The importance of job loss risk for individual savings

Ragnar Enger Juelsrud [1]
Ella Getz Wold [2]

[1] Norges Bank, [2] BI Norwegian Business School

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Motivation

- **Saving rates** typically increase during recessions
- Especially large increases during the financial crisis (and the recent pandemic)
- Higher savings reduce household demand, and could **amplify** economic downturns
- Potential driver: higher **job loss risk**
  - important driver of income risk data
- But also other recession effects: falling house prices, sentiments/uncertainty, wealth effects, expected long run income...

This paper: what we do

- Goal: **quantify** the causal impact of *job loss risk* on savings
  - how important is job loss risk in explaining recession-induced saving increases?
- Use Norwegian administrative data and the oil price collapse of 2014 as an exogenous increase in job loss risk for certain occupations
- Compare individuals living in the same region to account for other local recession effects
- Use liquid vs. illiquid savings along with model predictions to address potential declines in long run *earnings* potential

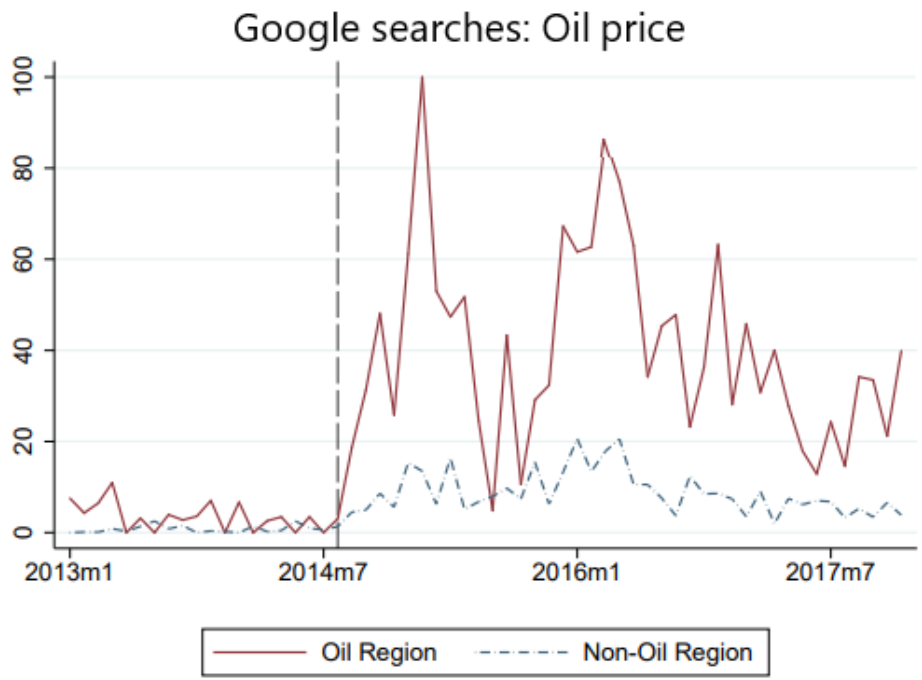
literature

This paper: what we find

- A one percentage point increase in job loss risk **increases liquid savings by 1.4%**, while leaving illiquid assets unchanged
  - increase in liquid savings driven by low-tenured workers
- Not driven by lower long-run earnings potential, which should induce a shift towards *illiquid* assets
- **Job loss risk channel** can account for 80-90% of the increase in liquid savings, and 40-50% of the increase in total savings
- Applying our results to other settings, we find that job loss risk can account for 75% of the US saving increase during the GR
  - and 25% during the pandemic

