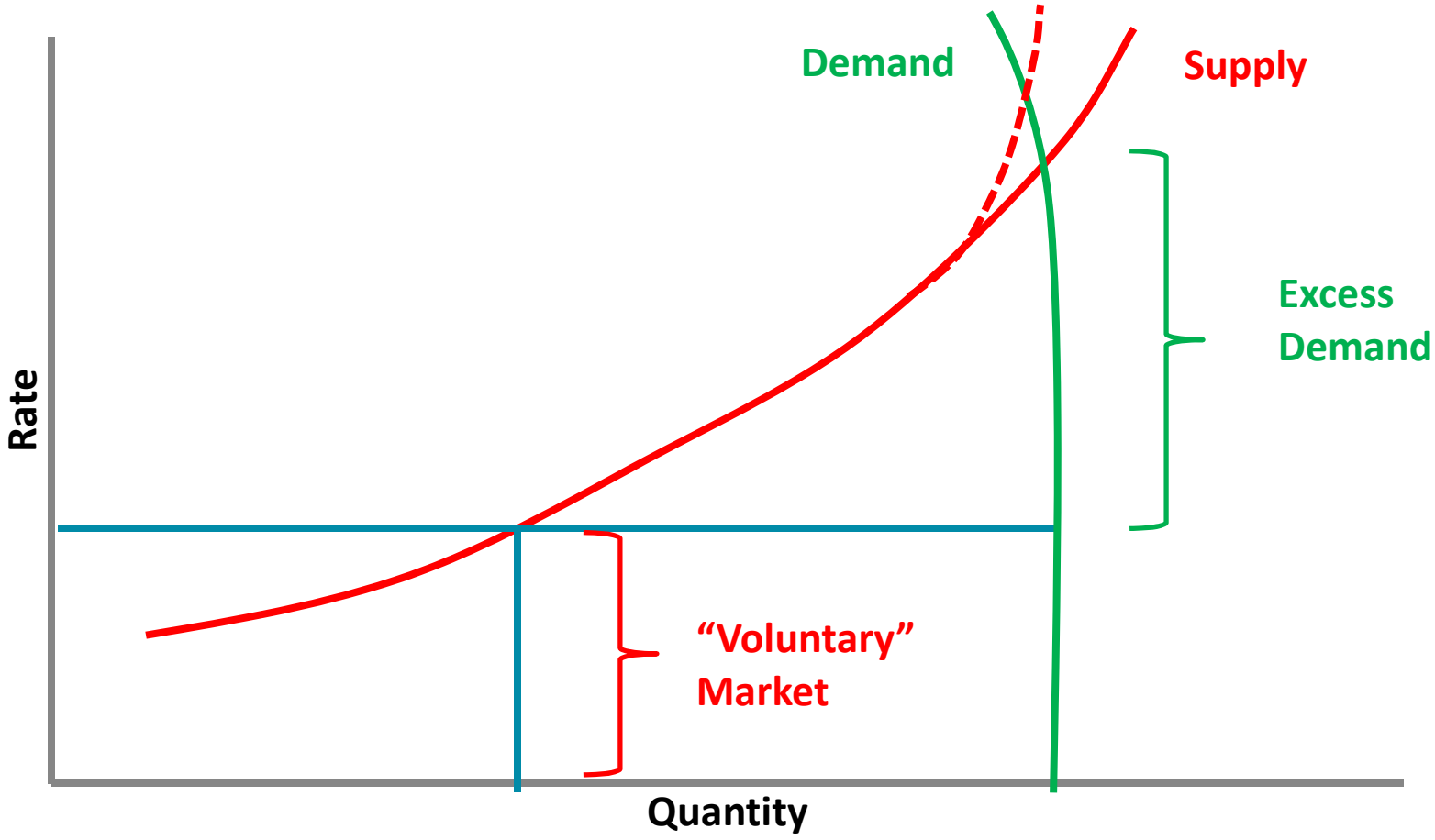
The Impact of Administered Pricing in the Workers Compensation Market—A Hypothetical Example



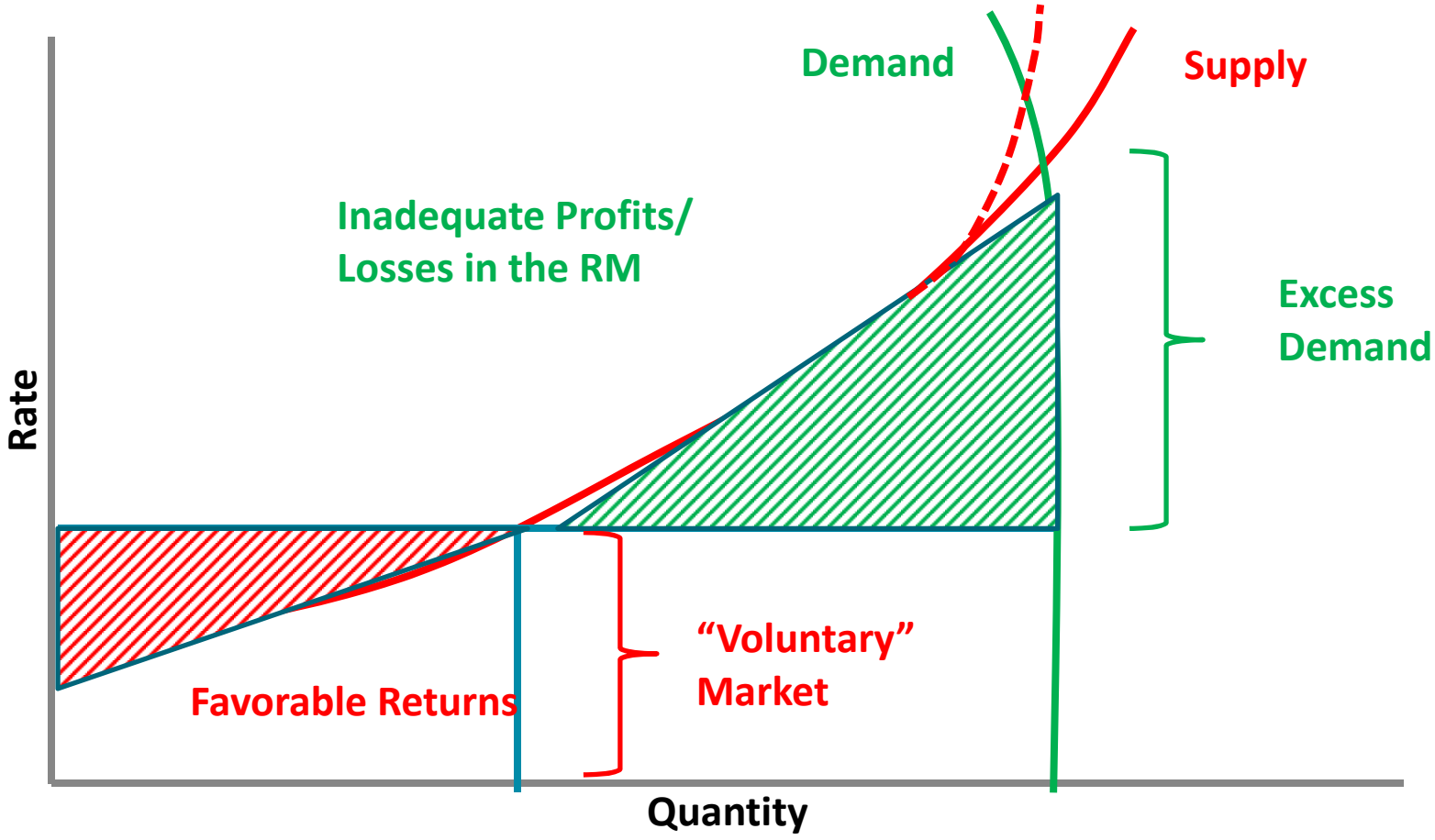
If All Policies Are Priced at the Market Clearing Price, WC Insurers Would Earn Significant Favorable Returns as Measured by Financial Needs



