The Public Economics of Sports

ECONOMICS OF SPORTS (ECON 325)

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Introduction

For most economists, the burden of showing the need for government intervention in markets falls on the person arguing in favor of it. Here I mean:

- Mandates/regulations,
- Taxes/subsidies,
- Ownership of inputs/goods/property rights.

We have a well-defined list of conditions that, if unmet, *could* justify government intervention in markets, i.e., some kind of market failure.

Does a sports league meet these conditions?

Introduction

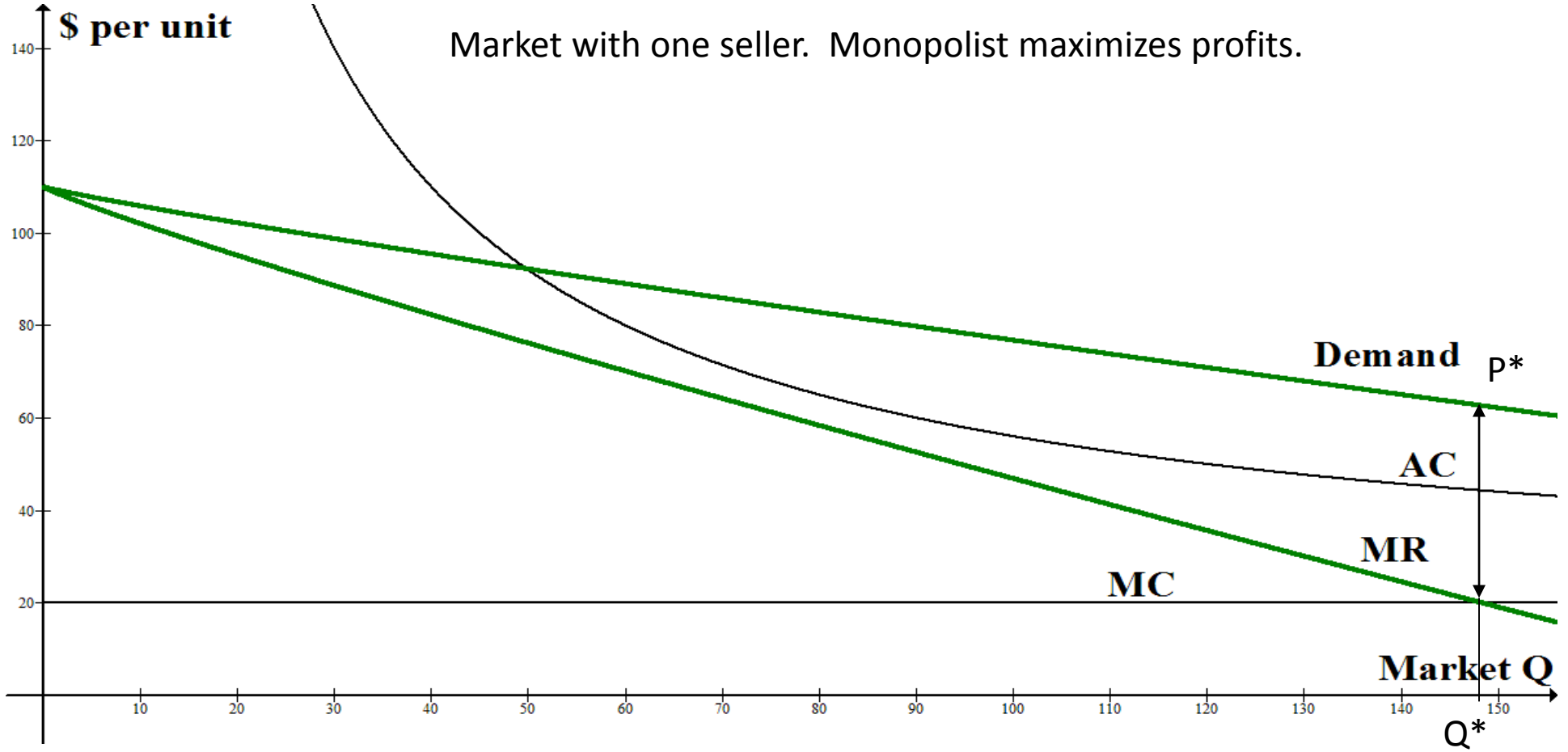
I'm not the only one (Neale 1964) to argue that a sports league has characteristics of a natural monopoly, owing to high fixed cost and low marginal cost, particularly of tickets for admission and broadcast viewing.

- It's possible that the level of output is too low, in terms of number of teams, seating capacity of stadiums, or number of screens showing broadcasts of games.
- Government intervention may be able to incentivize higher output, lower prices.

