CEO Pet Projects

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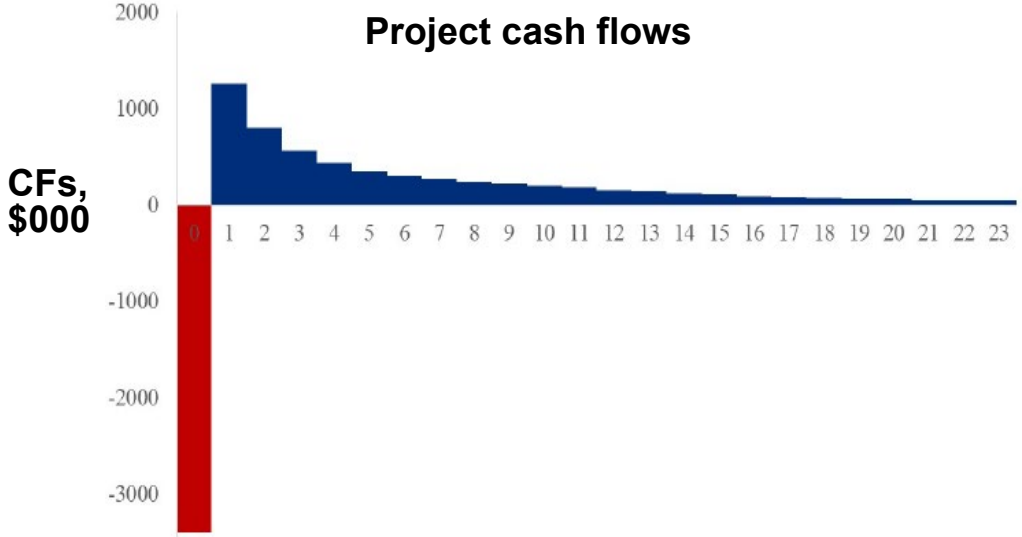
Motivation

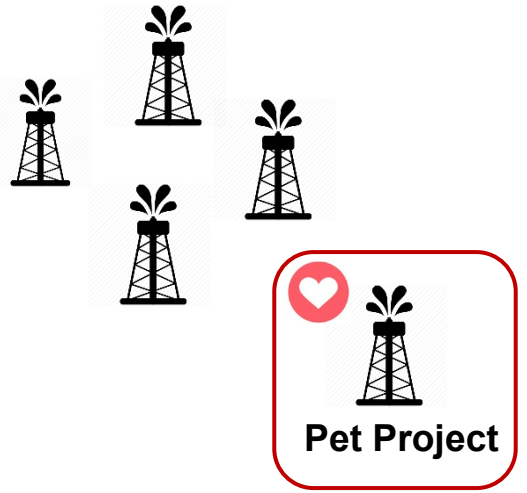
- Textbooks: CEO's main job is to implement highest NPV projects
- Corp. theory: some projects offer private benefits to CEO → pet projects
- Pet projects serve as the **centerpiece of the agency theory** and a key driver of the wedge between the CEO and shareholders
- Yet, empirical analysis of pet projects has been elusive, as it requires to:
  - Observe the investment opportunity set
  - Identify pet projects in the project pool
  - Measure the CEO's private benefits
  - Evaluate project performance vs. counterfactuals

This paper: among the first to reveal the CEO's monetary benefits in capital budgeting and study their role in project choice, sequencing, and outcomes

Empirical Setting

- **Projects**: 229,000 capital budgeting projects in the oil & gas sector
  - Nearly $1 trillion in firm CapEx (in 2020 dollars) across 19 states
  - Homogenous drilling projects (mean investment = **$3.4 mil.**)





- **CEOs' private benefits**: personal land assets on oil & gas fields
  - Mostly **vacant land** (away from primary residence)
  - Mean investment = $1.01 million
  - **Start of drilling on an oil field** → **a 107%** increase in signing bonus, even after the deposits are confirmed and documented

Main Findings

- **Resource allocation**
  - CEOs are 3 times more likely to start drilling in a field with personal assets
  - The effect is stronger during periods of high oil prices → greater managerial slack
  - CEOs invest 7 percentage points more corp. CapEx in the fields where they own assets
- **Project performance**: ~~information vs.~~ **agency**
  - CEO pet projects underperform other wells drilled by the same firm, in the same year, and in the same township: **11.8%** lower initial output and **9 p.p.** lower IRR
  - CEO's private assets add an **idiosyncratic constraint on the drilling location,** and such a constrained choice → lower project quality and local overinvestment
- **Governance**
  - Pet projects perform worse when the CEO has stronger control rights (chairman of the board) and faces weaker monitoring (less concentrated shareholder ownership)
- **Robustness**
  - Selection → use inherited assets; Local bias → control for distance & CEO home state
  - Reverse causality → Property bought before taking office; before the field was discovered

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A novel link between CEOs' private assets and capital budgeting decisions