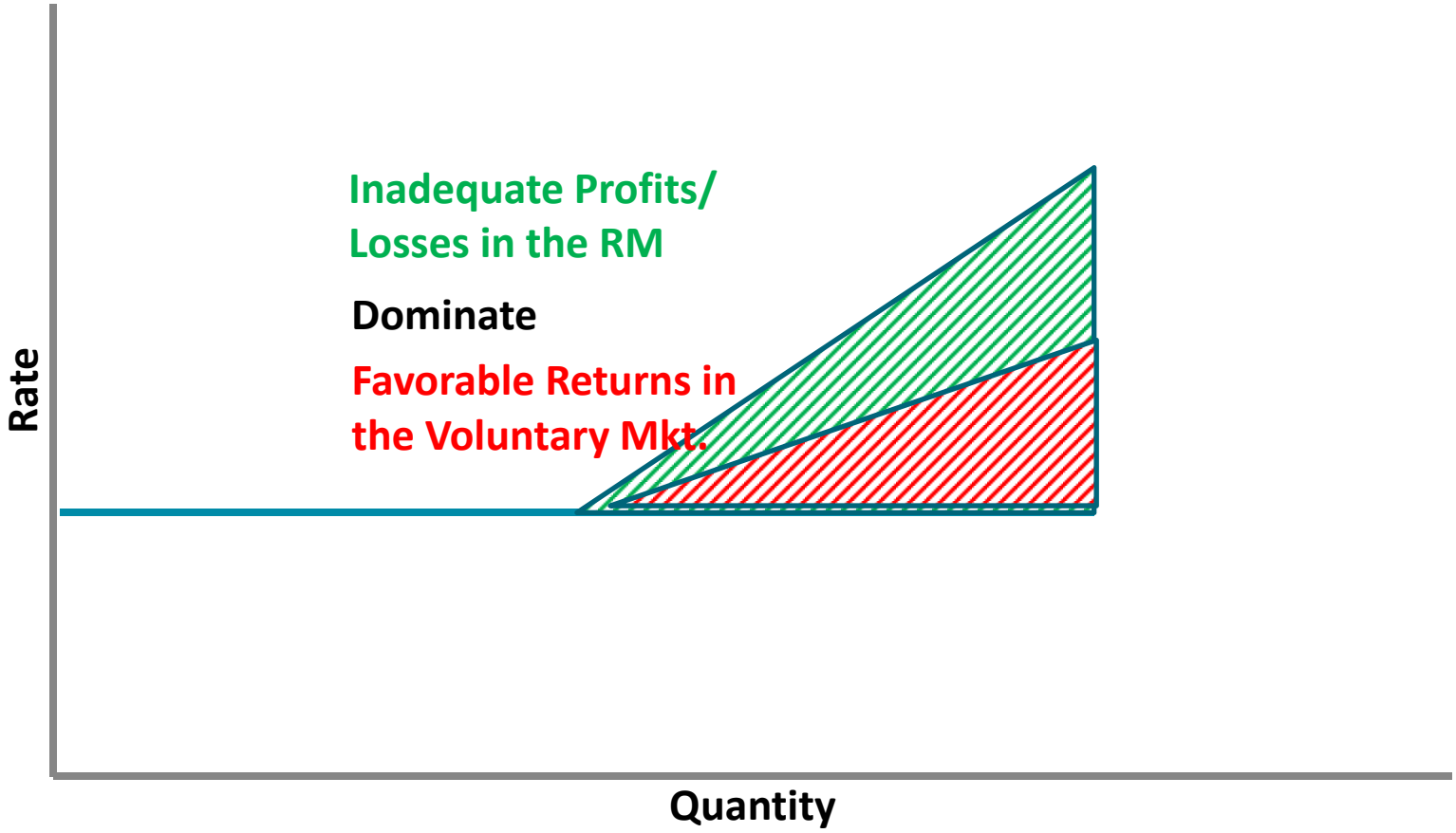
If Excess Demand Is Placed in a Residual Market (RM) and All Policies Are Priced at the Administratively Determined Price WC Insurers Could Face Substantial Losses as Measured by Financial Needs



