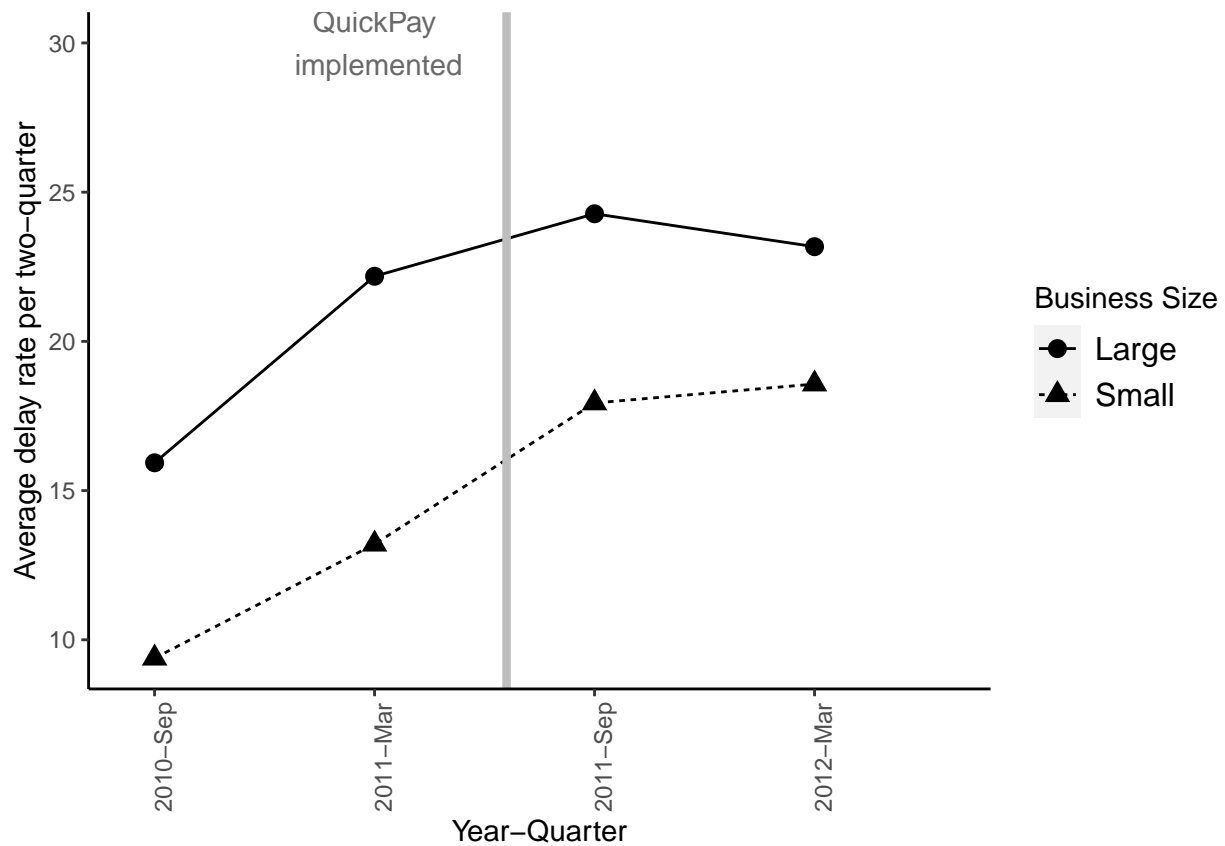


Delay Rate (Two Quarters): QuickPay (2009-2012)