Shock: oil price collapse of 2014

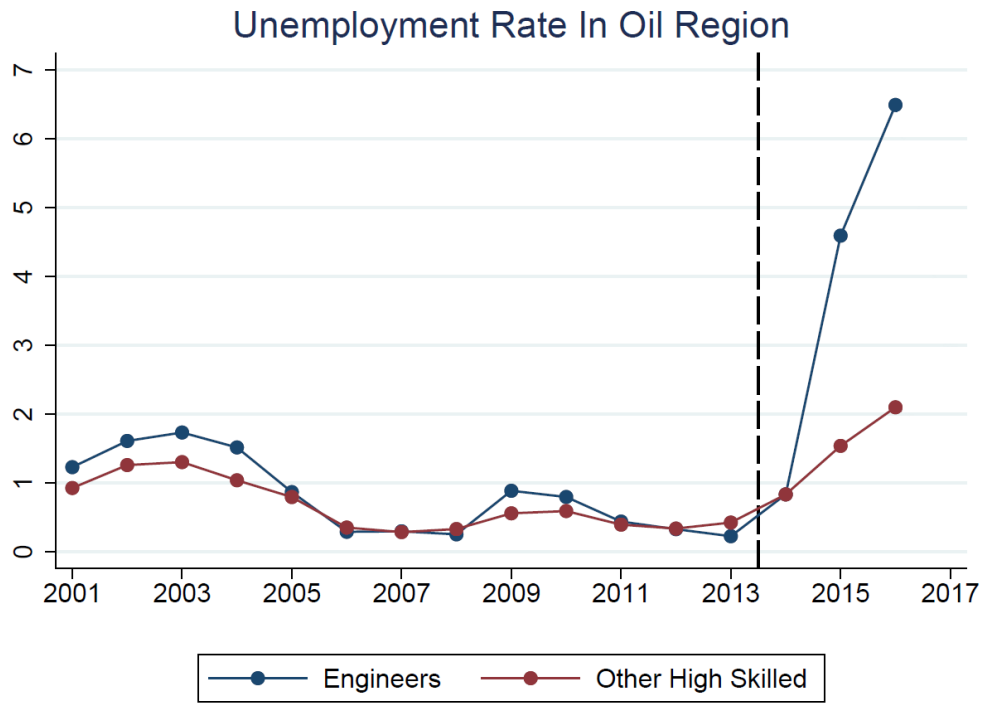
- Oil price collapse of 2014 led to a local recession in the “oil region”
  - Largest increase in county-level unemployment in sample graph



- Increase in google searches for “oil price” and “layoff” $\rightarrow$ **salient** shock layoffs

Shock: oil price collapse of 2014

- Substantial variation in unemployment across occupations
- Some media headlines: “Statoil is laying off more **engineers**”, “One out of three **engineers** are worried about loosing their job”, “Union leader for the **engineers**: worried unemployment will rise further”



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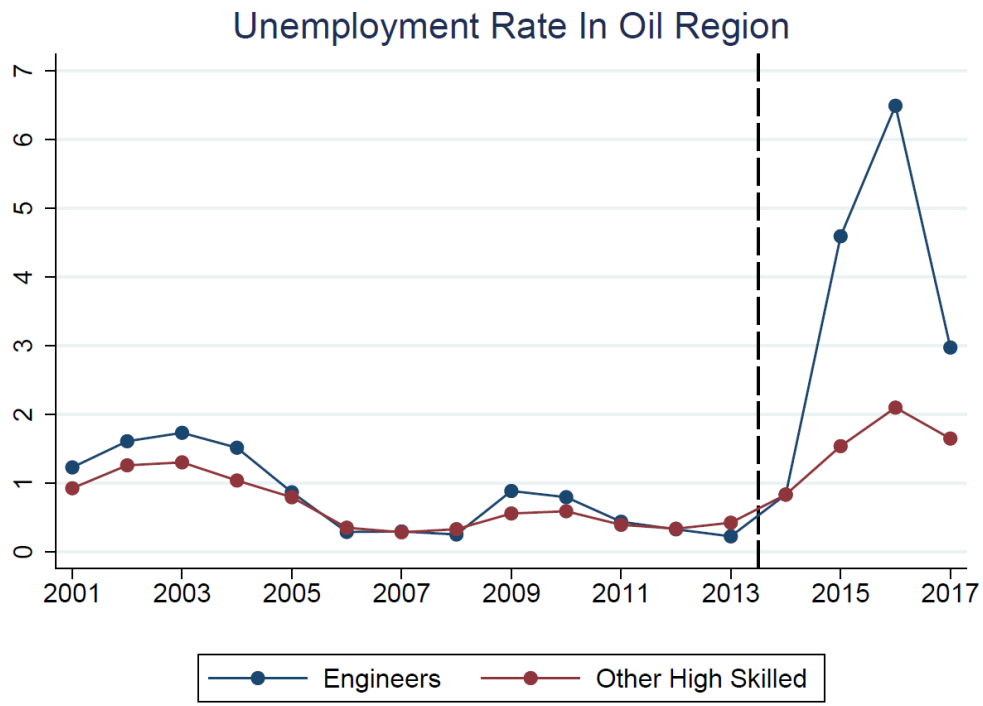


