The Effects of Social Movements: Evidence from #MeToo

Ro'ee Levy
MIT

Martin Mattsson
Yale

Gender in the Economy
NBER Summer Institute
July 24, 2020

Motivation: Social Movements

- Large societal changes are often attributed to social movements
  - Environmental movement
  - LGBTQ rights movement
  - The feminist movement

- Do social movements have a causal effect on norms and behavior?

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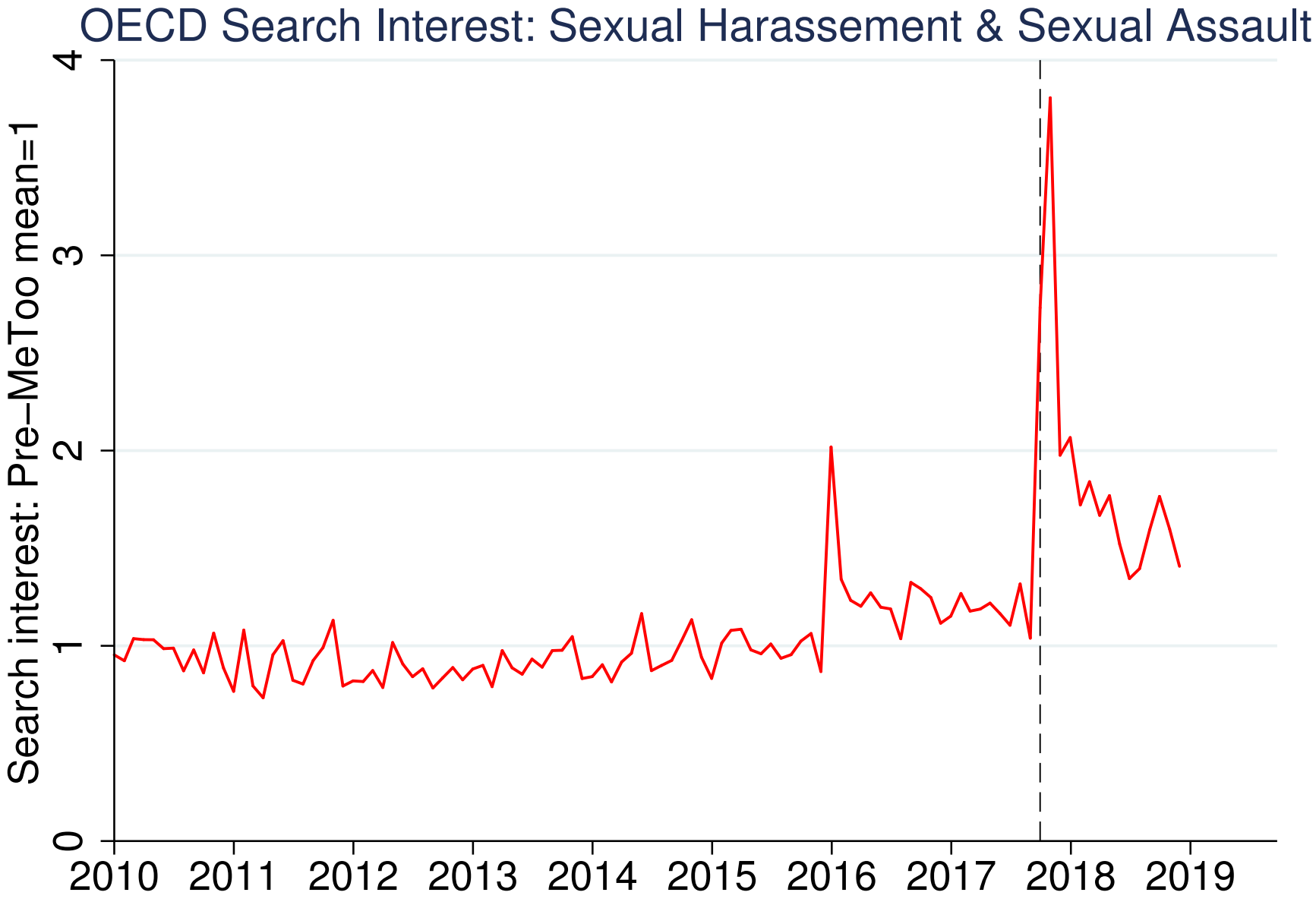
- Focus on the MeToo movement and measure its effect on sexual crimes reported to the police

- Underreporting of sexual crimes is a large problem globally
  - US: 33% of sexual crimes reported, 46% of other violent crimes
  - Larger positive externalities but substantial personal costs

MeToo and Interest in Sexual Misconduct

News



Setting: The MeToo Movement

- Went "viral" on 15 Oct, 2017
  - Rapidly changed public discourse
  - Very few immediate changes to laws or government institutions

- Criticized for:
  - Focus on high-profile cases
    - 38% agree that “The #MeToo movement only changed things for famous people” (Ipsos, Sep 2018)
  - White movement focusing on women with high socio-economic status (Onwuachi-Willig, 2018)

Contributions to literature

Empirical strategy example: Canada and Portugal

- We identify the effect of the MeToo movement on sexual crimes reported to the police using a triple-diff strategy: over time, across countries and by crime type

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The New York Times

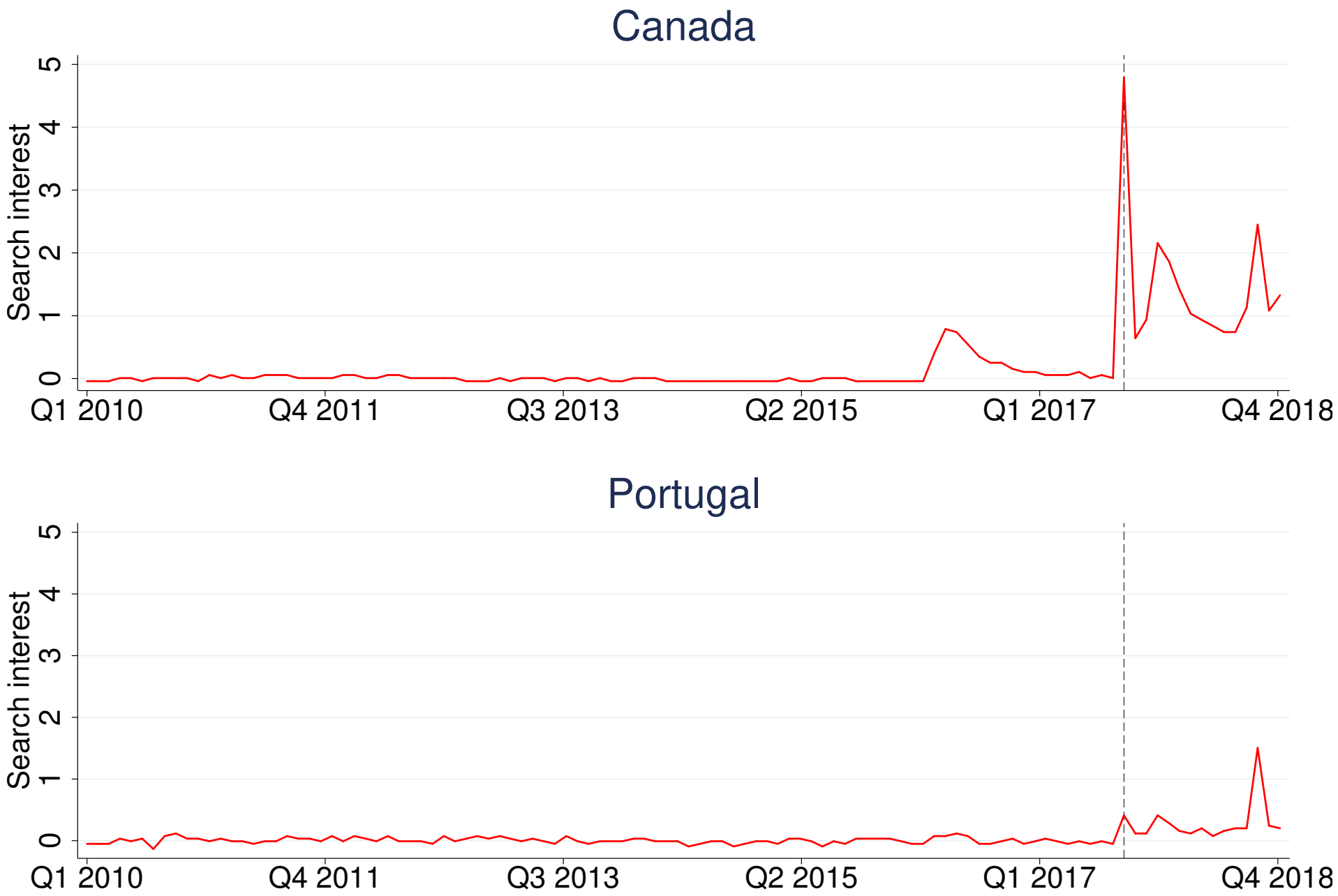
In Canada, a 'Perfect Storm' for a #MeToo Reckoning

METOO

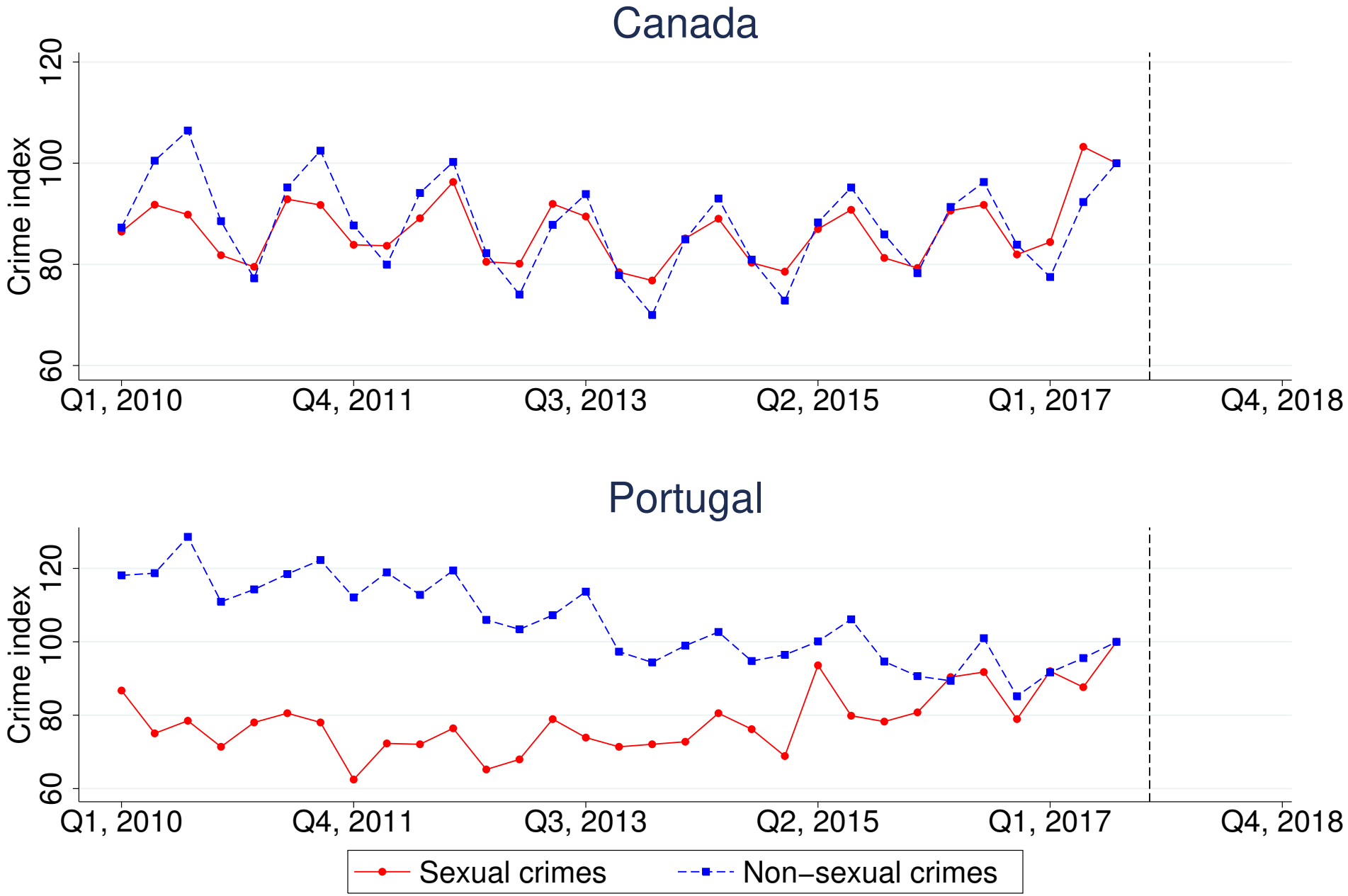
#MeToo em Portugal? Temos "uma forma mais formiguinha" de fazer a luta

Diferenças culturais ajudam a explicar impacto diferente do movimento #MeToo no debate sobre assédio e violência sexual.

