The impact of new free-trade agreements on incumbent firms and workers

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Background

- Trade liberalisation and trade agreements might reduce trade costs(eg red tape)
  - Cutting supply chains red tape costs could save US $88 billion in export cost (Third way, 2022)
  - Red tape barriers strongly affect extensive margin of trade (Maggi et al, 2018)
  - Red tape barriers cost service exporters USD 150 billions (WTO, 2021)
  - Standard ad valorem trade costs (iceberg) and per unit costs might be reduced

- Trade liberalisation might improve industry performance
  - More productive firms enter (Melitz, 2003; Egger and Kreickemeier, 2009)
  - Improved tfp, but incomplete passthrough and firms exercise market power (Amiti and Konings, 2007; Brandt et al, 2017; De Loecker et al, 2016; Dobbelaere and Wiersma, 2020).
  - Exporters' higher markups might be reduced, affect workers and firms unequally (DeLoecker and Warzinsky, 2012; Abraham et al.,2009; Guadalupe,2007;Verhoogen,2009;Asprilla et al., 2019)
  - Differential impacts from trade shock: product vs. factor supply shock, eg China (Autor et al., 2013, 2016; Balsvik et al., 2015; Aghion et al., 2022)

Background and contribution

- Price-setting power in product market related to labour market power
    - Price-setting power in product market related to incentives to mark-down wages in U.S. construction industry (Kroft et al., 2022) and in the EU in general (Soares, 2019)
    - Exporters' higher markups reflect more imperfect competition (Dobbelaere and Kiyota, 2018)
    - Firms' markup negatively related to wages, but appear increasing over time from the 1980s, partly driven by high markup firms (superstars) (Syverson, 2019, De Loecker et al., 2020; Autor et al, 2020)
    - Conclusions often rest on the ratio-estimator (DeLoecker and Warzynski 2012). Problematic identification issues arising from using a revenue elasticity in place of the output elasticity (Bond et al., 2021; Doraszelski and Jaumandreu, 2021).

- Contribution:
    - Use the establishment of new free-trade agreements to provide (potential) exogeneous variation in marginal production(sales) costs for exporters
    - Study the impact of such agreements on:
        - Firms' exports, their markups (while avoiding the ratio-estimator), and performance (roa),
        - worker pay across different levels of bargaining power and monopsonistic power.

Institutional background

- Norway is a small open economy, having trade agreements with 80 countries, trade agreements with key partners 50-150 years old (1874)
  - Norway negotiated free-trade agreements with other countries primarily through the European Free Trade Association (EFTA established 1960)
  - Norway is currently negotiating with China, India, Malaysia, Moldova, Vietnam, Brazil, Argentina, Uruguay, and Paraguay.

- The free-trade agreements secure Norwegian access to international markets and fasciliate and simplify trade with partner countries (e.g., by reducing tariffs and reduce bureaucracy). They are an important part of Norwegian trade policy.

- Our focus: 19 new modern day agreements established during the period 2004-2009, excluding the EU-expansion. Control: no agreement countries+countries w/historical agreements 30-60 years (original EU, USA, UK)

Free-trade agreements between Norway and trading countries outside the EEA 2004-2009

		In force			In force
Albany	17.12.2009	1.08.2011	Lebanon	24.06.2004	1.01.2007
Canada	26.01.2008	1.07.2009	Serbia	17.12.2009	1.07.2011
Colombia	25.11.2008	1.09.2014	South Korea	15.12.2005	1.09.2006
Egypt	27.01.2007	1.08.2007	South Africa	1.06.2006	1.05.2008
Bahrain	27.06.2009	1.07.2014	Botswana	14.07.2006	1.05.2008
United Arabic Emirates	27.06.2009	1.07.2014	Lesotho	7.08.2006	1.05.2008
Kuwait	27.06.2009	1.07.2014	Namibia	14.07.2006	1.05.2008
Oman	27.06.2009	1.07.2014	Swaziland	7.08.2006	1.05.2008
Qatar	27.06.2009	1.07.2014	Tunis	17.12.2004	1.08.2005
Saudi-Arabia	27.06.2009	1.07.2014			

EU-expansion excluded

Data

- Statistics Norway's administrative register data (2000-2018)
  - Comprise all workers, workplaces, and firms during this period. Information on educational qualifications, age, where they live, pay, working hours, individual union membership, occupations, industry, location, trade union agreement.