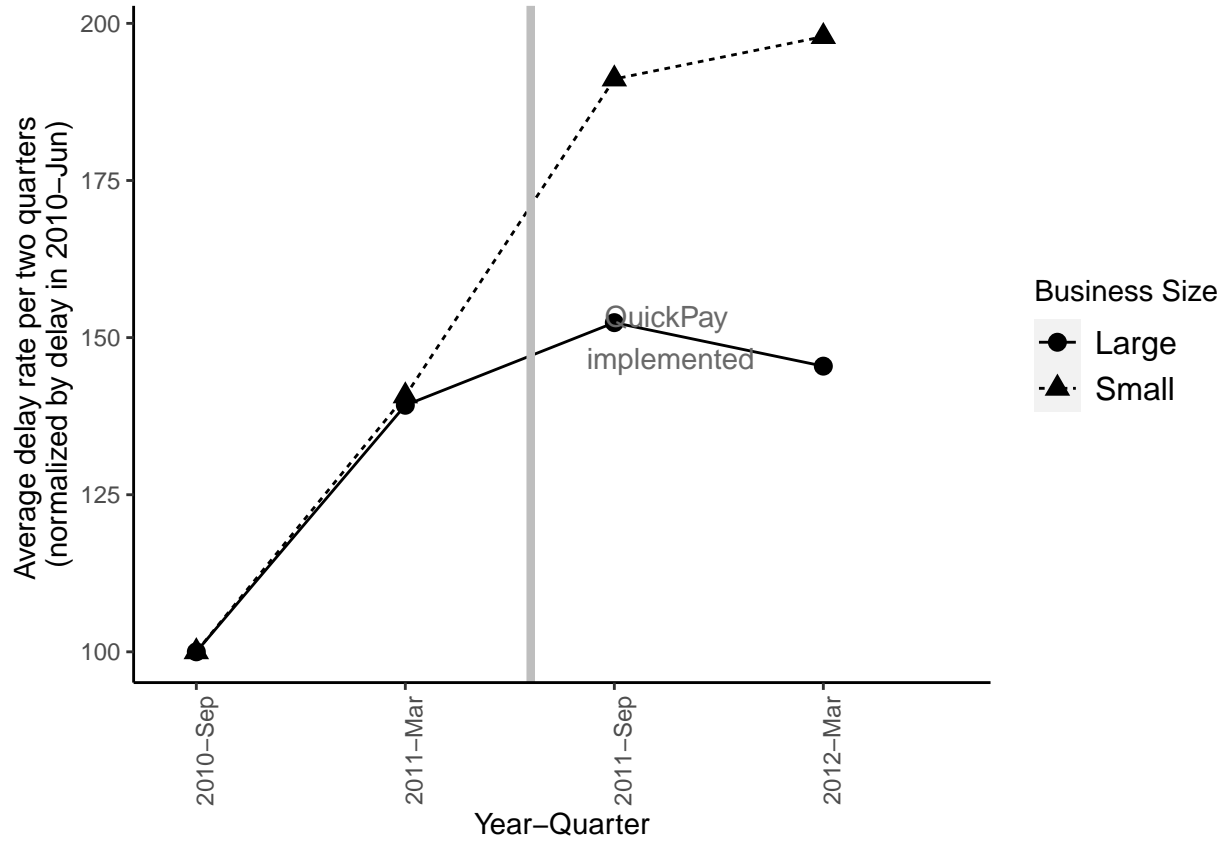
Nov 22, 2022

1 Delays over time

- Sample restricted to projects for which start dates matches the one in API
 - This is done by using first reported “action_date” and “date_signed”



1.1 Normalized delay rate



2 Full Sample Regressions

2.1 5% Winsorization

$$\begin{aligned}
 DelayRate_{it} = & \alpha + \beta_0 Treat_i + \beta_1 Post_t + \beta_2 (Treat_i \times Post_t) \\
 & + X_i + (Post_t \times X_i) + \mu_t + \theta_{firm} + \lambda_{task} + \epsilon_{it}
 \end{aligned}$$

2.1.1.1 One Quarter – One type

Table 1: Effect of QuickPay on project delay rates

	<i>DelayRate_{it}</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Treat_i</i>	−1.78*** (0.20)	−1.44*** (0.21)	−1.47*** (0.21)	−1.46*** (0.22)	−1.63*** (0.22)
<i>Post_t</i>	1.22*** (0.20)	−14.20*** (1.24)			
<i>Treat_i × Post_t</i>	1.77*** (0.26)	2.35*** (0.27)	2.40*** (0.27)	1.94*** (0.27)	1.93*** (0.27)
Constant	8.53*** (0.16)	32.73*** (1.00)			
Duration, Budget, Bids	No	Yes	Yes	Yes	Yes
<i>Post_t × (Duration, Budget, Bids)</i>	No	Yes	Yes	Yes	Yes
Year-Quarter fixed effects	No	No	Yes	Yes	Yes
Task fixed effects	No	No	No	Yes	Yes
Industry fixed effects	No	No	No	No	Yes
Observations	193,028	176,032	176,032	176,032	176,032
R ²	0.002	0.04	0.04	0.08	0.08
Adjusted R ²	0.002	0.04	0.04	0.07	0.07