Canada and Portugal: Search interest



Canada and Portugal: Crimes reported



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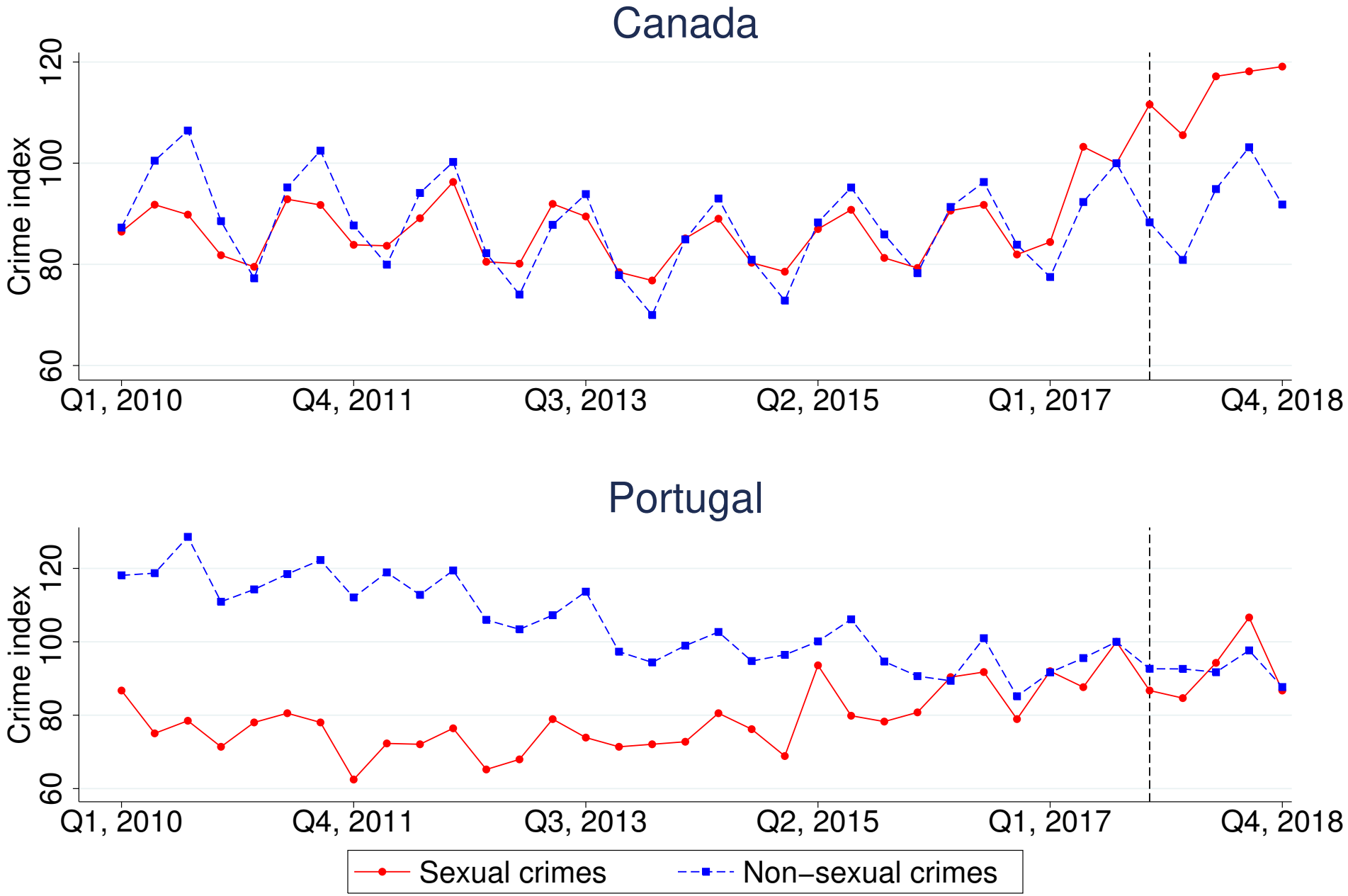


Effect of the Movement: International Data

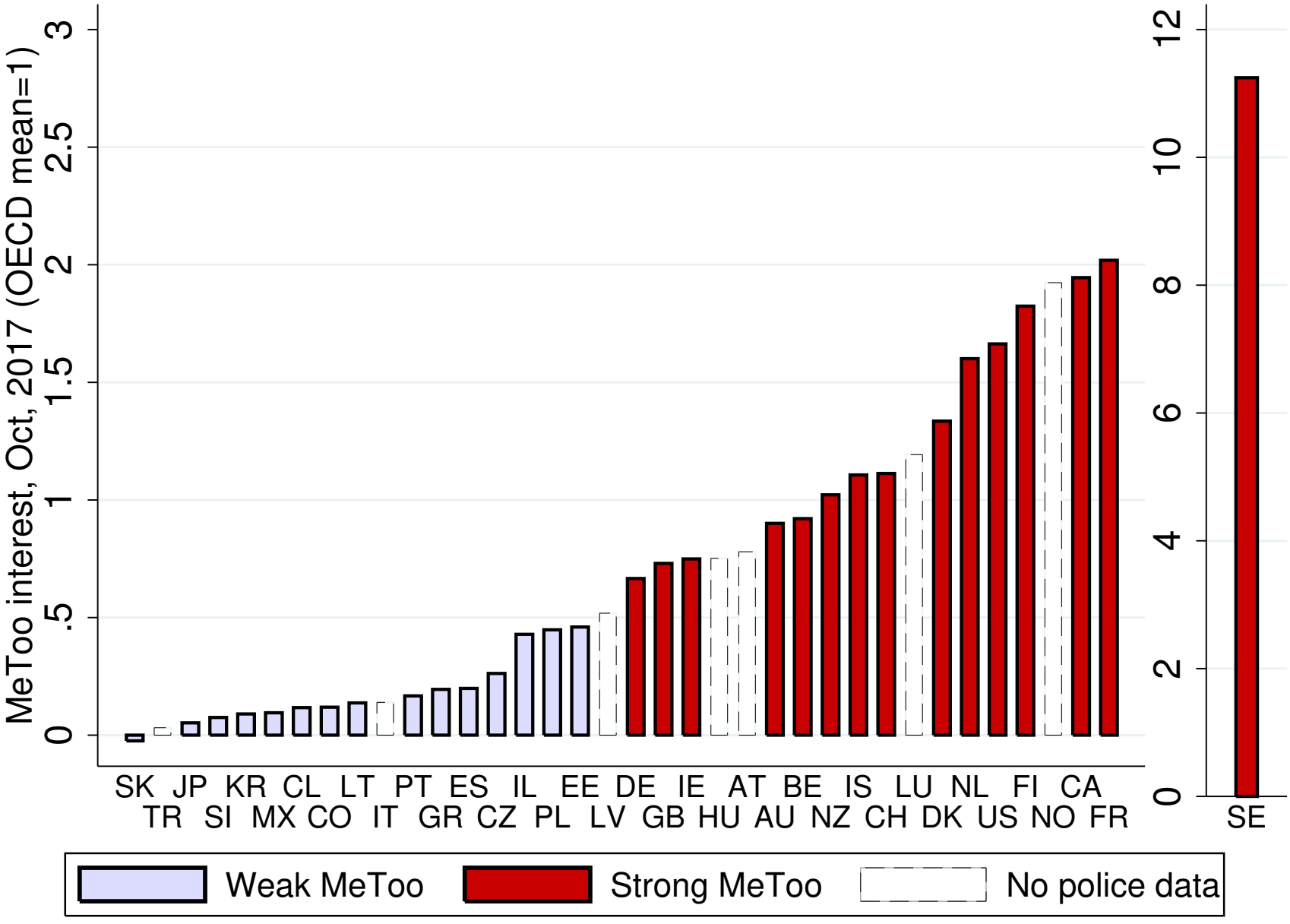
International Crime Data

- Novel data set of 2010-2018 crimes reported by quarter for 30 OECD countries (88% of OECD population) Harmonization Sources
  - Publicly available
  - Requested/purchased from police or statistical agency
  - FOIA

- Categorized into two crime types:
  - Sexual crimes (sexual assault and sexual harassment)
  - All other crimes
  - Exclude crimes with potential spillovers such as domestic abuse

Measure of MeToo strength: Google interest

Survey data



Triple-Diff Specification

$$y_{itc} = \beta_1 SexCrime_i \times StrongMeToo_c \times Post_t + \beta_2 SexCrime_i \times Post_t + \beta_3 StrongMeToo_c \times Post_t + \beta_4 Post_t + \beta_{5,ic} Trend_t + \gamma_{i,c,q(t)} + \varepsilon_{itc}$$

- y_{itc} is log of reported crime of crime type i, at time t, in country c
  - $SexCrime_i = 1$ for sexual crimes
  - $StrongMeToo_c = 1$ for above median MeToo strength countries
  - $Post_t = 1$ if Quarter $\geq$ Q4, 2017
  - $\gamma_{i,c,m(t)}$ is crime type$\times$country$\times$calendar quarter fixed effects
  - $\beta_{3,ic} Trend_t$ controls for differential trends by country$\times$crime type

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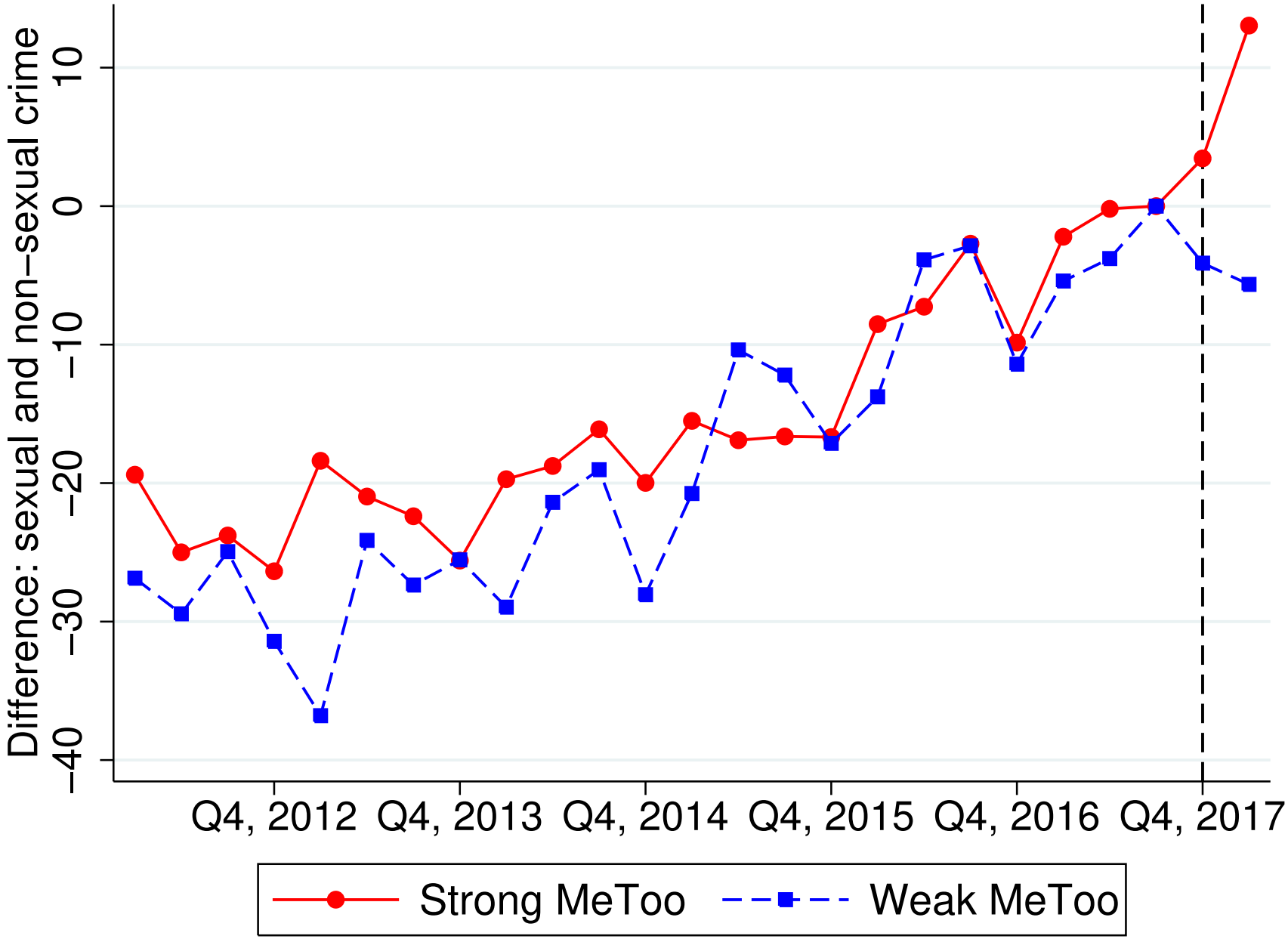
  - $\gamma_{i,c,m(t)}$ is crime type$\times$country$\times$calendar quarter fixed effects
  - $\beta_{3,ic} Trend_t$ controls for differential trends by country$\times$crime type
- Standard error clustered at the country$\times$crime type level
- Time period: First 6 months of movement

Reporting differences by MeToo strength

Diff-in-Diff | Residuals



Effect in first six months By country

	ln(crime)			
	(1)	(2)	(3)	(4)
Post * Strong MeToo	0.114**		0.009	0.009
	(0.048)		(0.031)	(0.031)
Post * Sexual crime		0.072**		0.019
		(0.030)		(0.044)
Post * Strong MeToo * Sexual crime			0.123***	0.104*
			(0.036)	(0.057)
Post * Weak MeToo * Sexual crime			0.019	
			(0.044)	
Country * Crime type * Lin. trend	X	X	X	X
Country * Crime type * Quarter	X	X	X	X
Post	X	X	X	X
Crime data used	Sexual crimes	All crimes	All crimes	All crimes
Final quarter	Q1 2018	Q1 2018	Q1 2018	Q1 2018
Observations	904	1,808	1,808	1,808
Clusters	30	60	60	60

Robustness checks

Placebo tests | Continuous interest measure

Length of short-term period:		
(1)	3 month effect	0.060
		(0.063)
(2)	9 month effect	0.095*
		(0.055)
Different measures of MeToo strength:		
(3)	6m MeToo search interest	0.102*
		(0.060)
(4)	SA/SH immediate search interest	0.037
		(0.059)
(5)	% heard of MeToo movement	0.095
		(0.080)
Alternative specifications:		
(6)	Weighted by country population	0.119**
		(0.052)
(7)	Only data based on date crimes were reported	0.119*
		(0.065)
(8)	Negative binomial regression	0.118**
		(0.048)
Alternative empirical strategies:		
(9)	Matrix completion method	0.165***
		(0.03)
(10)	2SLS: Fraction Eng. speakers as IV	0.096
		(0.071)

Measuring long-term effects

Different start dates

- Over time the movement spreads to countries with initially weak movements
  - These countries are no longer suitable control group
  - Interest over time by strength
- Diff-in-diff among countries with immediate strong movement
  - These countries were all treated at the same time
  - These are the countries for which we have estimates for effect after 15 months

Persistence

All countries | Long-term triple diff | Time line

	ln(crime)	
	(1)	(2)
Post * Sexual crime	0.104***	
	(0.035)	
2017 Q4 * Sexual crime		0.121***
		(0.033)
2018 Q1 * Sexual crime		0.122**
		(0.051)
2018 Q2 * Sexual crime		0.083**
		(0.037)
2018 Q3 * Sexual crime		0.087**
		(0.037)
2018 Q4 * Sexual crime		0.108**
		(0.043)
Country * Crime type * Lin. trend	X	X
Country * Crime type * Quarter	X	X
Post	X	
Q4 2017-Q4 2018 FE		X
Final quarter	Q4 2018	Q4 2018
Observations	1,012	1,012
Clusters	30	30

Mechanisms: US Data

US Data Sources

- FBI NIBRS Data
  - Incident level data for 2010-2018, from approximately 7,400 police agencies, 30% of US population
  - Counties matched with ACS 2016 data
- City data
  - 7 large cities - NYC, LA, Denver, Seattle, Louisville, Nashville, Kansas City (Population ~16 M) Criteria
- MeToo had no substantial geographical heterogeneity within US

$$y_{itc} = \beta_1 SexCrime_i \times Post_t + \beta_2 Post_t + \beta_{3,ic} Trend_t + \gamma_{i,c,m(t)} + \varepsilon_{itc}$$

Effects Interest by state

Effect of the MeToo Movement on Arrests

	ihs(crime)	
	(1)	(2)
Post * Sexual Assault, Arrest	−0.008	0.052***
	(0.026)	(0.018)
Post * Sexual Assault, No Arrest	0.095***	0.105***
	(0.016)	(0.011)
Difference	0.103***	0.053***
State * Crime Type * Lin. Trend	X	X
State * Crime Type * Month	X	X
Post	X	X
Final Month	Mar 18	Dec 18
Observations	9,981	10,899

By Subgroup | Effect on Cases Cleared | Effect of Covariates on Arrest

Effect By Victim and Offender Race

	ihs(crime)	
	(1)	(2)
Post * Sexual Assault, Victim Black	0.077***	
	(0.024)	
Post * Sexual Assault, Victim White	0.082***	
	(0.016)	
Post * Sexual Assault, Offender Black		0.095***
		(0.022)
Post * Sexual Assault, Offender White		0.092***
		(0.017)
Difference	-0.005	0.003
State * Crime Type * Lin. Trend	X	X
State * Crime Type * Month	X	X
Post	X	X
Final Month	Mar 18	Mar 18
Observations	9,981	9,981

