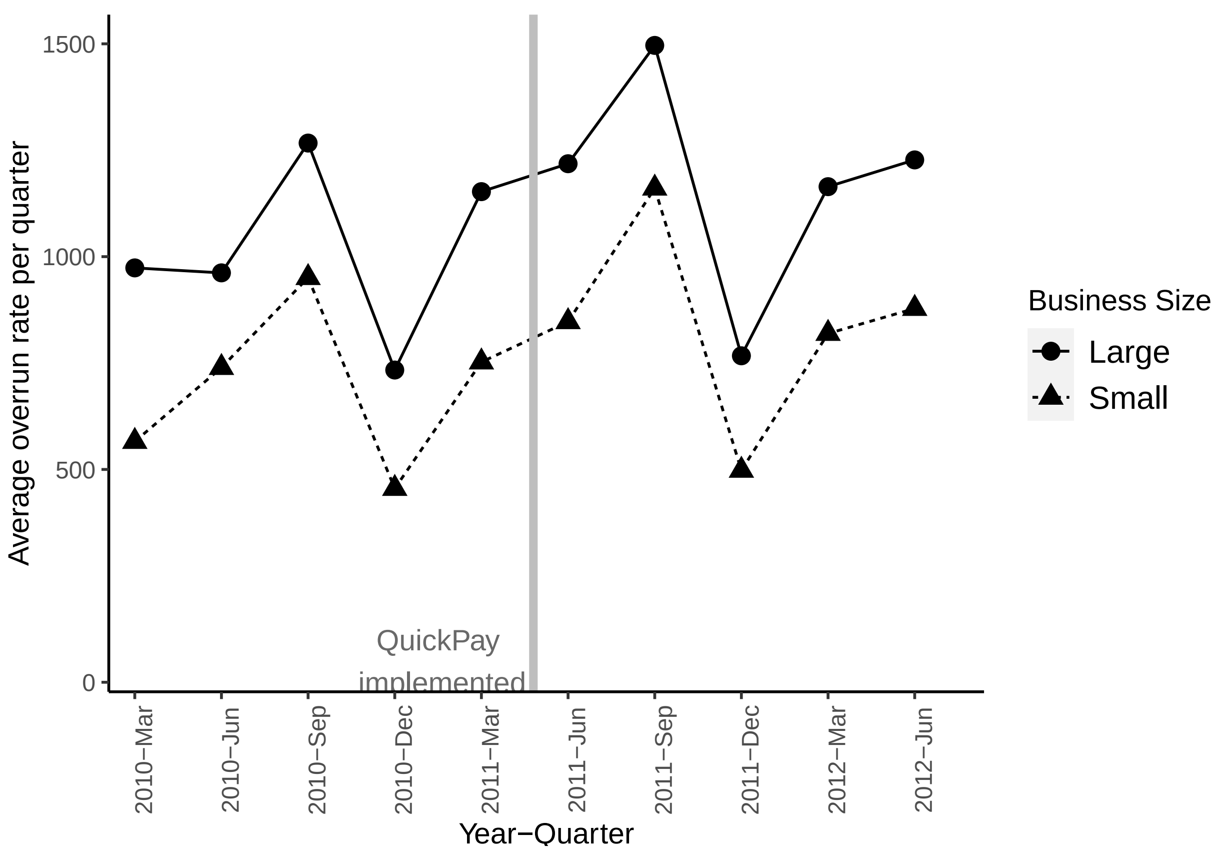
Budget Overruns: First Implementation of QuickPay (2009-2012)