- Main sample:
  - Manufacturing firms with at least 2 employees,
  - Registered in Statistics Norway's Structural Statistics, in the Accounting registers and in the Import and Export register, yielding after country restrictions. 2800 firms exporting 193 countries and 19 new trade agreements. Firms exporting to countries introducing free-trade agreements 2000-2003 and 2010-2018 discarded. Balanced firmXdestination country panel
  - Individual analyses: earnings reported to the Tax Authorities including taxable fringe benefits. Hourly wage constructed from spell-specific earnings and weekly working hours and spell length
  - Link in information from OECD (destination country product market regulation index), World Bank (destination country exchange rates) and ILO (destination country employment), and Norwegian Labour and Welfare Organization (occupational vacancy/unemployment data)

IW-estimator of Sun and Abraham (2021)

- Dynamic two-way fixed effects specification, 6 cohorts (agreements 2004-2009)

- Firm f Xdestination country c:

$$lnY_{cft} = \delta_0 + \sum_{t=y-4}^{t=y-2} \delta_t B_{cft} + \sum_{t=0}^{t=y+9} \delta_t P_{cft} + t_t + \delta_c X_{cft} + \theta_{cf} + \nu_{cft},$$
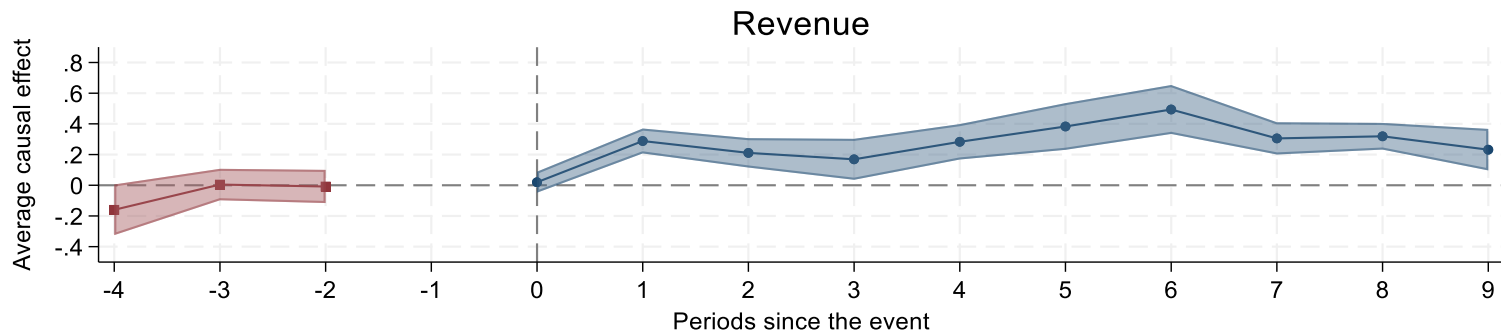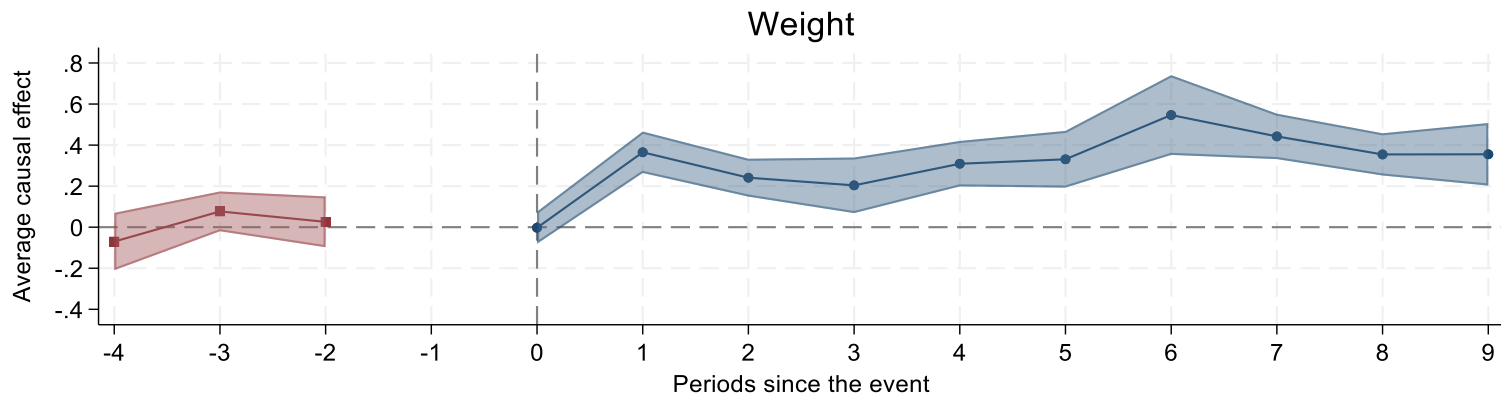
- Firm f:

$$ROA_{ft} = \delta_0 + \sum_{t=y-4}^{t=y-2} \delta_t B_{ft} + \sum_{t=0}^{t=y+9} \delta_t P_{ft} + t_t + \delta_c X_{ft} + \theta_f + \nu_{ft},$$
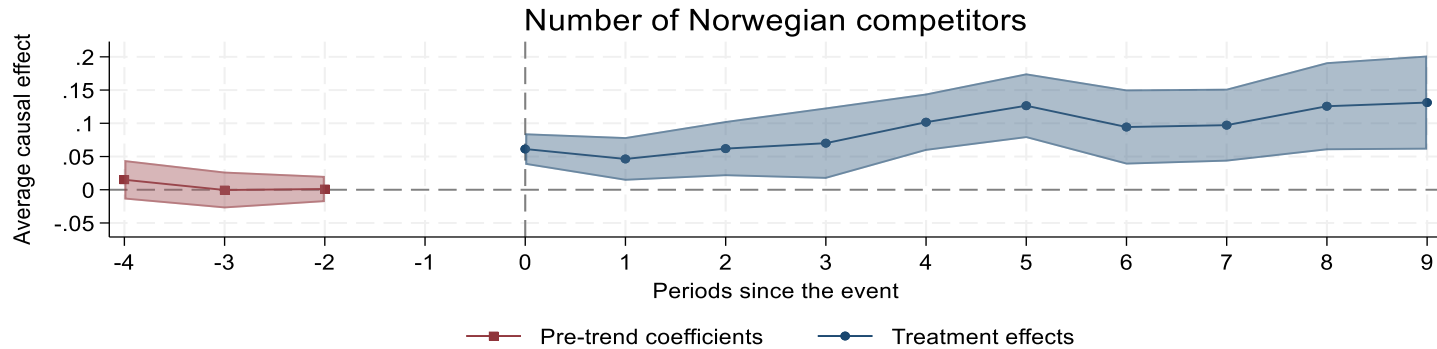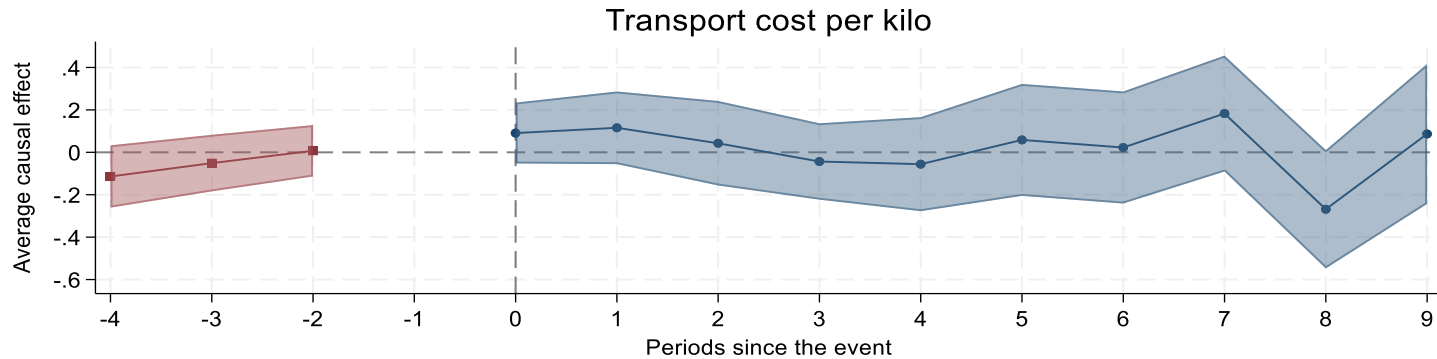
- Worker iXfirm f:

$$lnW_{ift} = \delta_0 + \sum_{t=y-4}^{t=y-2} \delta_t B_{ift} + \sum_{t=0}^{t=y+9} \delta_t P_{ift} + t_t + \delta_c X_{ift} + \theta_{if} + \nu_{ift},$$

Free trade agreements and exports 1

IW-estimator of Sun and Abraham (2021)

Free-trade agreements and exports 2

Transport cost per kilo

Number of Norwegian competitors

Pre-trend coefficients   Treatment effects

IW-estimator of Sun and Abraham (2021)

Inference on the export product mark-up

- Consider two Cobb-Douglas production functions:

$$R = A_R e^{\omega_R} L^{\beta_{RL}} K^{\beta_{Rk}} \text{ and } Y = A_Y e^{\omega_Y} L^{\beta_{YL}} K^{\beta_{Yk}}$$

- Firm's revenue: R(Y)= P(Y)Y where P(Y)=inverse product demand

- Then $\widehat{\omega}_P(\widehat{\omega}_Y) = \widehat{\omega}_R - \widehat{\omega}_Y$

- Profit max w.t.L: $\frac{\partial R(Y)}{\partial L} = \frac{\partial C(Y)}{\partial L}$ implying $\frac{\partial C(Y)/\partial Y}{P} = 1 + \epsilon_Y^P$ thus $\mu = \frac{1}{1+\epsilon_Y^P}$

  and $\frac{\partial \mu}{\partial x} = -\frac{1}{(1+\epsilon_Y^P)^2} \frac{\partial \epsilon_Y^P}{\partial x}$

Inference on the export product mark-up 2

- Follow Dhyne et al. (2021) implementation of Ackerman et al. (2015)/ Gandi et al. (2020) control-function approach into multi-product setting:

- Assume $Y = g(Y_1, ., Y_n) = Y_1^{\alpha_1} Y_2^{\alpha_2} Y_3^{\alpha_3} = \omega' L^{\beta_L} K^{\beta_k}$, $\alpha_1 + \alpha_2 + \alpha_3 = 1$

- $lnR_{cft}^{exp} = \beta^L lnL_{ft} + \beta^k lnK_{ft} - \beta^e lnR_{\Sigma f \neq ct}^{exp} - \beta^R lnR_{ft}^{dom} + \gamma_t + \omega_{cft}^R + \varepsilon_{cft}$

- $lnQ_{cft}^{exp} = \beta^L lnL_{ft} + \beta^k lnK_{ft} - \beta^e lnQ_{\Sigma f \neq ct}^{exp} - \beta^R lnQ_{ft}^{dom} + \gamma_t + \omega_{cft}^Y + \varepsilon_{cft}$