1. Identifying CEOs' Investment Properties

Data

1. Firms & Projects

DrillingInfo → the **universe** of domestic oil & gas projects

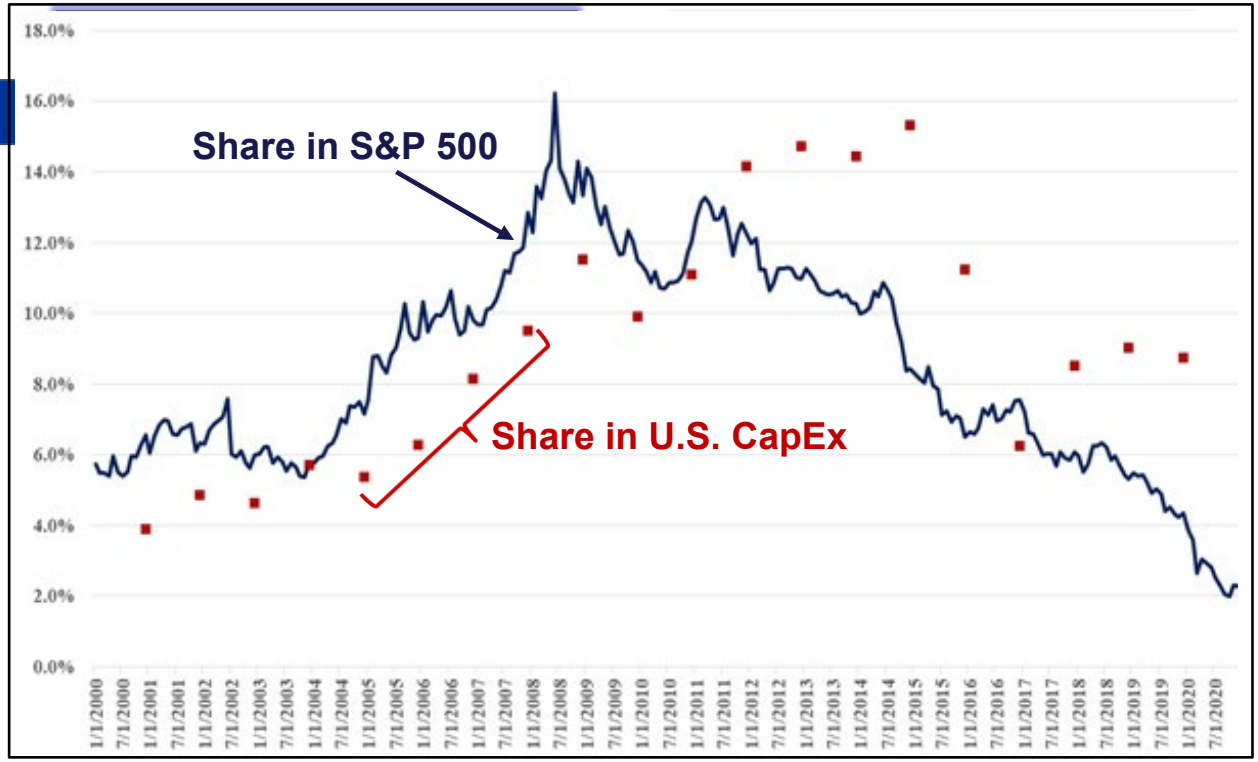
Boardex and Capital IQ

298 Firms

- **Public (57%) & private (43%)**
- Operate in 19 states
- **700+ projects per firm** → timing, location, and CFs
- **Constitute 8.4% of S&P 500** and support 10 mil. jobs

2. CEOs & Properties

Economic Importance of the Oil & Gas Sector



Data

Assessment Record

This data is for informational purposes only.

Owner Information

Original Name: DAVIDSON NANCY G
DAVIDSON CHARLES D

Standardized Name: DAVIDSON, CHARLES D
DAVIDSON, NANCY G

Original Address: 314 PARK LAUREATE DR
HOUSTON, TX 77024-5639

Property Information

Original Property Address: 15517 FM 109
BRENHAM, TX 77833-1549

Standardized Property Address: 15517 FM 109
BRENHAM, TX 77833-1549
WASHINGTON COUNTY

Land Use: FARMS

County: AUSTIN

Data Source: A

Legal Information

Assessor's Parcel Number: R000019159

Brief Description: A049 JOHN HODGE ACRES 67.769

Legal Description: CITY/MUNI/TWNSP: BRENHAM; TRACT: 7604002011

Sale Information

Sale Date: 12/29/1999

Assessment Information

Market Land Value: $591,082

Market Improvement Value: $190,599

Total Market Value: $781,681

→ **Land-to-Market Value = $\frac{\$591K}{\$781k}$ > 50%**

3. Properties

County **Tax & Deed** Records

GPS Mapping

155 invest. properties

- **Away from prim. residence**
- Land > 50% of value
- **Adjacent to an oil formation** (mean distance = **3.3 miles**)
- **Purchase/sale transactions** and GPS coordinates

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2. CEOs

Ancestry.com

Newspapers.com

Lexis Nexis Public Records

412 CEOs

- **State of origin** from SSN
- Primary residence
- **Real estate assets** owned directly or via family trust
- **Close relatives**, their residences, and real estate

3. Properties

County **Tax & Deed** Records

GPS Mapping

155 invest. properties

- **Away from prim. residence**
- Land > 50% of value
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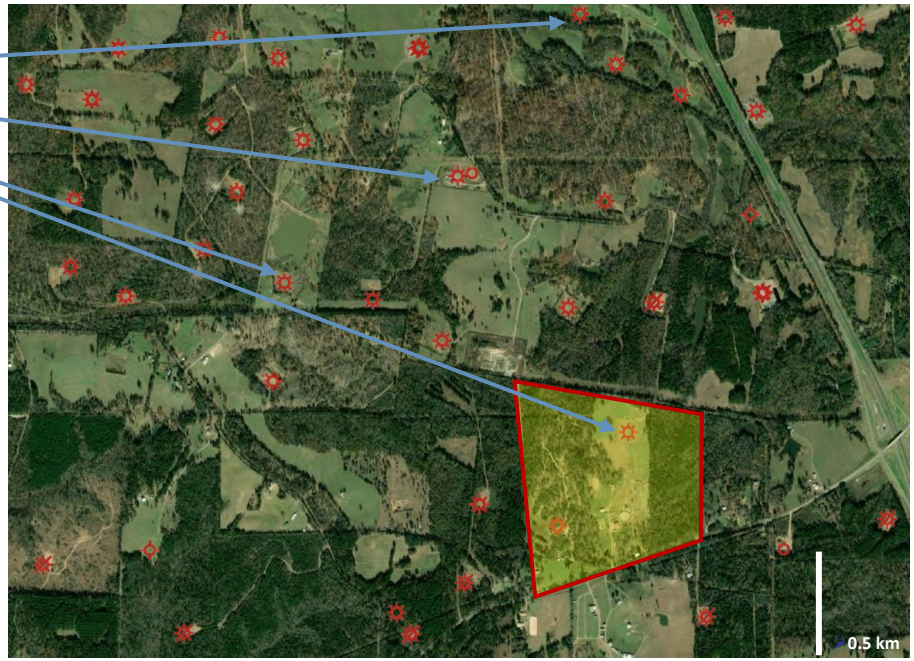
1. Nearly the **universe** of onshore U.S. oil & gas projects ≈ **10% of U.S. CapEx**
2. History of CEOs' private asset **inheritances**, **purchases, and sales**

Firms' Projects near CEOs' Properties

- **Using the GPS coordinates of CEOs' properties and individual wells**

Individual wells



Empirical Strategy:

1. Identify the **location & initiation date** of each project

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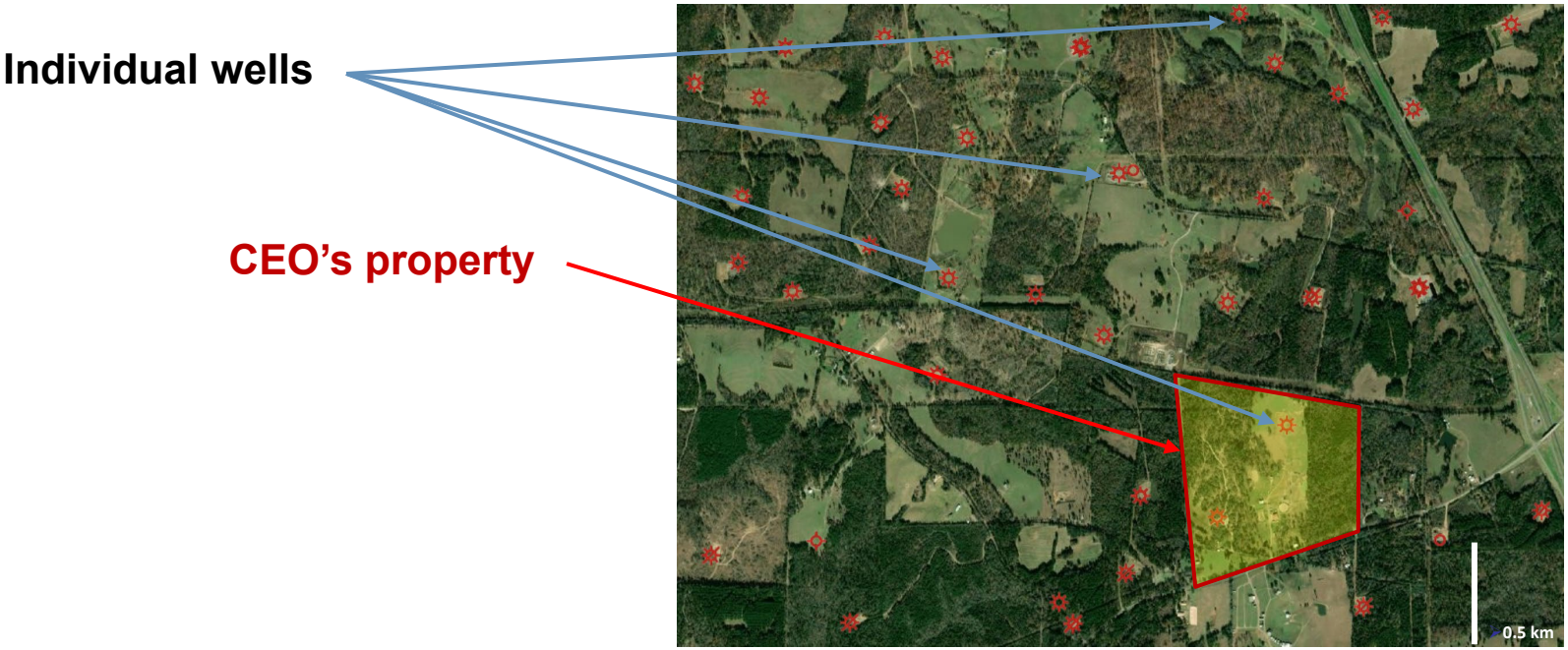
- **Using the GPS coordinates of CEOs' properties and individual wells**

