

An approach to measuring informal activity in California

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Early results presentation

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Question and positioning

Methodology

Core estimate: a synthetic taxable base. I use two distinct data sources within same model, applying effective tax parameters.

Transaction based approach

- Use NAICS-level taxable transactions, selecting all industries within coverage
- Direct mapping from observed data to taxable base
- Revenue estimate:

$$\hat{T}_t^{trans} = \sum_i \tau_{t,avg} (\hat{c}_t^{trans} \cdot \hat{i}_{t,avg})$$

PCE based (Household) approach

- Use county-level disposable income and local tax rates, but requires quintile-level parameterization on taxed spending.
- Revenue estimate:

$$\hat{T}_t^{pce} = \sum_{i,q} \tau_{it} (\hat{c}_{itq}^{pce} \cdot \hat{i}_{qt})$$

Data and model

Measure		Description	Source
GDP (nominal)	GDP_t	Output in current prices	FRED FED (1999-2023)
Collected tax	T_t	Collected tax revenue	FRED FED (1999-2023)
Compliance rate	ϕ_t	$Rev_t / \sum_i \tau_{ti} (c_{it} \cdot i_t)$	calc (2003-2024)
County quintiles	τ_{it}	y_t grouped	BLS PCE - CA (2000-2023)
GVA	GVA_t	GSP	BEA NAICS (1999-)
Export share	x_t	CA export val	CA TFA, (2005-2024)
Incidence	i_t	Share y_t taxable	BLS PCE - CA

Results: Estimated baseline values



Figure 1: Left plot shows estimated taxable receipts $\sum_i \tau_{ti}(c_{it} \cdot i_t)$ at county level, and industry level $\tau_t(c_t \cdot i_t)$. Right panel plots modeled revenue using both PCE and transaction-based incidence calculation, against actual tax receipts.

Results: Co-movement of GDP and EVADE

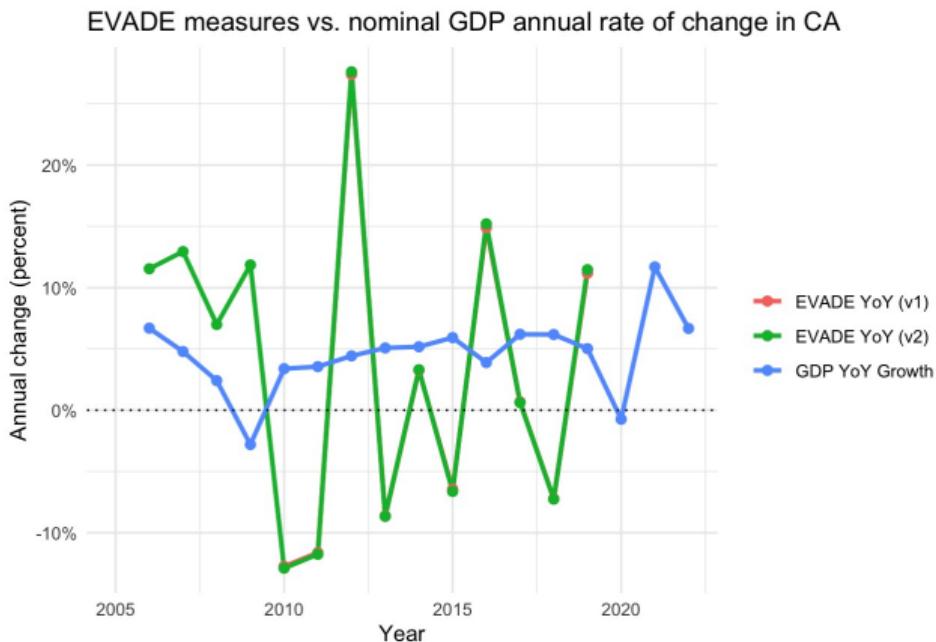
formula 1

$$\begin{aligned} GDP_t^{full} &= GSP_t + NTprod_t \\ &+ (1 - \delta_t)(1 - x_t)GVA_t \\ &+ (\phi_t - 1)T_t \end{aligned}$$

formula 2

$$EVADE_t = \frac{GDP_t^{full} - GDP_t}{GDP_t}$$

⇒ Large swings in *EVADE*,
volatility of GDP_t and
 $GDP_t^{full} - GDP_t$



Next steps

- Continue to **improve the EVADE measure**:
 - ▶ Distinguish measurement error from informality between *projected tax revenue figures* between the PCE and the transaction-based estimates
 - ▶ Disaggregate GDP, potentially imports to the county level for full alignment with PCE-approach
 - ▶ Include consumer-level subsidies on products for further refinement
- **Refine interpretation**: what does it mean for the EVADE measure to be volatile?
- **Provide more descriptives**: Plot against other raw data series, including collected income tax, and try to match model estimates with total tax incidence in CA