Note:

*p<0.1; **p<0.05; ***p<0.01

Each observation is a project-quarter.

SEs are robust and clustered at the project level.

Sample restricted to contractors holding one type of project.

2.1.2 Two-Quarters

Table 2: Effect of QuickPay on project delay rates

	<i>DelayRate_{it}</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Treat_i</i>	-4.65*** (0.54)	-3.28*** (0.58)	-3.49*** (0.58)	-3.19*** (0.61)	-3.39*** (0.62)
<i>Post_t</i>	4.26*** (0.56)	-27.19*** (3.55)			
<i>Treat_i × Post_t</i>	4.50*** (0.73)	5.76*** (0.79)	6.00*** (0.79)	5.17*** (0.80)	5.09*** (0.80)
Constant	19.78*** (0.43)	58.50*** (2.64)			
Duration, Budget, Bids	No	Yes	Yes	Yes	Yes
<i>Post_t × (Duration, Budget, Bids)</i>	No	Yes	Yes	Yes	Yes
Year-Quarter fixed effects	No	No	Yes	Yes	Yes
Task fixed effects	No	No	No	Yes	Yes
Industry fixed effects	No	No	No	No	Yes
Observations	82,002	74,580	74,580	74,580	74,580
R ²	0.004	0.05	0.05	0.10	0.10
Adjusted R ²	0.004	0.05	0.05	0.08	0.09

Note:

*p<0.1; **p<0.05; ***p<0.01

Each observation is a project-quarter.

SEs are robust and clustered at the project level.

Sample restricted to contractors holding one type of project.

2.2 2.5% Winsorization

$$\begin{aligned}
 DelayRate_{it} = & \alpha + \beta_0 Treat_i + \beta_1 Post_t + \beta_2 (Treat_i \times Post_t) \\
 & + X_i + (Post_t \times X_i) + \mu_t + \theta_{firm} + \lambda_{task} + \epsilon_{it}
 \end{aligned}$$

2.2.1 One Quarter

Table 3: Effect of QuickPay on project delay rates

	<i>DelayRate_{it}</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Treat_i</i>	-5.22*** (0.23)	-4.32*** (0.24)	-4.30*** (0.24)	-3.21*** (0.24)	-3.25*** (0.24)
<i>Post_t</i>	2.22*** (0.24)	-0.48 (0.49)			
<i>Treat_i × Post_t</i>	2.08*** (0.30)	2.64*** (0.32)	2.64*** (0.32)	2.18*** (0.31)	2.25*** (0.31)
Constant	12.26*** (0.19)	23.63*** (0.37)			
Duration, Budget, Bids	No	Yes	Yes	Yes	Yes
<i>Post_t × (Duration, Budget, Bids)</i>	No	Yes	Yes	Yes	Yes
Year-Quarter fixed effects	No	No	Yes	Yes	Yes
Task fixed effects	No	No	No	Yes	Yes
Industry fixed effects	No	No	No	No	Yes
Observations	287,530	263,488	263,488	263,488	263,488
R ²	0.004	0.04	0.04	0.07	0.07
Adjusted R ²	0.004	0.04	0.04	0.07	0.07

Note:

*p<0.1; **p<0.05; ***p<0.01

Each observation is a project-quarter.

SEs are robust and clustered at the project level.