By Subgroup

Effect by County Demographics

By neighborhood

	ihs(crime)					
	(1)	(2)	(3)	(4)	(5)	(6)
Post * Sexual Assault	0.088***	0.088***	0.088***	0.088***	0.088***	0.088***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Post * Sexual Assault * Med. Income (std. dev.)	0.013					
	(0.009)					
Post * Sexual Assault * % College		0.127				
		(0.098)				
Post * Sexual Assault * % Blacks (Compared to Whites)			0.071			
			(0.075)			
Post * Sexual Assault * % Other Race (Compared to Whites)				0.557***		
				(0.178)		
Post * Sexual Assault * % Hispanics					0.309***	
					(0.111)	
Post * Sexual Assault * % Vote Trump						−0.266***
						(0.071)
Interquartile Range of Demographic	1.207	0.132	0.194	0.054	0.062	0.265
Diff. in Effect * 75th-25th Pct.	0.016	0.017	0.014	0.03	0.019	-0.071
Observations	170,564	170,564	170,564	170,564	170,564	170,564

Additional Heterogeneity

- National data
  - Larger effect among female victims and male offenders By sex
  - Smaller effect in cases resulting in an injury Incident details
  - No heterogeneity by whether victim knew the offender Incident details
  - Larger effect in larger cities By city size
- City data
  - Effect on both stock of old crimes and flow of new crimes Stock vs. flow

Mechanisms

- Incidence
  - Find an effect even for crimes that occurred before the movement started Incidence
- Legislation
  - No laws changed in the first six-months after the movement started
  - International Lawyers Network (2019)
- Social norms and information
  - Surveys show that awareness increased substantially Beliefs 2018 Beliefs 2019

Conclusions

- MeToo movement increased reporting to the police by 10%
  - 69,041 more cases reported in first 15 months among the 15 OECD countries where the movement was strong
  - In the US:
    - 4,174 additional arrests
    - 25% of reporting gap between sexual crime and other violent crime
- Movements predominantly involving high-profile individuals can change the behavior of the general public
- Social movements can change behavior
  - Even for high-stakes decisions
  - Rapid change
  - Persistent

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Contributions to existing literature Back

"*Some ... hold that social movements are generally effective and account for most important political change. Others ... argue that social movements are rarely influential.*" -The political consequences of social movements, (Amenta et al., 2010)

- Causal effects of protest (Madestam et al., 2013)
  - Show causal effect of social movement on personal decision
- How do social norms change?
  - Effect of mass media / popular culture (Chong and Ferrara, 2009; Jensen and Oster, 2009; La Ferrara et al., 2012)
  - Unraveling of social norms (Bursztyn et al., 2017, 2018)
  - Demonstrate how norms change quickly in an important setting
- Reporting of gender based violence (Green et al., 2019; Iyer et al., 2012; Bhatnagar et al., 2019; McDougal et al., 2018)
  - First rigorous evidence that MeToo led to increase in reporting

Diff-in-diff: Search interest

Back

VARIABLES	(1)	(2)	(3)
Post	0.678***	0.247**	0.467***
	(0.0948)	(0.0966)	(0.0744)
Post x Concurrent MeToo Interest		0.436***	
		(0.0899)	
Concurrent MeToo Interest		-0.00663	
		(0.0606)	
Post x Immediate MeToo Interest			0.210***
			(0.0196)
Observations	3,996	3,996	3,996
R-squared		0.512	0.371
Country FE	Yes	Yes	Yes
Country*Time trend	Yes	Yes	Yes
Country*Month FE	Yes	Yes	Yes

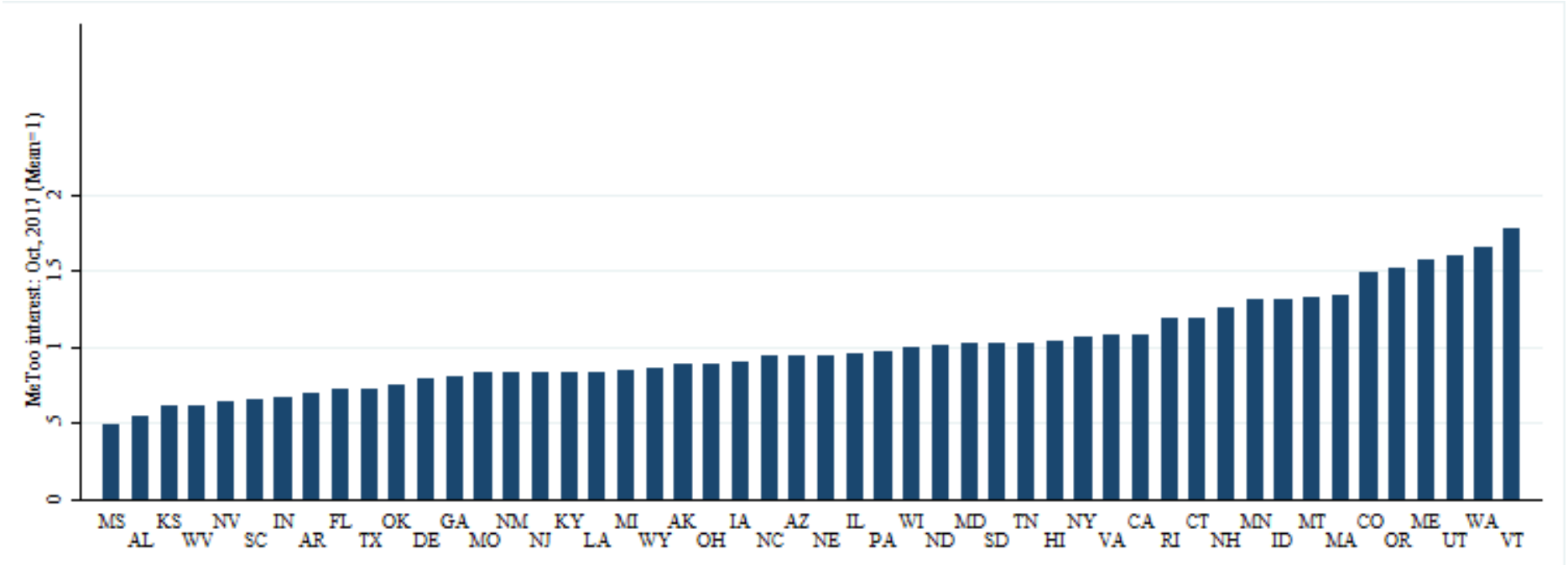
Standard errors clustered at the country level

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

MeToo Heterogeneity: US states

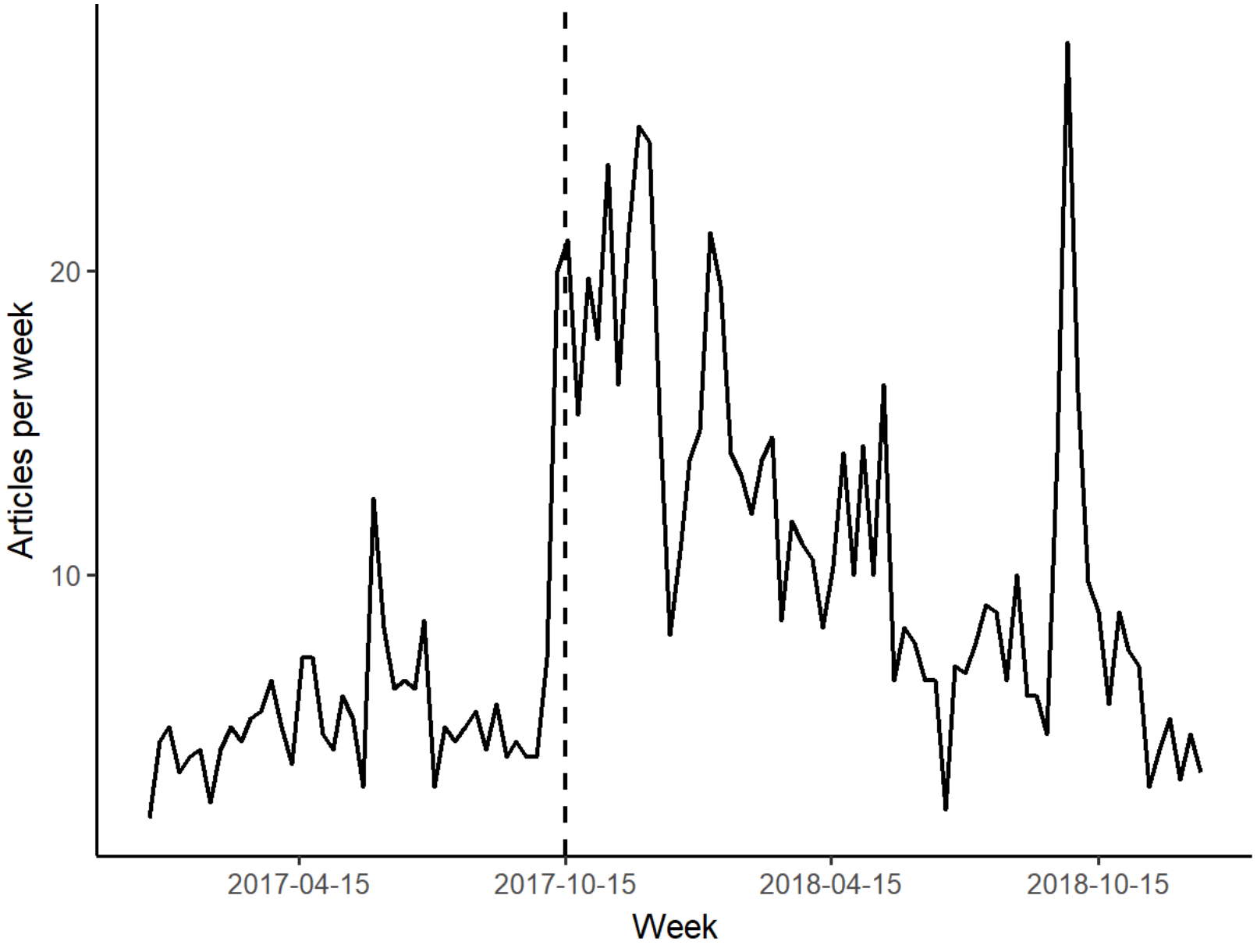
OECD data

US specification



News Coverage - Sexual Crimes

Back



Google Trends Example

Back

Me Too movement
Topic
France , 7/1/17 - 1/1/18

Me Too movement
Topic
Spain , 7/1/17 - 1/1/18

+ Add comparison

All categories

Web Search

Interest over time

International crime data harmonization

Back

- Country selection criteria
  - OECD country
  - Monthly/quarterly crime data disaggregated by sexual crime
- Crime is separated into 3 categories (when possible)
  - Sexual crime
    - Assault: physical (rape, fondling, etc.)
    - Harassment: non-physical (indecent exposure, stalking, sexual threats, etc.)
  - Crimes where there could have been potential spillovers (domestic abuse, prostitution, pornography, etc.)
    - These crimes are excluded and not used
  - All other crime (excluding minor traffic offenses)
- Crime summed up by quarter
  - If available, from Q1, 2010
  - Some countries categorize crime by reported date, others by the date the crime was committed

International Data Sources

Back

Country	Data Providing Organization	Time period	% population covered
Australia	New South Wales Bureau of Crime Statistics and Research, Queensland Police, Crime Statistics Agency of Victoria, and Western Australia Police	2010-2018	88%
Belgium	Federale politie	2010-2018	100%
Canada	Canadian Centre for Justice Statistics	2010-2018	100%
Chile	Policía de Investigaciones	2010-2018	100%
Colombia	Policía Nacional	2010-2018	100%
Czech republic	Policie České republiky	2010-2018	100%
Denmark	Danmarks Statistik	2010-2018	100%
Estonia	Politsei- ja Piirivalveamet	2010-2018	100%
Finland	Tilastokeskuksen	2010-2018	100%
France	Ministère de l'Intérieur	2010-2018	100%
Germany	Bundeskriminalamt	2012-2018	100%
Greece	Hellenic Statistical Authority (ELSTAT)	2010-2018	100%
Iceland	Lögreglan a höfudborgarsvaedinu	2010-2018	100%
Ireland	Central Statistics Office	2010-2018	100%
Israel	Central Bureau of Statistics	2010-2018	100%
Japan	National Statistics Center	2015-2018	100%
Korea	Supreme prosecutors' office	2010-2018	100%
Lithuania	Informatikos ir Rysiu Departamentas	2012-2015 and 2017-2018	100%
Mexico	Instituto Nacional de Estadística y Geografía	2015-2018	100%
Netherlands	Korps Nationale Politie	2012-2018	100%
New Zealand	New Zealand Police	Q3 2014-2018	100%
Poland	Wydział ds. Parlamentarnych i Informacji Publicznej	2010-2018	100%
Portugal	Instituto Nacional de Estatística	2010-2018	100%
Slovakia	Statisticky Urad	2010-2018	100%
Slovenia	Statistični Urad	2010-2018	100%
Switzerland	Bundesamt für Statistik	2010-2018	100%
Spain	Ministerio del Interior	2010-2018	100%
Sweden	Brottsförebyggande rådet	2010-2018	100%
United Kingdom	Home Office: Crime and Policing Analysis Unit and Open Data Northern Ireland	2010-2018	92%
United States	Federal Bureau of Investigation	2010-2018	30%

Google Trends Data

Back

- Monthly search intensity for the topic of "MeToo movement" as defined by Google for all OECD countries
  - Google defines a search for a topic as any search query including a phrase directly linked to the topic in any language
  - 0.997 correlation in October 2017 with measure we created using relevant terms in all major languages Hashtags
- Difference out the pre-Oct 1, 2017 mean of each search term by country
- Take mean of "MeToo interest" for some time period:
  - Immediate = October 2017 (2 weeks of the MeToo movement)
  - Q1 = October - December 2017
- Normalize interest so that OECD average = 1 in post period
- Categorize countries as being above or below OECD median

MeToo Hashtags

- Many similar hashtags started in many countries/languages around Oct 15, 2017
- Google tends data for all related hashtags was analyzed
- Hashtags that created a measurable search interest:
  - English: #MeToo (Oct 15)
  - French: #balancetonporc (Oct 13), #moiaussi (Oct 16)
  - Italian: #quellavoltache (Oct 13)
  - Spanish: #yotambien (Oct 16)

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Google Search and Survey Data

