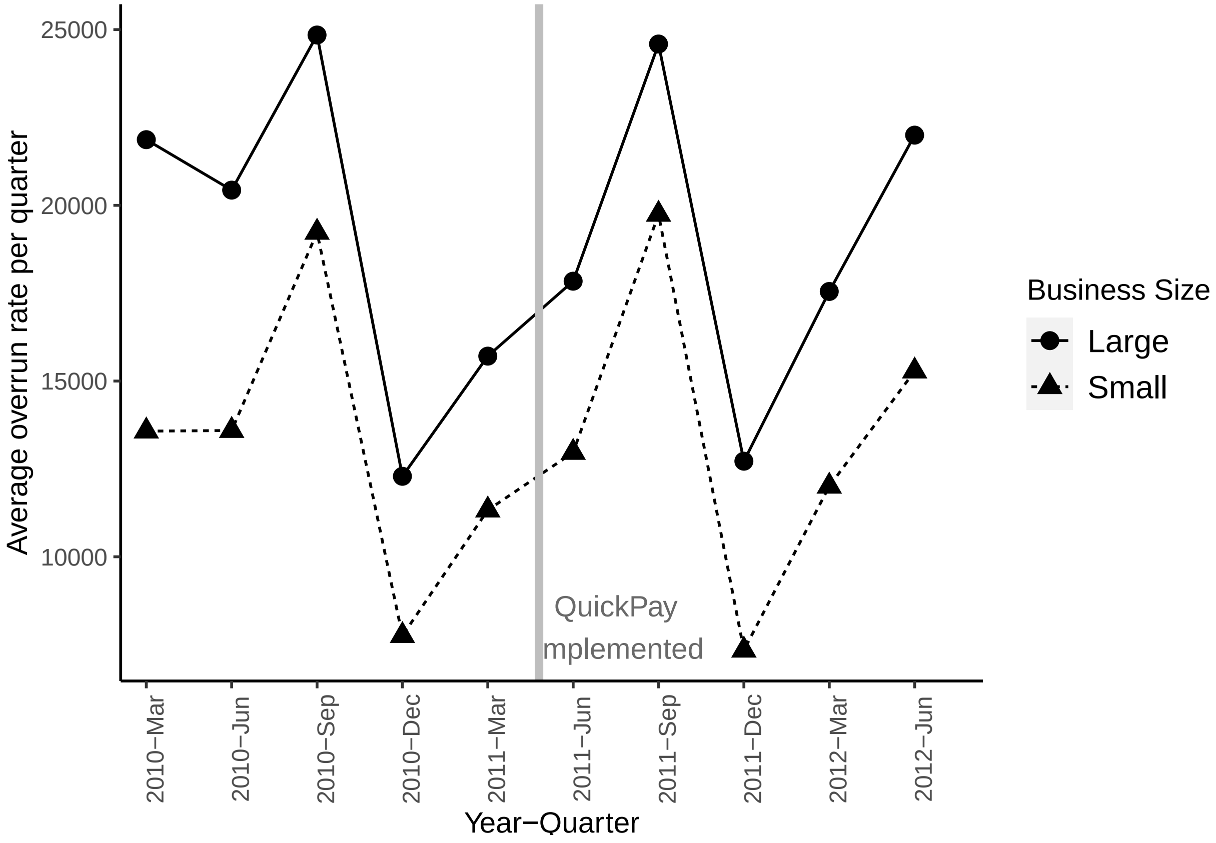
Budget Overruns (Modification Zero): QuickPay (2009-2012)