Mar 04, 2022

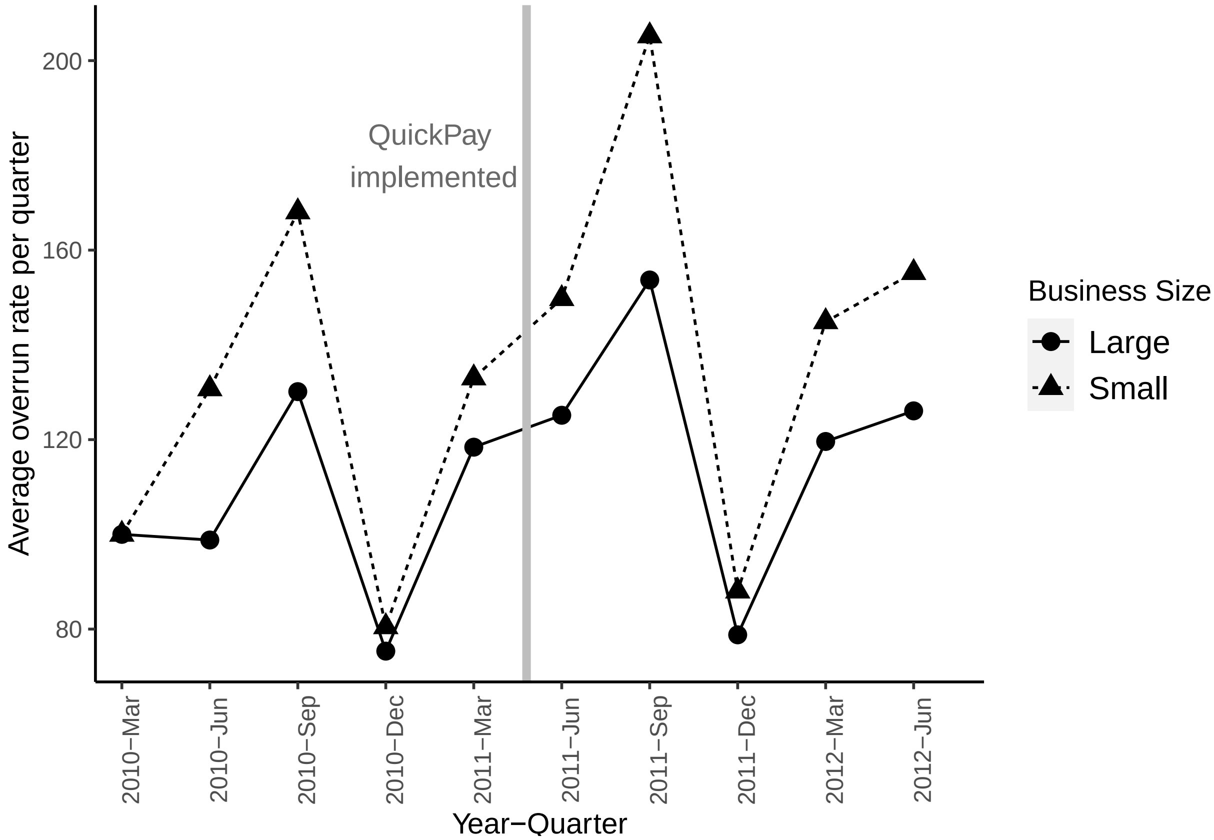
1 Note

- 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"
- Below is the definition of `base_and_all_options_value` from the data dictionary:
  - The change (from this transaction only) to the potential contract value (i.e., the base contract and any exercised or unexercised options).
- This means that every observation in raw data shows incremental change from previous budget. So some of the values can be zero.
- We, therefore, need to calculate the new budget at each point in time (by adding all previous values). We did this in the resampling step, but mentioning here for reference.
- This is different from calculation of delays, where `period_of_performance_current_end_date` indicated the new deadline of the project.

2 Budget Overrun over Time



2.1 Normalized Overrun



3 Notation

- Project i, Year-Quarter t
- X_i denotes project level controls: initial duration, initial budget, number of offers received
- $\mu_t, \theta_{firm}, \lambda_{task}$: Year-Quarter, Firm, and Product/Service code Fixed effects
- All continuous variables are winsorized at the 5% level

$$Treat_i = \begin{cases} 1, & \text{if project } i \text{ is a small business} \\ 0, & \text{otherwise} \end{cases}$$

$$Post_t = \begin{cases} 1, & \text{if year-quarter } t > \text{ April 27, 2011} \\ 0, & \text{otherwise} \end{cases}$$

4 Baseline Regressions

$$Overrun_{it} = \alpha + \beta_0 Treat_i + \beta_1 Post_t + \beta_2 (Treat_i \times Post_t) + \epsilon_{it}$$

