

# **Risks, Prices, & Structural Consequences of Product Illegality: What Cannabis Legalization Tells Us about Black Markets**

Jonathan Caulkins

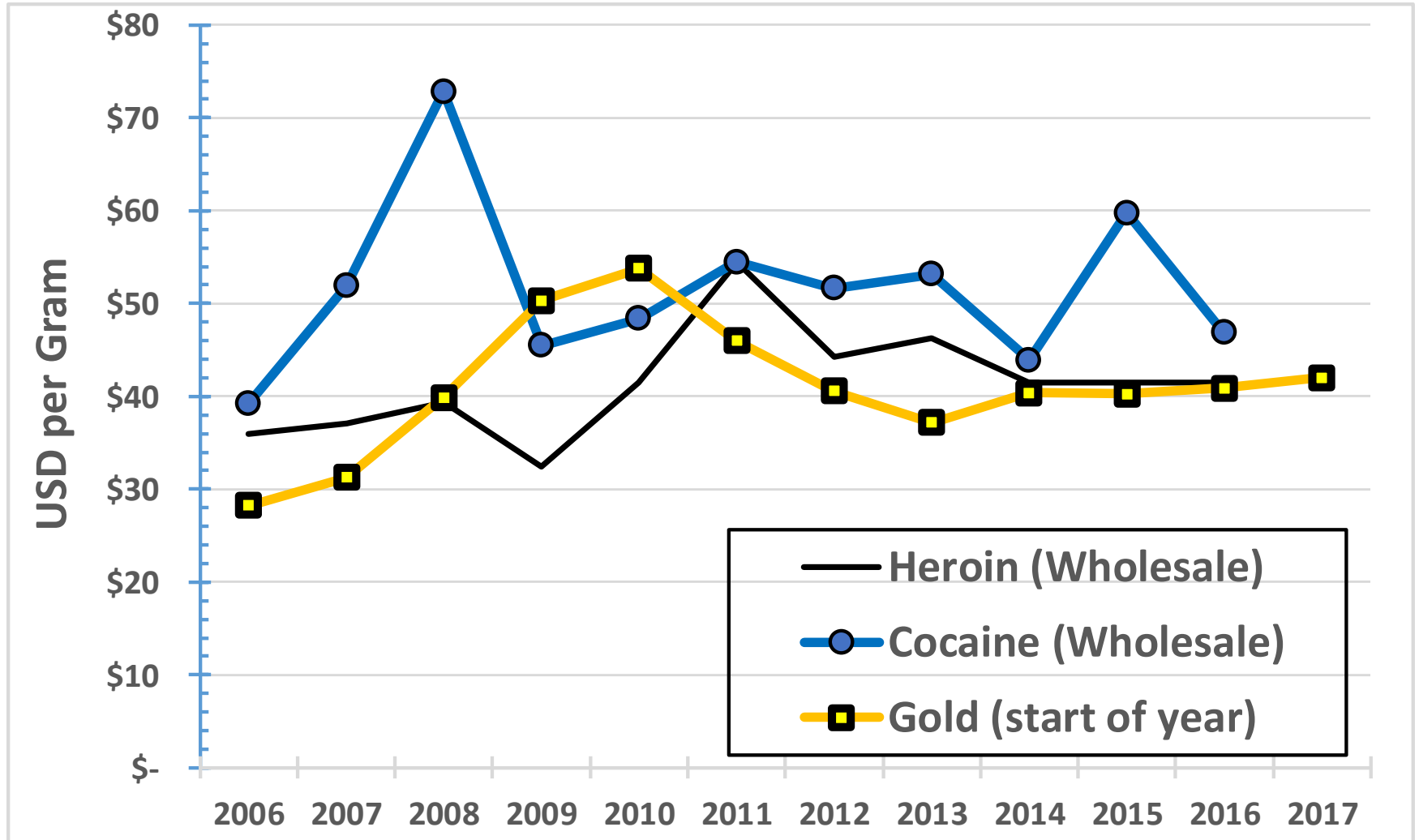
Carnegie Mellon University Heinz College

RAND Drug Policy Research Center

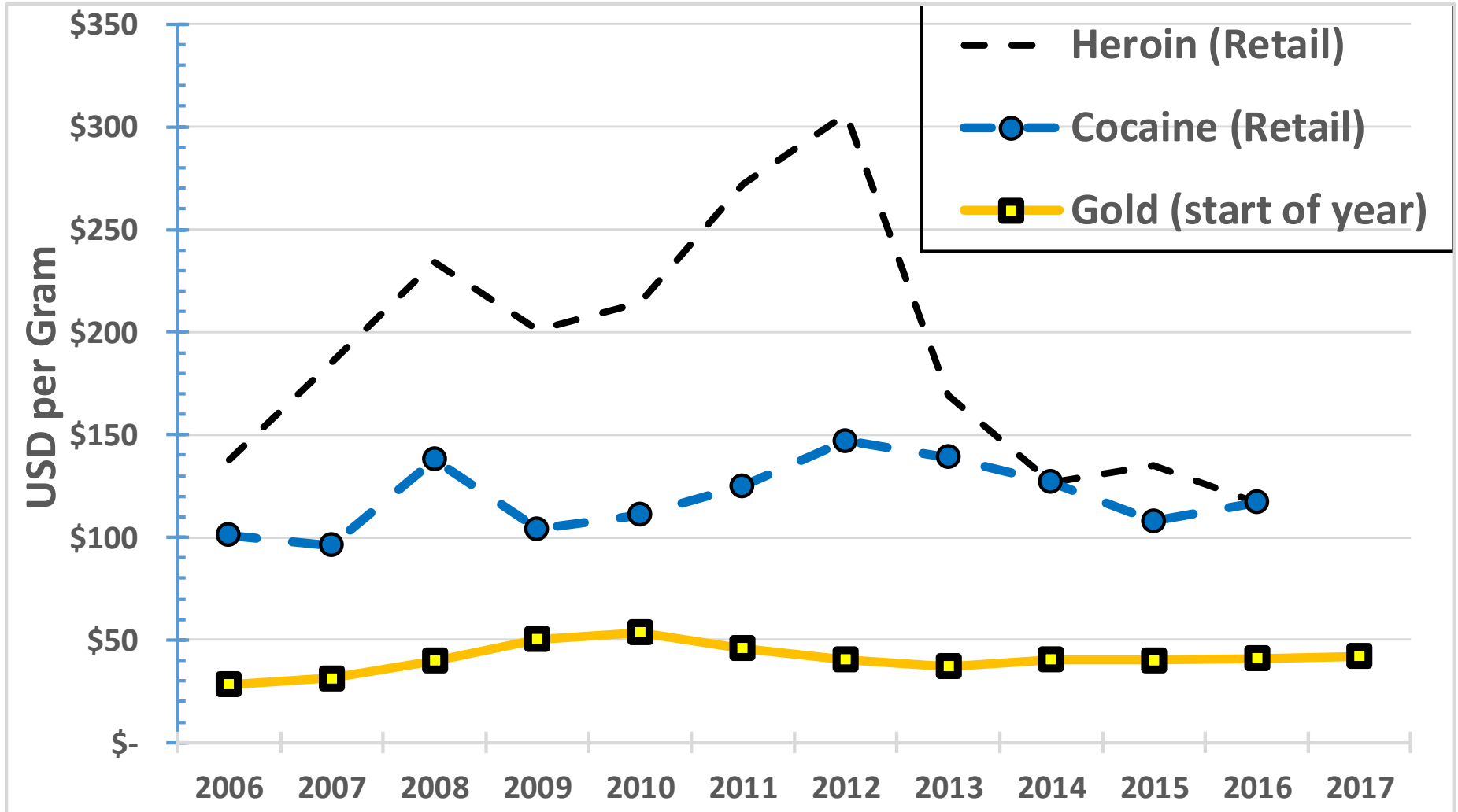
# **#1: Prices of Illegal Drugs Are Often High and That Matters**