Data

- Norwegian **tax data** merged with labor market data on **occupations**
- Sample: men without business income
- Dependent variables: *liquid savings* = bank deposits & *illiquid savings* = other financial assets
- **Treatment** group: engineers in oil region
- **Control** group: other high skilled workers in oil region

summary stats

Methodology

- Estimate a **non-dynamic diff-in-diff** regression:
  $Y_{i,t} = \alpha_i + \delta_k + \beta(T_i \times I_t^{post}) + \epsilon_{i,t}$

- And a **dynamic diff-in-diff** regression:
  $Y_{i,t} = \alpha_i + \delta_k + \beta_k(T_i \times \delta_k) + \epsilon_{i,t}$

- $Y_{i,t}$ is liquid or illiquid savings for individual i in year t
- α_i is individual fixed effects, while δ_k is year fixed effects
- $T_i = 1$ for engineers in oil region, $T_i = 0$ for high skilled workers in oil region
- $I_t^{post} = 1$ for $t \geq 2014$
- Standard errors are clustered at the individual level

- Baseline: condition on not (yet) being unemployed

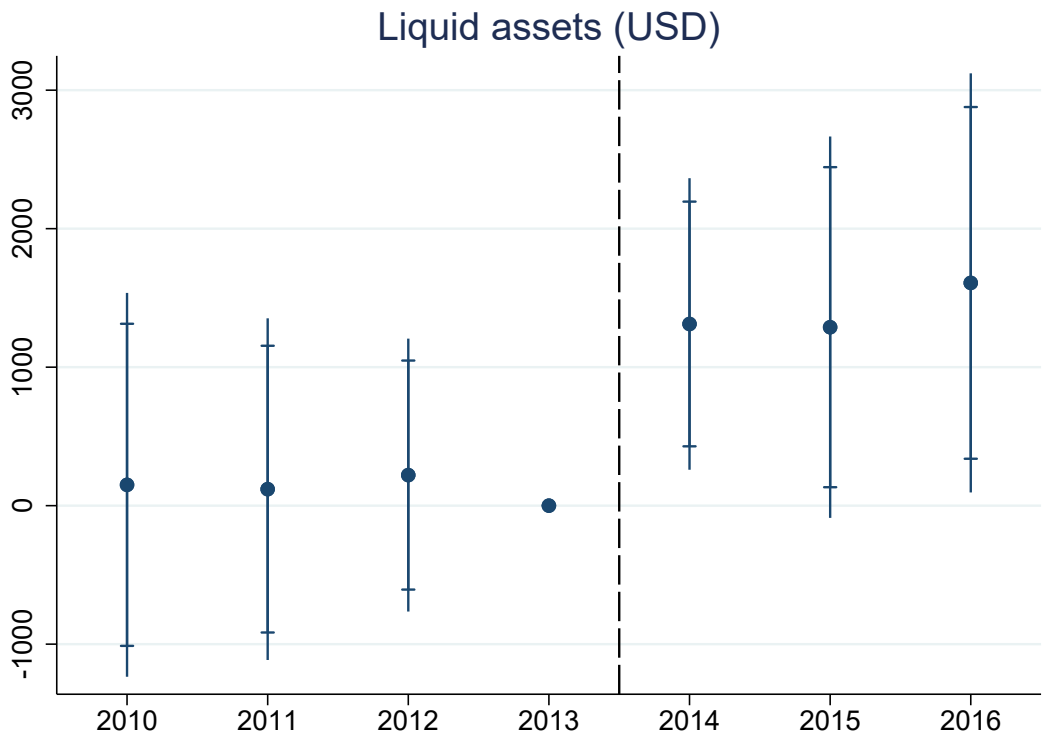
Saving effects

- A one percentage point increase in job loss risk:
  - increases liquid savings by 1.4%
  - while leaving illiquid savings unaffected

	(1) Liquid assets	(2) Liquid assets	(3) Illiquid assets	(4) Illiquid assets
$I_t^{post} \times T_i$	**1,279****	1,327**	-66.55	-388.2
	(566.6)	(571.6)	(801.7)	(902.2)
Percentage increase	3.82	3.70	-0.14	-0.76
per pp increase in job loss rate	**1.40**	1.74	-0.05	-0.36
Mean of dependent variable	33,405	35,886	47,433	51,387
Individual FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Sample period	2010 - 2014	2010 - 2016	2010 - 2014	2010 - 2016
Clusters	19,027	18,610	19,027	18,610
N	93,699	128,133	93,699	128,133

Saving effects - dynamics

- Identical saving trajectories in pre-period for engineers and high skilled
- Immediate increase in relative savings for engineers post-shock



raw data

Saving effects by tenure

- Job loss risk increases by twice as much for engineers with low-tenure
- Saving response driven entirely by low-tenured workers