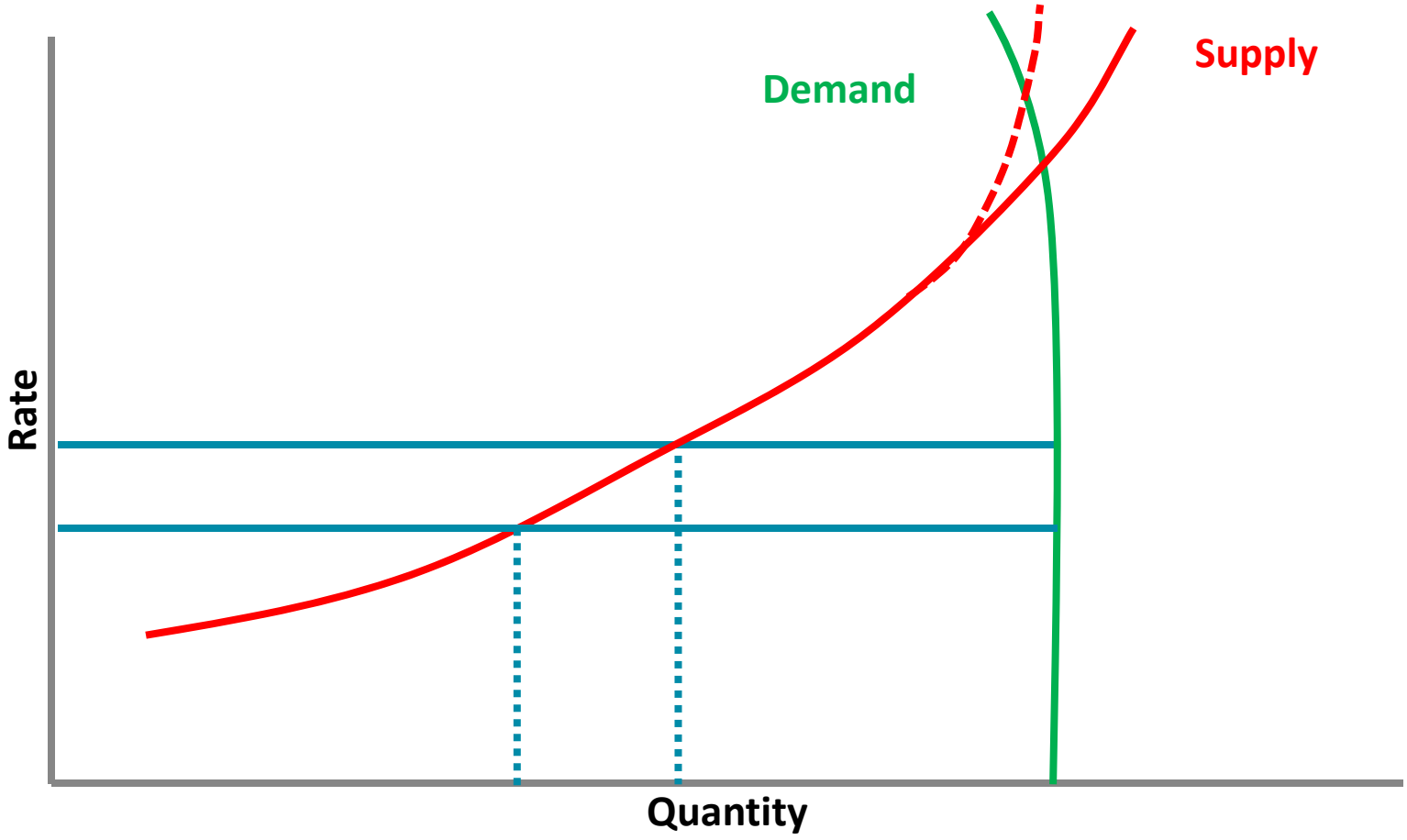
If Excess Demand Is Placed in a Residual Market (RM) and All Policies Are Priced at the Administratively Determined Price WC Insurers Could Face Substantial Losses as Measured by Financial Needs



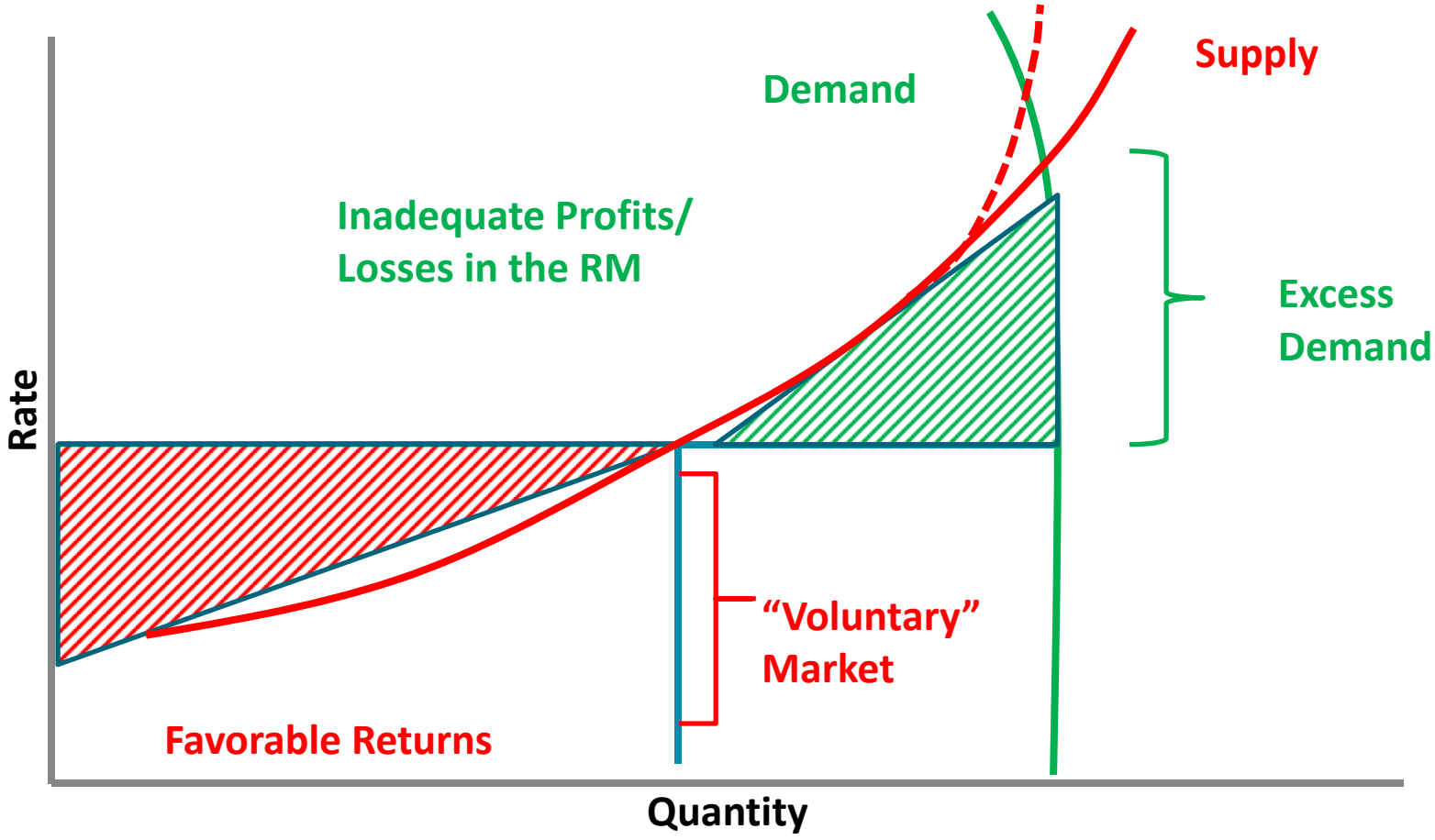
If Excess Demand Is Placed in a Residual Market And All Policies Are Priced at the Administratively Determined Price, WC Insurers Could Face Substantial Losses as Measured by Financial Needs