- Estimate: $\widehat{\omega}_{Pcft} = k_f + \epsilon_{Yct}^P \widehat{\omega}_{Ycft} + \xi_{ft}$
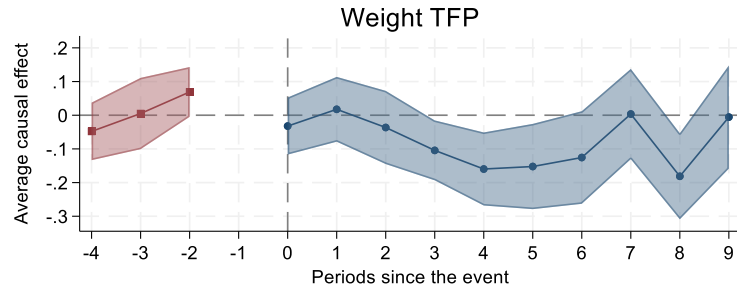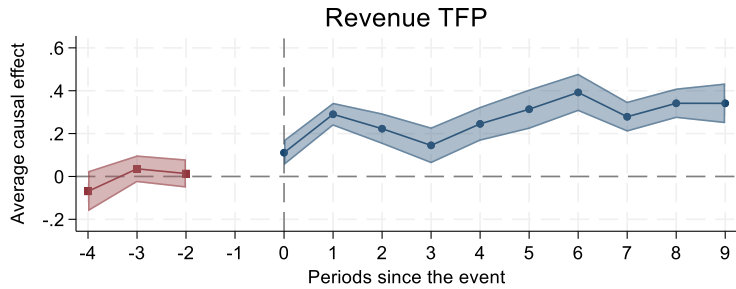
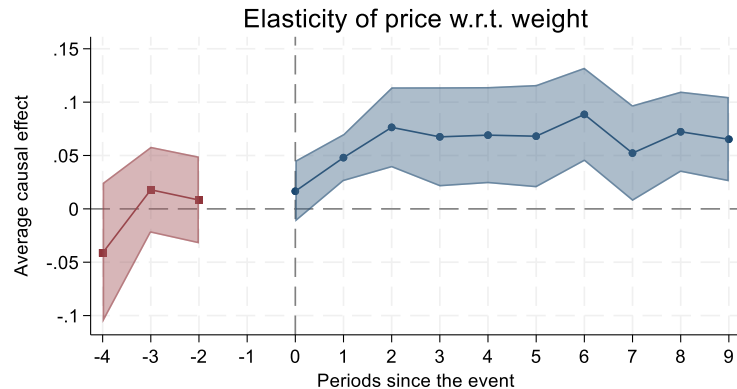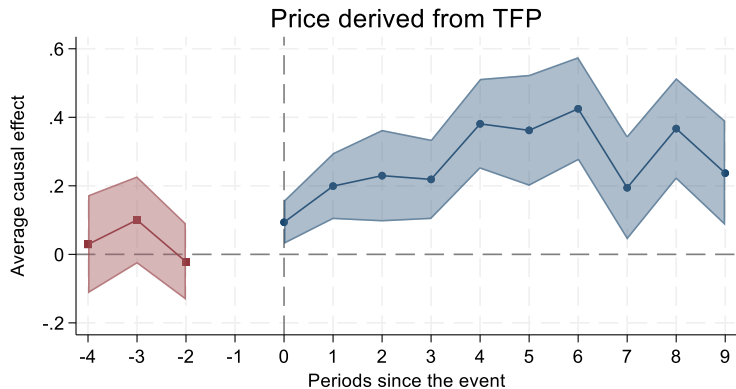 ϵ_{Yct}^P = Country and time-specific price elasticity

Inference on the export product mark-up 3

FOR SAMFUNNS-FORSKNING

	Revenue(value added)				Weight	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Ln L	0.301^{**}	0.501^{**}	0.471^{**}	0.388^{**}	0.435^{**}	0.499^{**}
	(0.002)	(0.004)	(0.106)	(0.002)	(0.022)	(0.001)
Ln C	-0.042^{**}	0.253^{**}	0.233^{**}	0.037^{**}	0.353^{**}	0.340^{**}
	(0.011)	(0.048)	(0.071)	(0.009)	(0.015)	(0.001)
$LnR^{\text{all other countries}}$		-0.239^{**}	-0.250^{**}			
		(0.036)	(0.057)			
$LnQ^{\text{all other countries}}$					-0.126^{**}	-0.150^{**}
					(0.015)	(0.002)
LnR^{domestic}		-0.153^{**}	-0.075^{**}			
		(0.012)	(0.006)			
LnQ^{domestic}					-0.736^{**}	-0.710^{**}
					(0.009)	(0.001)
Endogenous:			LnR^{dom} $LnR^{\text{all other countries}}$			LnQ^{dom} $LnQ^{\text{all other countries}}$
FXC	51909	51909	51909	48589	48589	48589
N (FxT)	238282	238282	238282	242144	248222	248222