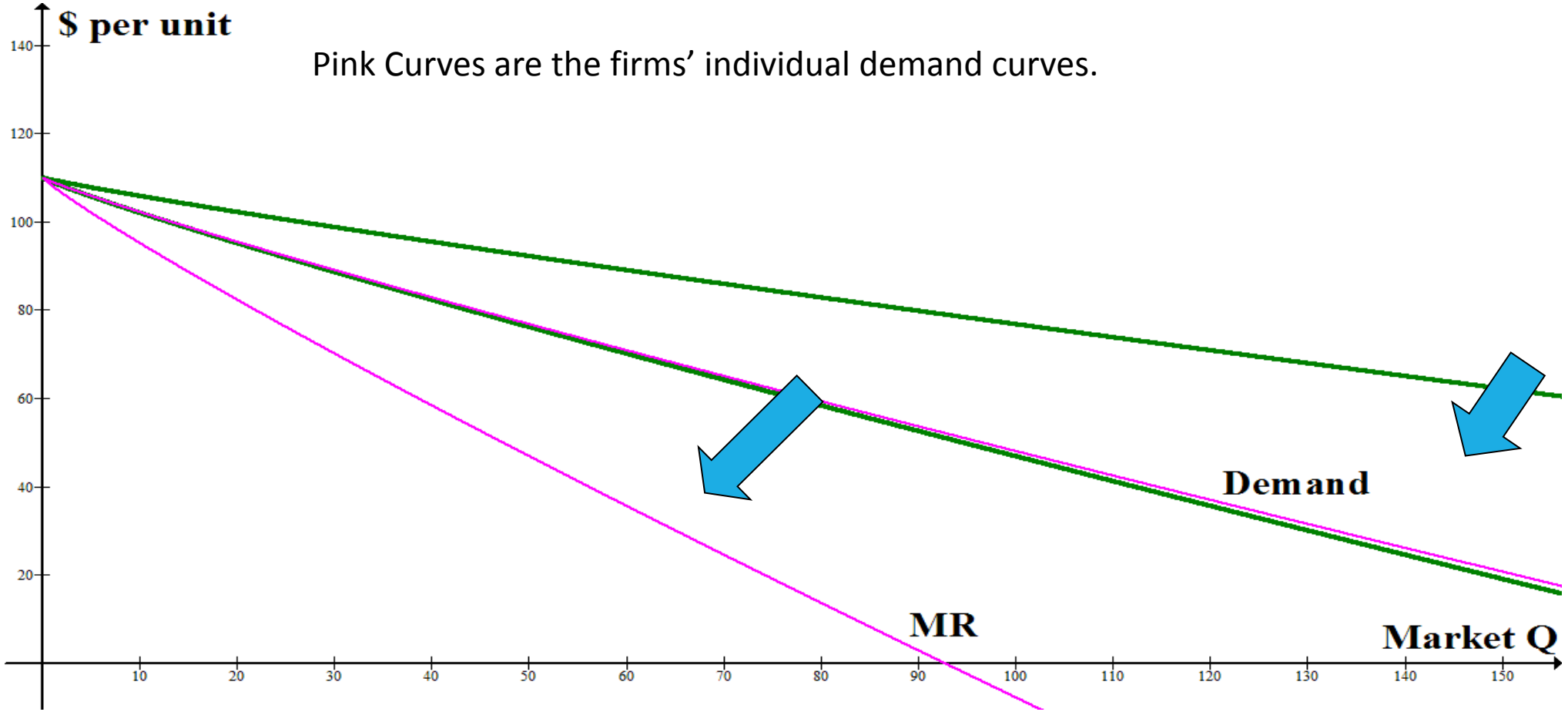
It's also possible that sports have positive externalities: recall all the free entertainment we get even if we just watch highlights or play fantasy sports (public goods).

- *And* negative externalities.