# Heroin and Cocaine In Sweden Are Worth Their Weight in Gold

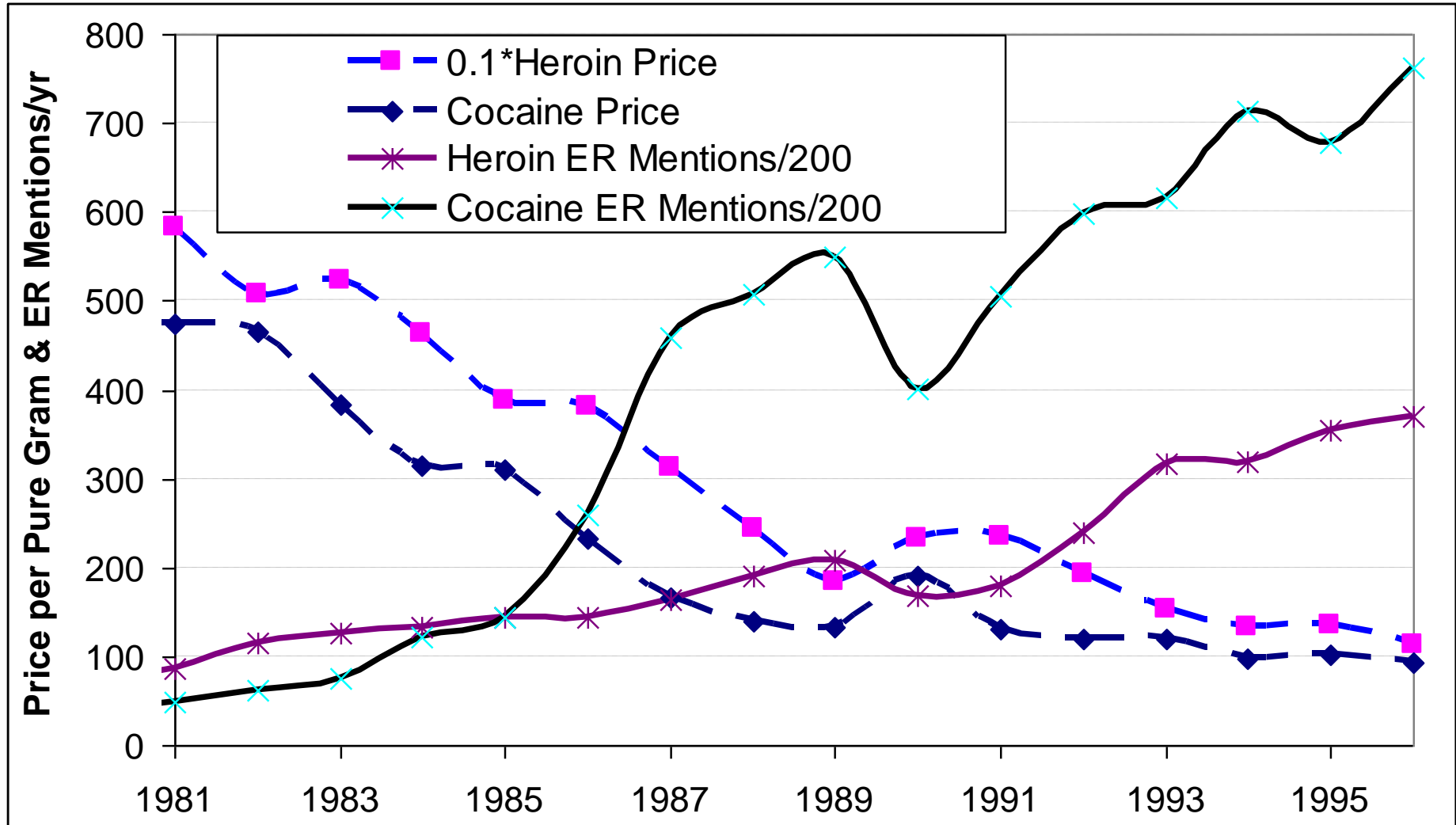
(even at wholesale prices)