Free-trade agreements and exports 3

Free-trade agreements and profits

IW-estimator of Sun and Abraham (2021)
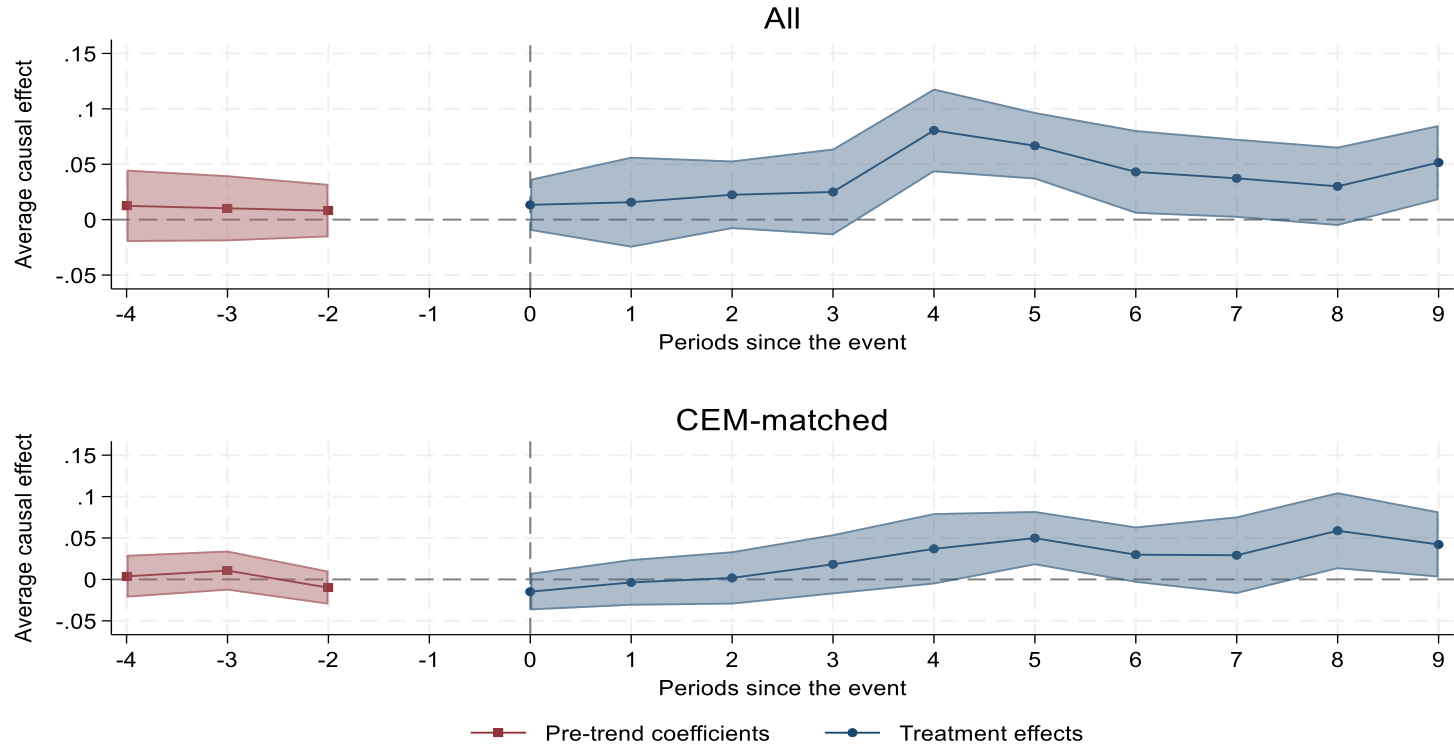
Do free-trade agreements affect log hourly wages?