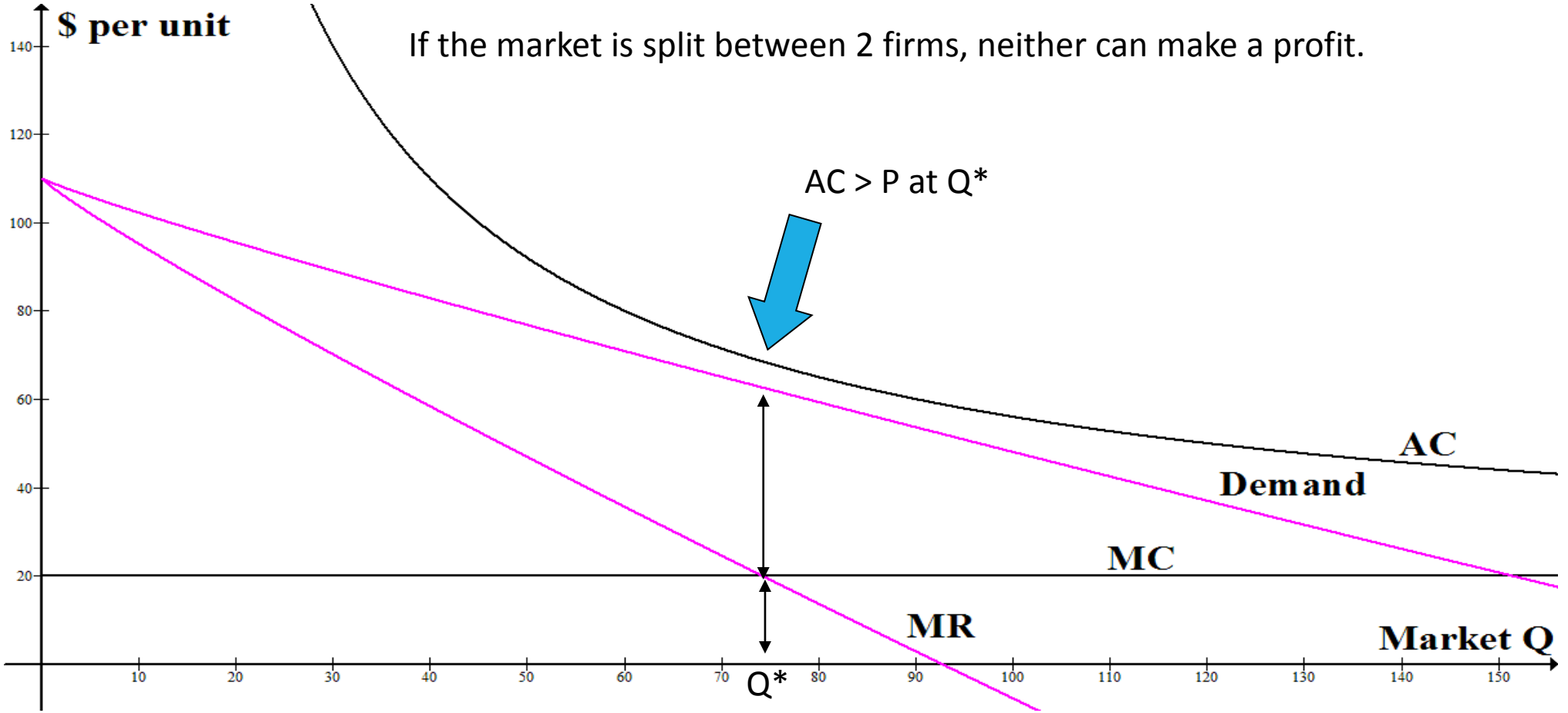
A Natural Monopoly



If a 2nd seller enters, demand is split between them



Losses After Entry



Reasoning: natural monopoly

Since both firms incur the large fixed costs and face a lower price than the monopoly did, neither can make a profit.

- So eventually at least one will go out of business.
- Then the market will go back to being a monopoly, hence, its natural state is monopoly.

May be why we haven't had a successful rival league in any of the "Big 4" since the AFL in the 1960s.

- And even they ended up merging with the NFL after about 10 years.

Regulating a natural monopoly

If the price were restricted to the marginal cost, consumers would be happy, butthis would drive a natural monopoly out of business.

- Since MC<AC for the natural monopolist, this would force him to sell below AC and incur losses.

A marginal cost pricing rule coupled with a subsidy to cover fixed costs could be a solution.

- Publicly funded stadiums could be an example of this solution, were the pricing regulations present . . . .

Regulating a natural monopoly, cont'd

A common solution for this is to allow the monopolist to mark up the output he sells to some consumers but make him sell to other consumers at a low price.

- Particularly they let him charge a high price to "inelastic" demanders and make him charge a low price to "marginal" or "elastic" demanders. This enables the monopolist to stay in business *and* produce a more efficient level of output.

Most clubs seem to be getting exceedingly good at doing this with ticket pricing.

Technologically it's now possible for the league to sell ("stream") broadcasts directly to fans and charge them according to willingness to pay, too.

- Subscriber and free-with-ads options, time delayed free broadcasts, etc.

It just has to decide whether it's going to commit to direct sale or sell the exclusive rights to, say, the Fox Sports Network. Doing both sometimes results in conflicts.

Natural monopoly, conclusion

Ordinarily we'd be upset about price discrimination, but if it's a means to the efficient level of attendance/viewership in a natural monopoly market, most economists will tolerate it.

- This seems to be what the major sports leagues are doing.
- If natural monopoly were the only issue, we probably have about the optimal quantity of sports.

Kahn (2007) concluded that we probably have the optimal number of teams, too, because a league's monopoly power solves the quality-quantity tradeoff that would occasion sub-optimal quality (talent) if free entry were allowed.

Paradoxically one of the other policies that can increase monopoly output is subsidy.

- Even if it's not coupled with a price cap nor used as an offset to fixed costs.
- An optimal per unit subsidy moves the monopolist down the marginal revenue curve until P=MC is achieved. Monopoly profit is *huge* at this point, but it technically gets you to the efficient output.

Sports subsidies

I mention this because there is evidence that, in the form of public contributions to stadium and infrastructure construction costs, sports leagues receive public subsidies from the cities in which franchises are located.

- The original source on this is Quirk & Fort's Pay Dirt (1992).
- Calculations on more recent construction have been performed by Long (2005). Subsidies to the 4 major U.S. sports amount to $19 billion dollars.
- Miller (2007) approaches the calculation from the club side by attempting to measure the effect of a new stadium on the market value of owning a club. He finds that owning a stadium is better than renting one, but not by so much that a team should actually "buy."

From Long (2005)

TABLE 3: Average Public Subsidy and Public Share, by League: All Facilities In Use In 2001, and Facilities Opened After 1990 (PV at 2001, Millions)

Data Set	*Average Total Development Cost*	*Average Reported Public Subsidy*	*Adjustment #1 Land & Infrastructure*	*Adjustment #2 Net Annual Public Expenses*	*Adjustment #3 Foregone Property Taxes*	*Average Total Public Subsidy*	*Average Change in Subsidy Level*
MLB ($t = 30$)	282	165	23	(25)	55	218	53
Average Public Share		59%				77%	19%
Opened 1990+ ($t = 17$)	284	177	29	(20)	57	243	66
Average Public Share		62%				86%	23%
NFL ($t = 29$)	218	165	15	(20)	46	206	41
Average Public Share		76%				94%	19%
Opened 1990+ (($t = 15$)	278	198	27	3	60	288	90
Average Public Share		71%				104%[1]	32%
NBA ($t = 28$)	193	56	21	(3)	35	109	53
Average Public Share		29%				56%	27%
Opened 1990+ (21)	222	54	27	5	42	128	74
Average Public Share		24%				58%	33%
NHL ($t = 30$)	190	72	13	1	32	118	46
Average Public Share		38%				62%	24%
Opened 1990+ (24)	203	56	16	8	37	117	61
Average Public Share		28%				58%	30%

NOTE: Public share outcomes in excess of 100% indicate that public participation in ongoing facility operations does not repay upfront public development costs; instead it presents addtional public expenses.