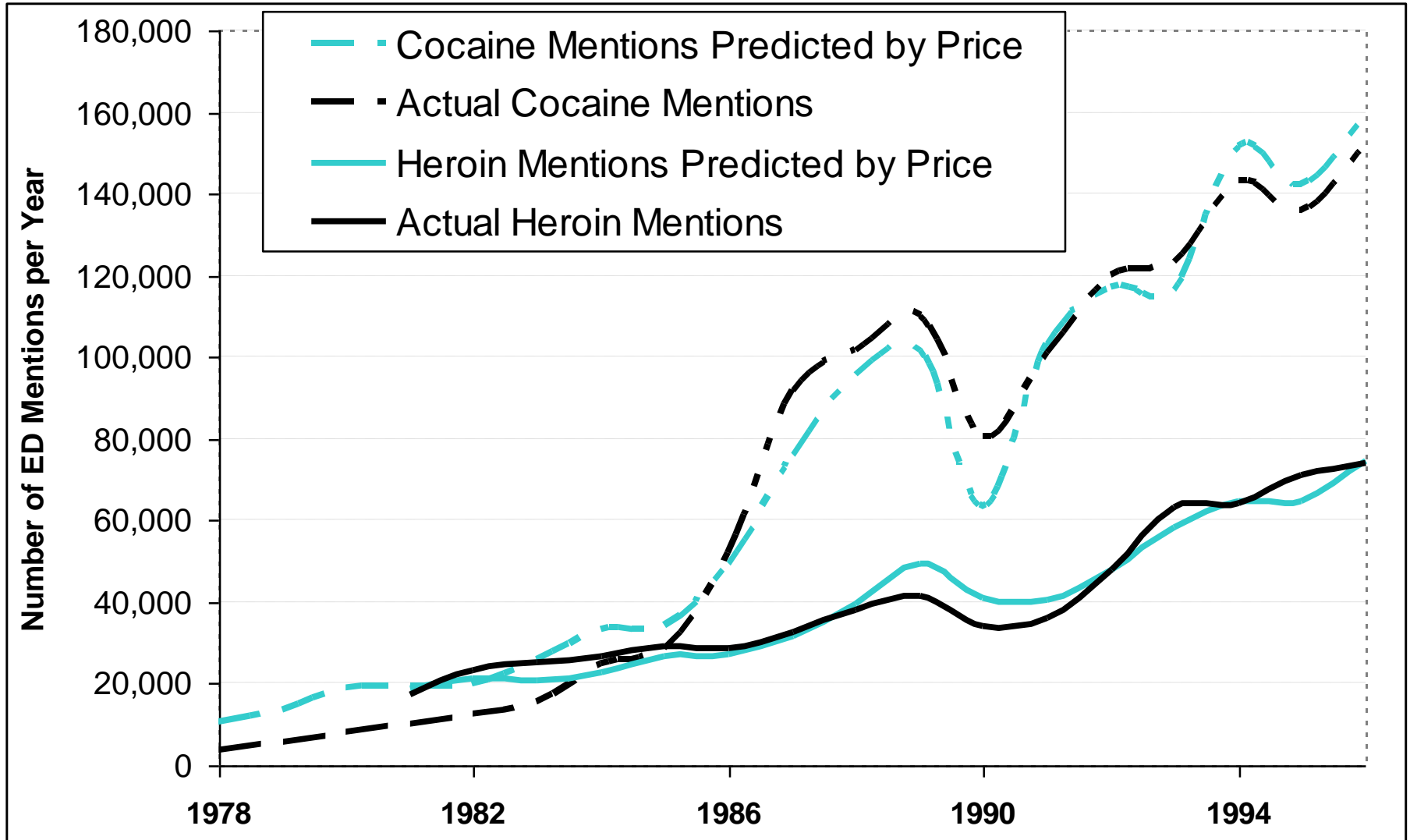
# At Retail, They Are Dearer than Gold



# Prices Matter: US Cocaine and Heroin ED Mentions Are Inversely Related to (Purity-Adjusted) Prices



# Price Raised to a Constant Elasticity Can Explain Most Variation in ED



# #2: Two Theories for Why Drug Prices are So High – Both by Peter

- Rejected theory: Monopoly power
  - Often there are few barriers to entry
  - Most of the markup happens at bottom of chain
    - 40-75% of retail price is wholesale-to-retail markup
  - Prices fell when Medellin “Cartel” was most powerful
- Structural consequences of product illegality
  - Reuter, Peter. *Disorganized crime: The economics of the visible hand*. Cambridge, MA: MIT press, 1983
- “Risks & Prices”
  - Reuter, P. and Kleiman, M.A., 1986. Risks and prices: An economic analysis of drug enforcement. *Crime and justice*, 7, pp.289-340.

# Structural Consequences of Product Illegality

- Need to avoid arrest forces inefficient practices
  - Sales rates
    - 20 per day for street dealers
    - 20 per minute for grocery store checkout clerk
  - Cost to package for retail sale
    - \$0.08 - \$0.20 to package a 0.1 gram vial of crack
    - \$0.006 - \$0.008 to buy 2.85 gram of packet of sugar
  - Scale of growing operations
    - 99 plants common under prohibition (so < 1,000 sq. ft.)
    - 3,267 sq. ft. (average of 8 commercial MJ growers in 2013)
    - 1,000,000 sq. ft. (Aphria's Lemington, ON greenhouses)



# Risks & Prices

- Competitive markets imply zero rents (aka “economic” profits)
  - Prices should be explainable by costs
- High money (aka “accounting”) profits compensate dealers for risks, notably of violence, arrest, and incarceration
- Theory of “compensating differentials” is common
  - Dates at least to Smith, Adam (1776)
  - A 2002 estimate for the US economy as a whole was \$6,600 per 1-in-1000 chance of death

# Good News! Risks & Prices Can Explain High Levels of Drug Prices Circa 1990

**Table 1: Estimates of Magnitude of Cost Components for Cocaine Sold at Retail, 1990**

Wholesale Price in Colombia	1%
Importing of drug	12%
Retail labor	13%
Higher-level labor	~3%
Drug and asset seizures	8-11%
Money laundering fees	2-4%
Packaging, Processing, and Inventory Costs	~2%
Compensation for risk of prison	23.6%
Compensation for physical risk	33%
<b>Total</b>	<b>~100%</b>

- Caulkins, J.P. and Reuter, P., 1998. What price data tell us about drug markets. *Journal of drug issues*, 28(3), pp.593-612.