	(1) Liquid assets	(2) Liquid assets	(3) Illiquid assets	(4) Illiquid assets
$I_t^{post} \times T_i$	414.1	135.7	19.23	-1,236
	(892.0)	(863.2)	(1,246)	(1,358)
$I_t^{post} \times T_i \times \text{Tenure}_i^{low}$	**2,235****	2,989***	141.6	1,899
	(1,119)	(1,119)	(1,598)	(1,778)
Percentage increase	6.79	8.43	0.30	3.69
per pp increase in job loss rate	**1.39**	2.69	0.06	1.18
Mean of dependent variable	32,919	35,429	47,474	51,436
Individual FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Sample period	2010 - 2014	2010 - 2016	2010 - 2014	2010 - 2016
Clusters	18,710	18,294	18,710	18,294
N	92,126	125,966	92,126	125,966

Robustness

- Results robust to using **alternative control group** of government workers with no increase in job loss risk
- No significant difference in **house price growth** between treatment and control groups
- No indication of differential exposure to **oil stocks**
- Very similar (initial) results when **not conditioning on employment**

Interpretation

- Claim: saving increase caused by higher job loss risk
- Alternative mechanism: decline in long run earnings potential
- Use simple model to argue that a decline in long run earnings potential is not driving our results
- Key intuition: more efficient to increase *illiquid* savings in order to compensate for lower long-run earnings
- In addition: low-tenured workers have larger increases in job loss risk, but smaller declines in long run earnings $\rightarrow$ not supportive of long run earnings channel

Theoretical framework

- 3-period endowment model with unemployment risk ρ in period 2
- Individual can save in two assets:
  - liquid asset $b \geq 0$: low return (0), but immediate access
  - illiquid asset $k \geq 0$: high return (r), but delayed access

- b_1^* and k_1^* are implicitly defined by respectively

$$u'(c_1) = \rho u'(c_{2,U}) + (1-\rho)u'(c_{2,E}) \tag{1}$$
$$u'(c_1) = r\rho u'(c_{3,U}) + r(1-\rho)u'(c_{3,E}) \tag{2}$$

- Consumption levels are given by

$$c_{2,E} = c_{3,E} = \frac{b_1 + y_2 + y_3 + rk_1}{2} \tag{3}$$
$$c_{2,U} = b_1 + \eta y_2 \tag{4}$$
$$c_{3,U} = rk_1 + y_3 \tag{5}$$

Theoretical framework

Proposition 1

With CRRA-utility, **higher job loss risk** *increases* liquid savings and has an indeterminate impact on illiquid savings, i.e. $\frac{\partial b_1^*}{\partial \rho} > 0$ and $\frac{\partial k_1^*}{\partial \rho} \lesseqgtr 0$

[$b_1^* \uparrow$ to increase $c_{2,U} \Rightarrow$ $k_1^* \downarrow$ + additional effect on k_1^* depending on c_3]

Proposition 2

With CRRA-utility, **lower long-run income** *decreases* liquid savings and increases illiquid savings, i.e. $\frac{\partial b_1^*}{\partial y_3} > 0$ and $\frac{\partial k_1^*}{\partial y_3} < 0$

[$k_1^* \uparrow$ to increase $c_{3,U}$ and $c_{3,E} \Rightarrow$ $b_1^* \downarrow$]

$\rightarrow$ observed increase in liquid savings cannot be explained by lower long-term earnings potential

Importance of job loss risk channel

- Savings increase during recessions due to i) **higher job loss risk** and ii) other "**local recession effects**"

- Our empirical estimates identify the size of i)
- Need a strategy to quantify the sum of i) and ii)

- Use two independent approaches:
- **Time-series approach**: calculate above-trend increase in savings for treatment group
- **Cross-sectional approach**: compare treatment group to other high-skilled workers *outside* of recession area

Importance of job loss risk channel (time-series)

- Calculate the above-trend increase in savings for treatment group
- Compare this to the predicted increase in savings resulting from:
  - the estimated impact of job loss risk on savings
  - the observed increase in job loss risk for the treatment group
- Job loss risk accounts for **93%** of the increase in liquid savings
  - ... and **54%** of the increase in total savings

Importance of job loss risk channel (cross-sectional)

- Compare engineers in oil region to high skilled workers outside of oil region to get i) + ii)