From Miller (2007)

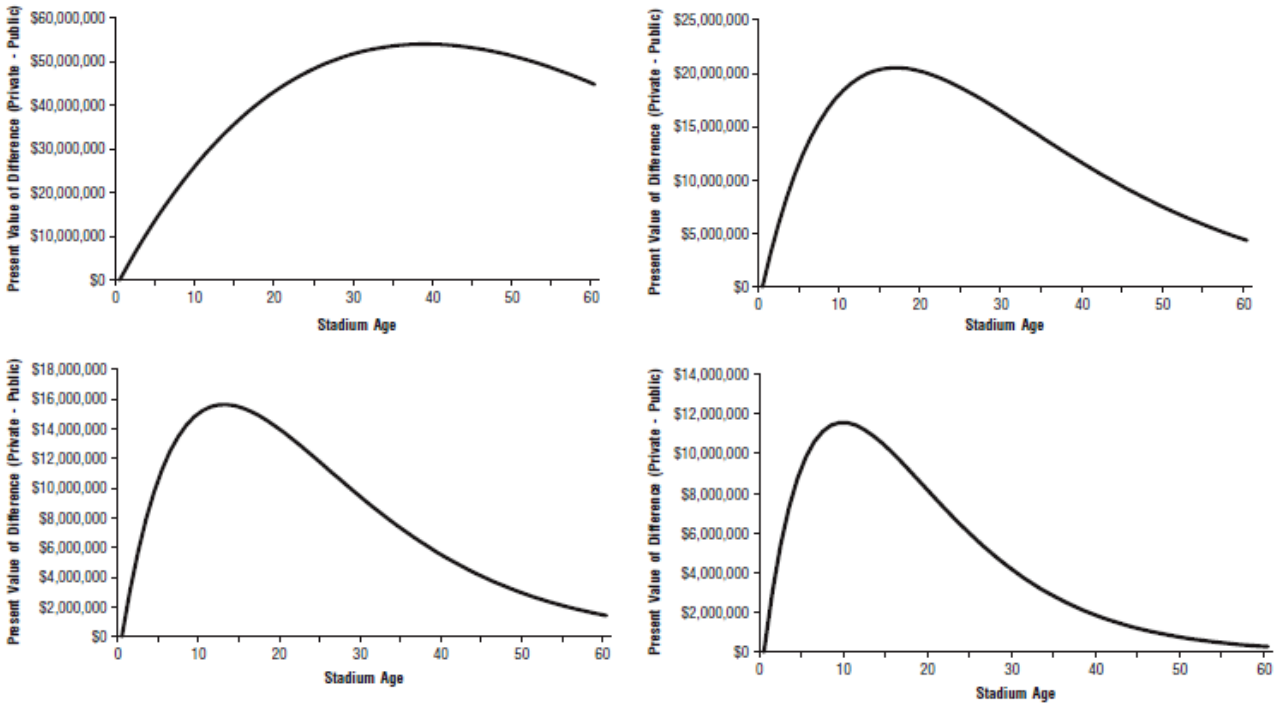


Figure 2: Panel 1. Difference in Franchise Values: Private Versus Public Stadiums 1% Discount Rate
Panel 2. Difference in Franchise Values: Private Versus Public Stadiums 5% Discount Rate
Panel 3. Difference in Franchise Values: Private Versus Public Stadiums 7% Discount Rate
Panel 4. Difference in Franchise Values: Private Versus Public Stadiums 10% Discount Rate

The present discounted value of private ownership of the club's stadium, net of the value of renting a publicly-subsidized one.

Upper left has the most generous temporal discount rate (1% per year).

- Still the PDV of owning no more than $60 million.
- Much less than the cost of a stadium.

If you want to get new "digs" it's better to get the city to pay for it.

Sports leagues: "we're also *monopsonists*"

Siegfried & Zimbalist (2000), among others, recognize that subsidization is proximally the result of clubs' bargaining positions vis-à-vis their host cities.

- I.e., the terms of their leases are very generous.

The leagues prevent teams from competing geographically with one another.

But the cities *do* compete, caving to threats that clubs will relocate and failing to collude against the leagues.