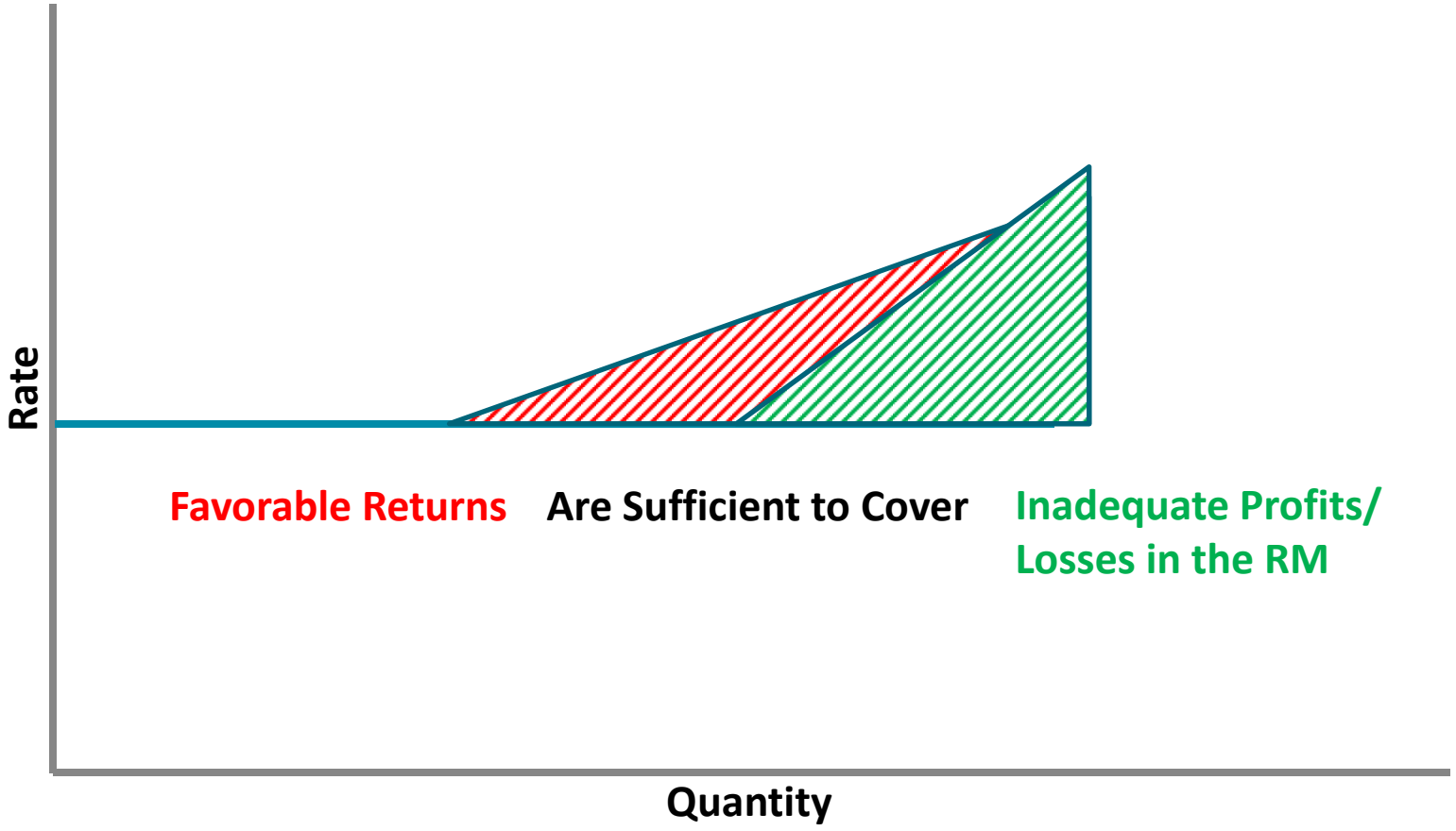
If Excess Demand Is Placed in a Residual Market And All Policies Are Priced at the Administratively Determined Price, WC Insurers Could Face Substantial Losses as Measured by Financial Needs



If Excess Demand Is Placed in a Residual Market And All Policies Are Priced at the Administratively Determined Price, WC Insurers Could Face Substantial Losses as Measured by Financial Needs



If Excess Demand Is Placed in a Residual Market And All Policies Are Priced at the Administratively Determined Price, WC Insurers Could Face Substantial Losses as Measured by Financial Needs



How Markets Work: Lessons for Workers Compensation

Implications of the Financial Needs Model of Supply in an Administered Pricing Environment

- For stability in the workers compensation market the residual market burden can not dominate the profitability of the voluntary segment of the WC market
- This is a testable hypothesis