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Mark up from \$1,500/kg in Colombia to \$15,000/kg at import is 12% of \$110/gm retail price

Value dealers' time at \$7 per hour (\$14/hr in 2019 \$)

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**325,000 incarcerated at \$43,500 compensation per year divided by \$60B total sales**

**Reuter et al. (1990) estimate risks of violence ~1.4 times the risks of prison**

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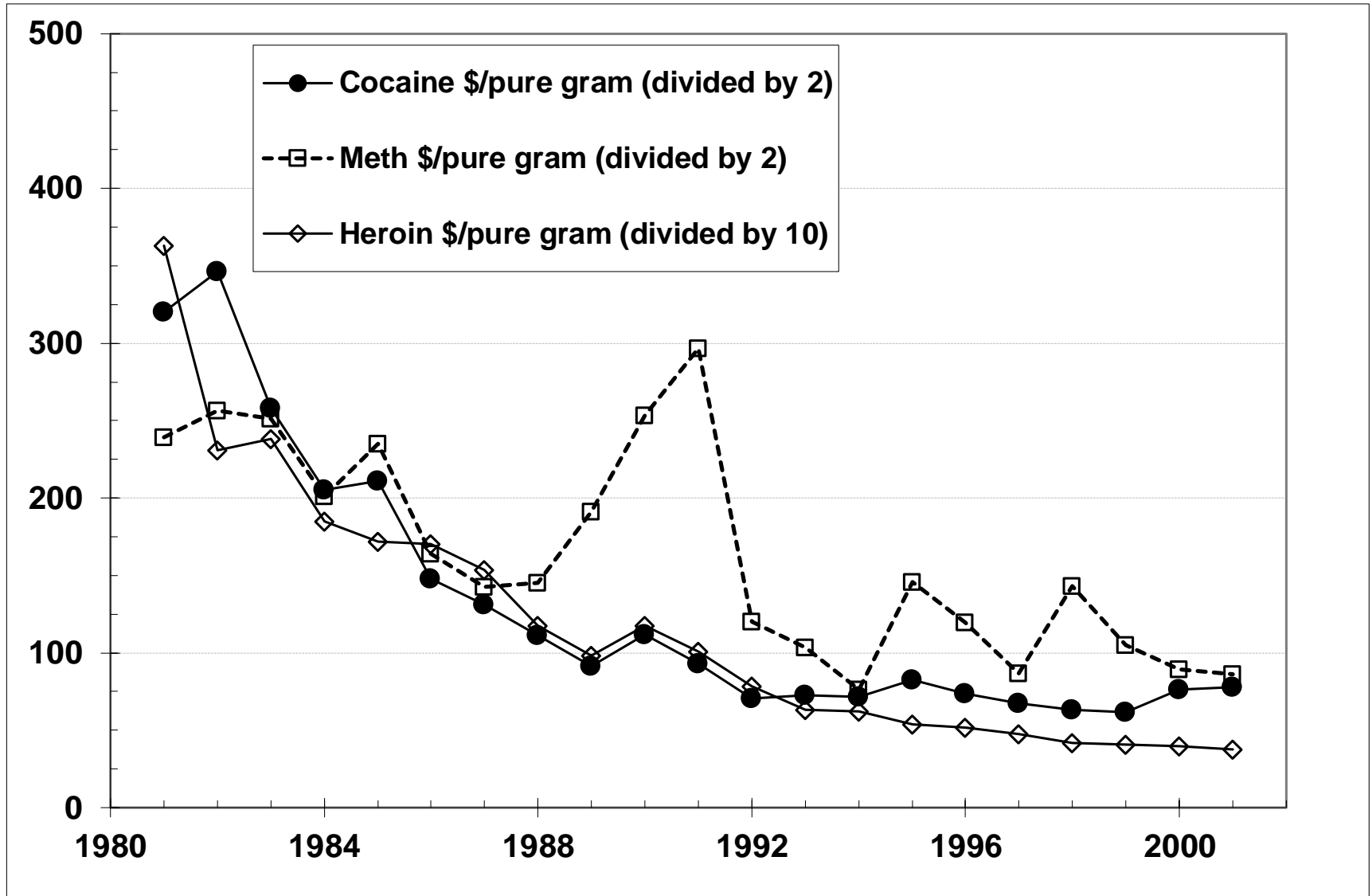
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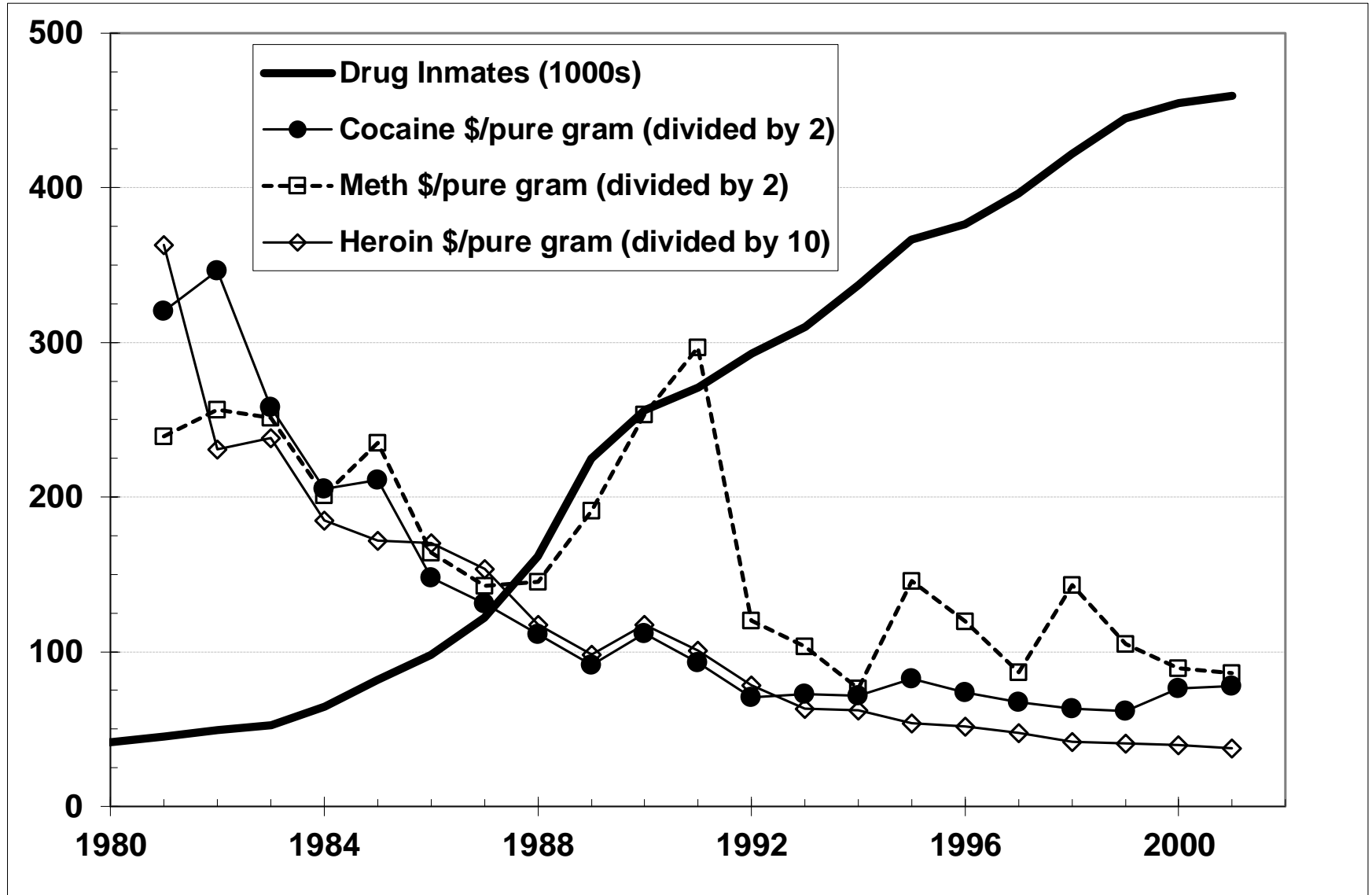
**Reuter et al. (1990) estimate risks of violence ~1.4 times the risks of prison**