2.2.2 Two-Quarters

Table 4: Effect of QuickPay on project delay rates

	<i>DelayRate_{it}</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Treat_i</i>	-10.70*** (0.59)	-8.44*** (0.62)	-8.46*** (0.62)	-5.53*** (0.63)	-5.34*** (0.64)
<i>Post_t</i>	6.48*** (0.64)	-1.54 (1.32)			
<i>Treat_i × Post_t</i>	3.59*** (0.80)	4.99*** (0.86)	5.01*** (0.87)	3.84*** (0.87)	4.04*** (0.87)
Constant	25.60*** (0.49)	44.93*** (0.94)			
Duration, Budget, Bids	No	Yes	Yes	Yes	Yes
<i>Post_t × (Duration, Budget, Bids)</i>	No	Yes	Yes	Yes	Yes
Year-Quarter fixed effects	No	No	Yes	Yes	Yes
Task fixed effects	No	No	No	Yes	Yes
Industry fixed effects	No	No	No	No	Yes
Observations	122,172	111,681	111,681	111,681	111,681
R ²	0.01	0.04	0.05	0.10	0.10
Adjusted R ²	0.01	0.04	0.05	0.09	0.09

Note:

*p<0.1; **p<0.05; ***p<0.01

Each observation is a project-quarter.

SEs are robust and clustered at the project level.

2.3 2.5% Truncation

$$\begin{aligned}
 DelayRate_{it} = & \alpha + \beta_0 Treat_i + \beta_1 Post_t + \beta_2 (Treat_i \times Post_t) \\
 & + X_i + (Post_t \times X_i) + \mu_t + \theta_{firm} + \lambda_{task} + \epsilon_{it}
 \end{aligned}$$

2.3.1 One Quarter

Table 5: Effect of QuickPay on project delay rates

	<i>DelayRate_{it}</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Treat_i</i>	−3.09*** (0.18)	−2.56*** (0.18)	−2.54*** (0.18)	−2.16*** (0.18)	−2.30*** (0.18)
<i>Post_t</i>	0.26 (0.18)	−1.43*** (0.38)			
<i>Treat_i × Post_t</i>	1.16*** (0.22)	1.28*** (0.23)	1.26*** (0.23)	1.09*** (0.23)	1.09*** (0.23)
Constant	7.67*** (0.15)	17.07*** (0.30)			
Duration, Budget, Bids	No	Yes	Yes	Yes	Yes
<i>Post_t × (Duration, Budget, Bids)</i>	No	Yes	Yes	Yes	Yes
Year-Quarter fixed effects	No	No	Yes	Yes	Yes
Task fixed effects	No	No	No	Yes	Yes
Industry fixed effects	No	No	No	No	Yes
Observations	277,791	253,749	253,749	253,749	253,749
R ²	0.002	0.04	0.05	0.09	0.09
Adjusted R ²	0.002	0.04	0.05	0.08	0.08

Note:

*p<0.1; **p<0.05; ***p<0.01

Each observation is a project-quarter.

SEs are robust and clustered at the project level.

2.3.2 Two-Quarters

Table 6: Effect of QuickPay on project delay rates

	<i>DelayRate_{it}</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Treat_i</i>	−8.68*** (0.52)	−6.83*** (0.55)	−6.85*** (0.55)	−5.20*** (0.55)	−5.24*** (0.55)
<i>Post_t</i>	0.23 (0.55)	−3.90*** (1.13)			
<i>Treat_i × Post_t</i>	3.50*** (0.68)	3.92*** (0.74)	3.92*** (0.74)	3.15*** (0.73)	3.17*** (0.74)
Constant	21.25*** (0.43)	38.94*** (0.84)			
Duration, Budget, Bids	No	Yes	Yes	Yes	Yes
<i>Post_t × (Duration, Budget, Bids)</i>	No	Yes	Yes	Yes	Yes
Year-Quarter fixed effects	No	No	Yes	Yes	Yes
Task fixed effects	No	No	No	Yes	Yes
Industry fixed effects	No	No	No	No	Yes
Observations	118,197	107,706	107,706	107,706	107,706
R ²	0.004	0.05	0.05	0.10	0.10
Adjusted R ²	0.004	0.05	0.05	0.09	0.09

Note:

*p<0.1; **p<0.05; ***p<0.01

Each observation is a project-quarter.

SEs are robust and clustered at the project level.