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

Table 1: Quickpay 2009-2011

	Overrun$_{it}$ (in days)				
	(1)	(2)	(3)	(4)	(5)
$Treat_i$	-329.68^{***}	-81.18^{***}	-75.66^{***}	-42.03	-24.14
	(25.53)	(25.95)	(25.93)	(26.51)	(26.63)
$Post_t$	143.11^{***}	-299.19^{***}			
	(23.43)	(39.87)			
$Treat_i \times Post_t$	-3.92	21.68	18.52	19.51	19.29
	(29.71)	(30.95)	(30.93)	(30.48)	(30.52)
Constant	$1{,}014.64^{***}$	820.03^{***}			
	(20.39)	(32.46)			
Duration, Budget, Bids	No	Yes	Yes	Yes	Yes
$Post_t \times$ (Duration, Budget, Bids)	No	Yes	Yes	Yes	Yes
Project Age Tercile	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	0.003	0.06	0.07	0.12	0.12
Adjusted R^2	0.003	0.06	0.07	0.11	0.11

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.

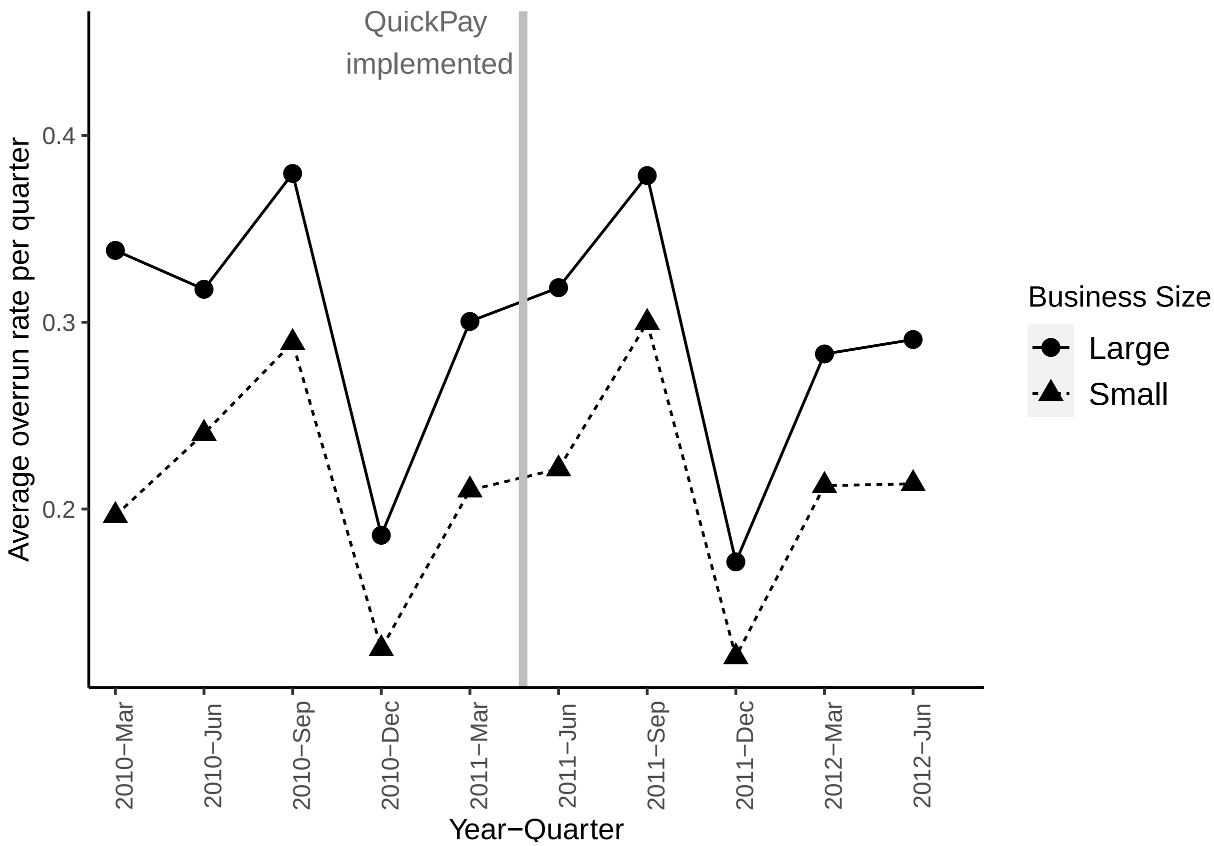
5 Percentage Overrun

$$PercentOverrun_{it} = \beta_0 + \beta_1 Treat_i + \beta_2 Post_t + \beta_3 (Treat_i \times Post_t) + e_{it}$$