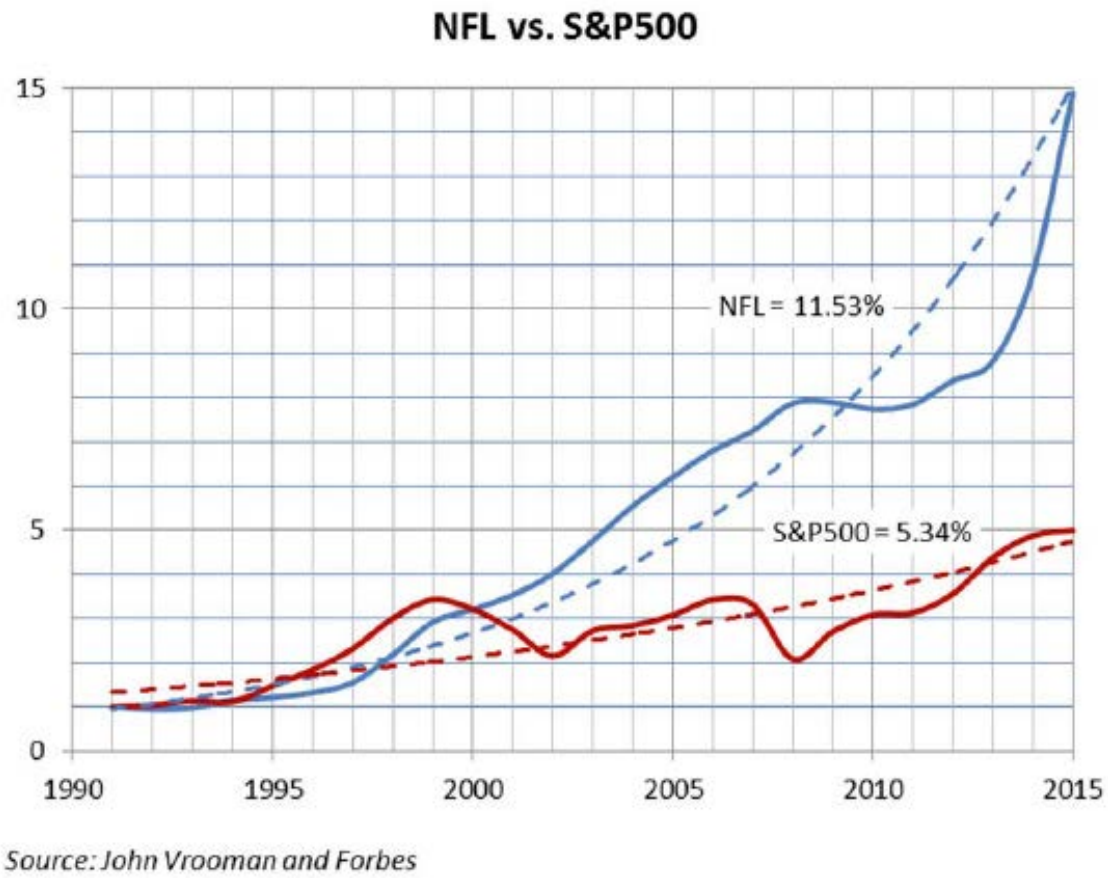
- We're in the same boat players were in before free agency! No bargaining power.

Empirically the subsidies don't seem to induce clubs to produce higher output, measured by winning games, either. Quinn, et al. (2003).

. . . And quacks like a duck . . . .

From John Vrooman at Vanderbilt (right).

Looks like monopoly rents to me.



But let's give them the "benefit" of the doubt

External benefit, that is.

Are there external benefits to the city from having a sports club located there,that are not captured by the club as revenue?

- If "yes," maybe the subsidies are justified.

These could take the forms of:

- Other free sports goods already mentioned ("highlights and fantasy games"),
- "Image enhancement," validating the city as a "major league" city,
- Increased demand for other local services, e.g., hotels, bars, restaurants.

Most of this would be expected to show up (positively) on the balance sheets of other local firms—just not the sports club's—so they would not be internalized.

Economic impact analysis

When clubs or sports boosters want to sell a city on the idea of (contributing to) building a stadium, they employ a consultancy to produce a study of the hypothetical economic impact.

- These are usually based on very strong assumptions about the spending multipliers and substitutability between sports and other entertainment.
- And famously overstate and double-count the benefits to the city.
- See Victor Matheson (pp. 137-142) in HSE for details.

There is a much less convoluted way to evaluate this, though. Justsee if the metropolitan area's economic output is higher after a club locates there or a new stadium is built.

- Regional GDP, GDP per capita, or something similar to measure this.

From Siegfried & Zimbalist (2000)

"Few fields of empirical economic research offer virtual unanimity of findings. Yet, independent work on the economic impact of stadiums and arenas has **uniformly found that there is no statistically significant positive correlation between sports facility construction and economic development** . . .

". . . in distinct contrast to the promotional studies that are typically done by consulting firms under the hire of teams or local chambers of commerce supporting facility development. Typically, such promotional studies project future impact and almost inevitably adopt unrealistic assumptions regarding local value added, new spending, and associated multipliers. They often use a regional input-output model that depends on outdated technical coefficients which are treated as invariant to shifts in supply and demand . . . ." – p. 103.

Economists agreeing with one another?

Baade (1996) offers one of the first modern estimates, concluding, based on 48 U.S. cities over the period, 1958-1987,

> "These results suggest that professional sports have been oversold by professional sports boosters as a catalyst for economic development . . . As a catalyst for economic development, professional sports' batting average resembles that of a replacement player rather than a major leaguer." – p. 16.

Coates & Humphreys (1999) actually found that (city average) per capita real income may go down (!) as a result of a sports franchise locating there.

Lertwachara & Cochran (2007) also find no effect for cities that gained/lost teams during 1980-2000.