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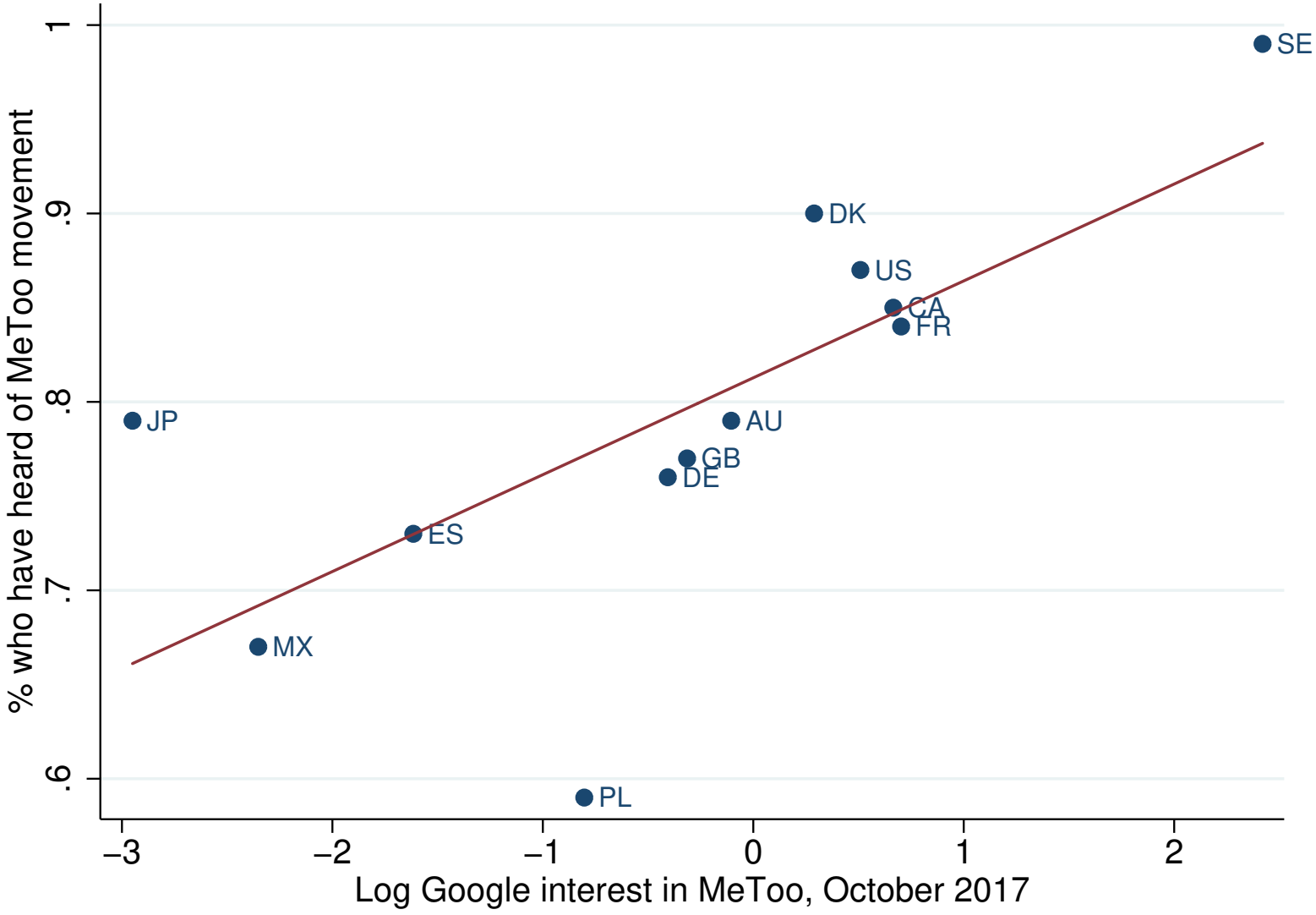


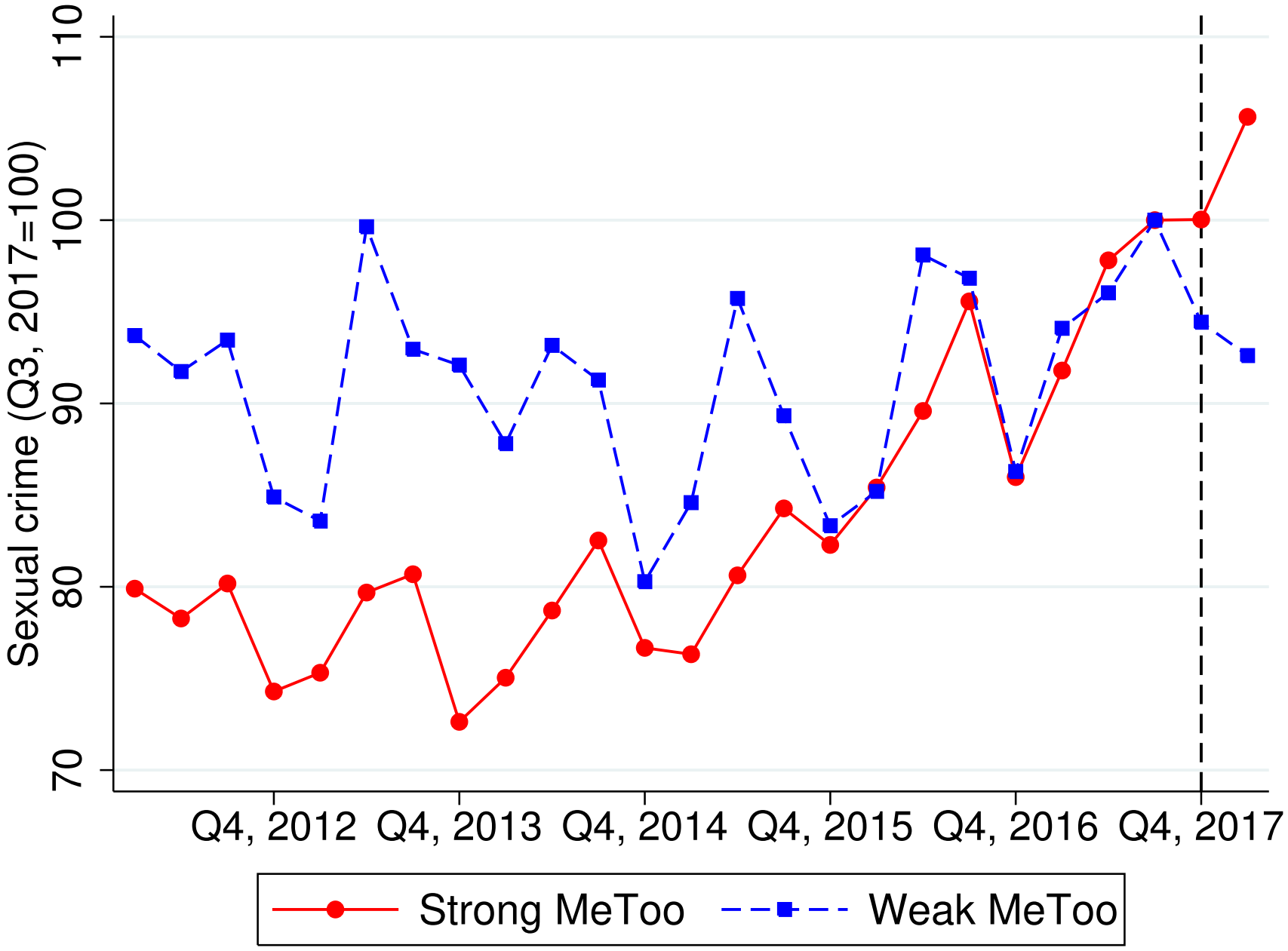
Start date by country

Back

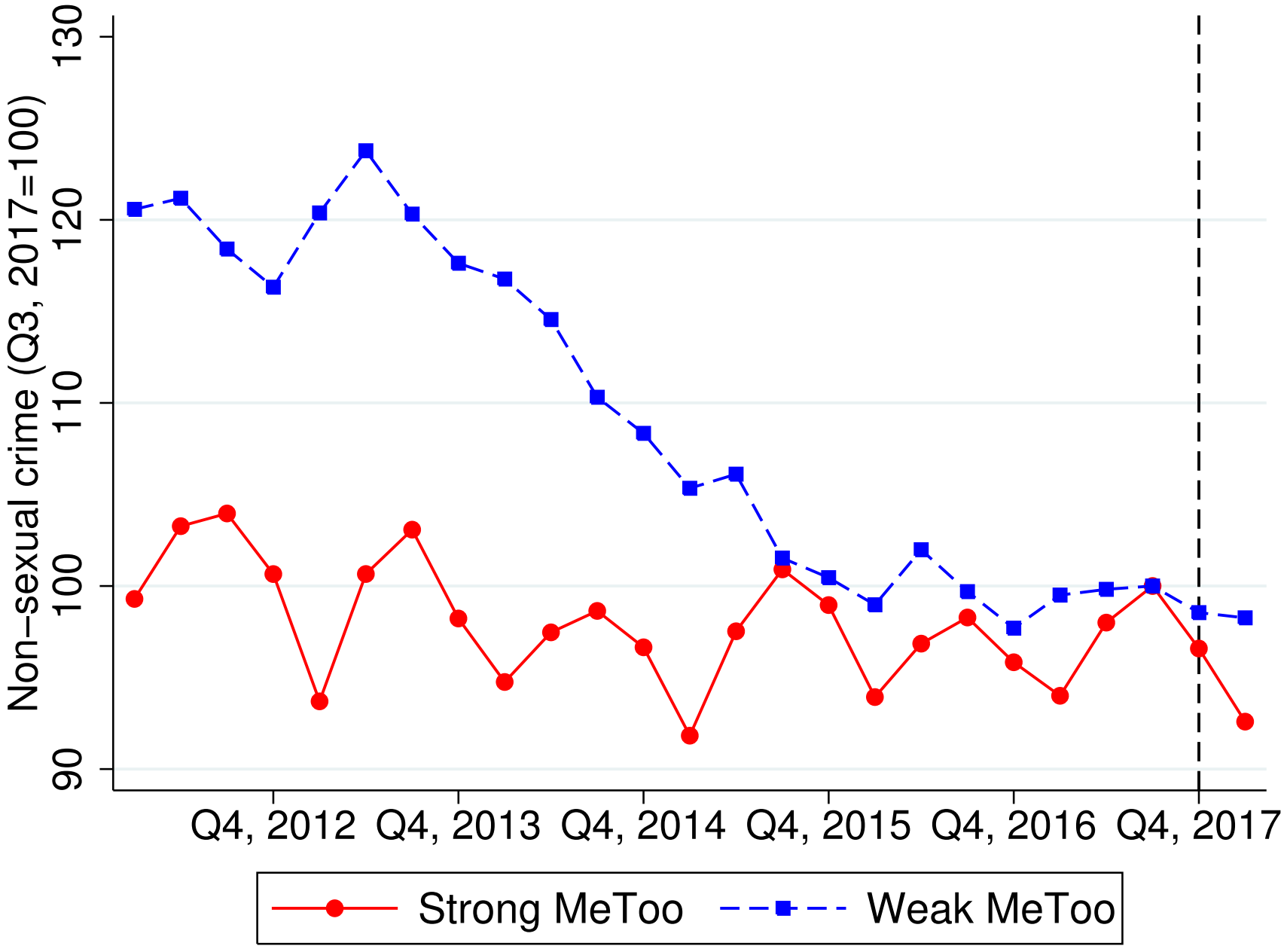
Country	Start date using search interest in MeToo topic	Start date using search interest in sexual harassment and sexual assault topics
Australia	October 2017	November 2017
Belgium	October 2017	No strong MeToo movement
Canada	October 2017	October, 2017
Chile	No strong MeToo movement	November, 2017
Colombia	No strong MeToo movement	April, 2018
Czech republic	November 2017	No strong MeToo movement
Denmark	October 2017	October 2017
Estonia	No strong MeToo movement	No strong MeToo movement
Finland	October 2017	October 2017
France	October 2017	October 2017
Greece	No strong MeToo movement	November 2017
Germany	October 2017	No strong MeToo movement
Iceland	October 2017	No strong MeToo movement
Ireland	October 2017	October 2017
Israel	No strong MeToo movement	November 2017
Japan	No strong MeToo movement	April 2018
Korea	February 2018	No strong MeToo movement
Lithuania	March 2018	November 2017
Mexico	No strong MeToo movement	November 2017
Netherlands	October 2017	No strong MeToo movement
New Zealand	October 2017	October 2017
Poland	No strong MeToo movement	No strong MeToo movement
Portugal	No strong MeToo movement	October 2017
Slovakia	No strong MeToo movement	No strong MeToo movement
Slovenia	No strong MeToo movement	December 2018
Switzerland	October 2017	October 2017
Spain	No strong MeToo movement	November 2017
Sweden	October 2017	October 2017
United Kingdom	October 2017	October 2017
United States	October 2017	October 2017

Sexual Crime by MeToo Interest

Back Residual plot



Other Crime by MeToo Interest (placebo) Residual plot



Sexual Crime: Detrended & Deseasonalized

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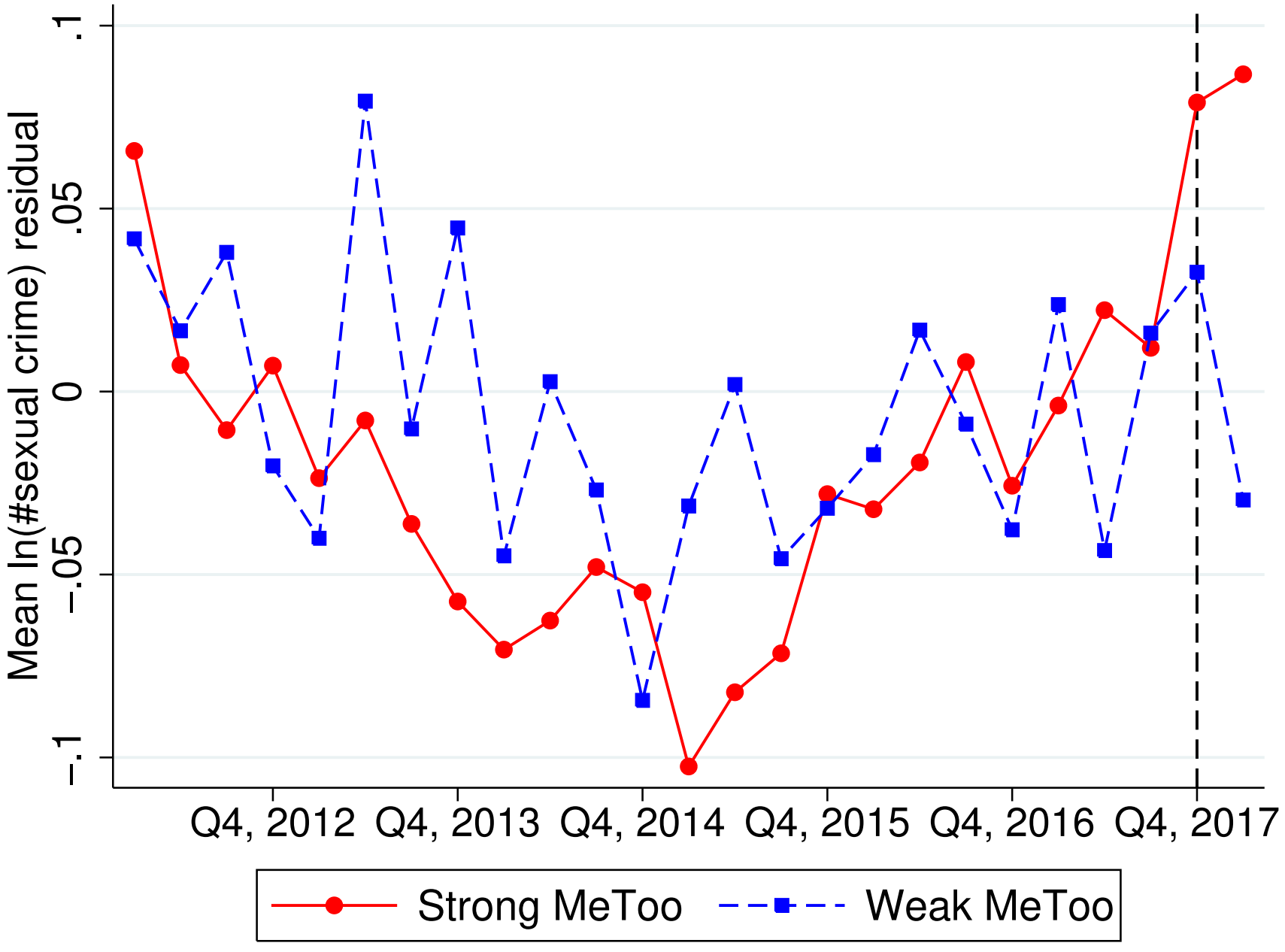