3 Logistic Regression for Positive Delays

3.1 One Quarter

3.2 Two Quarter

4 Sample with Non-Zero Delays

4.1 5% winsorization on full sample

$$\begin{aligned}
 DelayRate_{it} = & \alpha + \beta_0 Treat_i + \beta_1 Post_t + \beta_2 (Treat_i \times Post_t) \\
 & + X_i + (Post_t \times X_i) + \mu_t + \theta_{firm} + \lambda_{task} + \epsilon_{it}
 \end{aligned}$$

- Winsorization on full sample replaces extreme values
- In this specific case, extreme lower bound values got replaced by zero
- That is, all negative delays get replaced by zero
- So in effect, when we are focusing on subsample with non-zero winsorized delay, we are looking at observations with positive actual delay. That is, we no longer have observations with negative real delay in the data.

	$I(\text{Delay}_{it} > 0)$				
	(1)	(2)	(3)	(4)	(5)
Constant	-2.05*** (0.01)	-0.94*** (0.02)			
$Treat_i$	-0.42*** (0.02)	-0.24*** (0.02)	-0.24*** (0.02)	-0.17*** (0.03)	-0.20*** (0.03)
$Post_t$	0.10*** (0.02)	-0.32*** (0.03)			
$Treat_i \times Post_t$	0.18*** (0.03)	0.16*** (0.03)	0.16*** (0.03)	0.13*** (0.03)	0.13*** (0.03)
Duration, Budget, Bids	No	Yes	Yes	Yes	Yes
$Post_t \times (\text{Duration, Budget, Bids})$	No	Yes	Yes	Yes	Yes
Year-Quarter FE	No	No	Yes	Yes	Yes
Task FE	No	No	No	Yes	Yes
Contractor FE	No	No	No	No	Yes
AIC	192105.94	169728.46			
BIC	192148.21	169833.28			
Log Likelihood	-96048.97	-84854.23			
Deviance	192097.94	169708.46	168714.31	155008.15	154261.99
Num. obs.	287530	263488	263488	260905	260857

Each observation is a project-quarter. SEs are robust and clustered at the project level.

Table 7: Logistic Regression: One Quarter Delay

4.1.1 One Quarter

Table 9: Effect of QuickPay on project delay rates

	DelayRate_{it}				
	(1)	(2)	(3)	(4)	(5)
$Treat_i$	-9.22*** (0.69)	-9.34*** (0.69)	-9.38*** (0.68)	-7.62*** (0.70)	-7.54*** (0.71)
$Post_t$	2.29*** (0.54)	-0.51 (0.78)			
$Treat_i \times Post_t$	6.78*** (0.82)	6.62*** (0.82)	6.67*** (0.81)	6.25*** (0.80)	6.56*** (0.81)
Constant	73.51*** (0.45)	73.36*** (0.61)			
Duration, Budget, Bids	No	Yes	Yes	Yes	Yes
$Post_t \times (\text{Duration, Budget, Bids})$	No	Yes	Yes	Yes	Yes
Year-Quarter fixed effects	No	No	Yes	Yes	Yes
Task fixed effects	No	No	No	Yes	Yes
Industry fixed effects	No	No	No	No	Yes
Observations	30,138	30,130	30,130	30,130	30,130
R ²	0.01	0.02	0.03	0.14	0.14
Adjusted R ²	0.01	0.02	0.03	0.11	0.12

Note:

*p<0.1; **p<0.05; ***p<0.01

Each observation is a project-quarter.
SEs are robust and clustered at the project level.

	$I(\text{Delay}_{it} > 0)$				
	(1)	(2)	(3)	(4)	(5)
Constant	-1.63*** (0.02)	-0.66*** (0.03)			
$Treat_i$	-0.43*** (0.03)	-0.23*** (0.03)	-0.24*** (0.03)	-0.17*** (0.03)	-0.18*** (0.03)
$Post_t$	0.14*** (0.02)	-0.24*** (0.04)			
$Treat_i \times Post_t$	0.17*** (0.03)	0.14*** (0.04)	0.15*** (0.04)	0.11*** (0.04)	0.11*** (0.04)
Duration, Budget, Bids	No	Yes	Yes	Yes	Yes
$Post_t \times (\text{Duration, Budget, Bids})$	No	Yes	Yes	Yes	Yes
Year-Quarter FE	No	No	Yes	Yes	Yes
Task FE	No	No	No	Yes	Yes
Contractor FE	No	No	No	No	Yes
AIC	103653.12	90445.89			
BIC	103691.97	90542.12			
Log Likelihood	-51822.56	-45212.94			
Deviance	103645.12	90425.89	90246.58	81486.80	80974.48
Num. obs.	122172	111681	111681	110106	110066

