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## 1. Motivation & research question

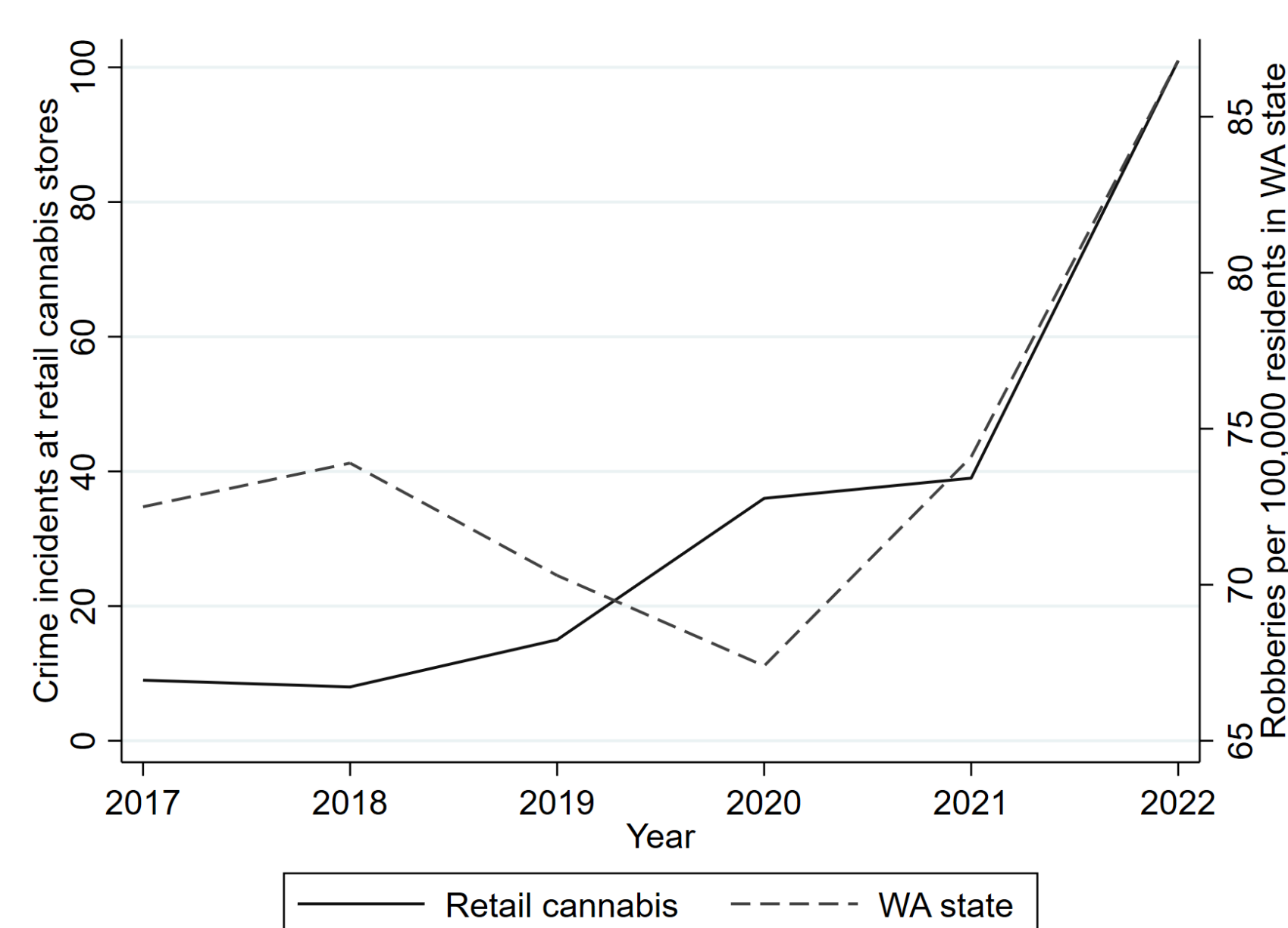
- Retail crime has surged to the forefront of public discourse in the United States
  - The U.S. Chamber of Commerce (2022) declared organized retail crime a “national crisis”
  - Numerous policy initiatives have been enacted to fight retail crime
- Retail crime imposes costs on businesses, individuals, and society. Understanding these costs is central for determining the optimal level of public crime prevention.
  - Many retailers invest heavily in strategies to prevent retail crime, including security guards, surveillance and training.
- One factor often overlooked when discussing the costs of retail crime is its impact on market outcomes, in particular market prices.
- Crime-induced price changes—the **cost pass-through of retail crime**—have distributional implications and can introduce an excess burden by distorting firms’ and consumers’ decisions.
- Yet, evidence of a causal link between retail crime and market prices is **nonexistent**.