	(1) Liquid assets	(2) Liquid assets	(3) Illiquid assets	(4) Illiquid assets
$I_t^{post} \times T_i$	1,279**	1,542***	-66.55	1,278**
	(566.6)	(481.5)	(801.7)	(606.6)
Mean of dependent variable	33,405	32,635	47,433	42,157
Individual FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Sample period	2010 - 2014	2010 - 2014	2010 - 2014	2010 - 2014
Control group area	**Oil region**	**Non-oil region**	**Oil region**	**Non-oil region**
Clusters	19,027	63,854	19,027	63,854
N	93,699	315,671	93,699	315,671

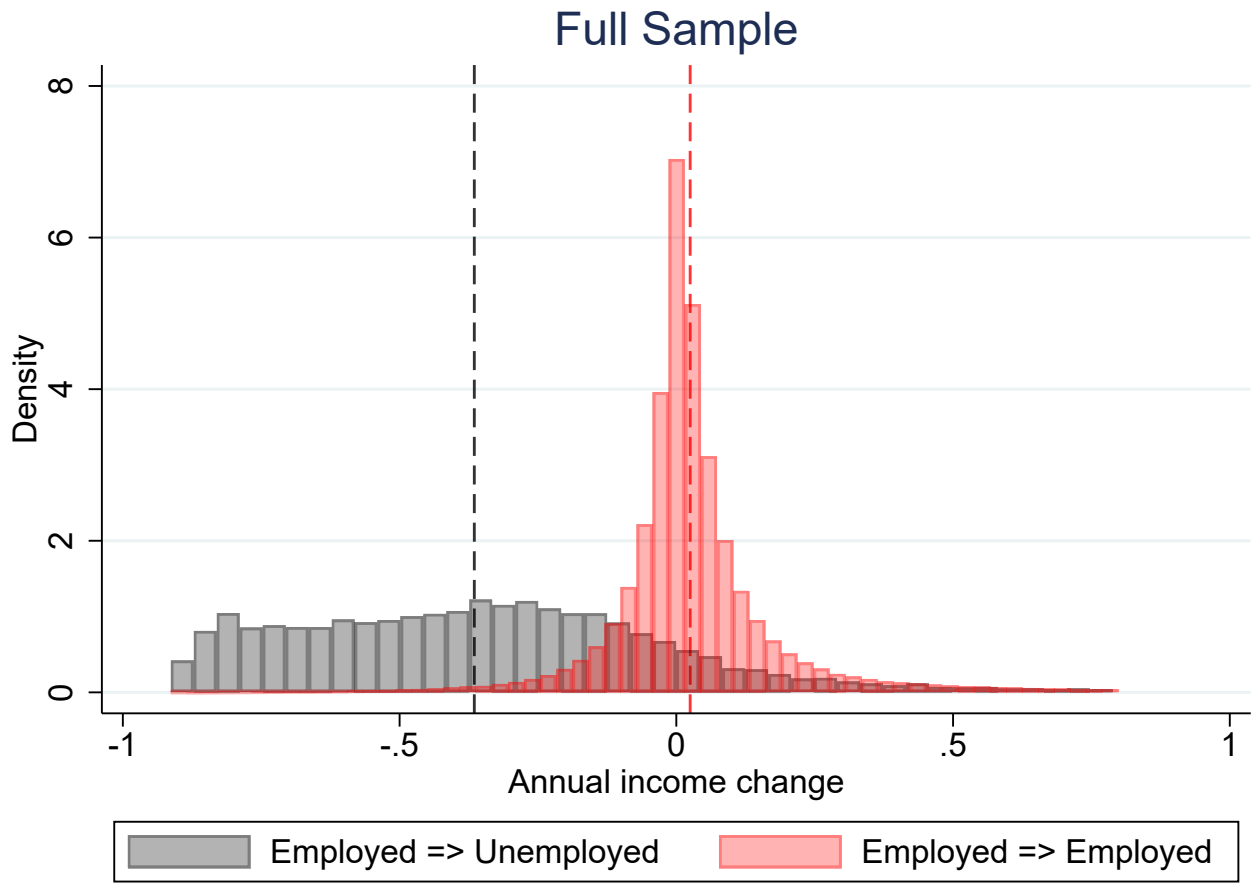
- Job loss risk accounts for **83%** of the increase in liquid savings
  - ... and **45%** of the increase in total savings

To conclude

- A one percentage point increase in job loss risk increases liquid savings by 1.4%, while leaving illiquid assets unchanged
  - increase in liquid savings driven by low-tenured workers
  - unlikely to be driven by lower long run earnings
- Job loss risk channel can account for 80-90% of the increase in liquid savings, and 40-50% of the increase in total savings
- Applying our results to other settings, we find that job loss risk can account for 75% of the US saving increase during the GR
  - and 25% during the pandemic