Non-sexual Crime: Detrended & Deseasonalized

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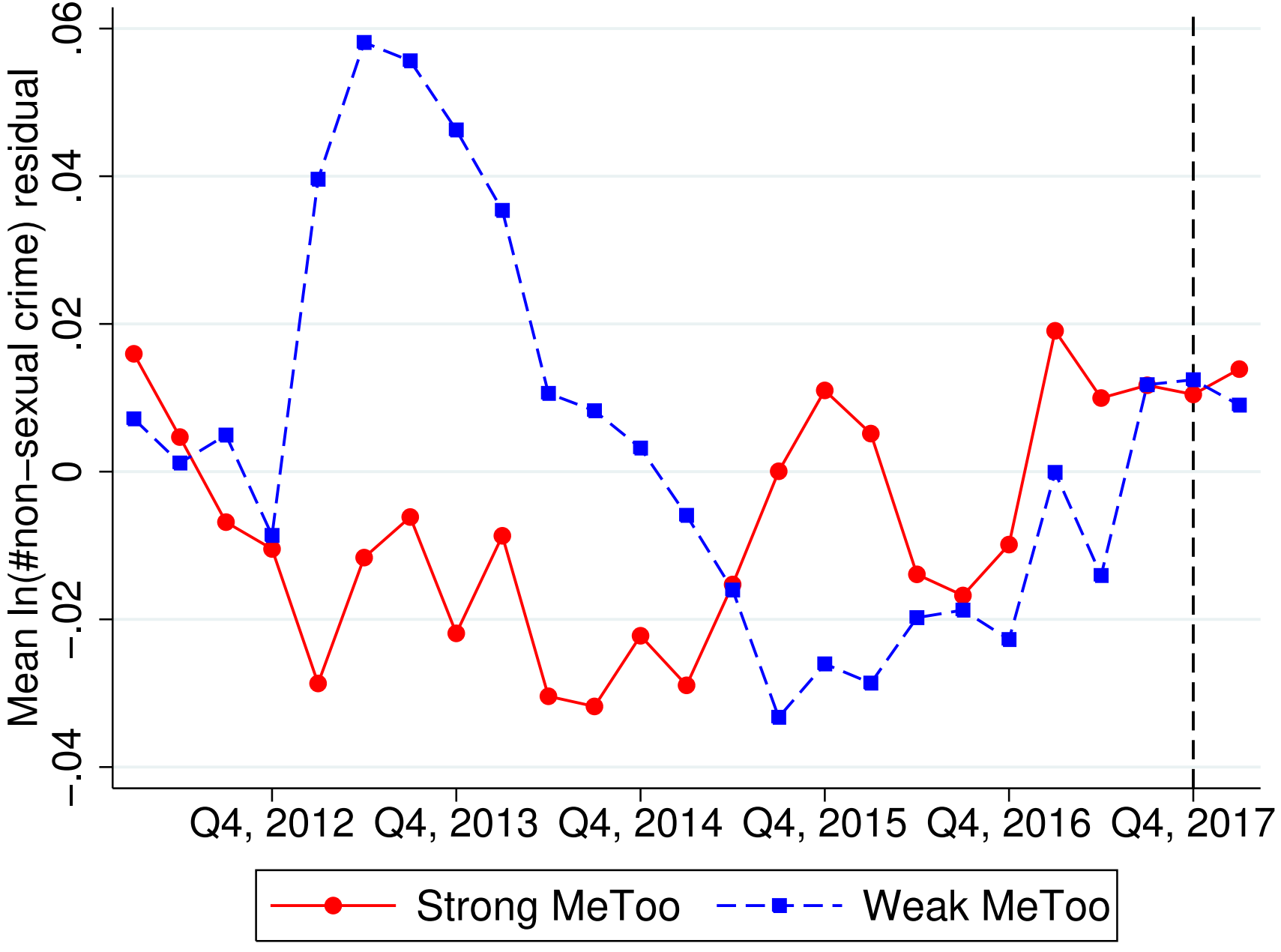

Triple Difference: Detrended & Deseasonalized

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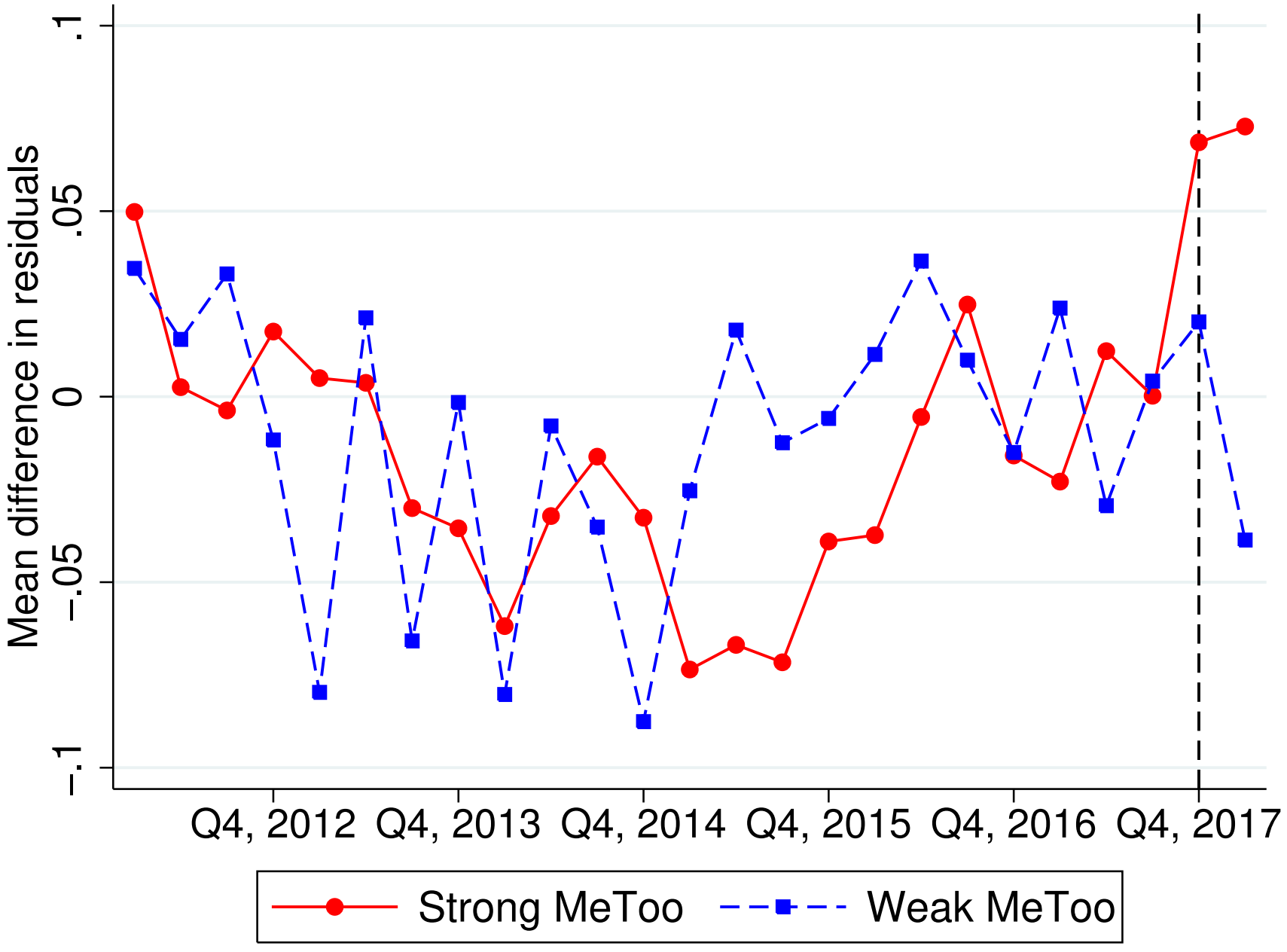
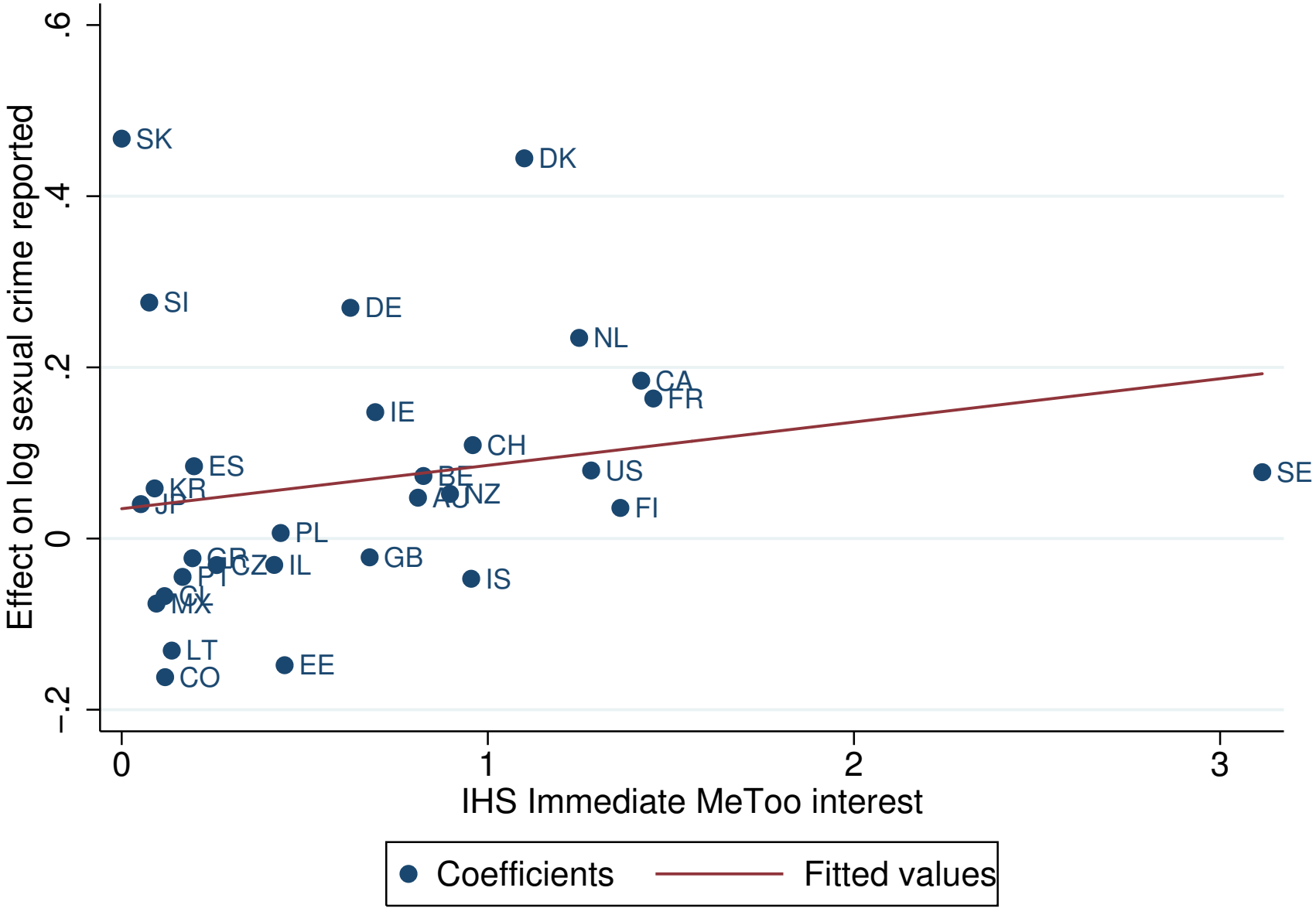


Effects by MeToo Interest

Main specification | Contionuous specification



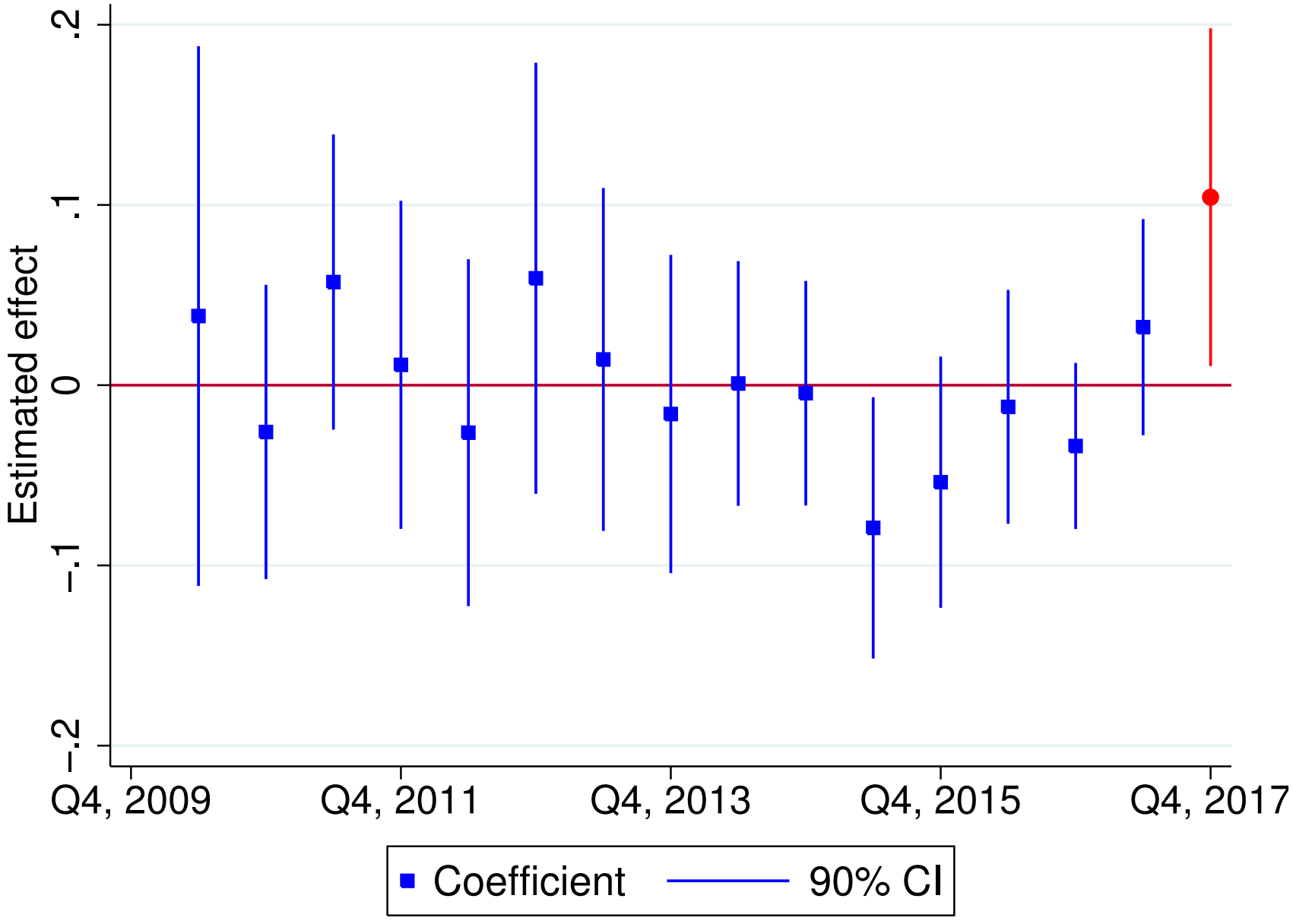
Continuous Measures of Interest

Back Scatter plot

	(1)
Post * Sexual Crime * IHS MeToo strength	0.046
	(0.043)
Post * Sexual crime	0.071**
	(0.030)
Post * IHS MeToo strength	0.007
	(0.017)
Post	0.020
	(0.015)
Country * Crime type * Lin. trend	X
Country * Crime type * Quarter	X
Post	X
Final quarter	Q1 2018
Observations	1,808
Clusters	60