How Markets Work: Lessons for Workers Compensation

Financial Needs, the Residual Market, and Equilibrium in Insurance Markets

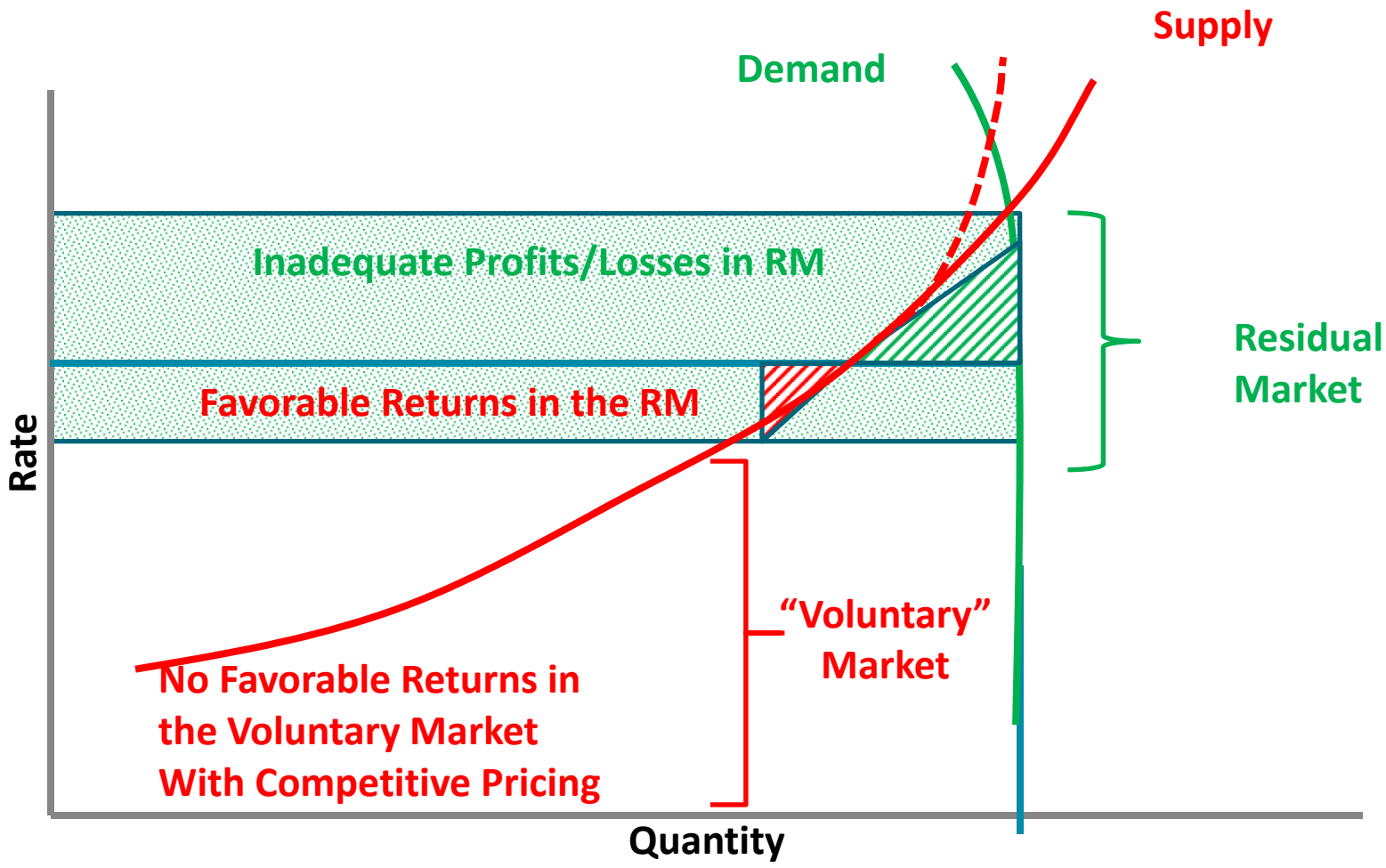
Competitive Market Environment

How Markets Work: Lessons for Workers Compensation

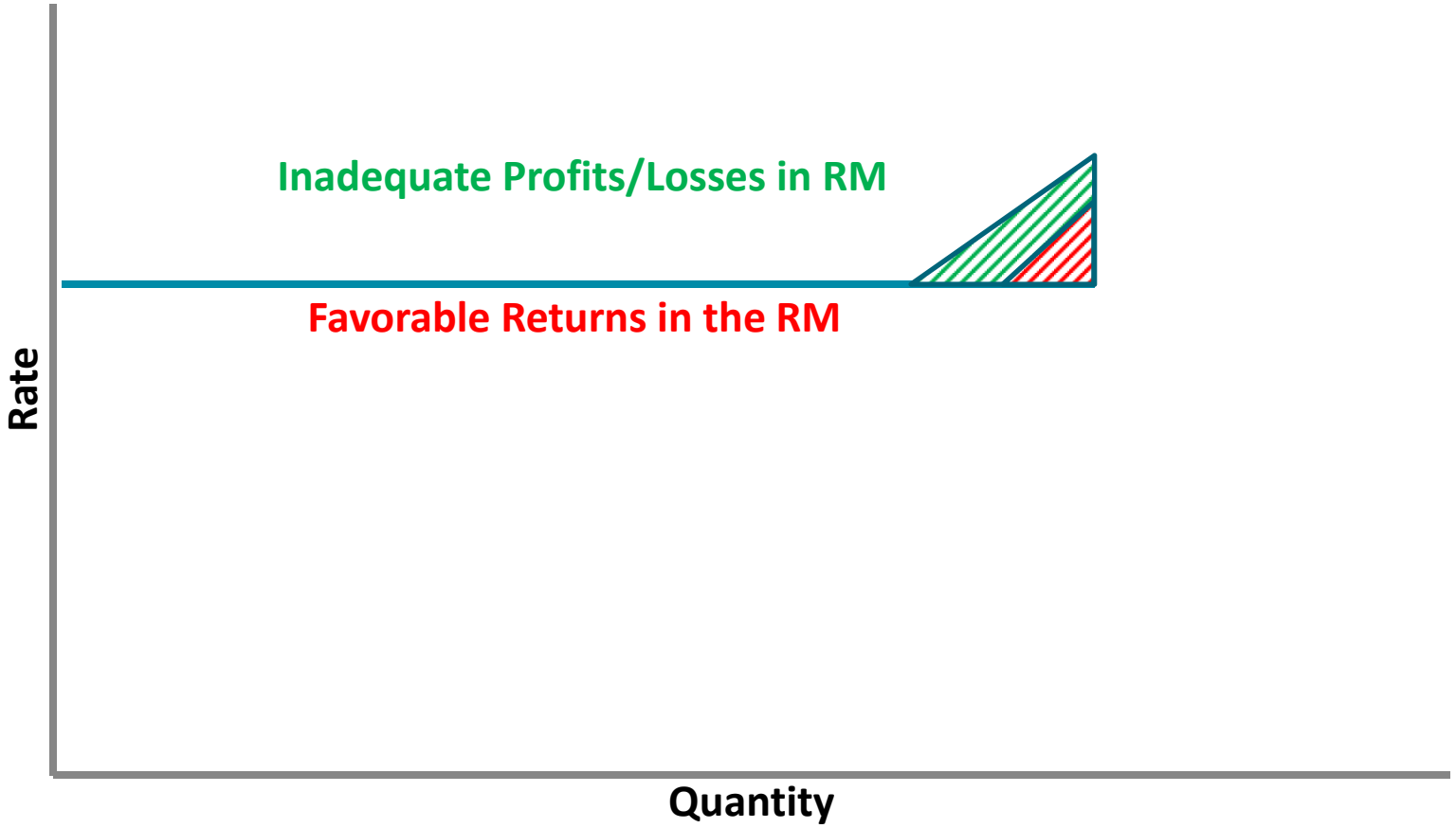
Implications of the Financial Needs Model of Supply in a Competitive Market Environment

- Insurers have considerable but not complete flexibility in setting premium rates on individual policies
- Insurers may be unwilling to voluntarily write some applications even at high premium rates ("rationing")
- In addition, regulators may want to insulate businesses from high premium rates at the upper portion of the supply curve
- Insurers typically are required to satisfy excess demand at least indirectly
  - Collectively via a residual market pool
  - A state fund may be an alternative arrangement