Extra

Probability of large income loss* is less than 3% for the employed and more than 60% for the unemployed



*in excess of 25% (*income=real wages+transfers*)

back

- Several papers study the link between “labor risk” and saving behavior
  - Guiso et al. 1992, Carroll and Dunn 1997, Lusardi 1998, Pettinicchi and Vellekoop 2019
  - Chetty and Szeidl 2007, Ceritoglu 2013, Basten et al. 2016, Hendren 2017
  - Carroll et al. 2003, Harmenberg and Oberg 2021
  - Fuchs-Schundeln and Schundeln 2005, Barcelo and Villanueva 2016

- Challenge 1: **identification**
  - exogenous increase in job loss risk
  - accounting for other recession effects

- Challenge 2: **quantitative interpretation**
  - mapping between job loss risk and savings

- We contribute by tackling *both* challenges

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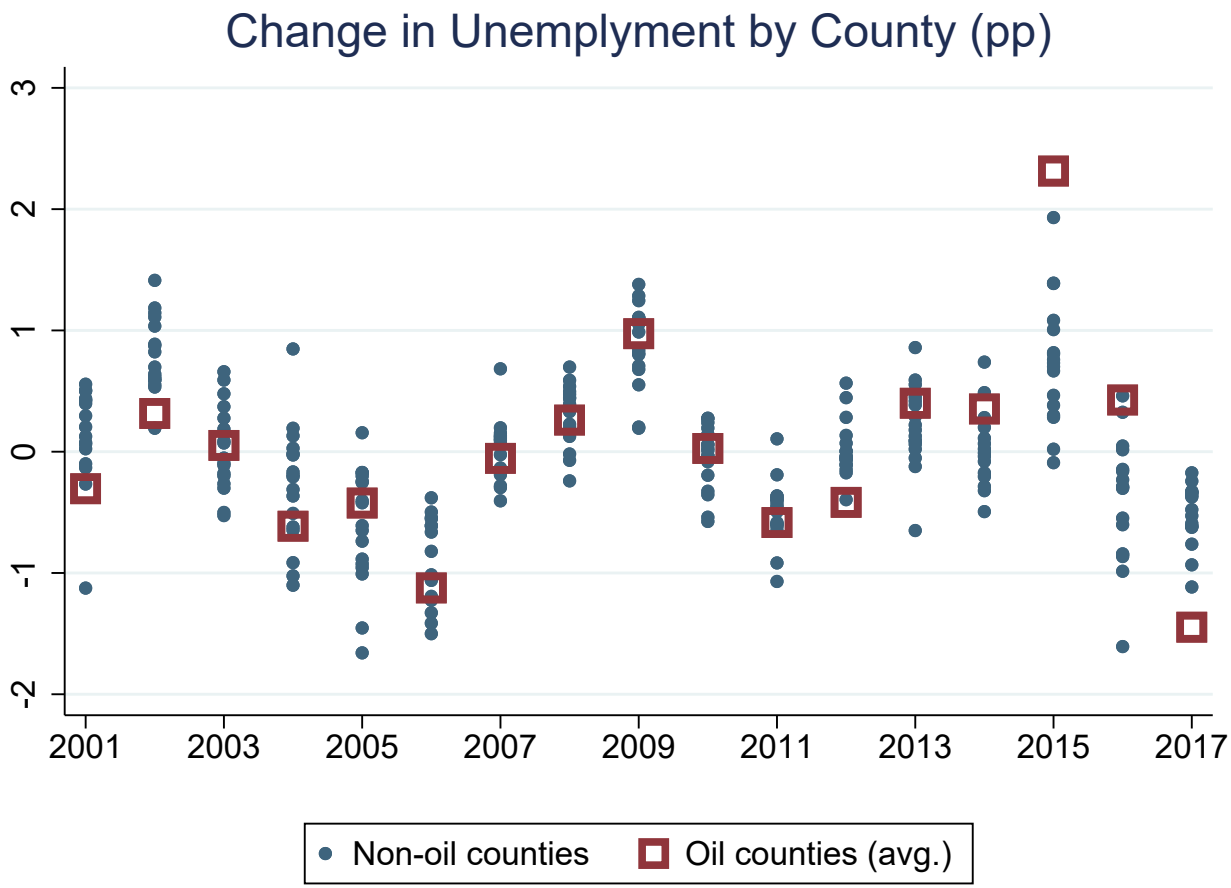
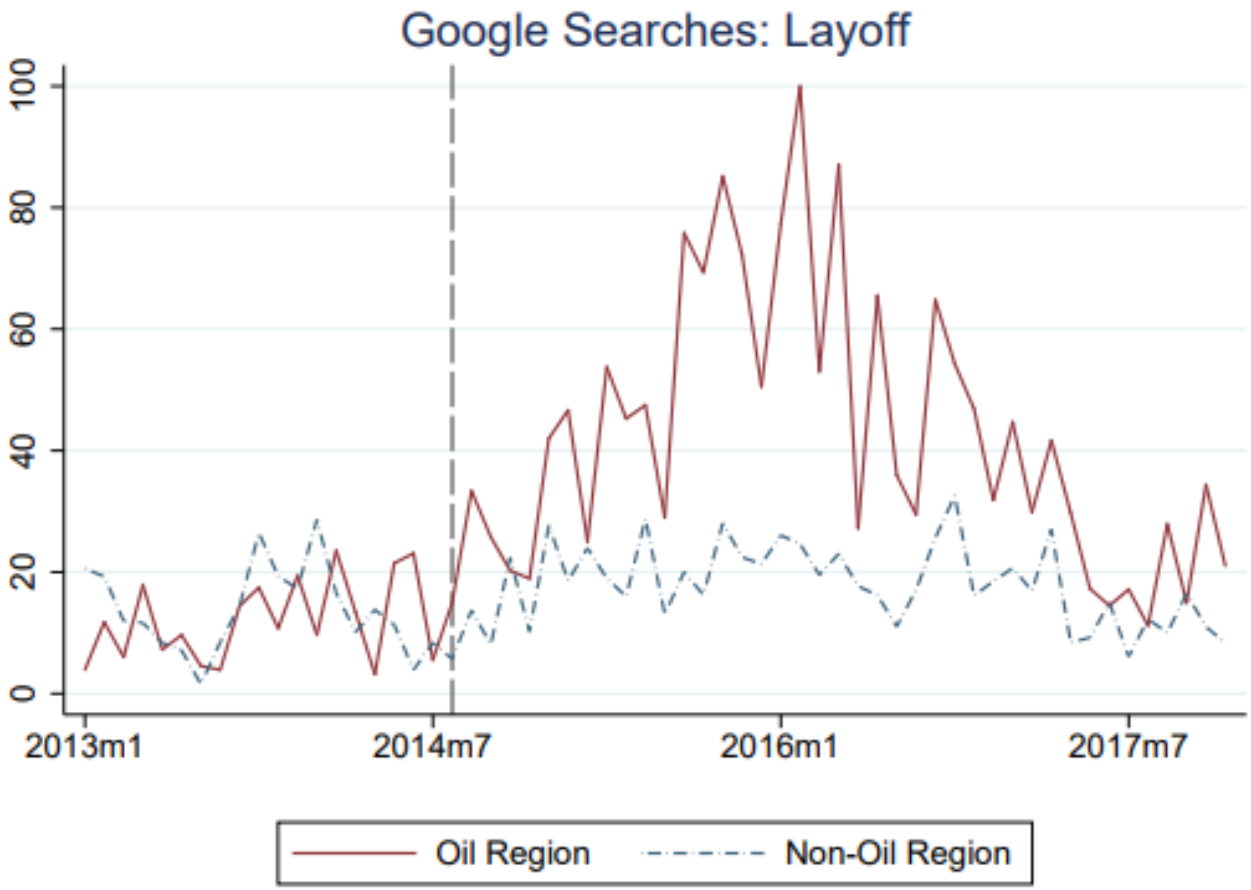