- See Abowd and Lemieux (1993),Dobbelaere and Kiyota(2018) and Dodini et al(2022)
- Efficient Nash bargaining (on wages AND employment):

$$W^U = \left\{ \frac{1}{\mu} \frac{\epsilon_L^Q}{(1+\theta)} + \frac{\theta}{1+\theta} \right\} \frac{R}{L}, \theta = \frac{\gamma}{1-\gamma}$$

- Pure Nash wage bargaining (only wages)

$$W^U = \left\{ \frac{\epsilon_L^Q}{\mu} - g(\epsilon_W^L) \frac{L}{R} + \theta \right\} \frac{R}{L}, \theta = \frac{\gamma}{1-\gamma}, \text{ and } \overline{W} = \frac{\epsilon_L^Q}{\mu} \frac{R}{L}$$
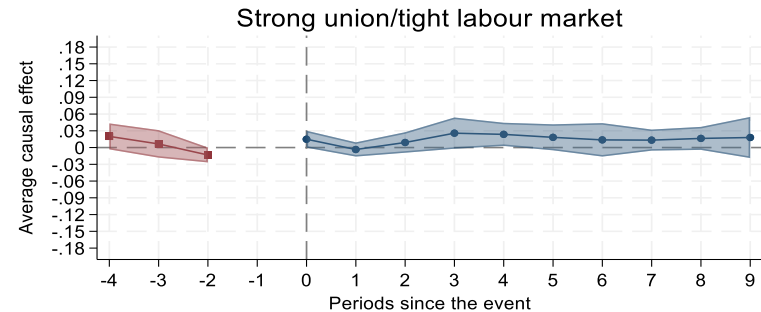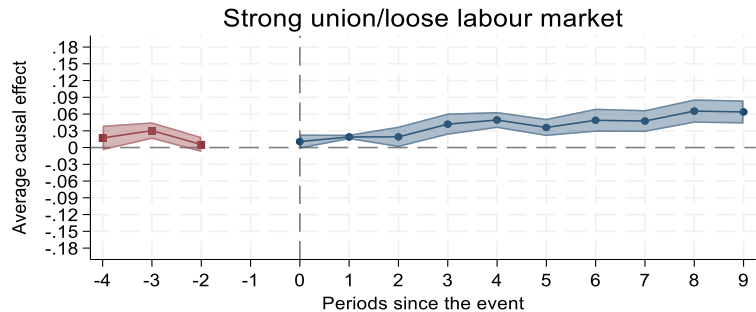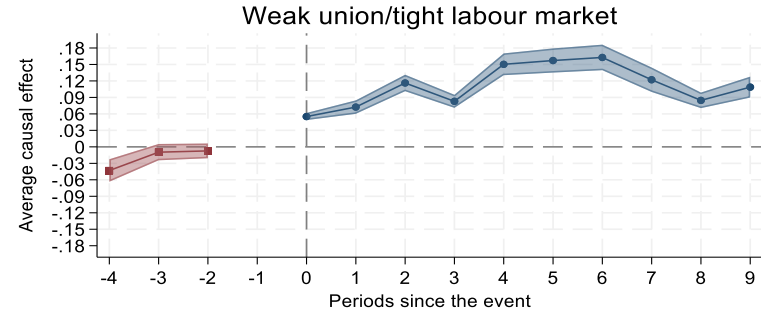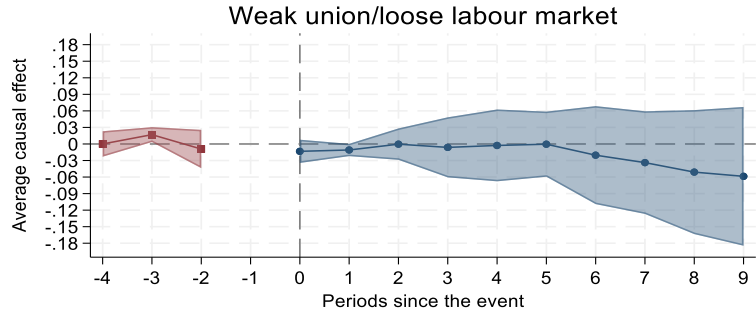
- In both cases, $\frac{\partial lnW^U}{\partial \mu} < 0$, where higher θs (stronger unions) mitigate this. But only for pure wage bargaining is $\frac{\partial lnW^U}{\partial \mu}$ sensitive to employer monopsony powers.