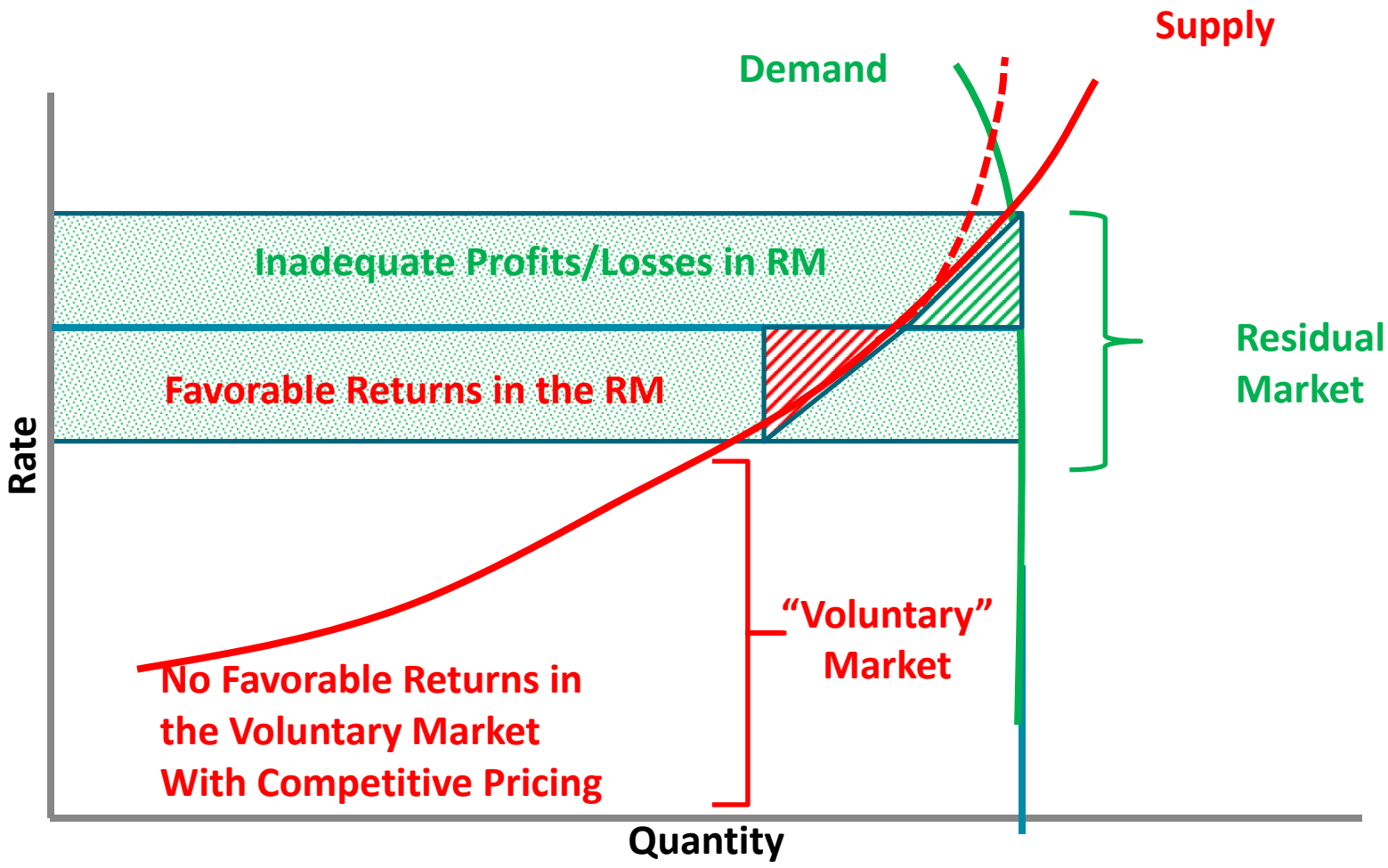
In Competitive Markets Where Excess Demand Is Placed in a Residual Market, the Administratively Determined Price Is Critical



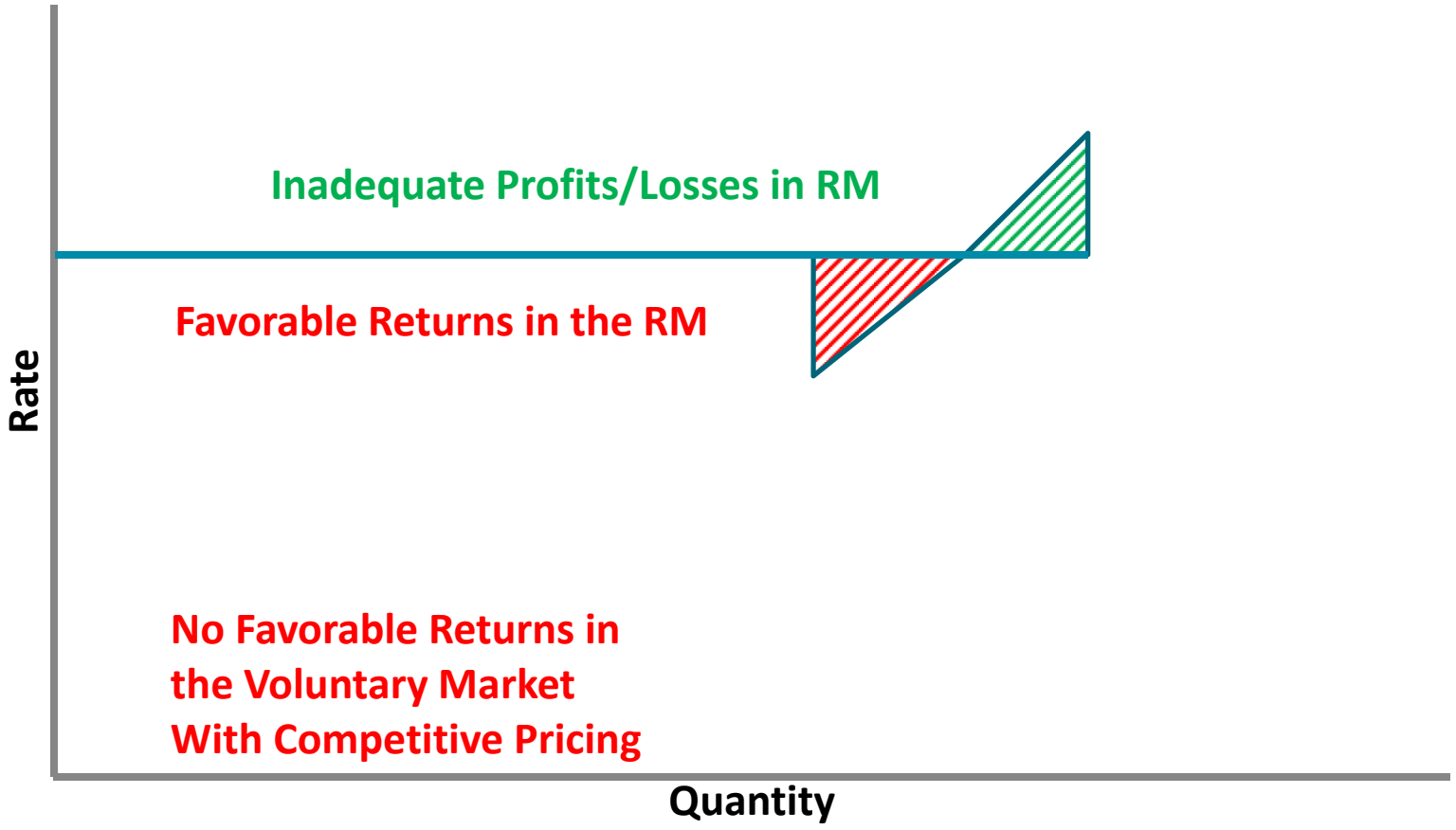
In Competitive Markets Where Excess Demand Is Placed in a Residual Market, the Administratively Determined Price Is Critical



In Competitive Markets Where Excess Demand Is Placed in a Residual Market, the Administratively Determined Price Is Critical



In Competitive Markets Where Excess Demand Is Placed in a Residual Market, the Administratively Determined Price Is Critical