Coates & Humphreys (2011) find some positive wage effects on occupations considered especially likely to complement sports entertainment.

And Agha (2013) finds that Minor League baseball teams are good for incomes, overall.

Very recent literature

Harger et al. (2016) find that, during 2000-2010, there is no evidence of new businesses opening as a result of new sports facilities.

Prof. Holger Preuss has authored numerous studies, beginning with the World Cup of 2006, finding mostly negligible economic effects of hosting “mega” sports events.

As with most empirical questions, there are some exceptions, but the bulk of the evidence indicates that sports do not have the positive external benefits that would justify subsidies.

- Just for fun: your source for a list of articles criticizing stadium subsidies and bids to host mega sporting events, e.g., Olympics, Super Bowls, Final Fours.

Disclaimer: I *am* a sports fan

It's very likely sports does not affect incomes, employment, or economic growth . . .

And that subsidies to clubs represent a net cost to the cities that offer them, rents extracted by the league's market power . . .

From fans, who on average have incomes that are*above average*, and transferred to owners and players, whose incomes are ***much higher*** *than average*.

What gives?

Siegfried & Zimbalist again, 3 reasons

When you think about it, it's entirely reasonable that sports would have negligible effects. For the following reasons.

Diversion of public spending from other projects ("budgetary impact").

- Unless you get the team to pay for their own stadium.

Even if you do, there's the substitution effect: the household leisure budget is pretty much fixed; spending on sports means less spending on other entertainment.

Leakage: spending on other local entertainment might have a larger multiplier effect than sports. Very rich owners and players have low marginal propensities to consume:

- They face very high rates of taxation,
- They have high savings rates, relative to the rest of us,
- They might not even live in the city their club resides in most of the year.

Example of leakage (S&Z 2000)

A baseball team earns $10 million in revenue from MLB (comes from outside the city) and $60 million in local ticket revenue and $2.5 million from sales to visitors from outside the locality.

The multipliers for sports and other entertainment spending are based on the table (right).

- Multipliers are: $1/[1 - MPC * (1 - MPI) * (1 - t)]$.

The $60 million would generate $[60 * (1.51 - 1.25)] = \$15.6$ million more if spent on non-sports entertainment.

The $12.5 million from outside produces $1.25 * 12.5 = \$15.625$ million in new activity.

The net is very close to zero.

	Sports Club	Other Local Entertainment
Marginal Propensity to Consume	0.67	0.8 (lower MPS)
Marginal Propensity to Import	0.5	0.35 (more likely to live in city)
Marginal Tax Rate	0.4	0.35 (less rich)
Multiplier	1.25	1.51

Siegfried & Zimbalist, conclusion

Cities pass referenda on stadium subsidies because non-sports-fans fail to organize in opposition to the “boosters,” and the misinformation about a stadium’s benefits defuse would-be opponents.

As potential solutions, the authors list:

- Acquisition of the clubs by their home cities or bases of fans,
- Some kind of commitment among the municipal governments to “collectively bargain” with the leagues,
- Divestiture of the leagues into multiple smaller leagues that would continue competing on the field in “interleague” play—but also off the field over entrance into geographical markets, and
- Merely allowing clubs to move cities freely, i.e., without the consent of the rest of the league.

Free goods are still goods

What about external benefits that *don't* show up on other firms' balance sheets?

In the book Soccernomics, Szymanski & Kuper summarize why hosting the World Cup is still worthwhile for a country: happiness (in an eponymously named chapter, pp. 235-252).

- In a (2010) paper, Szymanski & Kavetsos measure a significant, positive, but short-lived (pertaining only in the year of the tournament) effect of hosting the World Cup on the average self-reported happiness of people in the host country.
- Although it lasts much less long, the magnitude of the effect on happiness is 1.5 times as large as the effect of being married is.
- Many of these countries are European or Latin American, though, and they *really* like soccer.

Surely there's no way of putting a price on happiness, though . . .

Valuing non-priced amenities

Johnson et al. (2001) used a survey to attempt to measure the value of the public goods produced by the Pittsburgh Penguins, e.g., civic pride, conversation, so forth.

- This is called the Contingent Valuation Method.
- Their estimates were in the neighborhood of $40 million, still well shy of the subsidies given to teams for hockey arenas.

Feng & Humphreys (2016) find positive estimated effects (aggregate in $ hundreds of millions) on residential property values, based on proximity to sports venues in Columbus, OH.

Carlino & Coulson (2004), back this up based on NFL data from the 1990s.