Do retail crime incidents cause stores to increase prices?

## 2. Institutional context & data

- We investigate the impact of (organized) retail crime on prices using the retail cannabis industry as a natural laboratory
- We use rich scanner data covering the universe of transactions for all 508 active cannabis retailers in Washington State
- We match this with store-level data on reported robberies and burglaries at cannabis retailers
  - For each crime incident, we observe the date, retail establishment, a link to the police report, newspaper articles, etc.
  - 62 armed robberies, 14 burglaries during the sample period (March 2018-December 2021)
- Why cannabis? Besides unusually rich data, cannabis retailers sell in brick-and-mortar stores (no online sales) and compete in well-defined local markets. This allows us to investigate **potential spillover effects of crime from victimized stores to nearby rival stores** (e.g. due to demand substitution, strategic price effects, or an own-cost shock at rival stores).

Fig. 1: Comparing overall robberies to cannabis retail crime in Washington state



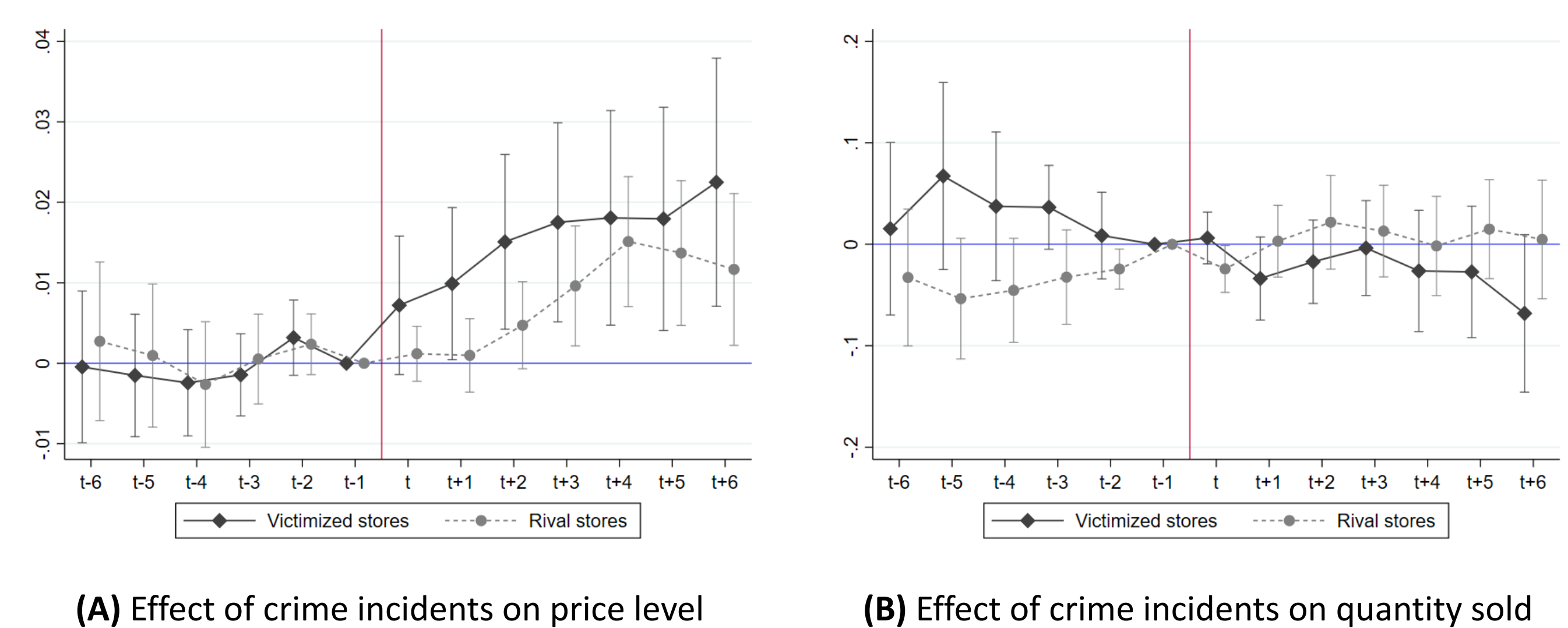
Notes: The figure displays annually reported organized retail crime incidents in the Washington state cannabis industry (solid line) and robberies per 100,000 inhabitants in Washington state (dotted line) from 2017 through 2022. Data sources: Uncle Ike’s Robbery Tracker for cannabis industry incidents and the FBI Crime Data Explorer for state-wide robbery statistics.