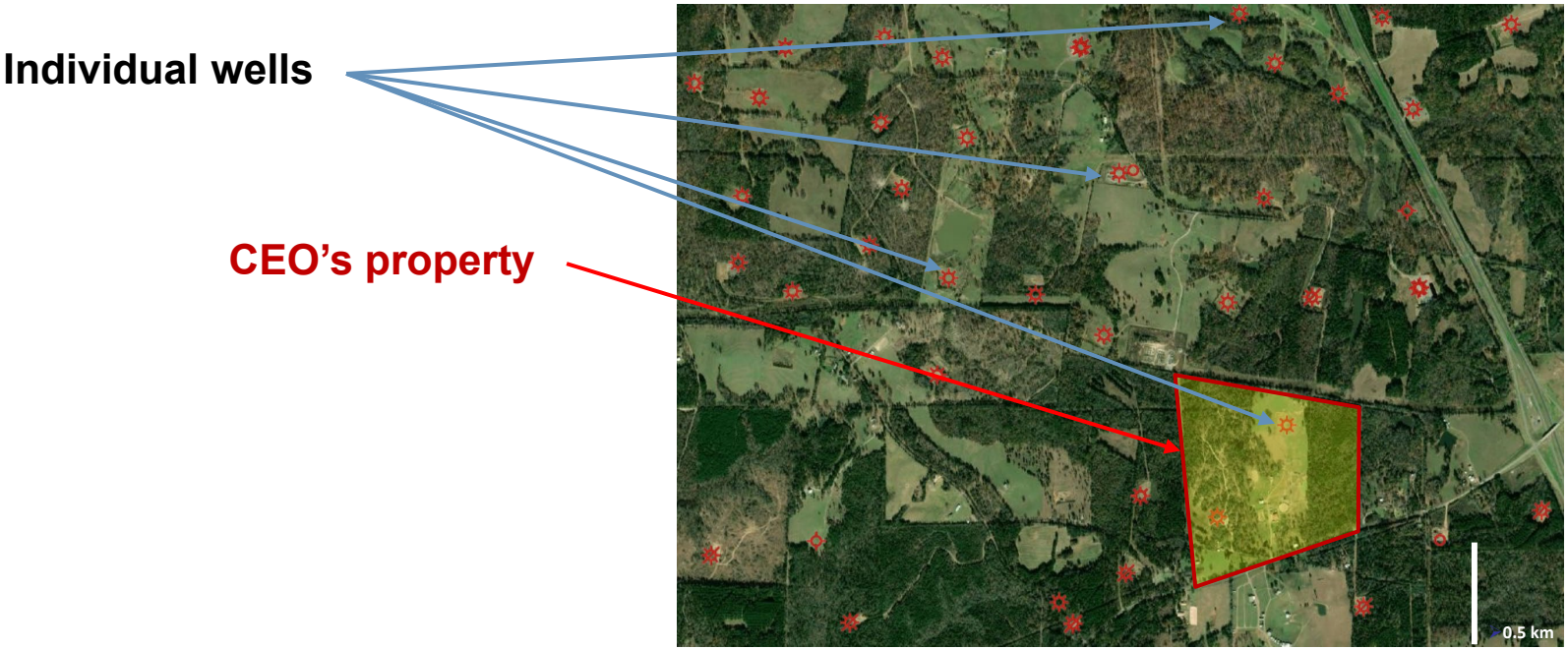


Empirical Strategy:

1. Identify the location & initiation date of each project
2. Reconstruct each land **lot's position & ownership period**

Firms' Projects near CEOs' Properties

- **Using the GPS coordinates of CEOs' properties and individual wells**



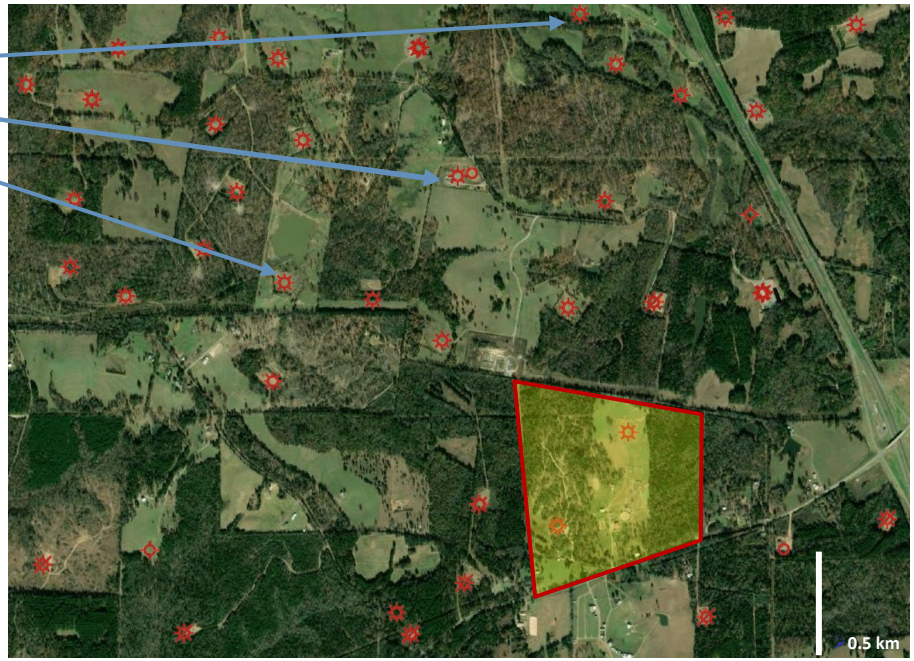
Empirical Strategy:

1. Identify the location & initiation date of each project
2. Reconstruct each land **lot's position & ownership period**
3. Quantify **pecuniary benefits** from the firm's investment in the field