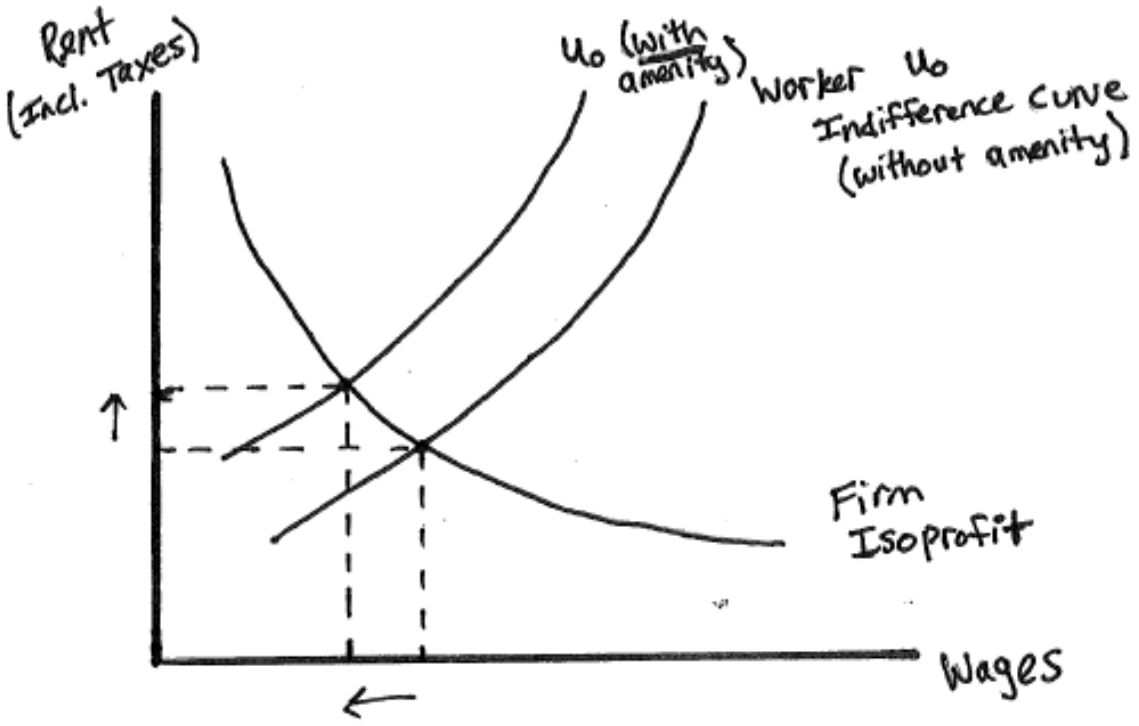
- A positive 6-10% effect on housing rent. If the city is large enough, this could justify subsidies for a stadium. The authors don't actually do this calculation, though.

So maybe they get capitalized into real estate prices?

Proximity to sports venues is an amenity, bundled with the sale of the house, that the buyer pays for.

- Higher house prices (as Carlino & Coulson found) or
- Lower wages.

If people like living near a sports team but there are no (firms') production externalities, workers' indifference curves shift leftward (figure), i.e., they're willing to tolerate lower wages and higher rent in exchange for the amenity of the team.

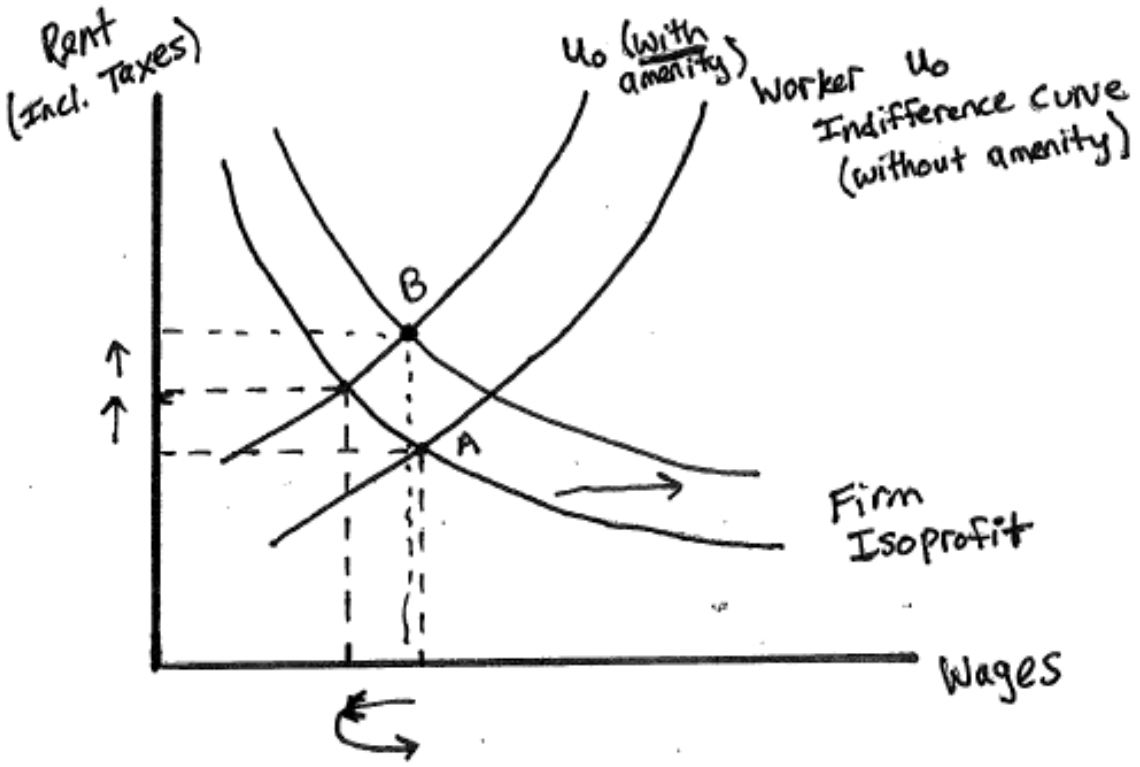


So maybe they get capitalized into real estate prices?

It also makes the Coates & Humphreys (2011) finding of wage increases stand out.