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

5.1 Percentage Overrun over time

- Sample restricted to projects with modification zero when they first appeared in our sample.
- $PercentOverrun_{it} = 100 \times Overrun_{it} / Budget_{i,t-1}$


QuickPay
implemented
Average overrun rate per quarter
0.4
0.3
0.2
2010−Mar
2010−Jun
2010−Sep
2010−Dec
2011−Mar
2011−Jun
2011−Sep
2011−Dec
2012−Mar
2012−Jun
Year−Quarter
Business Size
Large
Small

5.1.1 Normalized Overrun

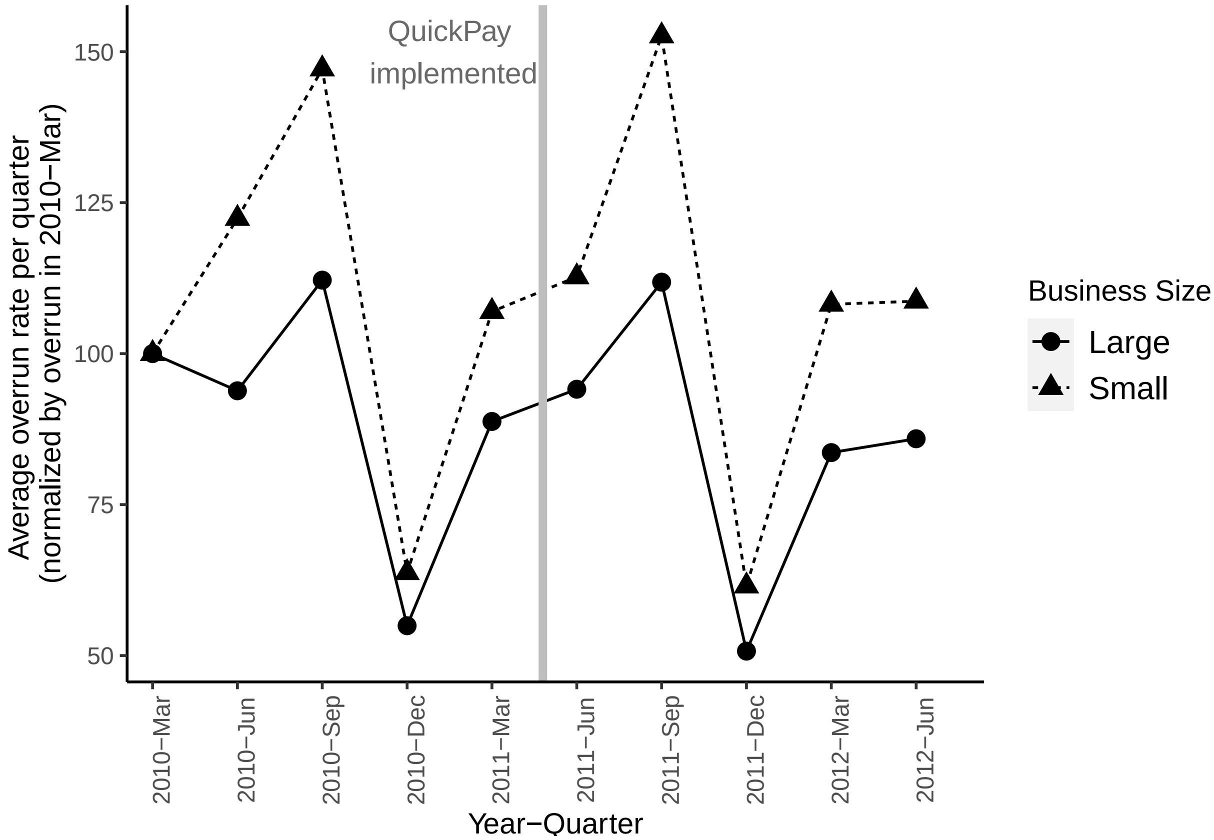


Table 2: Effect of QuickPay on project overrun rates

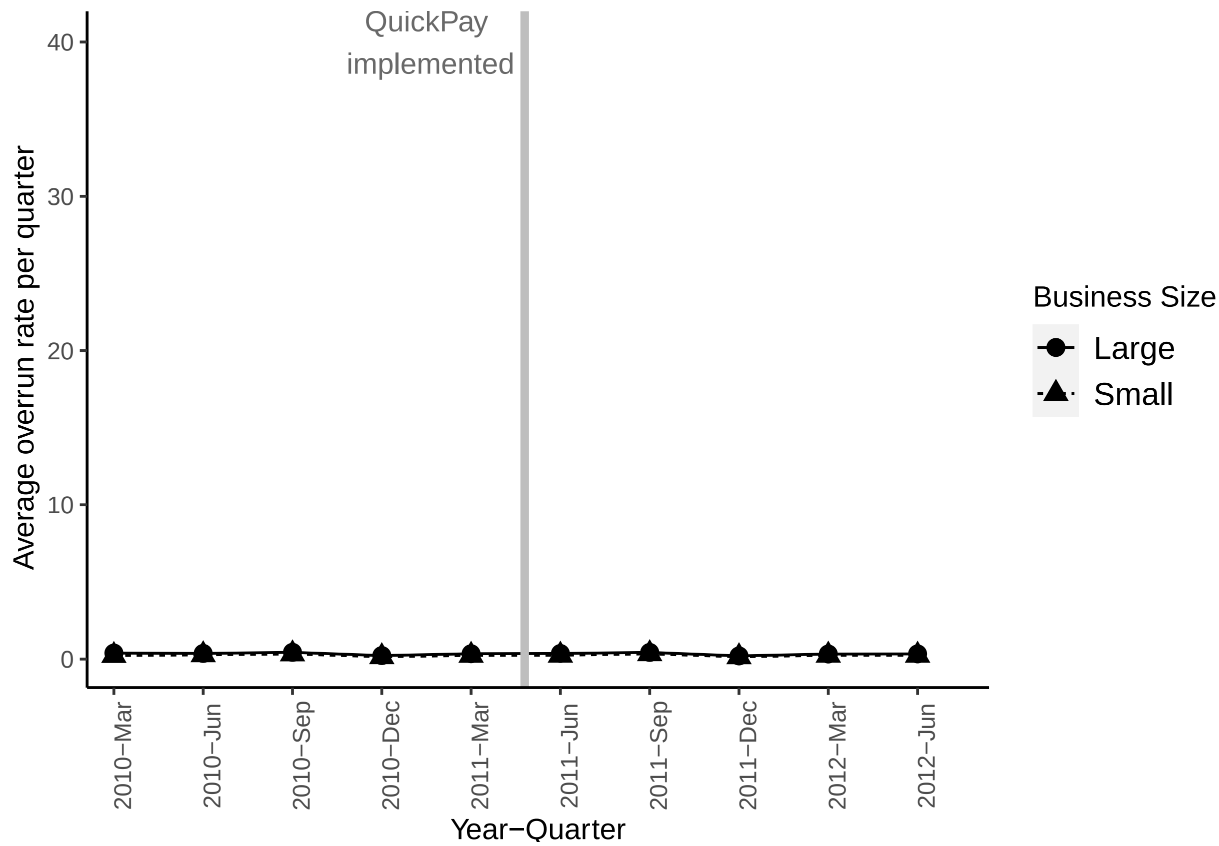
	$PercentOverrun_{it}$				
	(1)	(2)	(3)	(4)	(5)
$Treat_i$	-0.09^{***}	-0.05^{***}	-0.05^{***}	-0.01	-0.001
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
$Post_t$	-0.01	-0.10^{***}			
	(0.01)	(0.01)			
$Treat_i \times Post_t$	0.01	0.01	0.01	0.0002	0.001
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Constant	0.29^{***}	0.43^{***}			
	(0.01)	(0.01)			
Duration, Budget, Bids	No	Yes	Yes	Yes	Yes
$Post_t \times$ (Duration, Budget, Bids)	No	Yes	Yes	Yes	Yes
Project age	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	279,512	258,150	258,150	258,150	258,150
R^2	0.002	0.03	0.04	0.10	0.11
Adjusted R^2	0.002	0.03	0.04	0.10	0.10

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.