**Structural consequences seem to account for less than 20% of retail price.**

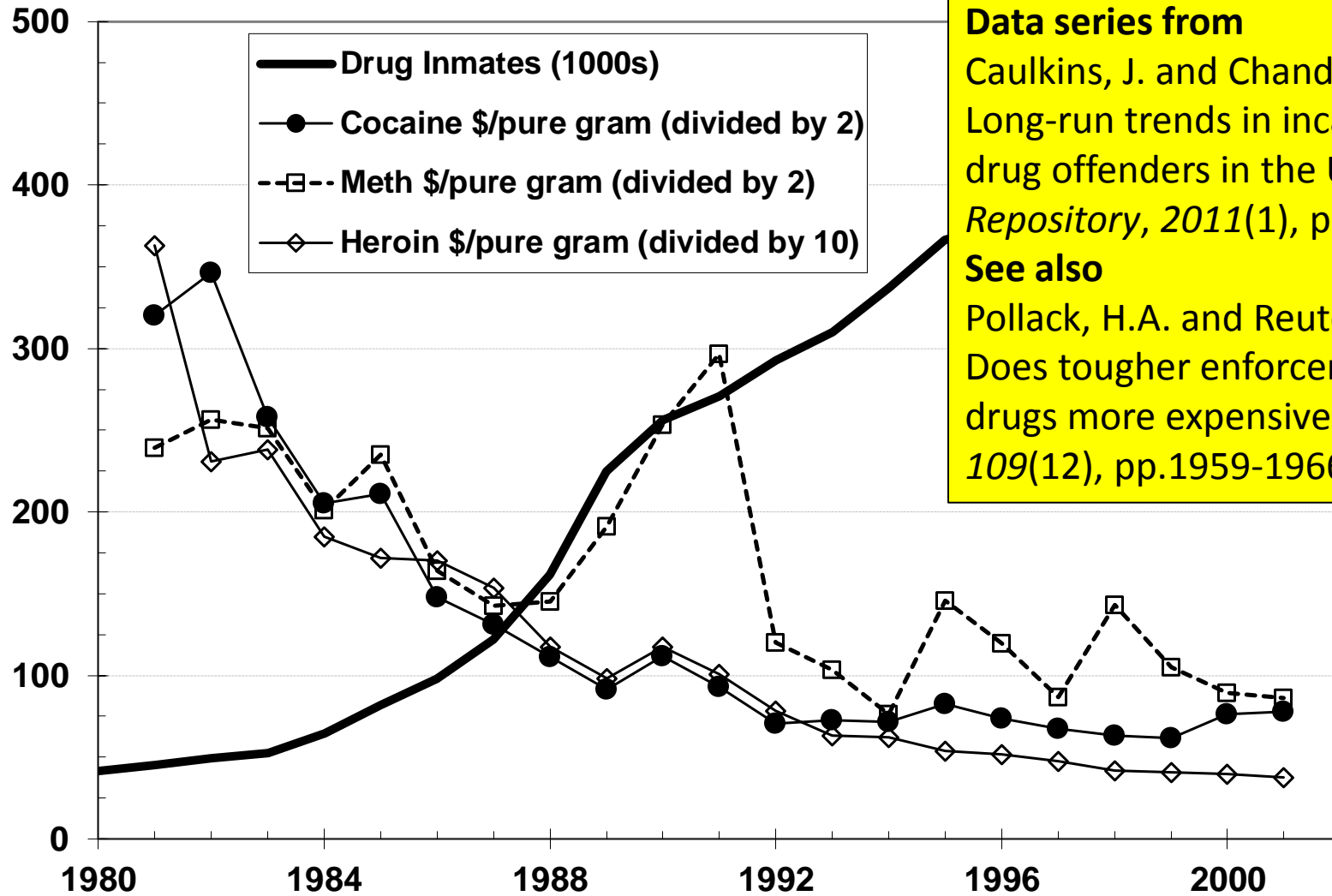
# Bad News! Risks & Prices Cannot Explain Price Trends



# Prices Collapsed in the US During the 1980s Expansion in Drug Enforcement



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**Data series from**  
Caulkins, J. and Chandler, S., 2011. Long-run trends in incarceration of drug offenders in the US. *QNRS Repository*, 2011(1), p.2168.  
**See also**  
Pollack, H.A. and Reuter, P., 2014. Does tougher enforcement make drugs more expensive?. *Addiction*, 109(12), pp.1959-1966.