How Markets Work: Lessons for Workers Compensation

Competitive Market

Implications for Ratemaking

How Markets Work: Lessons for Workers Compensation

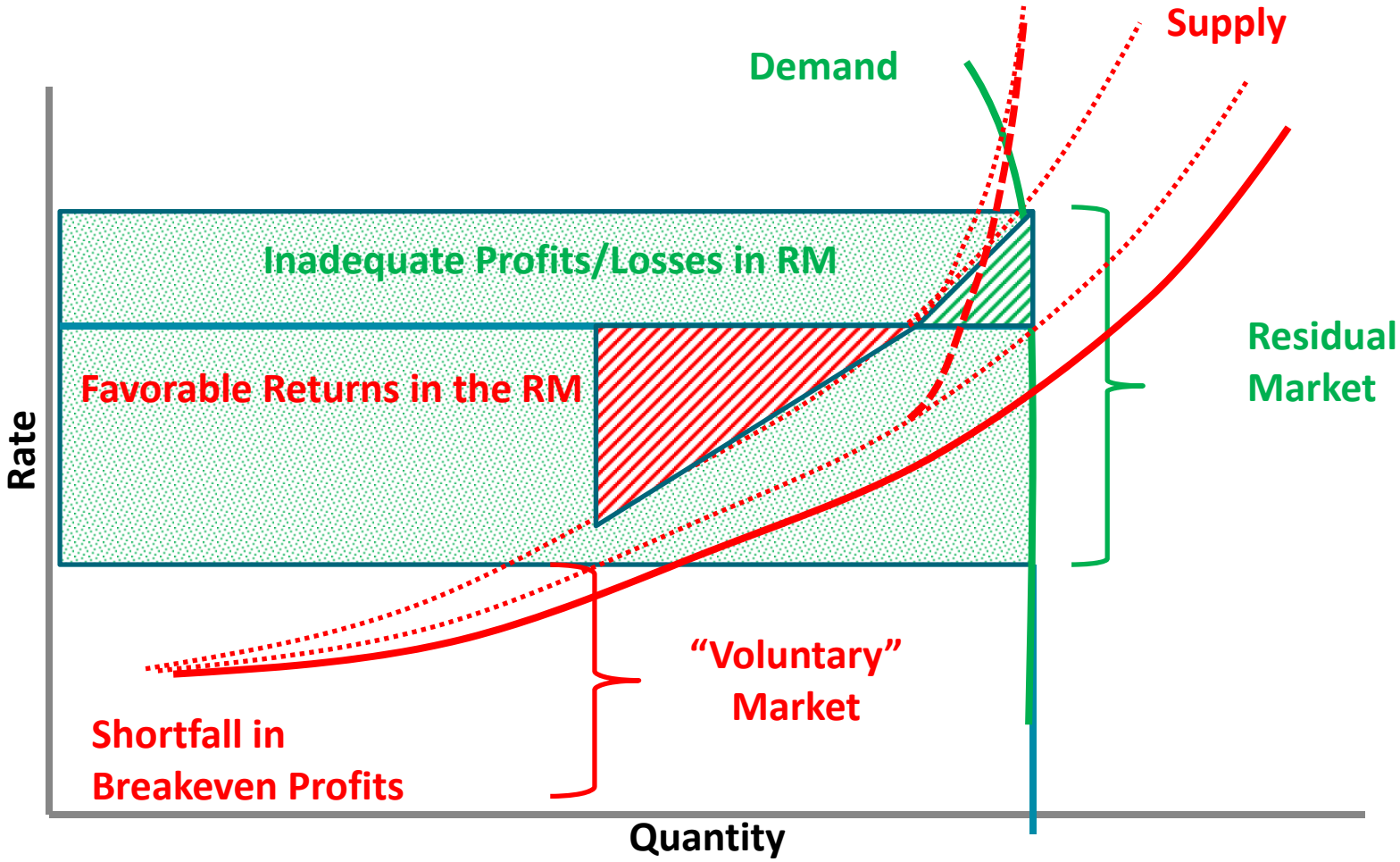
Implications for Ratemaking

The primary effect is to lower the approved loss cost for the “voluntary” market

To the extent that this loss cost is used as a benchmark to set premiums for individual policies, it will shift the supply curve down from the “true” supply curve

That is, the benchmark is lower than it should be

In Competitive Markets Where Excess Demand Is Placed in a Residual Market, the Administratively Determined Price Is Critical



How Markets Work: Lessons for Workers Compensation

Implications for Ratemaking

- Lowering the filed loss cost creates risk of inadequate total market return from competitive pricing
- Inadequate total market return causes market tightening
- Higher premium rate policies incur underwriting losses and are shifted from the competitive market to the residual market
- Resulting increase in residual market share produces a decrease in the subsequent filed loss cost, shifting supply curve even further from the true values
- Creating a potential downward spiral

How Markets Work: Lessons for Workers Compensation

Preliminary Observations

The Balloon Theory of the WC Market

How Markets Work: Lessons for Workers Compensation

The Balloon Theory of the WC Market

- The financial needs model offers an effective description of the factors that underlie the supply curve for workers compensation insurance
- The analysis shows that there is a single market for workers compensation insurance
- This market often will not clear at prevailing premium rates
- Residual markets exist to serve the employers who would otherwise be “rationed out”
- In administered pricing environments, the premium rates must be such that favorable returns cover the losses in the residual market
- In competitive market environments, the premium rates in the residual market must be sufficient for the favorable returns to cover the losses in that market