- If a sports team is a positive amenity, workers would pay with *lower*—not higher—wages to work in a city with a team.

You'd need a big outward shift in labor demand to offset the negative effect on wages (figure) and reconcile C&H 2011 with C&C 2004.



Caveats, conclusions

These amenities sound like luxury goods. It's not surprising that a developed country would pay to increase its happiness by hosting sporting events.

- Even without any positive benefits to GDP.
- Kuper & Szymanski estimated the 2008 Olympics would create $54 billion worth of happiness for London, the host city.

Poor countries should want the income, though. Watching soccer doesn't put food in your stomach or electricity in your light bulbs.

An insight from labor economics occurs to me, with respect to compensating differentials: workers are supposed to sort across firms based on their preferences for amenities offered.

- Might they do the same with cities? "If you like sports, move to a 'good sports town'."
- The wage or rent differential might not have to be that big to attract the *marginal* worker.
- Shouldn't the differential depend on how *good* the sports teams are, too?

To be fair: negative externalities

Rees & Schnepel (2009) quantified the effects of hosting a NCAA football game on a city's crime reports. And found increases in assaults (9%), vandalism (18%), drunk driving (13%), disorderly conduct (41%) and "liquor law violations" (76%), associated with the playing of the game.

- And they're bigger after an upset (win or loss) by the home team.
- Can't rule out an intermediary link in the causal chain: alcohol may be the catalyst that explains it all.

Kalist & Lee (2014) confirm that this is not just a problem for college games:

"NFL home games . . . are associated with a 2.6% increase in total crimes, while specific crimes such as larceny and motor vehicle theft are 4.1% and 6.7% higher, respectively." – p. 14.

- Leaning on other research on the cost of criminal victimization, the authors monetize the crime associated with football, estimating a cost of $86,000 per home game.
- Rose-colored glasses: are the victims also fans? Is this priced into tickets (and thus internalized)?

Negative externalities . . . inside the household

Card & Dahl (2011) found that domestic violence also occurs in response to football games:

> ". . . 'upset losses' by the home team . . . Lead to a roughly 10% increase in the number of police reports of at-home male-on-female intimate partner violence."

Other games, home team wins and non-upset-losses, have practically no effect on domestic violence.

Occurs in a narrow interval of time after the game's conclusion.

Larger effects for upset losses to a traditional rival team or in a game with playoff implications.

Come on, football fans

TABLE IV

UNEXPECTED EMOTIONAL SHOCKS FROM FOOTBALL GAMES AND MALE-ON-FEMALE INTIMATE PARTNER VIOLENCE OCCURRING AT HOME

	Poisson regression intimate partner violence, male on female, at home baseline model				
	(1)	(2)	(3)	(4)	(5)
(a) Loss × predicted win *(upset loss)*	0.112	0.099	0.100	0.096	0.100
	(0.034)	(0.032)	(0.032)	(0.031)	(0.031)
Loss × predicted close *(close loss)*	0.031	0.030	0.032	0.025	0.026
	(0.026)	(0.024)	(0.024)	(0.024)	(0.024)
(b) Win × predicted loss *(upset win)*	0.001	0.007	0.016	0.010	0.007
	(0.037)	(0.027)	(0.027)	(0.029)	(0.029)
Predicted win	–0.014	–0.019	–0.018	–0.009	–0.081
	(0.028)	(0.025)	(0.025)	(0.024)	(0.035)
Predicted close	–0.022	–0.012	–0.013	–0.010	–0.080
	(0.025)	(0.030)	(0.028)	(0.030)	(0.043)
Predicted loss	–0.016	–0.007	–0.016	0.006	–0.071
	(0.023)	(0.021)	(0.021)	(0.021)	(0.039)
Nongame day	—	—	—	—	—
Nielsen rating					0.003
					(0.001)
Agency fixed effects	X	X	X	X	X
Season, week of season, and holiday variables		X	X	X	X
Weather variables			X	X	X
Nielsen data subsample				X	X

Conclusions

"If all public subsidies to sports teams were eliminated, the existing teams could and would survive. Player salaries would decline, perhaps substantially, and team owners would earn lower profits and capital gains." – Siegfried & Zimbalist (2000), p. 101.

- Sports leagues are natural monopolies that are doing a fine job of extracting surplus from consumers through price discrimination.

To justify additional subsidies, usually in the form of stadiums with generous lease terms, there would have to be substantial external benefits.

- That probably do not exist in terms of spillover production in the local economy, but
- May exist in terms of "happiness"—an amenity that may be measureable as being capitalized into house prices.

The benefits would have to be counted net of the external costs, such as crime.

- Which are not negligible.

Appendix: market failure list (back)

Markets allocate resources efficiently if:

1. The market exists, i.e., property rights are well-defined and buyers can be made to pay for their transfer from sellers.
2. This includes (positive or negative) externalities associated with a good, e.g., pollution, congestion. If a 3rd party to the transaction receives (bears the burden of) a benefit (cost) not internalized in the transaction between buyer and seller, the market is producing too little (much) of that good.
3. There are no barriers to entry. Competition ensures that production increases to the point at which willingness to pay of the marginal consumer equals marginal cost.
4. Buyer and seller have perfect and symmetric information about the good's value, e.g., neither of them "balks" at the transaction because they suspect the other party has more information and is swindling them.