Change in Unemplyment by County (pp)
3
2
1
0
-1
-2
2001
2003
2005
2007
2009
2011
2013
2015
2017
Non-oil counties
Oil counties (avg.)

back


Google Searches: Layoff
100
80
60
40
20
0
2013m1
2014m7
2016m1
2017m7
Oil Region
Non-Oil Region

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	Average			Median		
	Engineers	High Skilled	Low Skilled	Engineers	High Skilled	Low Skilled
Liquid assets	35,900	34,700	19,600	14,200	11,500	5,600
Illiquid assets	23,800	43,000	11,300	1,600	1,600	0
Prim. Housing Wealth	233,100	252,000	134,100	227,500	238,500	0
Other Real Wealth	44,600	52,300	23,200	8,300	7,700	100
Debt	183,600	197,400	104,200	153,200	161,000	33,200
Wage Income	94,600	85,600	55,400	90,300	78,800	55,600
Age	44	45	38	44	45	37
Liquid assets > 0 (%)	99	99	98			
Illiquid Assets > 0 (%)	61	64	39			
Housing Wealth > 0 (%)	76	76	48			
Net Wealth > 0 (%)	72	71	67			
Observations	21,901	74,113	160,223			

Table 1: **Summary statistics.** Summary statistics for 2013 in 2015 USD (rounded to closest 100 with exchange rate USD/NOK 7.5).