How Markets Work: Lessons for Workers Compensation

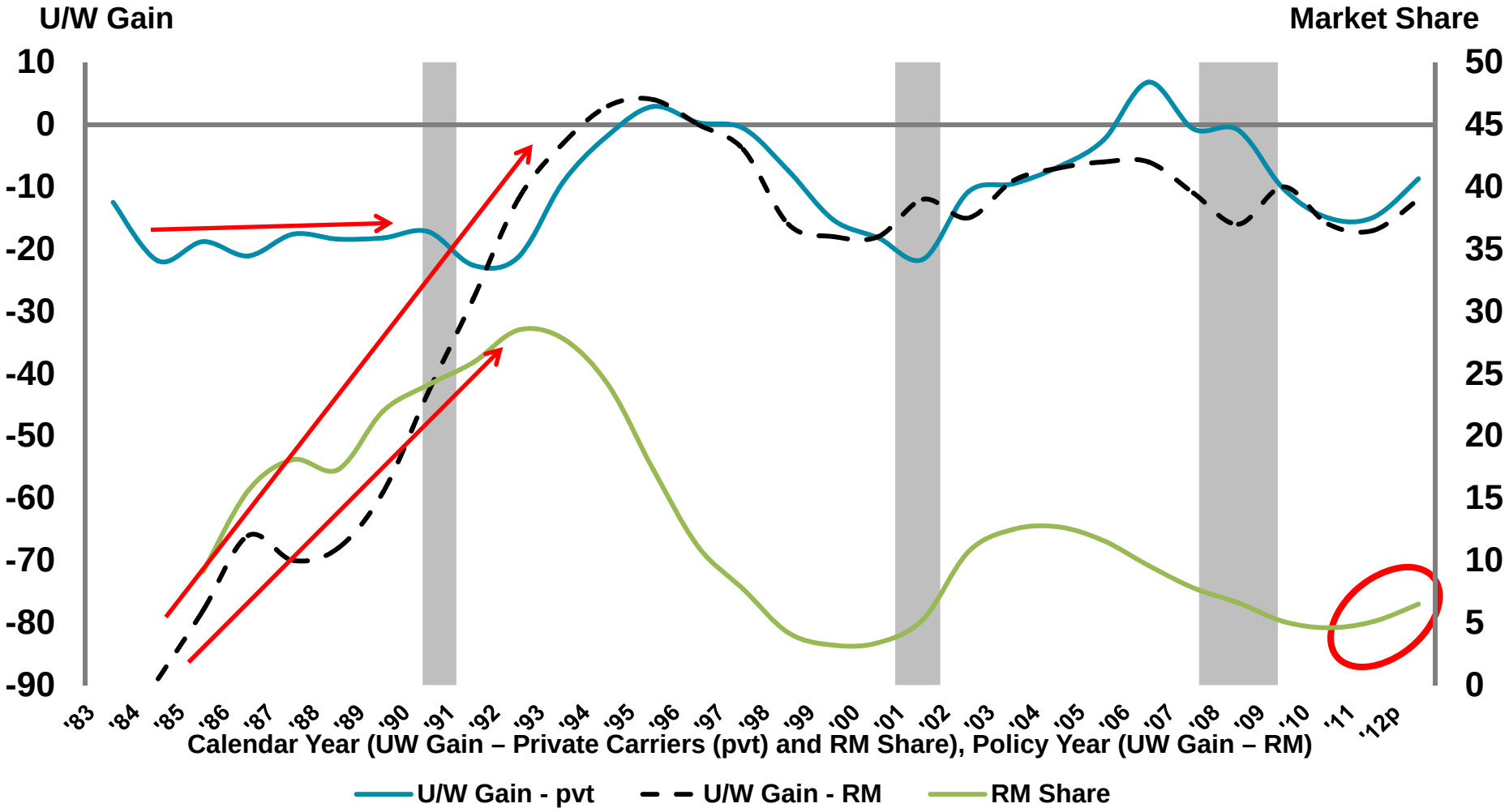
The Balloon Theory of the WC Market

- In other words—when the rating environment squeezes the voluntary market
- The pressure merely shifts to the residual market end of the balloon
- And if the pressure is too great, the balloon will burst

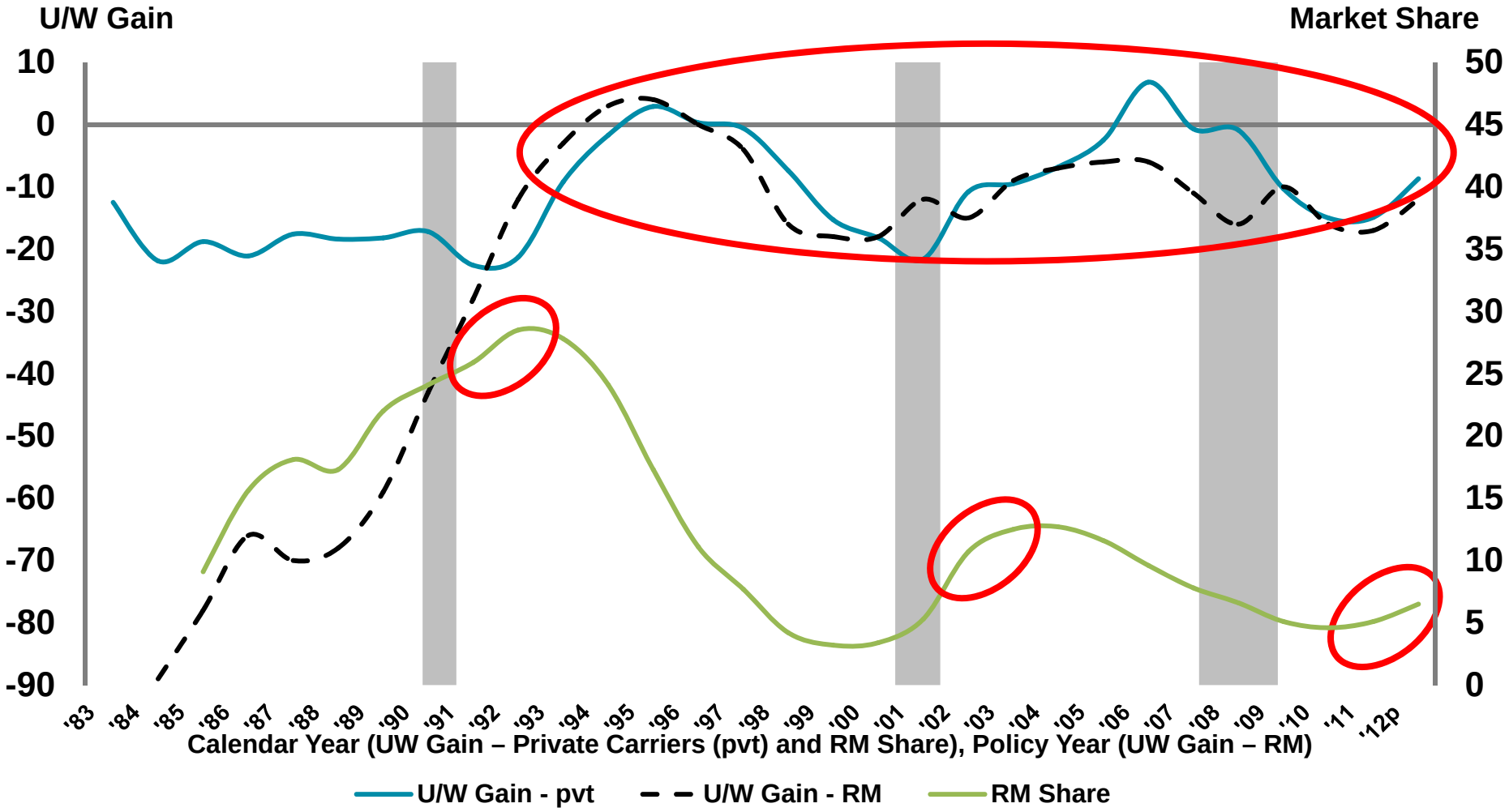
How Markets Work: Lessons for Workers Compensation

The Voluntary and Residual Markets Are Two Ends of a Single Workers Compensation Market

Residual Market Share of the WC Market Grew Following the Most Recent Recessions



Residual Market Share of the WC Market Grew Following the Most Recent Recessions



How Markets Work: Lessons for Workers Compensation

The Business Cycle and Workers Compensation

- Economic factors and the residual market:
  - Grew following recessions
  - Shrank during recovery
- The residual market tracks the underwriting cycle
- The underwriting cycle tracks the business cycle

Time for Discussion?