Each observation is a project-quarter. SEs are robust and clustered at the project level.

Table 8: Logistic Regression: Two Quarter Delay

4.1.2 Two Quarters

Table 10: Effect of QuickPay on project delay rates

	DelayRate_{it}				
	(1)	(2)	(3)	(4)	(5)
$Treat_i$	-16.47*** (1.60)	-16.73*** (1.60)	-16.59*** (1.59)	-12.45*** (1.64)	-11.87*** (1.66)
$Post_t$	9.03*** (1.33)	-0.10 (2.00)			
$Treat_i \times Post_t$	11.55*** (1.97)	11.12*** (1.97)	11.09*** (1.96)	10.11*** (1.95)	10.45*** (1.95)
Constant	119.88*** (1.08)	122.61*** (1.53)			
Duration, Budget, Bids	No	Yes	Yes	Yes	Yes
$Post_t \times (\text{Duration, Budget, Bids})$	No	Yes	Yes	Yes	Yes
Year-Quarter fixed effects	No	No	Yes	Yes	Yes
Task fixed effects	No	No	No	Yes	Yes
Industry fixed effects	No	No	No	No	Yes
Observations	18,616	18,609	18,609	18,609	18,609
R ²	0.02	0.03	0.03	0.18	0.18
Adjusted R ²	0.02	0.02	0.03	0.14	0.14

Note:

*p<0.1; **p<0.05; ***p<0.01

Each observation is a project-quarter.
SEs are robust and clustered at the project level.

4.2 2.5% winsorization on non-zero sample

$$\begin{aligned} DelayRate_{it} = & \alpha + \beta_0 Treat_i + \beta_1 Post_t + \beta_2 (Treat_i \times Post_t) \\ & + X_i + (Post_t \times X_i) + \mu_t + \theta_{firm} + \lambda_{task} + \epsilon_{it} \end{aligned}$$

4.2.1 One Quarter

Table 11: Effect of QuickPay on project delay rates

	<i>DelayRate_{it}</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Treat_i</i>	-24.72*** (2.43)	-24.71*** (2.44)	-24.59*** (2.42)	-15.28*** (2.49)	-13.41*** (2.54)
<i>Post_t</i>	15.46*** (2.15)	3.48 (2.95)			
<i>Treat_i × Post_t</i>	25.24*** (3.07)	24.34*** (3.07)	24.07*** (3.05)	22.04*** (3.03)	22.49*** (3.05)
Constant	118.01*** (1.72)	124.90*** (2.22)			
Duration, Budget, Bids	No	Yes	Yes	Yes	Yes
<i>Post_t × (Duration, Budget, Bids)</i>	No	Yes	Yes	Yes	Yes
Year-Quarter fixed effects	No	No	Yes	Yes	Yes
Task fixed effects	No	No	No	Yes	Yes
Industry fixed effects	No	No	No	No	Yes
Observations	32,707	32,699	32,699	32,699	32,699
R ²	0.01	0.02	0.02	0.14	0.15
Adjusted R ²	0.01	0.02	0.02	0.12	0.12

Note:

*p<0.1; **p<0.05; ***p<0.01

Each observation is a project-quarter.

SEs are robust and clustered at the project level.