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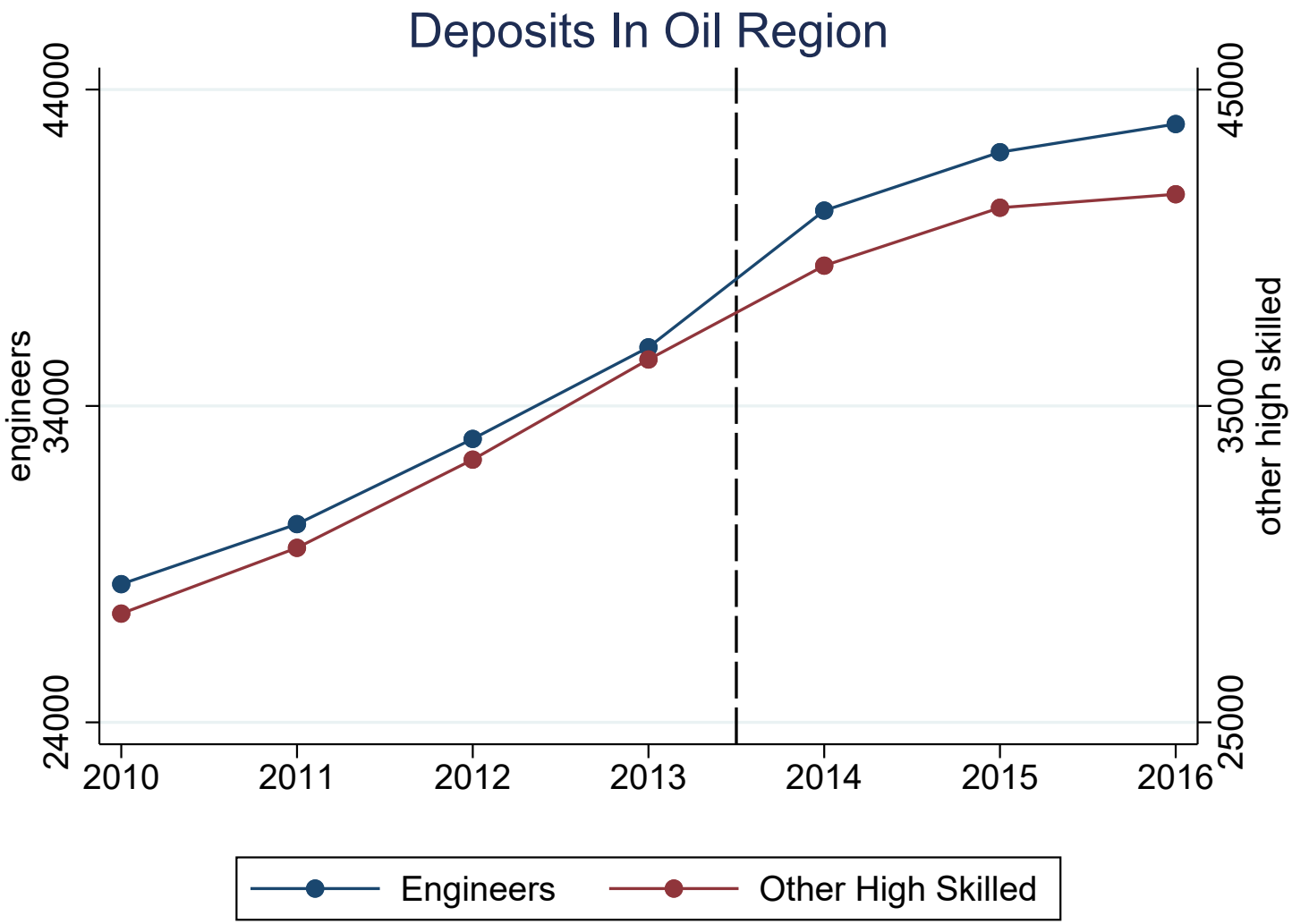
Deposits In Oil Region
44000
34000
24000
engineers
45000
35000
25000
other high skilled
2010
2011
2012
2013
2014
2015
2016
Engineers
Other High Skilled

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