Firms' Projects near CEOs' Properties

- **Using the GPS coordinates of CEOs' properties and individual wells**

A field gets developed

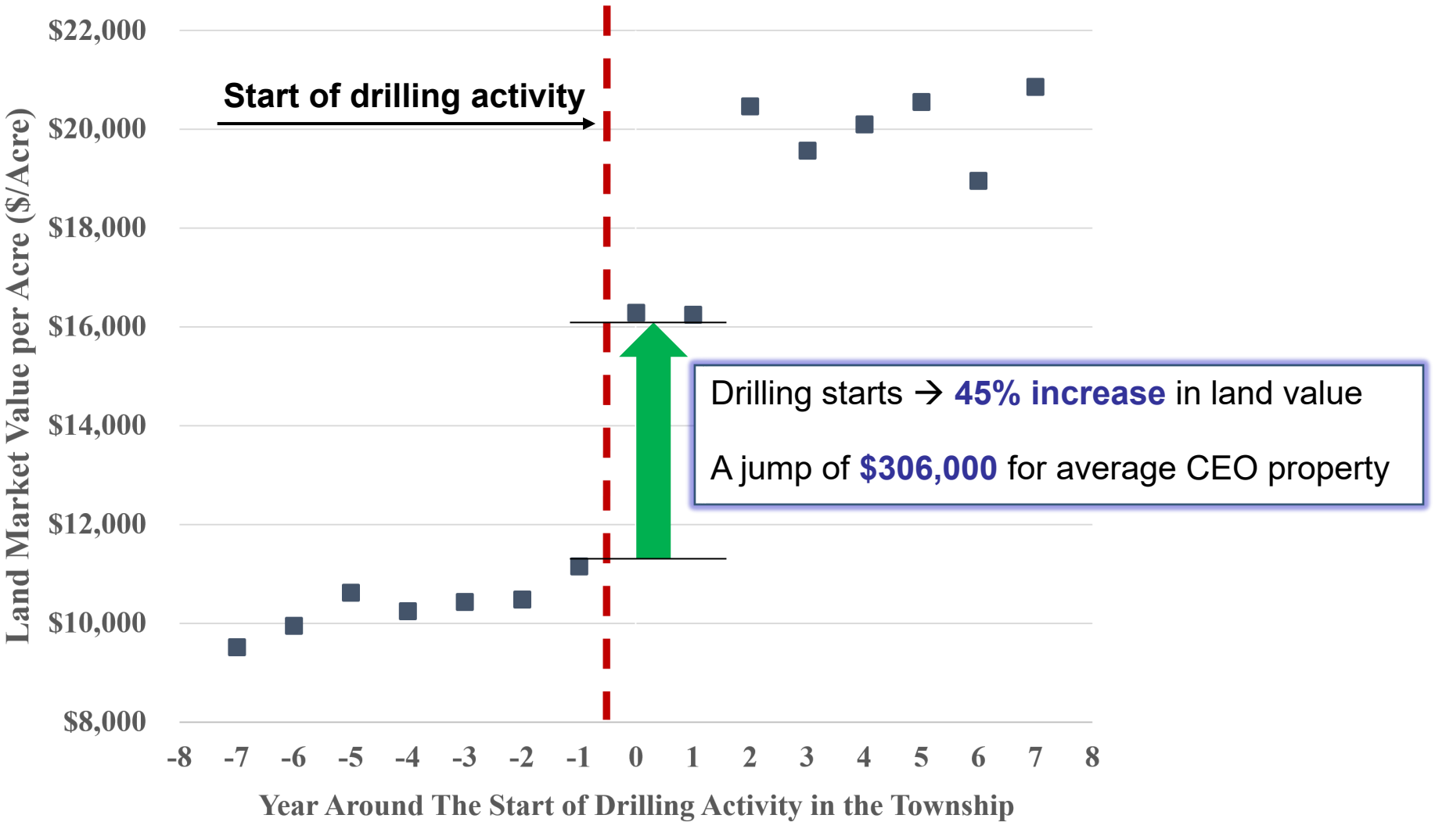


1. Royalty rate to landowners increases**:**
   - Extra $100.5K in discounted cash flow **per each well** drilled on the property
2. Bonus payments per acre **increase 107%**
3. **For example**, for a CEO with 2 wells per property ~ **$338K** or **21% ($1.6M)** of the average CEO **current compensation**

Empirical Strategy:

1. Identify the location & initiation date of each project
2. Reconstruct each land lot's position & ownership period
3. Quantify the **CEO's pecuniary benefits** from the firm's investment in the field

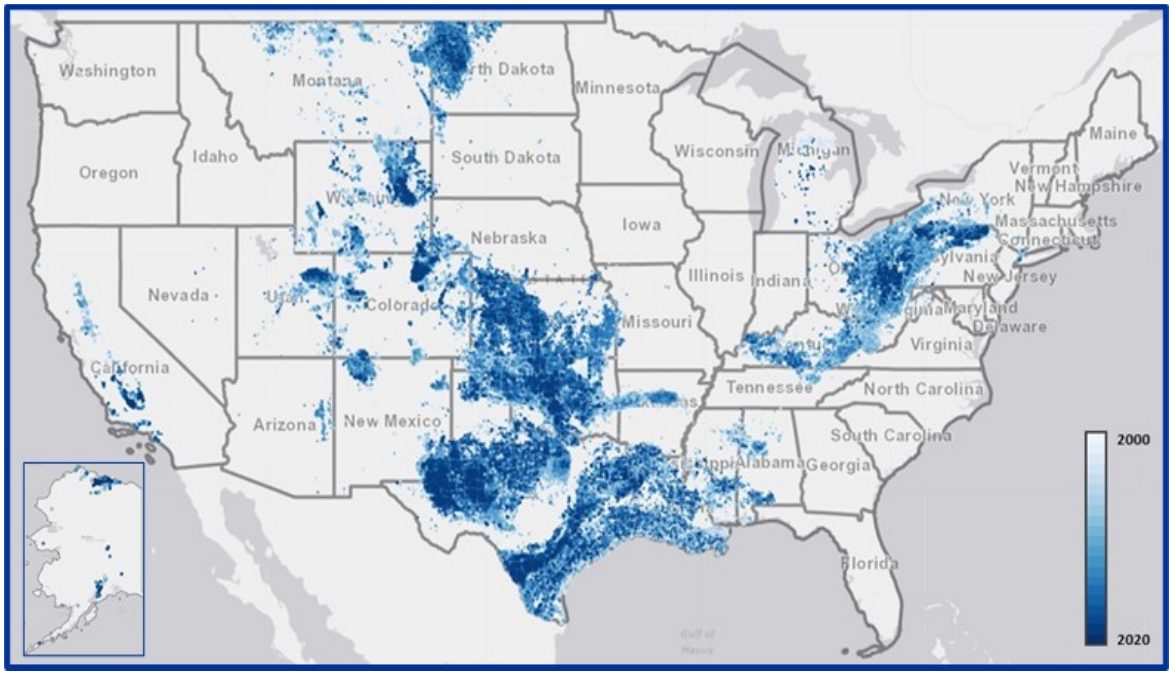
The Effect of Drilling Initiation on Land Values