# Caveats

- US squanders a lot of imprisonment on people who are cheap to replace
- Risks and prices theory is about risk per market participant, not aggregate punishing
- Maybe prices would have fallen even faster in the absence of enforcement ramp up
  - Kuziemko and Levitt (2004) An Empirical Analysis of Imprisoning Drug Offenders. *JPE*, 88, 2043-2066.
  - Rydell et al. (1996) predict similar to K&L

# #3: Lessons Drawn from Failure of Risks & Prices Theory Are Many

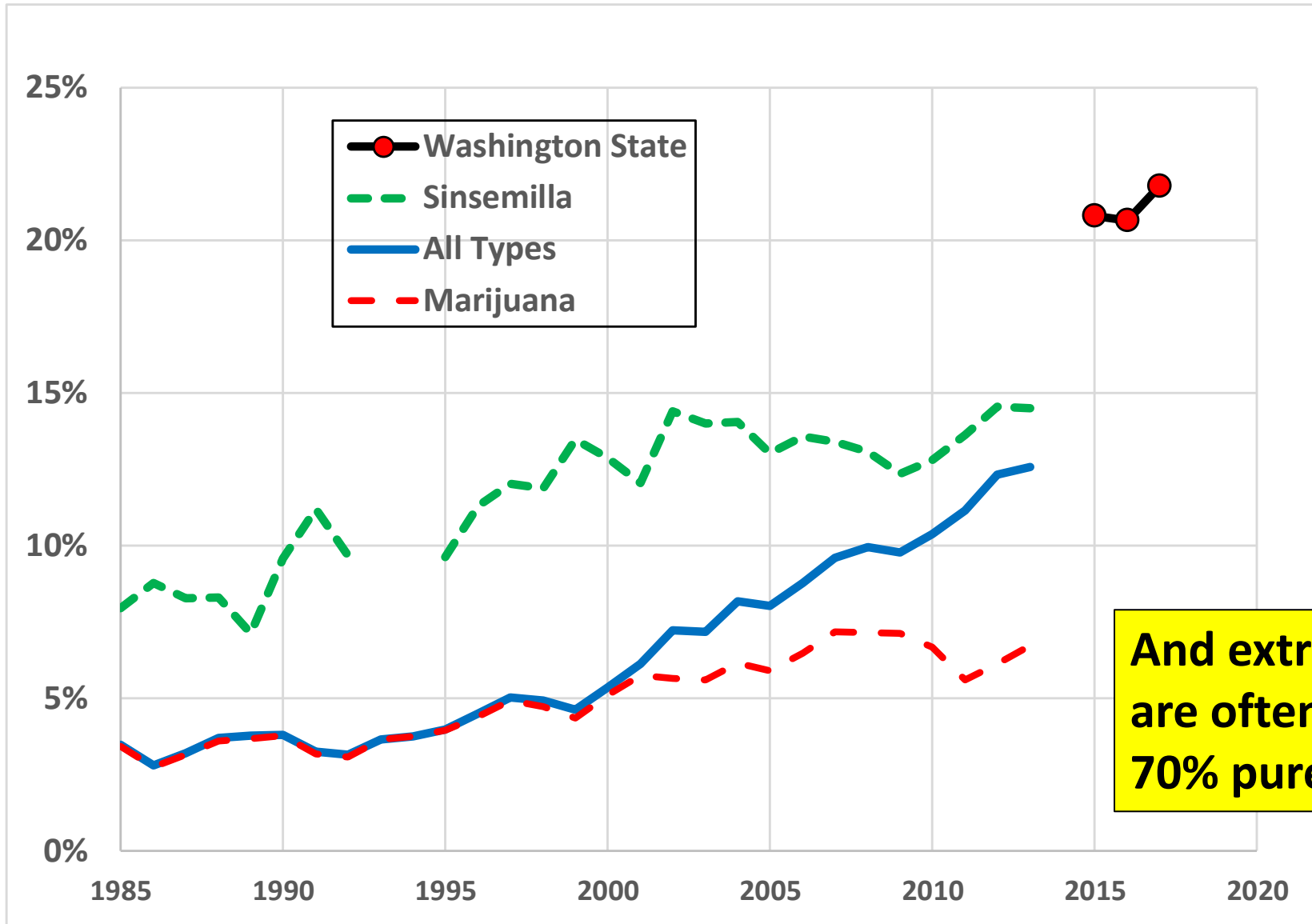
- Eschew long mandatory minimum sentences
  - Caulkins, J.P. and Reuter, P., 2017. Dealing more effectively and humanely with illegal drugs. *Crime and justice*, 46(1), pp.95-158.
- Free law enforcement to mold market into less destructive forms
  - Caulkins, J. and Reuter, P., 2009. Towards a harm-reduction approach to enforcement. *Safer Communities*, 8(1), pp.9-23.
- Hate all law enforcement
- Legalize drugs