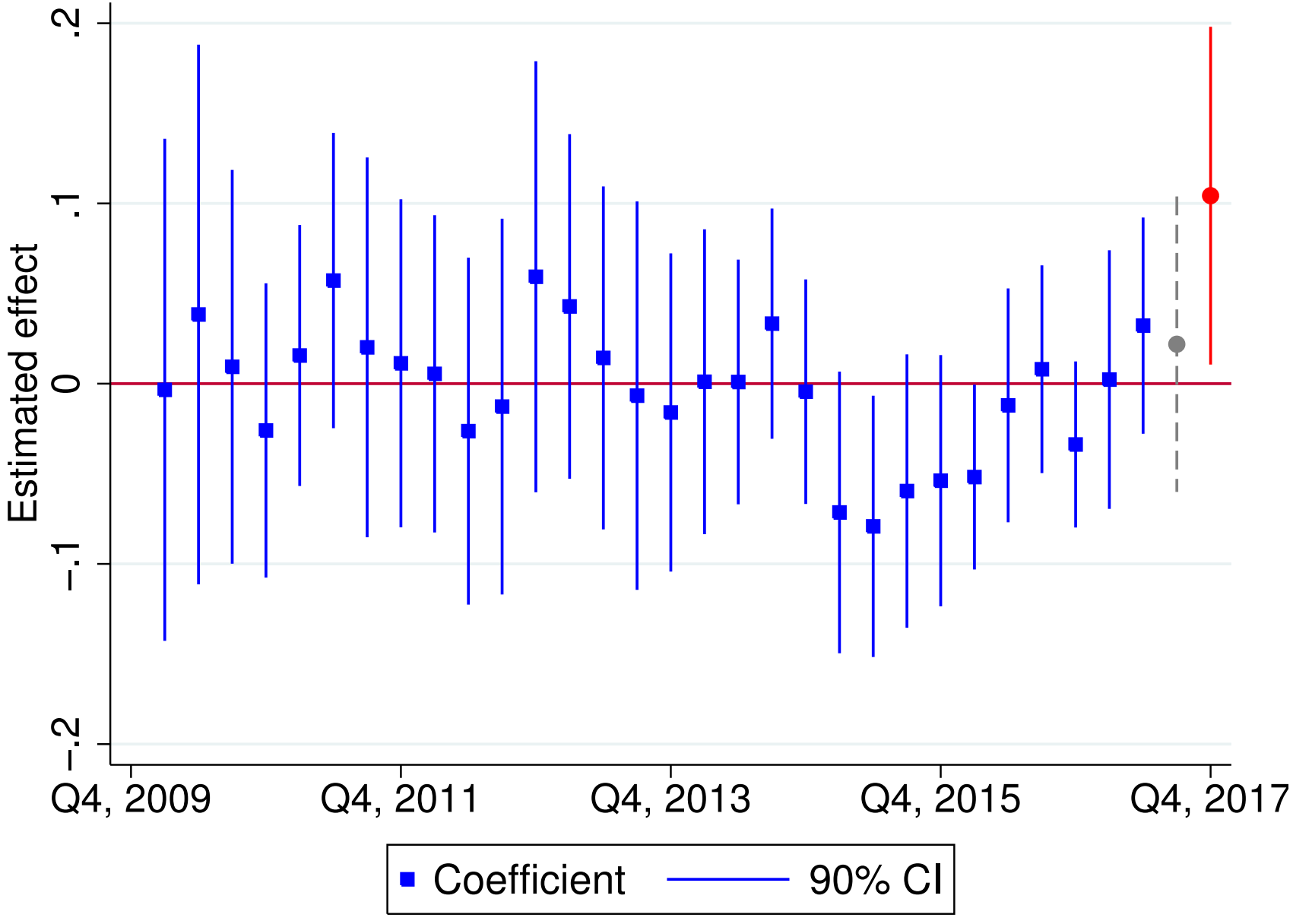
Placebo Tests Q2 2010 - Q1 2018

Back



Placebo Tests 2010 - Q1 2018

Back



All Countries Long-Term Diff-in-Diff

Back

VARIABLES	(1) ln(crime)	(2) ln(crime)
Post * Sexual crime	0.0745***	
	(0.0252)	
2017 Q4 * Sexual crime		0.0901***
		(0.0316)
2018 Q1 * Sexual crime		0.0494
		(0.0389)
2018 Q2 * Sexual crime		0.0422
		(0.0425)
2018 Q3 * Sexual crime		0.0772***
		(0.0262)
2018 Q4 * Sexual crime		0.127***
		(0.0415)
Observations	1,988	1,988
Post	X	
Country * Crime type * Lin. trend	X	X
Country * Crime type * Quarter	X	X
Q4 2017-Q4 2018 FE		X

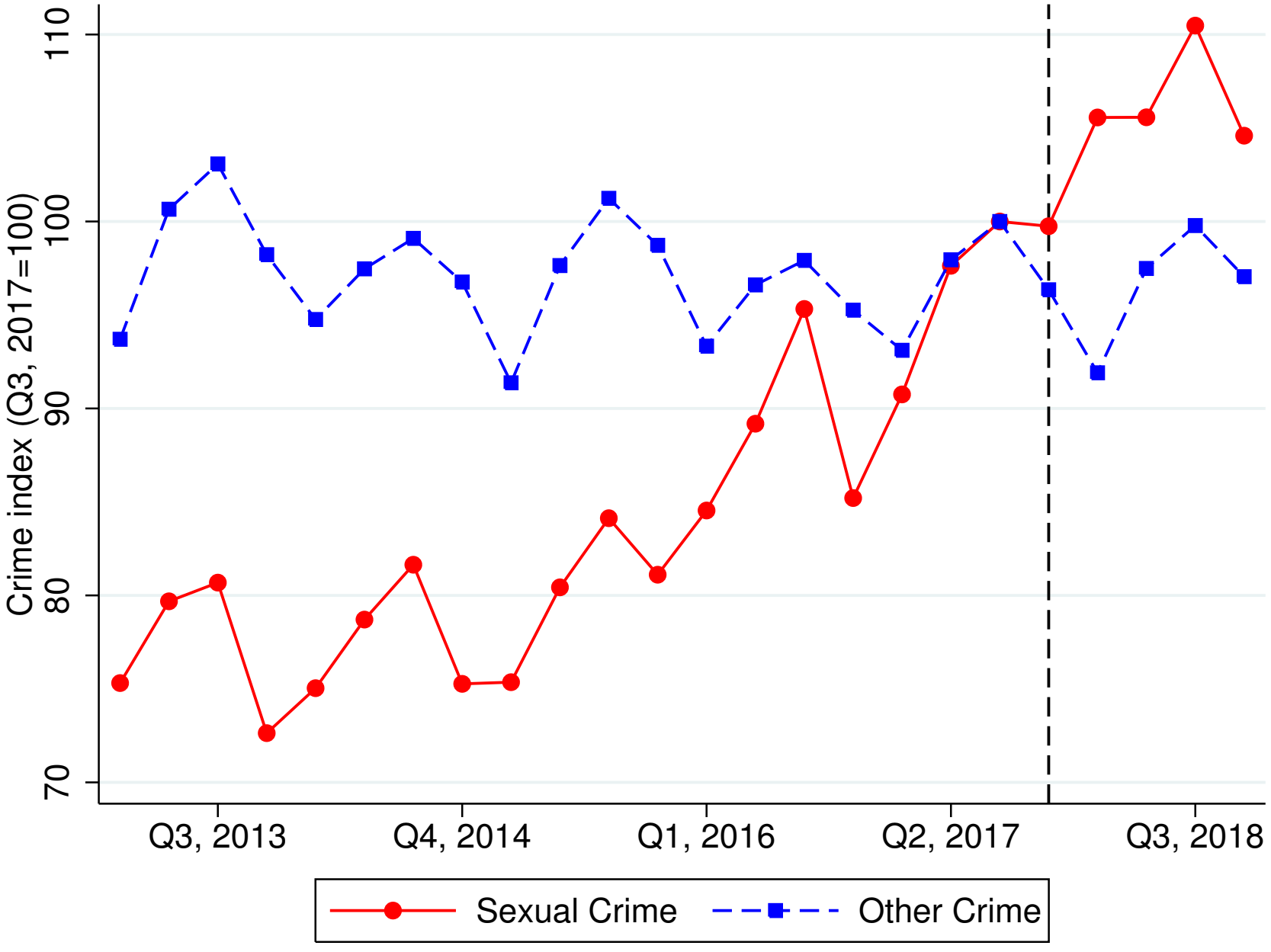
Long-Term Triple Difference

Back

VARIABLES	(1) ln(crime)	(2) ln(crime)
Post * Strong MeToo * Sexual crime	0.0605	
	(0.0483)	
Post * Sexual crime	0.0435	
	(0.0335)	
Q1 * Strong MeToo * Sexual crime		0.0629
		(0.0625)
Q2 * Strong MeToo * Sexual crime		0.147**
		(0.0717)
Q3 * Strong MeToo * Sexual crime		0.0827
		(0.0840)
Q4 * Strong MeToo * Sexual crime		0.0216
		(0.0510)
Q5 * Strong MeToo * Sexual crime		-0.0367
		(0.0830)
Observations	1,988	1,988
Post	X	
Country * Crime type * Lin. trend	X	X
Country * Crime type * Quarter	X	X
Q4 2017-Q4 2018*Crime type		X
Q4 2017-Q4 2018*Strong MeToo		X

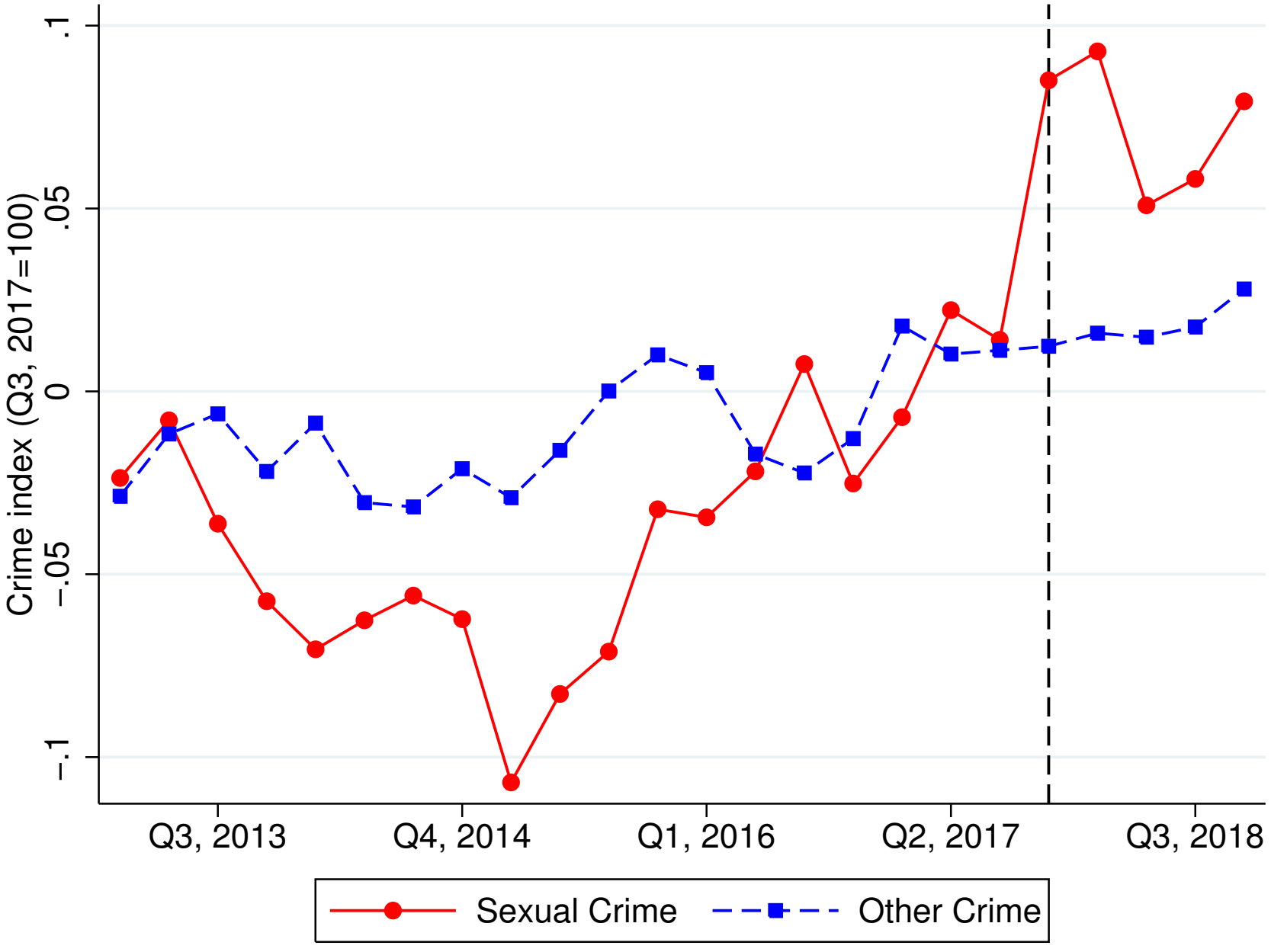
Long-term Effect: Raw data

Back



Long-term Effect: Detrended & Deseasonalized

Back



Measuring long-term effects, additional strategy

- Determine individual start date for each country
  - Criterion 1: First month when MeToo interest was higher than OECD October 2017 median
  - Criterion 2: First month when interest in sexual harassment and sexual assault was highest since 2010

$$y_{itc} = \beta_1 MeToo_{ct} \times SexCrime_i + \beta_2 MeToo_{ct} + \beta_{3,ic} Trend_t + \gamma_{i,c,q(t)} + \varepsilon_{itc}$$