2. CEOs' Investment Properties and

Firms' Entry into Oil & Gas Regions

Oil & Gas Exploration in Our Sample, 2000-2020



Decision to Enter an Oil Field

Dependent Variable: indicator $Enter_{i,r,t}$

[*t*-statistics in brackets]

CEO personal investment $_{i, r, t}$	0.04** [2.47]	0.04** [2.40]	0.04** [2.49]	0.04** [2.42]	0.03** [2.37]	0.03** [2.29]	0.03** [2.28]	0.03** [2.21]
Controls	Field oil-to-gas ratio, distance to HQ, drilling activity, firm's annual invest.							
Firm FE	No	Yes	No	No	No	Yes	No	No
Year FE	No	No	Yes	No	No	Yes	No	No
CEO FE	No	No	No	Yes	No	Yes	Yes	No
Field FE	No	No	No	No	Yes	Yes	Yes	No
Firm × Year FE	No	No	No	No	No	No	Yes	Yes
Field × Year FE	No	No	No	No	No	No	No	Yes
CEO × State FE	No	No	No	No	No	No	No	Yes
No. obs. (mil.)	2.46	2.46	2.46	2.46	2.46	2.46	2.46	2.46

Enter $_{i,r,t}$ = an indicator equal to 1 if firm *i* starts drilling in **oil field *r*** in year *t*, and 0 otherwise

Granular geospatial analysis:

Oil field's mean radius = **33 miles**

1,530 active oil fields in the sample

Decision to Enter an Oil Field

Dependent Variable: indicator *Enter*$_{i,r,t}$ [*t*-statistics in brackets]								
CEO personal investment $_{i, r, t}$	0.04** [2.47]	0.04** [2.40]	0.04** [2.49]	0.04** [2.42]	0.03** [2.37]	0.03** [2.29]	0.03** [2.28]	0.03** [2.21]
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Year FE	No	No	Yes	No	No	Yes	No	No
CEO FE	No	No	No	Yes	No	Yes	Yes	No
Field FE	No	No	No	No	Yes	Yes	Yes	No
Firm × Year FE	No	No	No	No	No	No	Yes	Yes
Field × Year FE	No	No	No	No	No	No	No	Yes
CEO × State FE	No	No	No	No	No	No	No	Yes
No. obs. (mil.)	2.46	2.46	2.46	2.46	2.46	2.46	2.46	2.46

A firm is **3 percentage points** (**2.9 times**) more likely to enter the field where its CEO owns an invest. property

Additional result from a hazard model:

- A firm is **quicker to enter** the field where its CEO owns a property

Controls for **unobserved heterogeneity**

Firm×year: investment opportunity set, financial condition, annual invest. budget

Field×year: invest. attractiveness, new discoveries, changes in regulation/taxes

CEO×state FE: skill, risk aversion, local or homestate bias

Robustness

- **Local bias**
  - All tests control for the distance to the firm's headquarters (HQ)
  - CEO × State F.E. account for the CEO's home state & state of HQ
- **Reverse causality (firm investment leads CEOs to buy properties)**
  - Replicate with properties acquired before CEO's appointment
  - Replicate with properties purchased before oil deposits discovered
- **Managerial slack**
  - Effect stronger when oil prices are high (greater free cash flow)

3. Investment Intensity

Investment Rate in a Field

Dependent Variable: *Investment rate*$_{i,r,t+1}$ *(in percent)* [*t*-statistics in brackets]								
CEO personal investment $_{i, r, t}$	12.63** [2.58]	8.78** [2.25]	8.14* [1.97]	6.89** [2.18]	7.98* [1.82]	6.41* [1.68]	8.11** [1.99]	6.82** [2.21]
CEO pers. invest. × Field productivity	-1.96** [-2.29]	-1.66* [-1.92]	-1.99* [-1.90]	-1.36** [-2.49]	-1.91** [-2.22]	-1.65* [-1.82]	-1.97* [-1.89]	-1.36** [-2.51]
Controls	Field productivity, oil/gas ratio, distance to HQ, drilling activity, firm investment							
Firm FE	No	Yes	No	No	No	Yes	No	No
Year FE	No	No	Yes	No	No	Yes	No	No
CEO FE	No	No	No	Yes	No	Yes	Yes	No
Field FE	No	No	No	No	Yes	Yes	Yes	No
Firm × Year FE	No	No	No	No	No	No	Yes	Yes
Field × Year FE	No	No	No	No	No	No	No	Yes
CEO × State FE	No	No	No	No	No	No	No	Yes
No. obs. (thousands)	14.41	14.38	7.29	6.27	14.40	14.38	7.29	6.27

A firm invests **6.8 pp more** into its CEO's field, **controlling for field quality**

Pet investments are **less sensitive to field quality** and its marginal product

Does this mean that CEOs overinvest in pet projects? ***Next >>>***

4. Project Outcomes: Information vs. Agency

Investment Performance

Dependent Variable: *Well's production output* $_{z,i,r,t}$ ($ mil.) [*t*-statistics in brackets]								
CEO personal investment $_{i, r, t}$	-0.62*** [-3.62]	-0.61*** [-3.62]	-0.53*** [-2.92]	-0.52*** [-3.00]	-0.70** [-2.39]	-0.70** [-2.40]	-0.50** [-2.02]	-0.38* [-1.78]
Controls	Well's oil/gas ratio, distance to HQ, township drilling activity, firm's investment							
Firm FE	No	Yes	No	Yes	Yes	Yes	Yes	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No
CEO FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Township FE	No	No	No	No	Yes	Yes	No	No
Technology FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO State FE	No	No	No	No	No	Yes	Yes	Yes
Firm × Year FE	No	No	No	No	No	No	No	Yes
Township × Year FE	No	No	No	No	No	No	Yes	Yes
No. obs. (000)	228.2	228.2	228.2	228.2	227.2	227.2	217.4	217.3

Well's production value:

cash inflows (in $ millions) from the well's initial annual oil & gas output

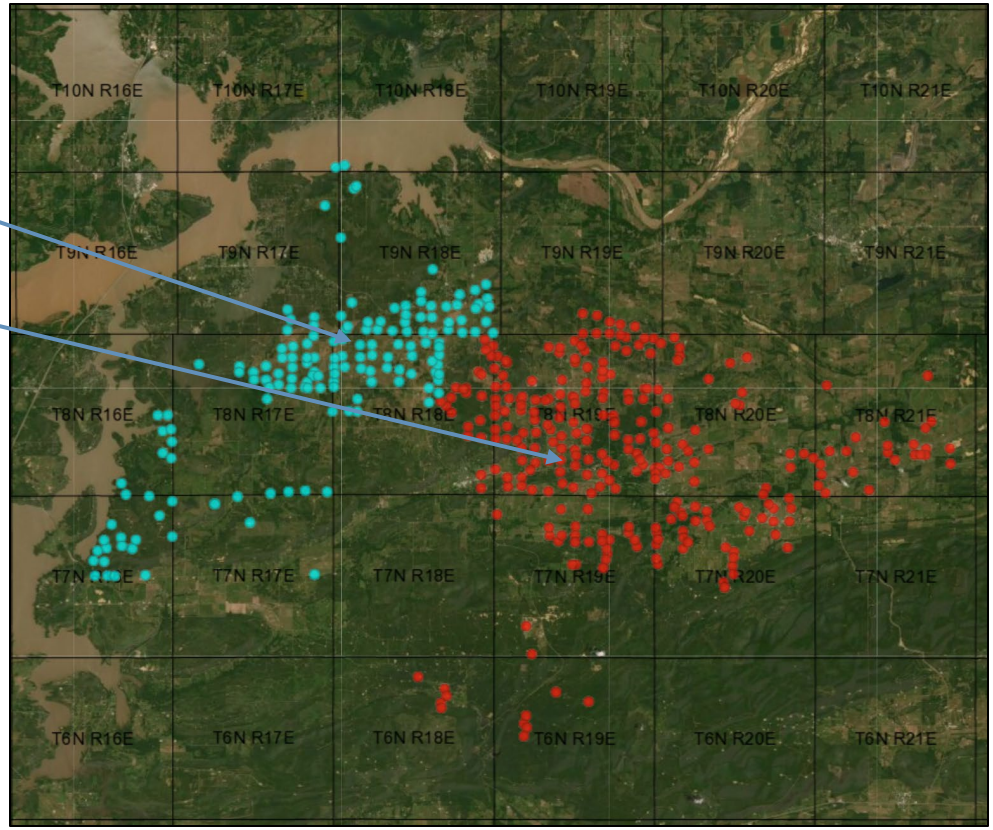
CEO Personal Investment$_{i,r,t}$:

Indicator equal to 1 if the well was **drilled on the CEO's investment field**

Source of Identification

Field A

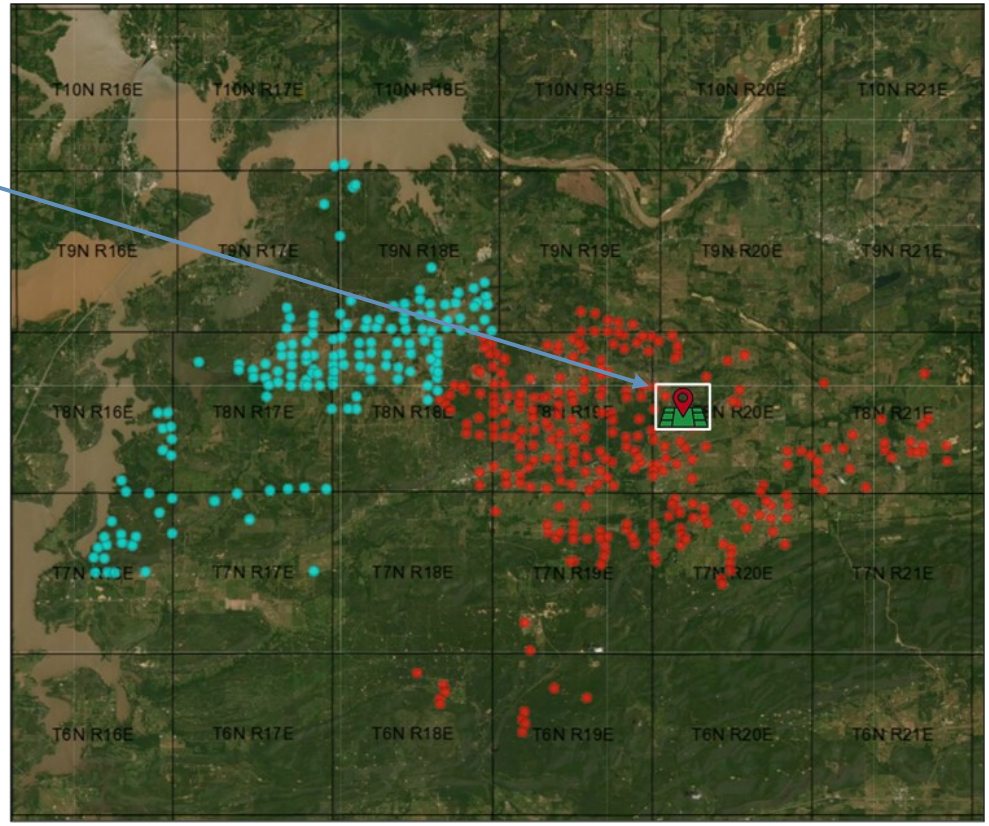
Field B



1. We distinguish between different oil and gas formations

Source of Identification

CEO's personal property on Field B

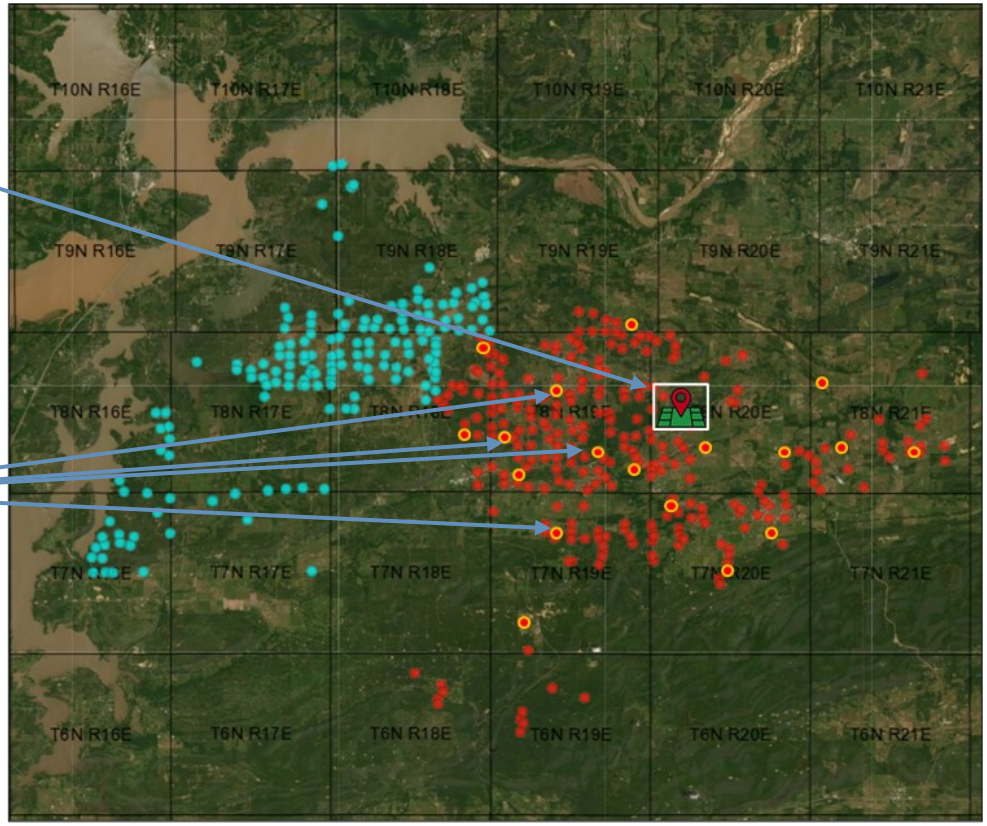


1. We distinguish between different oil and gas formations

Source of Identification

CEO's personal property on Field B

Firm's wells drilled in the field of its CEO's property

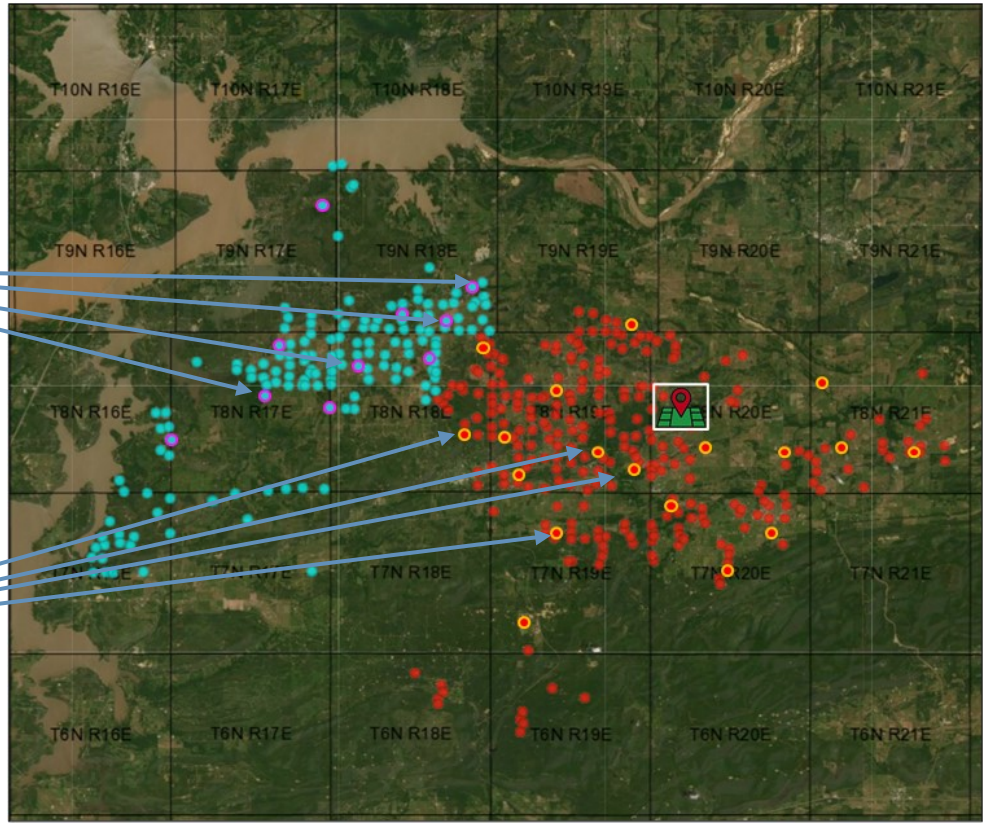


1. We distinguish between different oil and gas formations
2. Tag the wells drilled by the CEO's firm on the oil and gas formation (yellow)
   - **CEO Personal Investment**$_{i,r,t}$ = 1 for the yellow wells

Identification with High Dimensional FE

Firm's Wells Drilled on other Fields

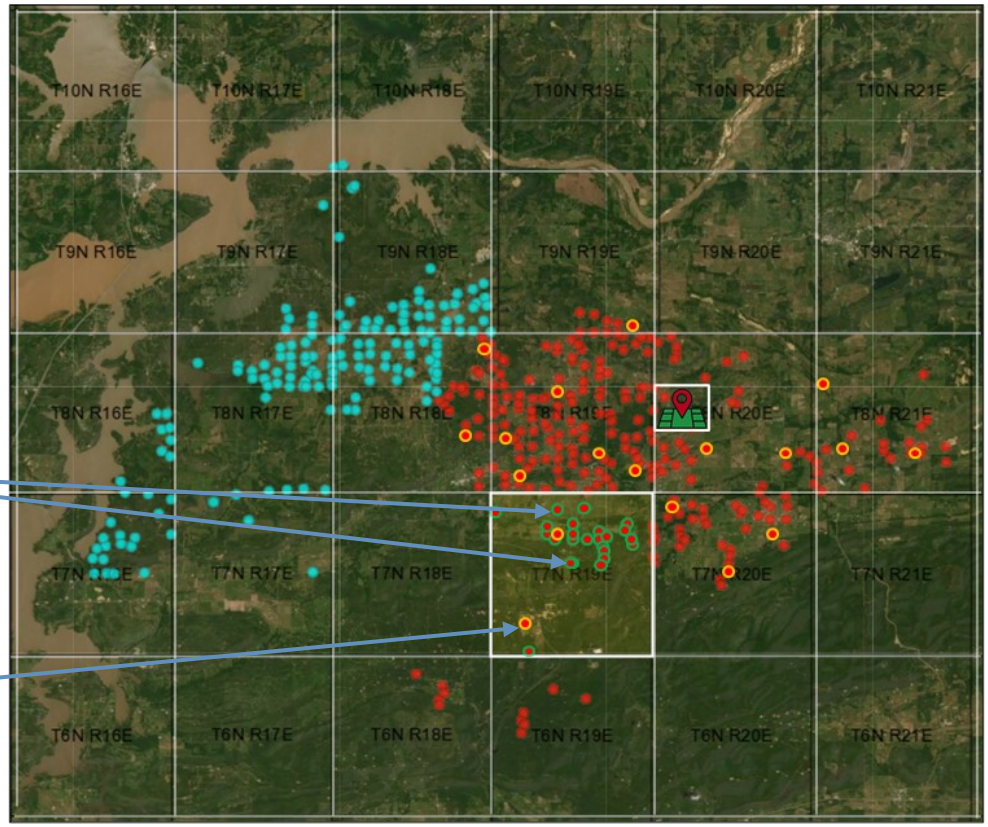
Firm's Wells Drilled on Field Adjacent to CEO's Property



Firm × year F.E. compare the firm's **treated wells (yellow)** with any other **wells drilled by the same firm (purple)** in the **same year**

- Control for firm-year unobservable characteristics:
  - Such as firm's investment opportunities, budget, or CEO's incentives

Identification with High Dimensional FE



Township × year F.E. compare a firm whose CEO owns a property nearby (yellow) with other firms (green) **within a given township in the same year.**

- Control for time-varying factors for each township:
  - Such as the deposit quality, new discoveries, or new regulations

Investment Performance

Dependent Variable: *Well's production output* $_{z,i,r,t}$ ($ mil.) [*t*-statistics in brackets]								
CEO personal investment $_{i, r, t}$	-0.62*** [-3.62]	-0.61*** [-3.62]	-0.53*** [-2.92]	-0.52*** [-3.00]	-0.70** [-2.39]	-0.70** [-2.40]	-0.50** [-2.02]	-0.38* [-1.78]
Controls	Well's oil/gas ratio, distance to HQ, township drilling activity, firm's investment							
Firm FE	No	Yes	No	Yes	Yes	Yes	Yes	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No
CEO FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Township FE	No	No	No	No	Yes	Yes	No	No
Technology FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO State FE	No	No	No	No	No	Yes	Yes	Yes
Firm × Year FE	No	No	No	No	No	No	No	Yes
Township × Year FE	No	No	No	No	No	No	Yes	Yes
No. obs. (000)	228.2	228.2	228.2	228.2	227.2	227.2	217.4	217.3

Pet projects **underperform** other wells of the same firm in the same year:

- **$380K (or 12%)** lower initial output

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CEO FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
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Technology FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO State FE	No	No	No	No	No	Yes	Yes	Yes
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Controls	Well's oil/gas ratio, distance to HQ, township drilling activity, firm's investment							
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Year FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No
CEO FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Township FE	No	No	No	No	Yes	Yes	No	No
Technology FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO State FE	No	No	No	No	No	Yes	Yes	Yes
Firm × Year FE	No	No	No	No	No	No	No	Yes
Township × Year FE	No	No	No	No	No	No	Yes	Yes
No. obs. (000)	228.2	228.2	228.2	228.2	227.2	227.2	217.4	217.3

Pet projects **underperform** other wells of the same firm in the same year:

- **$380K (or 12%)** lower initial output

Likely **contributing factors**:

- Overinvestment (excessive drilling)
- Location constraints

5. Governance and Project Performance

Objectives:

- Directional associations 
- Mediating effects
- No implied causality

Role of Governance – Ownership HHI

Dependent Variable: *Well's production output* $_{z,i,r,t}$ ($ mil.) [*t*-statistics in brackets]								
CEO personal investment $_{i, r, t}$	-0.94*** [-6.52]	-0.90*** [-6.23]	-0.91*** [-3.11]	-1.38*** [-4.57]	-0.82*** [-5.21]	-0.76*** [-4.85]	-0.90*** [-3.20]	-1.39*** [-4.63]
CEO pers. inv. × Owner. HHI	0.04*** [2.90]	0.03** [2.59]	0.06*** [2.70]	0.20*** [6.07]	0.04*** [2.46]	0.03** [1.99]	0.06*** [2.65]	0.20** [6.11]
Ownership HHI $_{i, t}$	-0.01 [-0.93]	-0.00 [-0.19]	-0.02*** [-2.68]		-0.01 [-0.93]	-0.00 [-0.08]	-0.02** [-2.68]	
F-Statistics	14.51	14.40	21.31	34.41	15.57	15.73	15.00	26.04
No. obs. (000)	158.9	158.9	150.9	150.9	158.9	158.9	150.9	150.9
Controls	Well's oil/gas ratio, distance to HQ, township drilling activity, firm's investment							
Firm FE	No	Yes	Yes	No	No	Yes	Yes	No
Year FE	Yes	Yes	No	No	Yes	Yes	No	No
CEO FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Township FE	No	No	No	No	No	No	No	No
Technology FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO State FE	No	No	Yes	Yes	No	No	Yes	Yes
Firm × Year FE	No	No	No	Yes	No	No	No	Yes
Township × Year FE	No	No	Yes	Yes	No	No	Yes	Yes

Public vs. Private Firms

Dependent Variable: *Well's production output* $_{z,i,r,t}$ ($ mil.) [*t*-statistics in brackets]								
CEO personal investment $_{i, r, t}$	-0.84*** [-9.70]	-0.81*** [-9.16]	-0.74*** [-3.21]	-0.50*** [-2.67]	-0.75*** [-7.52]	-0.71*** [-6.82]	-0.74*** [-3.30]	-0.52*** [-2.79]
CEO pers. inv. × *Private firm*	0.95*** [3.58]	0.83*** [3.14]	1.05*** [3.10]	1.09*** [2.41]	0.90*** [3.54]	0.77*** [3.00]	1.04*** [3.11]	1.09** [2.42]
Private firm $_{i,t}$	-0.47 [-1.39]	-0.02 [-0.07]	-0.30** [-2.37]		-0.42 [-1.31]	-0.02 [-0.06]	-0.32** [-2.48]	
Controls	Well's oil/gas ratio, distance to HQ, township drilling activity, firm's investment							
Firm FE	No	Yes	Yes	No	No	Yes	Yes	No
Year FE	Yes	Yes	No	No	Yes	Yes	No	No
CEO FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Township FE	No	No	No	No	No	No	No	No
Technology FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO State FE	No	No	Yes	Yes	No	No	Yes	Yes
Firm × Year FE	No	No	No	Yes	No	No	No	Yes
Township × Year FE	No	No	Yes	Yes	No	No	Yes	Yes
No. obs. (000)	228.2	228.2	217.5	217.3	228.2	228.2	217.4	217.3

Pet projects' underperformance is driven by public firms

→ starker separation of ownership & control

Separation of CEO & Chairman Roles

Dependent Variable: *Well's production output* $_{z,i,r,t}$ ($ mil.) [*t*-statistics in brackets]								
CEO personal investment $_{i, r, t}$	-0.79*** [-6.70]	-0.76*** [-7.01]	-0.89*** [-3.91]	-0.67*** [-2.60]	-0.69*** [-5.82]	-0.66*** [-5.50]	-0.89*** [-4.07]	-0.68*** [-2.65]
CEO pers. inv. × CEO is not chair	0.64*** [3.48]	0.61*** [3.36]	0.97*** [3.07]	1.15*** [2.85]	0.69*** [3.90]	0.62*** [3.54]	0.94*** [3.03]	1.13** [2.82]
CEO is not chair	-0.18 [-0.74]	-0.02 [-0.09]	-0.53 [-0.32]		-0.18 [-0.70]	0.03 [0.12]	0.07 [0.46]	
Controls	Well's oil/gas ratio, distance to HQ, township drilling activity, firm's investment							
Firm FE	No	Yes	Yes	No	No	Yes	Yes	No
Year FE	Yes	Yes	No	No	Yes	Yes	No	No
CEO FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Township FE	No	No	No	No	No	No	No	No
Technology FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO State FE	No	No	Yes	Yes	No	No	Yes	Yes
Firm × Year FE	No	No	No	Yes	No	No	No	Yes
Township × Year FE	No	No	Yes	Yes	No	No	Yes	Yes
No. obs. (000)	186.7	186.7	177.6	177.5	186.7	186.7	177.6	177.5

Pet projects perform worse if the CEO has stronger control rights (board chair)

Summary: Project Performance

	IRR (%)		*NPV* ($ mil.)		*Unprofitable*	
CEO personal investment $_{i, r, t}$	-0.21** [-2.42]	-0.09** [-2.32]	-1.08*** [-2.83]	-0.56* [-1.94]	0.04** [2.24]	0.04* [1.71]
Controls	Well's oil/gas ratio, distance to HQ, township drilling activity, firm's investment					
Firm FE	Yes	No	Yes	No	Yes	No
Year FE	Yes	No	Yes	No	Yes	No
CEO FE	No	Yes	No	Yes	No	Yes
Township FE	Yes	No	Yes	No	Yes	No
Technology FE	Yes	Yes	Yes	Yes	Yes	Yes
CEO State FE	No	Yes	No	Yes	No	Yes
Firm × Year FE	No	Yes	No	Yes	No	Yes
Township × Year FE	No	Yes	No	Yes	No	Yes
No. obs. (000)	221.3	211.6	222.0	212.4	222.0	212.4

1. Pet projects underperform across a variety of benchmarks
2. They increase the fraction of value-reducing projects

Conclusion

- CEOs' pecuniary benefits affect project choice, sequencing, and execution
  - Both extensive and intensive margins
- Pet projects underperform
- Managerial slack & control rights have first-order mediating effects

Novel evidence on the distortionary effect of

CEOs' private assets on resource allocation