# #4: What Cannabis Legalization Says about Structural Consequences

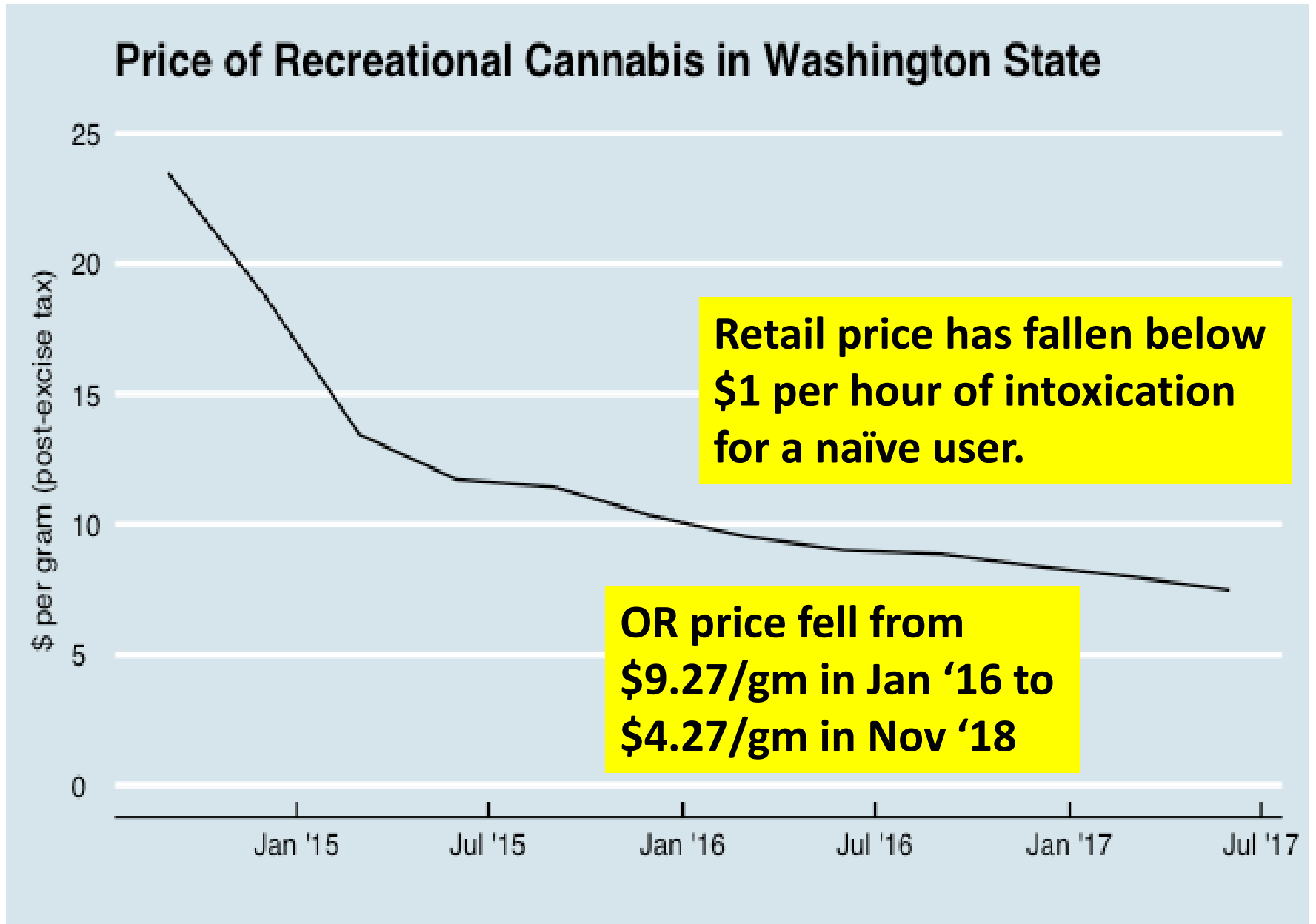
- Note: Cannabis prices in the U.S. were never about risk compensation
  - Not a very violent market
  - Cannabis accounted for at most 10% of incarceration but 40-50% of retail market value

# “Iron Law of Prohibition” is Wrong

## Potency Rose with Policy Liberalization



# Price Declines of Marijuana in WA State



# Wholesale Price Declines

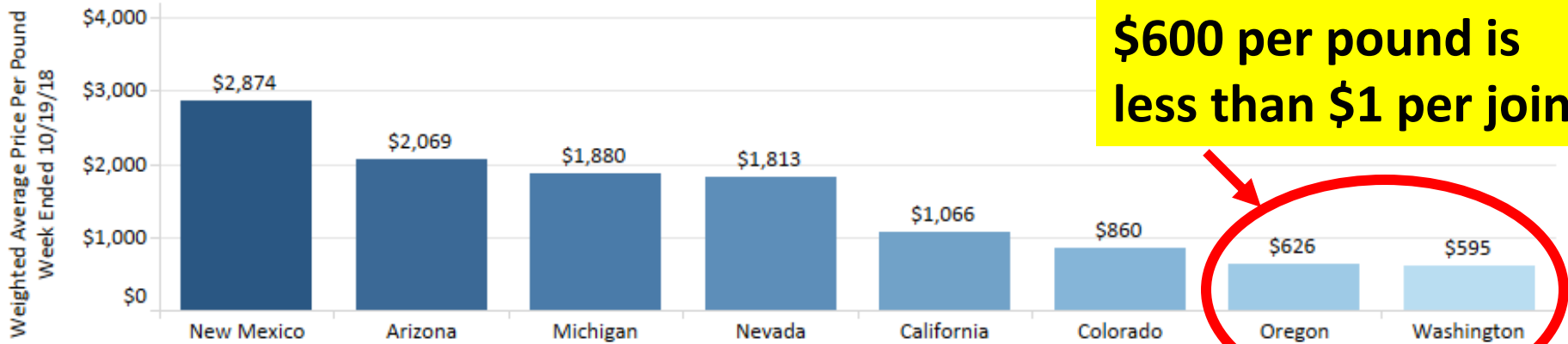


## Chart of the Week

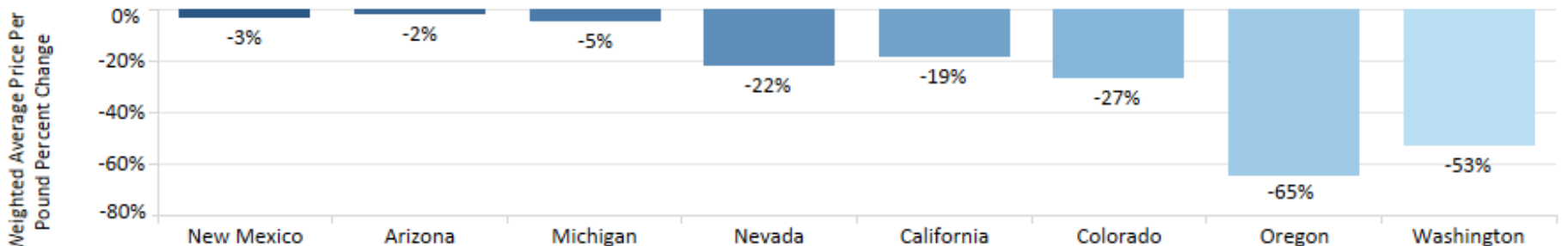
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### Average Wholesale Cannabis Prices Versus One Year Ago