Sep 20, 2021

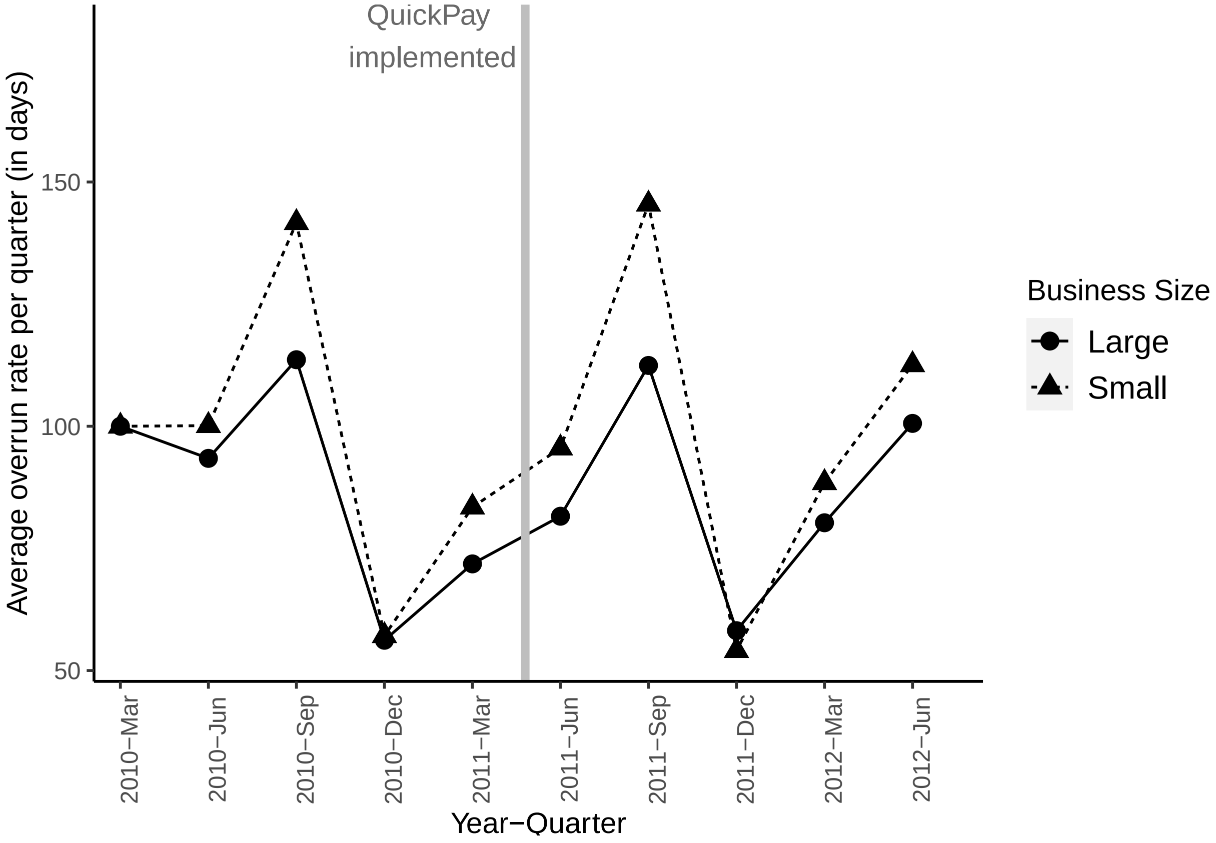
1 Note

- Sample restricted to projects with modification zero
- 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

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

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

Table 1: Quickpay 2009-2011

	$Overrun_{it}$ (in days)				
	(1)	(2)	(3)	(4)	(5)
$Treat_i$	$-3{,}090.70^{***}$	$-1{,}826.52^{***}$	$-1{,}705.50^{***}$	$-1{,}741.12^{***}$	$-4{,}370.53^{**}$
	(453.69)	(447.45)	(445.22)	(501.72)	(2,144.17)
$Post_t$	$8{,}216.29^{***}$	$-3{,}736.40^{***}$			
	(527.31)	(647.74)			
$Treat_i \times Post_t$	$-2{,}889.36^{***}$	$-1{,}767.38^{**}$	$-1{,}927.16^{***}$	$-1{,}768.43^{**}$	$-1{,}032.53$
	(686.43)	(692.08)	(690.79)	(691.80)	(712.84)
Constant	$11{,}977.14^{***}$	$2{,}836.88^{***}$			
	(344.34)	(443.54)			
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
Firm Fixed Effects	No	No	No	No	Yes
Observations	89,813	82,661	82,661	82,661	82,661
R^2	0.01	0.08	0.08	0.11	0.26
Adjusted R^2	0.01	0.08	0.08	0.10	0.18

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.