## 3. Empirical strategy & results

- We exploit the quasi-random timing of store-level retail crime incidents to estimate the causal effect of crime on store outcomes
- We distinguish between two treatment groups:
  - Victimized stores:** stores that directly experience a robbery or burglary (n = 57)
  - Rival stores:** stores located within a 5-mile radius of a victimized store (n = 264)
- We assign treatment the month of a store-level crime incident
- We compare both treatment groups to a common control group: Stores in unaffected local markets, i.e. stores located 30-60 miles from a victimized store (n = 329)
- We use the ‘stacked’ differences-in-differences (DID) estimator for our main specification (see Cengiz et al., 2019). Compared to other estimators that deal with staggered treatment timing, with stacked DiD the rules governing clean controls easily extend to geographic criteria.

Crime incidents cause a 1.5-1.8% increase in prices at victimized and rival stores, but there is no short-term effect on quantity sold.

Fig. 2: Effect of crime incidents on store-level prices and quantity sold



Notes: The figures show the effect of crime incidents on store-level outcomes. Coefficients are interpretable as percent increases in outcome levels relative to the month before a crime incident. The black line depicts the cumulative effects of crime on outcomes at victimized stores, while the grey line represents rival stores.

## 4. Policy analysis – crime as a hidden tax

- We model crime as a marginal cost shock that can be understood as a hidden crime tax levied on cannabis retailers.
- Our policy analysis follows three steps:
  - Derive the general welfare implications and sufficient statistics from the symmetric oligopoly model by Weyl and Fabinger (2013)
  - Use stores’ wholesale price data to estimate own and competitors’ marginal cost pass-through rates
  - Combine estimates and theoretical insights to quantify the hidden tax rate and welfare effects
- We find a **1% unit tax per crime incident**. The hidden tax reduces consumer surplus by \$22.8 million per year and producer surplus by \$11 million per year, for a total annual welfare effect of \$33.9 million (the incidence of the hidden tax falls 67% on consumers and 33% on retailers). The annual excess burden for the Washington state cannabis industry is \$20.2 million.

## 5. Conclusion

- Retail crime pass-through extends beyond victimized stores and can affect local market prices more generally.
- Our analysis underscores the importance of considering pass-through effects when evaluating the social costs of retail crime.
- When we scale the excess burden of retail crime pass-through to all U.S. retailers based on relative shares of sales, our estimates imply an additional annual welfare cost of about \$80 billion nationwide.

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