Current Average Wholesale Cannabis Price By State



Current Average Wholesale Cannabis Price Percent Change Versus One Year Ago



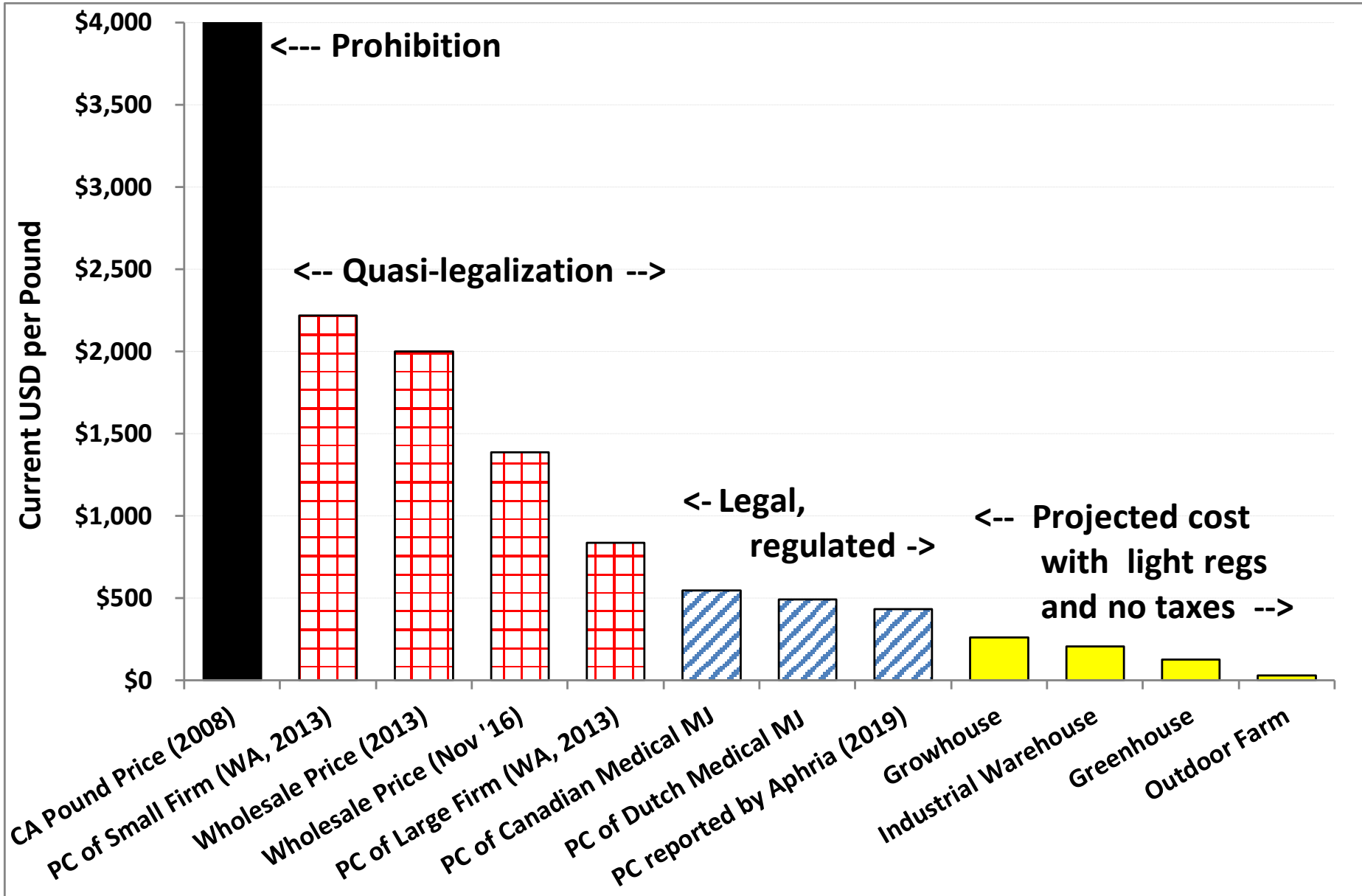
Note: Volume weighted averages derived from wholesale transactions for all grow types (i.e., indoor, greenhouse and outdoor) and market types (i.e., medical and adult use).

Source: Cannabis Benchmarks

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**National spot index declines about 2.5% per month, compounded.**

# Production Costs Are Falling



# Simple Math of Legal Production

- **Current retail cannabis price is ~\$10 per gram**
- **Could production cost fall to ~\$10 per pound?**
  - Cannabis yields ~1,000 pounds per acre
  - Production cost for tomatoes is \$10,000 per acre
  - That'd be ~\$0.02 per gm, or ~\$0.01 - \$0.02 per joint

**Long-run profitability requires getting consumers to pay much more than it costs to produce the product. Parallels with Starbucks & bottled water.**



# Structural Consequences Repealed When Prohibition Was Repealed

- Harness scale economies
  - Continuous not batch production
- Extract cannabinoids outside of flowers
- Tap skilled horticulturalists
  - Develop better strains
  - Modern agricultural science approach
- Offer a variety of products
- Develop brands and market them
- Increase retail sales per sales-staff hour

# Conclusion

- CW: Risks & prices model failed for hard drugs
- New wisdom: Structural consequences were large for cannabis
- Policy implications
  - Cannabis legalization is not just same old, same old but without the arrests. It will affect supply.
  - Maybe (?) think about law enforcement & prohibition differently for hard drugs???
    - Do least amount of enforcement necessary to keep people's heads down & minimize collateral harm
    - Don't maximize pain inflicted on dealers
    - And ...? [insert your ideas here]