- Where $MeToo_{ct} = 1$ if start month is first of quarter t or earlier, $MeToo_{ct} = 2/3$ if start month is second of quarter t and so on
- This allows us to include any country that ever had a strong MeToo movement
- Risk of reverse causality: increase in sexual crime reporting may have triggered MeToo movement

Different MeToo Start Dates by Country

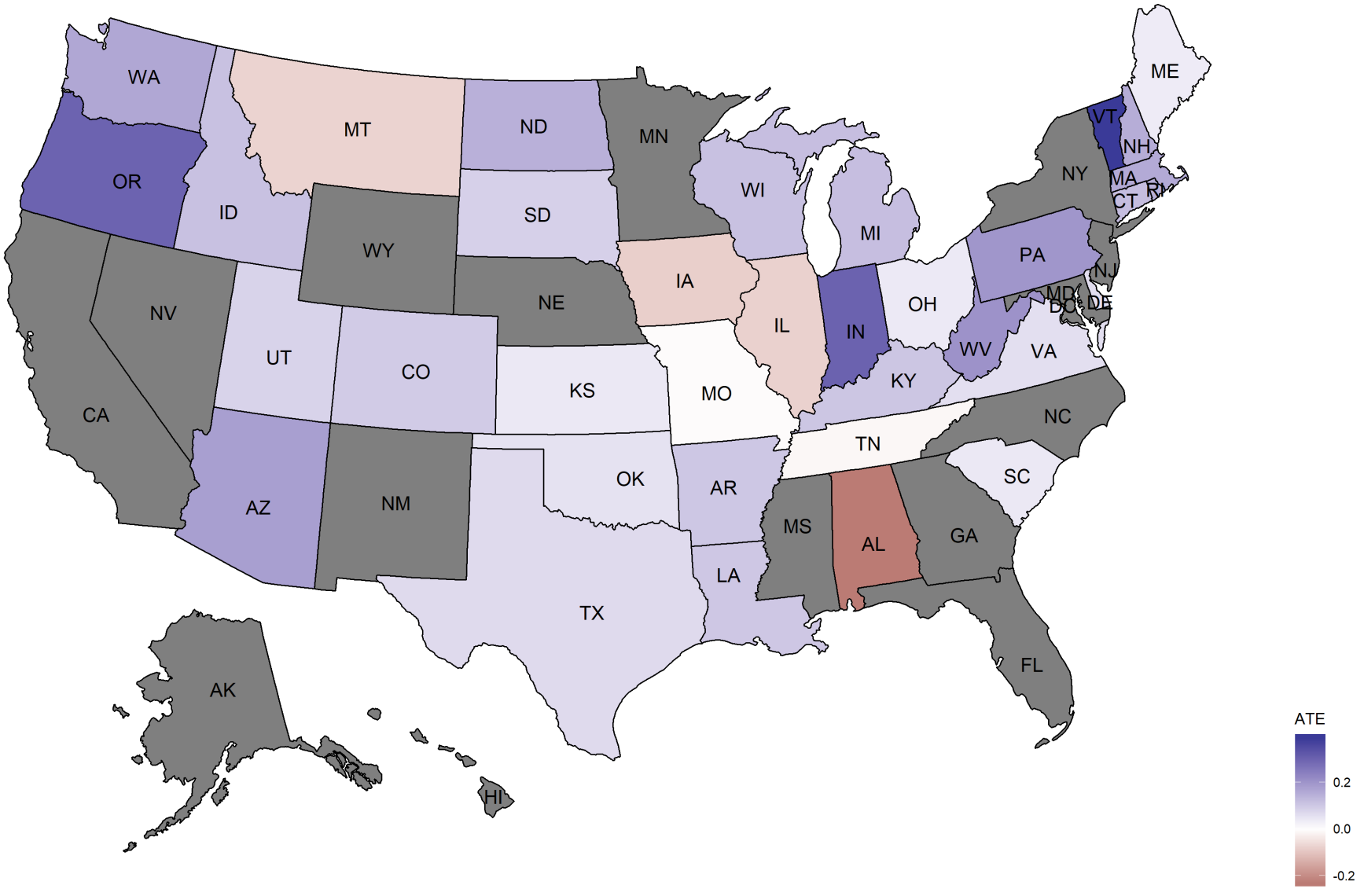
List start dates Back

	ln(crime)			
	(1)	(2)	(3)	(4)
Post MeToo start * Sexual Crime	0.094**		0.081**	
	(0.035)		(0.030)	
Quarter of MeToo start * Sexual Crime		0.080*		0.057*
		(0.045)		(0.029)
1Q after MeToo start * Sexual Crime		0.107**		0.056
		(0.049)		(0.045)
2Q after MeToo start * Sexual Crime		0.103**		0.045
		(0.041)		(0.043)
3Q after MeToo start * Sexual Crime		0.081**		0.108***
		(0.037)		(0.030)
4Q after MeToo start * Sexual Crime		0.092**		0.133***
		(0.044)		(0.039)
Country * Crime type * Lin. trend	X	X	X	X
Country * Crime type * Quarter	X	X	X	X
Post MeToo start	X		X	
Quarters since MeToo start FE		X		X
Final quarter	Q4 2018	Q4 2018	Q4 2018	Q4 2018
Sample	MeToo only	MeToo only	MeToo only	MeToo only
Observations	1,204	1,204	1,300	1,300
Clusters	36	36	40	40
MeToo start indicator	MeToo search interest		SH/SA search interest	

	ihs(crime)		
	(1)	(2)	(3)
Post * Sexual Assault	0.081***		
	(0.015)		
Post * Sexual Assault		0.112***	
		(0.036)	
Post * Sexual Harassment		0.148***	
		(0.055)	
Post * Sexual Crimes			0.129***
			(0.036)
State * Crime Type * Lin. Trend	X		
State * Crime Type * Month	X		
City * Crime Type * Lin. Trend		X	X
City * Crime Type * Month		X	X
Post	X	X	X
Data	NIBRS	City	City
Final Month	Mar 2018	Mar 2018	Mar 2018
Observations	6,654	1,863	1,242

Results By State

Back



US Persistence

Month-by-Month ◂ Back

	ihs(crime)				
	(1)	(2)	(3)	(4)	(5)
Post * Sexual Crimes	0.100***		0.125***		
	(0.011)		(0.021)		
2017 Q4 * Sexual Crimes		0.070***		0.125***	0.113***
		(0.017)		(0.033)	(0.039)
2018 Q1 * Sexual Crimes		0.093***		0.136**	0.081
		(0.020)		(0.065)	(0.067)
2018 Q2 * Sexual Crimes		0.101***		0.107***	0.090**
		(0.018)		(0.038)	(0.037)
2018 Q3 * Sexual Crimes		0.106***		0.138***	0.136***
		(0.020)		(0.035)	(0.035)
2018 Q4 * Sexual Crimes		0.137***		0.115***	0.102**
		(0.026)		(0.038)	(0.041)
Location * Crime Type * Lin. Trend	X	X	X	X	X
Location * Crime Type * Month	X	X	X	X	X
Post	X	X	X	X	X
Data	NIBRS	NIBRS	Cities	Cities	Cities
Crimes	All	All	All	All	Reported Within 1 M
Observations	7,266	7,266	1,368	1,368	1,361

US Sexual Crimes, Aggregated by Crime Type

Back

	ihs(crime)		
	(1)	(2)	(3)
Post * Sexual Assault	0.081***		
	(0.015)		
Post * Sexual Assault		0.096***	0.096***
		(0.018)	(0.027)
State * Crime Type * Lin. Trend	X	X	X
State * Crime Type * Month	X	X	X
Post	X	X	X
Agg Crimes	Sexual/Other	NIBRS Categories	NIBRS Categories
S.E	Robust	Cluster by Crime Type	Cluster by Crime*State
Num of Clusters		21	735
Final Month	Mar 18	Mar 18	Mar 18
Observations	6,654	69,867	69,867

Effect by Arrest

Back

	ihs(crime)			
	(1)	(2)	(3)	(4)
Post * Sexual Assault	0.014	0.091***	0.071***	0.107***
	(0.027)	(0.016)	(0.019)	(0.011)
State * Crime Type * Lin. Trend	X	X	X	X
State * Crime Type * Month	X	X	X	X
Post	X	X	X	X
Final Month	Mar 18	Mar 18	Dec 18	Dec 18
Crimes	Arrest	No Arrest	Arrest	No Arrest
Observations	6,654	6,654	7,266	7,266

Effect of Case Covariates on Arrests

Back

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Post	−0.008***	−0.008***	−0.008***	−0.008***	−0.009***	−0.007***	−0.007***	−0.008***	−0.007***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Agency		X							X
Injury			X						X
Location				X					X
Relationship					X				X
Type						X			X
Weapon							X		X
Victim								X	X
Cal Month	X	X	X	X	X	X	X	X	X
Trend	X	X	X	X	X	X	X	X	X
Final Month	Mar 18	Mar 18	Mar 18	Mar 18	Mar 18	Mar 18	Mar 18	Mar 18	Mar 18
Observations	625,172	625,172	625,172	625,172	625,172	625,172	625,172	625,172	625,172

Effect on the Number of Cases Cleared

Back

	ihs(crime)					
	(1)	(2)	(3)	(4)	(5)	(6)
Post * Sexual Assault, Not Cleared	0.106***			0.112***		
	(0.016)			(0.011)		
Post * Sexual Assault, Cleared	0.011			0.065***		
	(0.024)			(0.016)		
Post * Sexual Assault		0.025	0.103***		0.068***	0.115***
		(0.025)	(0.017)		(0.017)	(0.011)
Difference	0.096***			0.047***		
State * Crime Type * Lin. Trend	X	X	X	X	X	X
State * Crime Type * Month	X	X	X	X	X	X
Post	X	X	X	X	X	X
Final Month	Mar 18	Mar 18	Mar 18	Dec 18	Dec 18	Dec 18
Crimes	All	Cleared	Not Cleared	All	Cleared	Not Cleared
Observations	9,981	6,654	6,654	10,899	7,266	7,266

Effect by Race

Back

	ihs(crime)			
	(1)	(2)	(3)	(4)
Post * Sexual Assault	0.079***	0.077***	0.092***	0.074***
	(0.016)	(0.024)	(0.017)	(0.023)
State * Crime Type * Lin. Trend	X	X	X	X
State * Crime Type * Month	X	X	X	X
Post	X	X	X	X
Final Month	Mar 18	Mar 18	Mar 18	Mar 18
Group	White Victims	Blacks Victims	White Offenders	Black Offenders
Observations	6,654	6,654	6,654	6,654

Effect by Victim and Offender Sex

Back

	ihs(crime)	
	(1)	(2)
Post * Sexual Assault, Victim Female	0.091***	
	(0.016)	
Post * Sexual Assault, Victim Male	0.033	
	(0.024)	
Post * Sexual Assault, Offender Female		0.015
		(0.042)
Post * Sexual Assault, Offender Male		0.098***
		(0.016)
Difference	0.058**	-0.083*
State * Crime Type * Lin. Trend	X	X
State * Crime Type * Month	X	X
Post	X	X
Final Month	Mar 18	Mar 18
Observations	9,981	9,981

Effect by Neighborhood Demographics

Back

	ihs(crime)					
	(1)	(2)	(3)	(4)	(5)	(6)
Post * Sexual Crimes	0.128***	0.135***	0.128***	0.129***	0.129***	0.128***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Post * Sexual Crimes * Med. Income (std. dev.)		0.045**				
		(0.020)				
Post * Sexual Crimes * % College			0.147			
			(0.096)			
Post * Sexual Crimes * % Blacks (Compared to Whites)				0.064		
				(0.093)		
Post * Sexual Crimes * % Other Race (Compared to Whites)					0.042	
					(0.132)	
Post * Sexual Crimes * % Hispanics						−0.148*
						(0.087)
Interquartile Range of Demographic		1.123	0.235	0.295	0.275	0.368
Diff. in Effect * 75th-25th Pct.		0.051	0.035	0.019	0.012	-0.055
Neighborhood * Crime Type * Lin. Trend	X	X	X	X	X	X
Neighborhood * Crime Type * Month	X	X	X	X	X	X
Post	X	X	X	X	X	X
Post * Democraphic	X	X	X	X	X	X
Final Month	Mar 18	Mar 18	Mar 18	Mar 18	Mar 18	Mar 18
Observations	25,056	25,056	25,056	25,056	25,056	25,056

Treatment Effect By Incident Details

Back

	ihs(crime)		
	(1)	(2)	(3)
Post * Fondling	0.111***		
	(0.019)		
Post * Rape	0.093***		
	(0.017)		
Post * Sodomy	−0.024		
	(0.031)		
Post * Statutory Rape	0.027		
	(0.042)		
Post * Sexual Assault, No Injury		0.093***	
		(0.016)	
Post * Sexual Assault, Injury		0.028	
		(0.022)	
Post * Sexual Assault, Knew Offender			0.089***
			(0.016)
Post * Sexual Assault, Stranger			0.104***
			(0.035)
Difference		0.065***	-0.015
State * Crime Type * Lin. Trend	X	X	X
State * Crime Type * Month	X	X	X
Post	X	X	X
Final Month	Mar 18	Mar 18	Mar 18
Observations	16,635	9,981	9,981

Criteria for Selecting Cities

Back

- 50 largest cities in the US
- Publicly available micro data
- Data includes
  - Date crime occurred and date crime was reported
  - Sexual assault crimes
  - Location of where the crime occurred