6 Relative Overrun

6.1 Relative overruns over time

- Sample restricted to projects with modification zero when they first appeared in our sample.
- $RelativeOverrun_{it} = 100 \times RelativeOverrun_{it}/IntialBudget_i$


QuickPay
implemented
Average overrun rate per quarter
40
30
20
10
0
2010−Mar
2010−Jun
2010−Sep
2010−Dec
2011−Mar
2011−Jun
2011−Sep
2011−Dec
2012−Mar
2012−Jun
Year−Quarter
Business Size
Large
Small

6.1.1 Normalized overrun

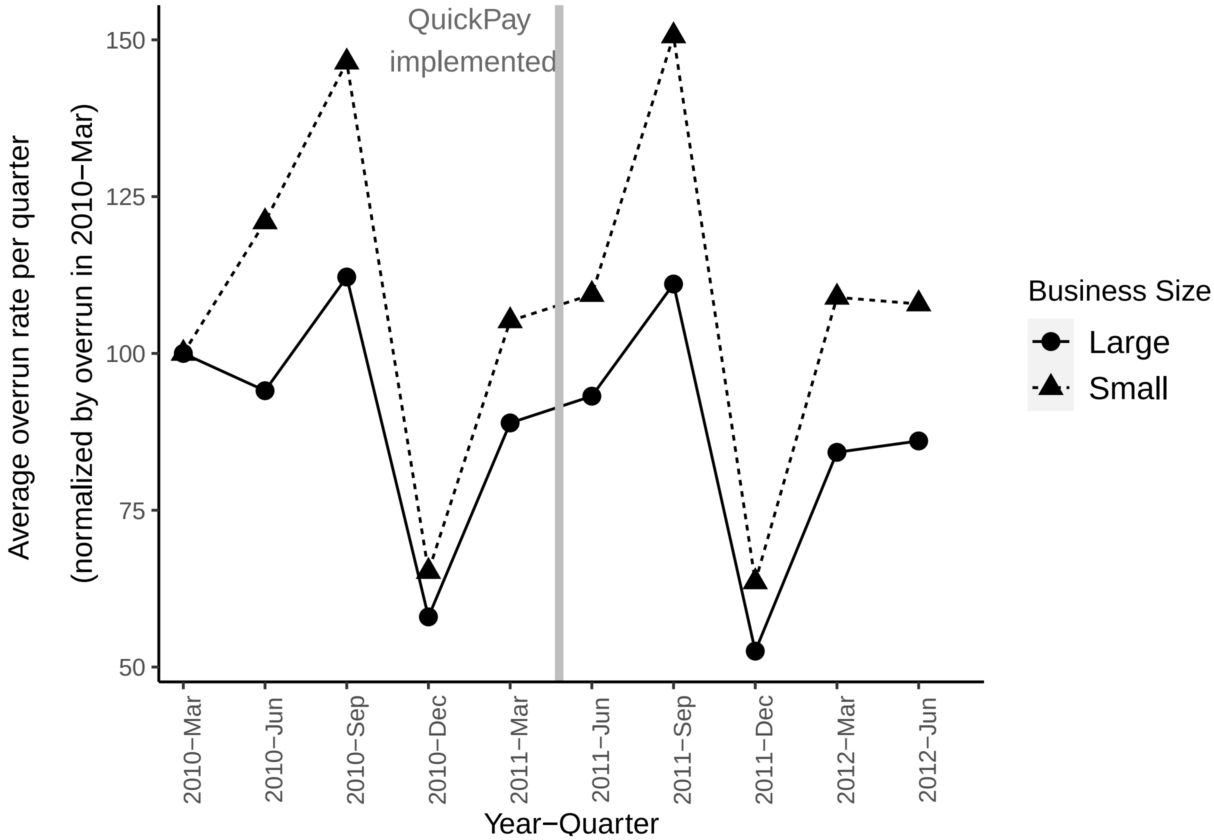


Table 3: Effect of QuickPay on project overrun rates

	$RelativeOverrun_{it}$				
	(1)	(2)	(3)	(4)	(5)
$Treat_i$	-0.10^{***}	-0.09^{***}	-0.09^{***}	-0.01^{*}	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
$Post_t$	-0.01	-0.10^{***}			
	(0.01)	(0.01)			
$Treat_i \times Post_t$	0.02^{*}	0.02^{*}	0.02^{*}	-0.005	-0.004
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Constant	0.34^{***}	0.54^{***}			
	(0.01)	(0.01)			
Duration, Bids	No	Yes	Yes	Yes	Yes
$Post_t \times$ (Duration, Bids)	No	Yes	Yes	Yes	Yes
Project age	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	0.002	0.01	0.02	0.10	0.10
Adjusted R^2	0.002	0.01	0.02	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.