Free-trade agreements, pay and occupations

	All		White collar	Blue collar	Union	Non-union
	FE	IW-FE	IW-FE	IW-FE	IW-FE	IW-FE
F4event	-0.021	**-0.033****	**-0.036****	**-0.013**[x]	**-0.022***	**-0.058****
	(0.020)	(0.010)	(0.014)	(0.006)	(0.008)	(0.014)
F3event	0.0001	-0.003	0.006	-0.008	-0.003	0.001
	(0.014)	(0.004)	(0.009)	(0.009)	(0.005)	(0.007)
F2event	-0.006	-0.006	-0.007	-0.001	-0.003	-0.017
	(0.015)	(0.007)	(0.006)	(0.006)	(0.005)	(0.007)
L0event	0.015	**0.013****	**0.023****	**-0.005**[x]	**0.013****	0.007
	(0.015)	(0.004)	(0.005)	(0.003)	(0.004)	(0.005)
L1event	0.030	**0.023****	**0.031****	0.001	**0.012****	**0.033****
	(0.020)	(0.003)	(0.003)	(0.003)	(0.003)	(0.007)
L2event	**0.041**[x]	**0.033****	**0.045****	-0.005	**0.019****	**0.047****
	(0.022)	(0.008)	(0.011)	(0.005)	(0.006)	(0.015)
L3event	**0.045***	**0.042****	**0.048****	0.003	**0.026****	**0.061****
	(0.020)	(0.011)	(0.012)	(0.015)	(0.009)	(0.018)
L4event	**0.056**[x]	**0.053****	**0.061****	-0.005	**0.034****	**0.082****
	(0.028)	(0.014)	(0.011)	(0.019)	(0.013)	(0.017)
L5event	0.052	**0.048****	**0.055****	-0.009	**0.034****	**0.072****
	(0.031)	(0.014)	(0.013)	(0.018)	(0.013)	(0.016)
L6event	0.055	**0.051***	**0.057****	-0.012	**0.038**[x]	**0.076****
	(0.034)	(0.019)	(0.013)	(0.030)	(0.018)	(0.022)
L7event	0.039	**0.039**[x]	**0.048****	-0.025	0.027	**0.064****
	(0.028)	(0.019)	(0.012)	(0.031)	(0.020)	(0.019)
L8event	0.036	**0.038**[x]	**0.042****	-0.027	0.034	**0.058***
	(0.026)	(0.022)	(0.009)	(0.038)	(0.024)	(0.022)
L9event	0.038	**0.040**[x]	0.044**	-0.029	0.033	**0.058***
	(0.029)	(0.023)	(0.009)	(0.038)	(0.025)	(0.026)
Average treatment effect	0.041	**0.038****	**0.045****	-0.011	**0.027***	**0.056****
N (WxFxT)	922742	922742	371400	549609	614441	302441

Free-trade agreements, pay and labour market conditions

Conclusion

- The Norwegian government motivate the importance of free-trade agreements by the allegation that they secure Norwegian firms access to international markets and fasciliate and simplify trade with partner countries.

- What happens when a free-trade agreements is signed?
  - Both export revenues and export weight to these countries increase.
  - The number of Norwegian competitors in these countries also increases.
  - The mark-up of the Norwegian incumbent firms in these countries drop.
  - Firm return on assets increases
  - On average, workers' hourly wage increases, but this depends on occupations, bargaining strength and labour market thightness. Nobody looses money.

- From the incumbent firms' and their workers' perspective, the introduction of these agreements have thus been successful.