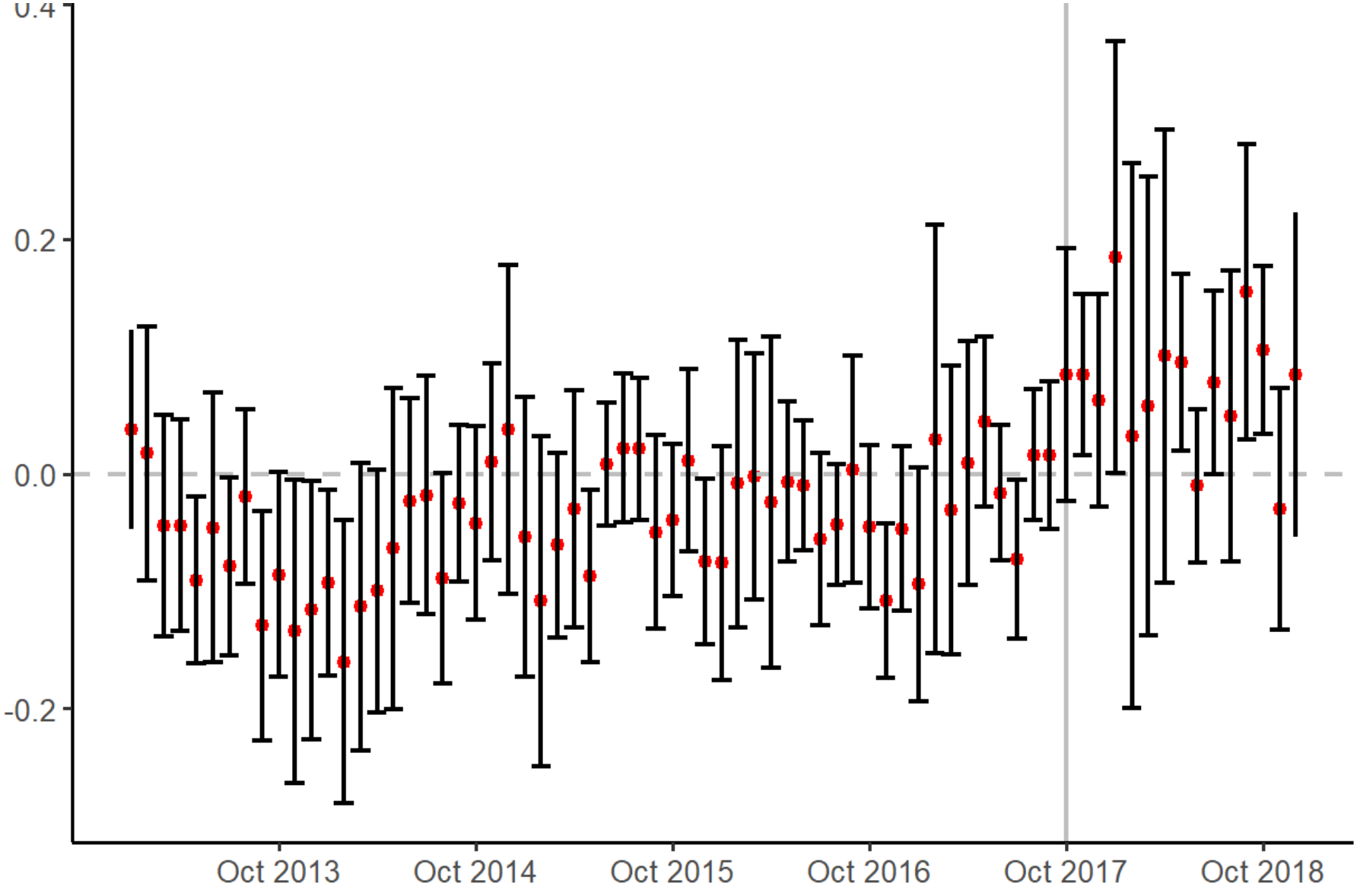
Treatment Effect by City Size

Back

	(1)	(2)	(3)
Post * Sexual Assault	0.107***	0.108***	0.158***
	(0.013)	(0.019)	(0.052)
Min Pop	25K	100K	500K
Observations	151,756	25,894	1,732
Note *		*p<0.1; **p<0.05; ***p<0.01	

Treatment Effect, by Month

Back



Stock Vs Flow: Effect by Reporting Lag

Back

	(1)	(2)
Post * Sexual Crimes, Lag<=30 Days	0.095**	0.111***
	(0.038)	(0.023)
Post * Sexual Crimes, Lag>30 Days	0.215***	0.135***
	(0.049)	(0.048)
City * Crime Type * Lin. Trend	X	X
City * Crime Type * Month	X	X
Post	X	X
Treatment Dates	Oct 17-Mar 18	Apr 18-Dec 18
Observations	1,842	1,905

Sexual Crimes Reported - By City

Back

	ihs(crime)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Post * Sexual Crimes	0.144***	0.085***	0.189**	0.083	0.401	−0.074	0.093
	(0.041)	(0.032)	(0.074)	(0.075)	(0.307)	(0.082)	(0.065)
Crime Type * Time	X	X	X	X	X	X	X
Crime Type * Month	X	X	X	X	X	X	X
Post	X	X	X	X	X	X	X
Final Month	Mar 18	Mar 18	Mar 18	Mar 18	Mar 18	Mar 18	Mar 18
City	NYC	LA	Seattle	Denver	Nashville	Louisville	Kansas City
Observations	198	198	198	126	126	198	198

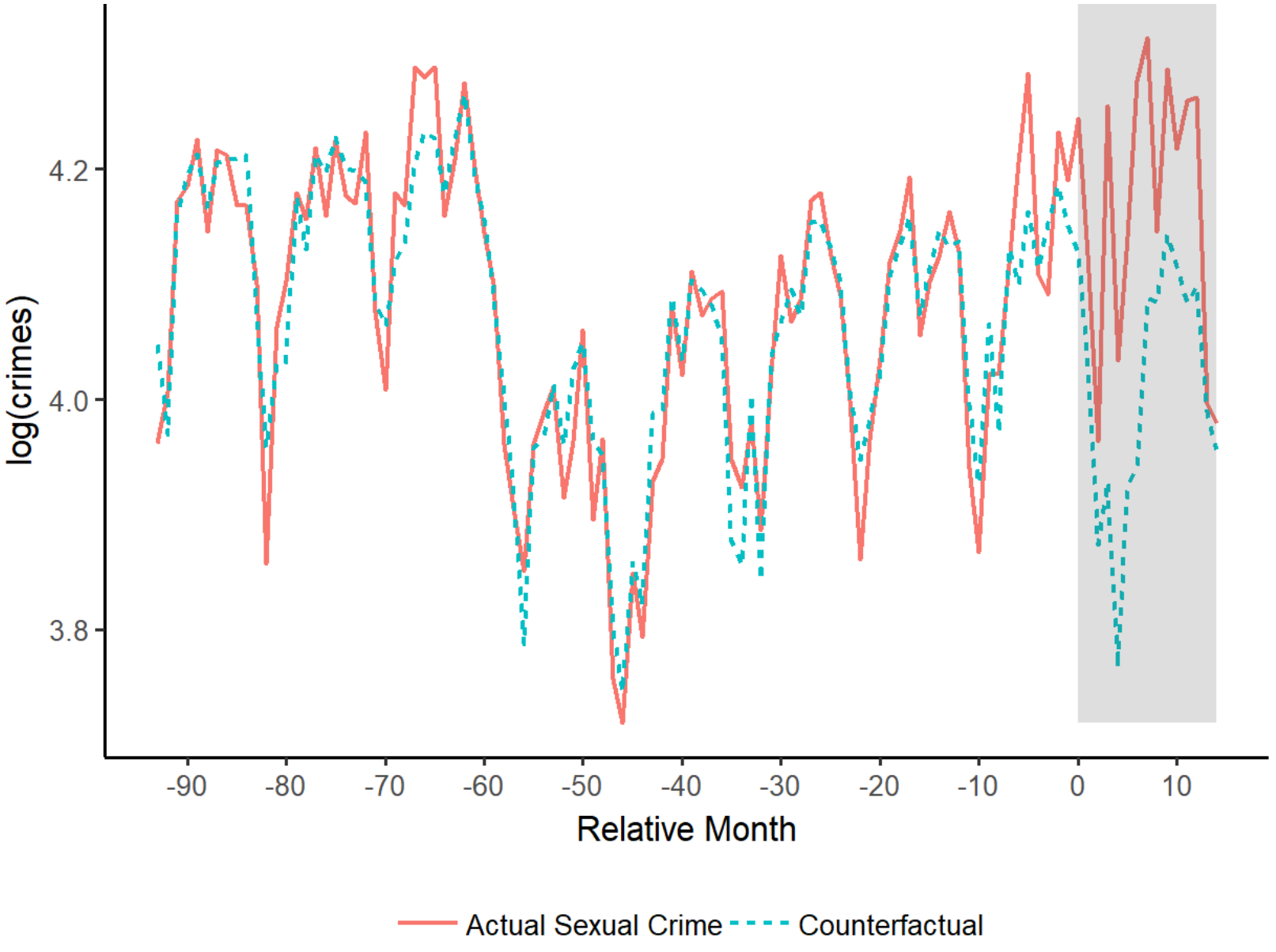
Matrix Completion method

Details Back

	Diff-in-Diff	**Matrix Completion (Athey et al. 2017)**
Groups	Sexual crimes, other crimes	Every city*crime type is a group, 43 treated and 440 control
FE	City*crime type trend, city*crime type*calendar month	Group & time fixed effects
Estimation	OLS	Create counterfactual outcomes by minimizing matrix prediction errors with penalization
S.E	Robust	Bootstrapped
ATE	0.129***	0.179***

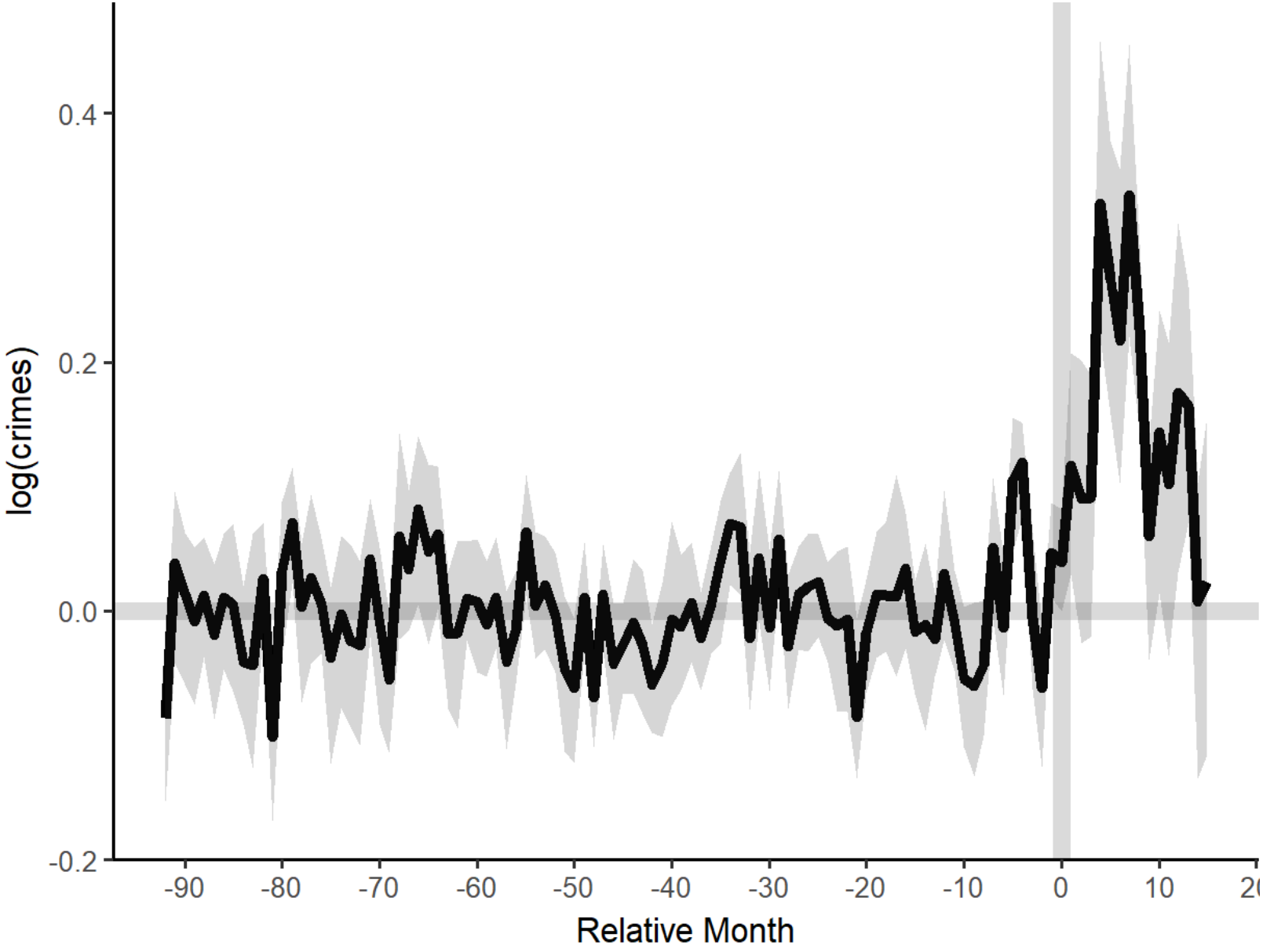
Counterfactual

Back



Average Treatment Effects

Back



Matrix Completion - Introduction

Back

$$Y(0) = \begin{pmatrix} & \textbf{time}_1 & \textbf{time}_2 & \dots & \textbf{time}_{\textbf{pre}} & \textbf{time}_{\textbf{pre+1}} & \dots & \textbf{time}_{\textbf{t}} \\ \textbf{category}_1 & y_{11} & . & . & y_{1,pre} & y_{1,pre+1} & . & y_{1,t} \\ \textbf{category}_2 & . & . & & & . & . & . \\ \dots & . & & . & & . & . & . \\ \textbf{category}_{\textbf{n-1}} & y_{n-1,1} & . & . & y_{n-1,pre} & y_{1,pre+1} & . & y_{n,t} \\ \textbf{category}_{\textbf{n}} & y_{n,1} & . & . & y_{n,pre} & ? & ? & ? \end{pmatrix}$$

where $category_i$ is a crime type, $time_j$ is a month, $y_{ij} = log(crime_{ij})$

- Our goal is to find untreated outcomes for the treated units*periods.

Matrix Completion - Estimator

Back

1. Model: $Y(0) = L^* + \varepsilon$
2. Estimator: $\hat{L} = \underset{L}{argmin}\{\frac{1}{|Control|}||P_{Control}(Y - L)||_F^2 + \lambda||L||_*\}$, where:
   - $Control = \{(i,j) \mid Y_{ij} \text{ is not treated}\}$
   - $P_{Control}(L) = \begin{cases} L_{it} & (i,t) \in Control \\ 0 & otherwsie \end{cases}$
   - $||L||_F = \sum_{it} L_{it}^2$
   - $||L||_*$ is the nuclear norm: $\sum_i \sigma_i(L)$ where $\sigma_i(L)$ are the singular values of L
   - λ is a regularization parameter selected through cross-validation
3. $ATT = \frac{\sum_{ij}[Y(1)_{(i,j)\notin Control} - L(0)_{(i,j)\notin Control}]}{|(i,j)\notin Control|}$

Intuition: Make L as similar to Y as possible, while minimizing its nuclear norm (a tractable way to decrease rank). Similar to Lasso method for a vector of coefficients

Incidence: Crimes That Occurred Before MeToo

Back

	ihs(crime)
Post * Sexual Crimes	0.194**
	(0.077)
City * Crime Type * Lin. Trend	X
City * Crime Type * Month	X
Post	X
Final Month	Dec 2017
Crimes Included	3 Month <= Lag
Observations	1,179

Change in Beliefs 2018

Back

	Workplace sexual harassment no longer a problem		Accusers cause more problem than they solve	
	(1)	(2)	(3)	(4)
April-May 2018	−0.136***		−0.010	
	(0.032)		(0.025)	
Women, 2018		−0.047		0.004
		(0.042)		(0.034)
Men, 2018		−0.234***		−0.026
		(0.047)		(0.035)
Respondent FE	X	X	X	X
Observations	9,252	9,236	9,212	9,196

Change in Beliefs 2019

Back

	Workplace sexual harassment no longer a problem		Accusers cause more problem than they solve	
	(1)	(2)	(3)	(4)
Nov 2018-Jan 2019	−0.110***		0.071***	
	(0.023)		(0.021)	
Women, 2019		−0.078**		0.115***
		(0.031)		(0.031)
Men, 2019		−0.144***		0.025
		(0.035)		(0.029)
Respondent FE	X	X	X	X
Observations	11,710	11,710	11,662	11,662