4.2.2 Two Quarters

Table 12: Effect of QuickPay on project delay rates

	<i>DelayRate_{it}</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Treat_i</i>	-26.92*** (3.28)	-26.68*** (3.27)	-26.37*** (3.25)	-16.57*** (3.35)	-14.83*** (3.39)
<i>Post_t</i>	19.70*** (2.95)	3.33 (4.34)			
<i>Treat_i × Post_t</i>	24.39*** (4.26)	23.17*** (4.24)	23.12*** (4.22)	21.01*** (4.20)	21.41*** (4.22)
Constant	145.54*** (2.29)	164.54*** (3.14)			
Duration, Budget, Bids	No	Yes	Yes	Yes	Yes
<i>Post_t × (Duration, Budget, Bids)</i>	No	Yes	Yes	Yes	Yes
Year-Quarter fixed effects	No	No	Yes	Yes	Yes
Task fixed effects	No	No	No	Yes	Yes
Industry fixed effects	No	No	No	No	Yes
Observations	20,072	20,065	20,065	20,065	20,065
R ²	0.01	0.02	0.02	0.17	0.18
Adjusted R ²	0.01	0.02	0.02	0.13	0.14

Note:

*p<0.1; **p<0.05; ***p<0.01

Each observation is a project-quarter.

SEs are robust and clustered at the project level.

4.3 2.5% truncation on non-zero sample

$$\begin{aligned}
 DelayRate_{it} = & \alpha + \beta_0 Treat_i + \beta_1 Post_t + \beta_2 (Treat_i \times Post_t) \\
 & + X_i + (Post_t \times X_i) + \mu_t + \theta_{firm} + \lambda_{task} + \epsilon_{it}
 \end{aligned}$$

4.3.1 One Quarter

Table 13: Effect of QuickPay on project delay rates

	<i>DelayRate_{it}</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Treat_i</i>	-21.32*** (2.22)	-21.89*** (2.23)	-21.82*** (2.22)	-12.79*** (2.24)	-10.76*** (2.28)
<i>Post_t</i>	14.83*** (1.88)	-0.38 (2.59)			
<i>Treat_i × Post_t</i>	20.95*** (2.73)	19.97*** (2.72)	19.86*** (2.71)	18.00*** (2.67)	18.48*** (2.68)
Constant	116.22*** (1.55)	112.15*** (2.02)			
Duration, Budget, Bids	No	Yes	Yes	Yes	Yes
<i>Post_t × (Duration, Budget, Bids)</i>	No	Yes	Yes	Yes	Yes
Year-Quarter fixed effects	No	No	Yes	Yes	Yes
Task fixed effects	No	No	No	Yes	Yes
Industry fixed effects	No	No	No	No	Yes
Observations	31,077	31,069	31,069	31,069	31,069
R ²	0.01	0.03	0.04	0.18	0.19
Adjusted R ²	0.01	0.03	0.04	0.15	0.16

Note:

*p<0.1; **p<0.05; ***p<0.01

Each observation is a project-quarter.

SEs are robust and clustered at the project level.

4.3.2 Two Quarters

- 2.5% truncation done after calculating 2Q delays

Table 14: Effect of QuickPay on project delay rates

	<i>DelayRate_{it}</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Treat_i</i>	-23.95*** (2.93)	-24.47*** (2.92)	-24.19*** (2.91)	-14.04*** (2.94)	-12.24*** (2.98)
<i>Post_t</i>	18.72*** (2.52)	-2.48 (3.69)			
<i>Treat_i × Post_t</i>	21.89*** (3.68)	20.75*** (3.66)	20.70*** (3.65)	18.74*** (3.61)	19.19*** (3.63)
Constant	142.49*** (2.03)	148.49*** (2.80)			
Duration, Budget, Bids	No	Yes	Yes	Yes	Yes
<i>Post_t × (Duration, Budget, Bids)</i>	No	Yes	Yes	Yes	Yes
Year-Quarter fixed effects	No	No	Yes	Yes	Yes
Task fixed effects	No	No	No	Yes	Yes
Industry fixed effects	No	No	No	No	Yes
Observations	19,074	19,067	19,067	19,067	19,067
R ²	0.01	0.03	0.03	0.20	0.21
Adjusted R ²	0.01	0.03	0.03	0.16	0.17

Note:

*p<0.1; **p<0.05; ***p<0.01

Each observation is a project-quarter.

SEs are robust and clustered at the project level.