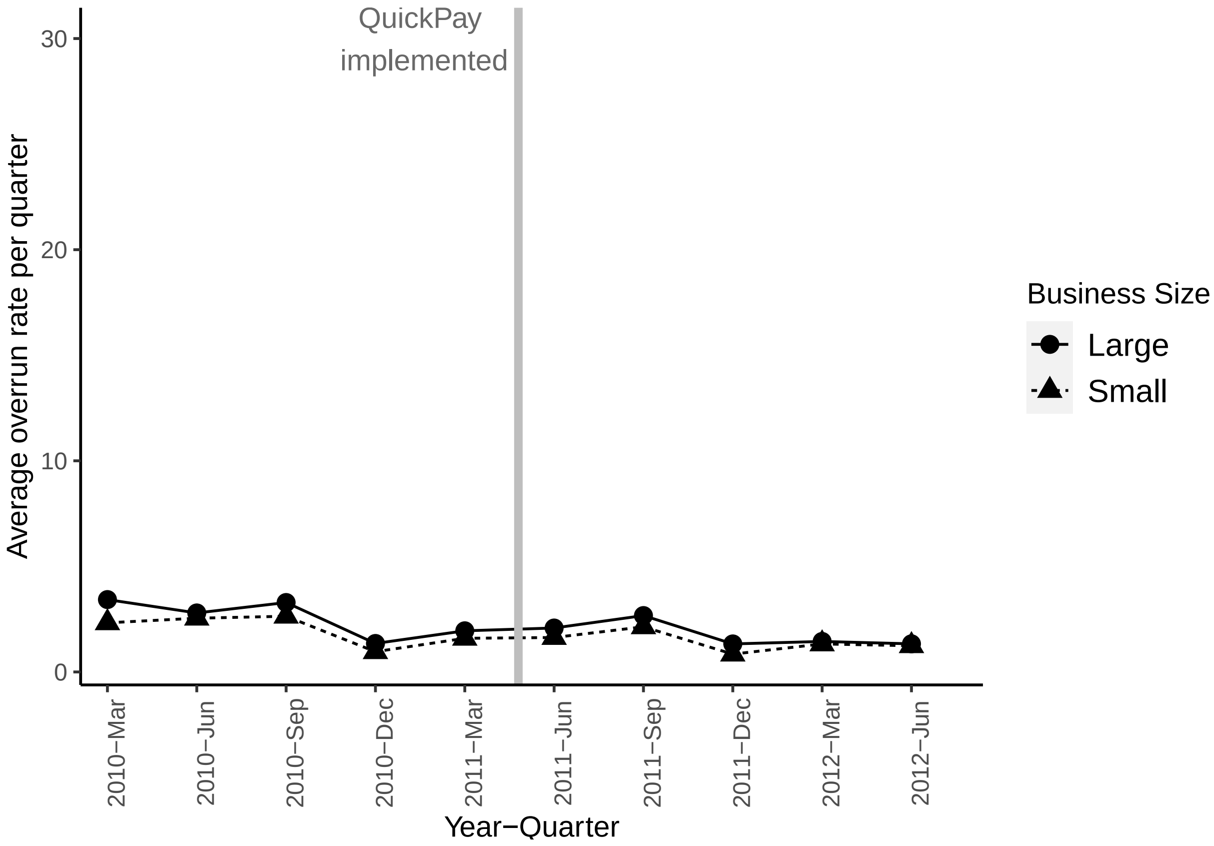
5 Percentage Overrun

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

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

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
10
20
30
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

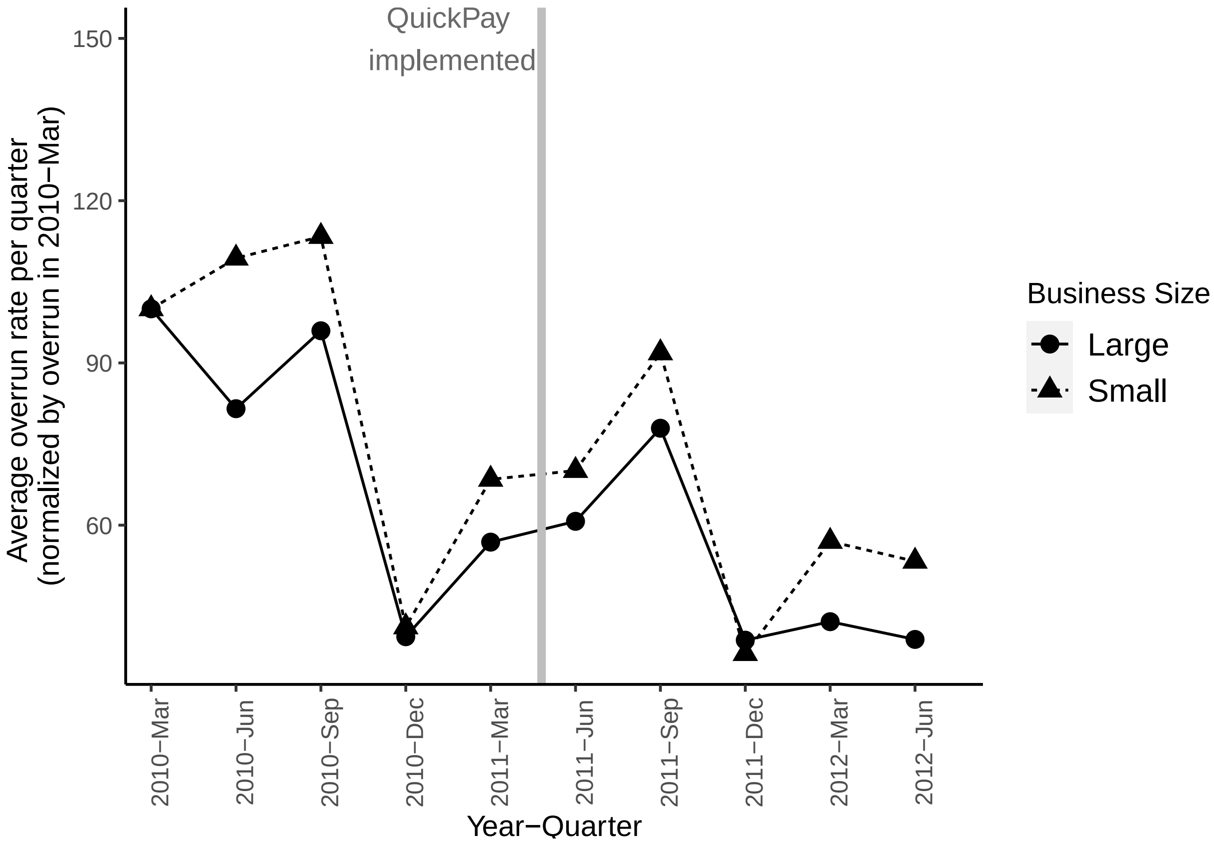


Table 2: Effect of QuickPay on project overrun rates

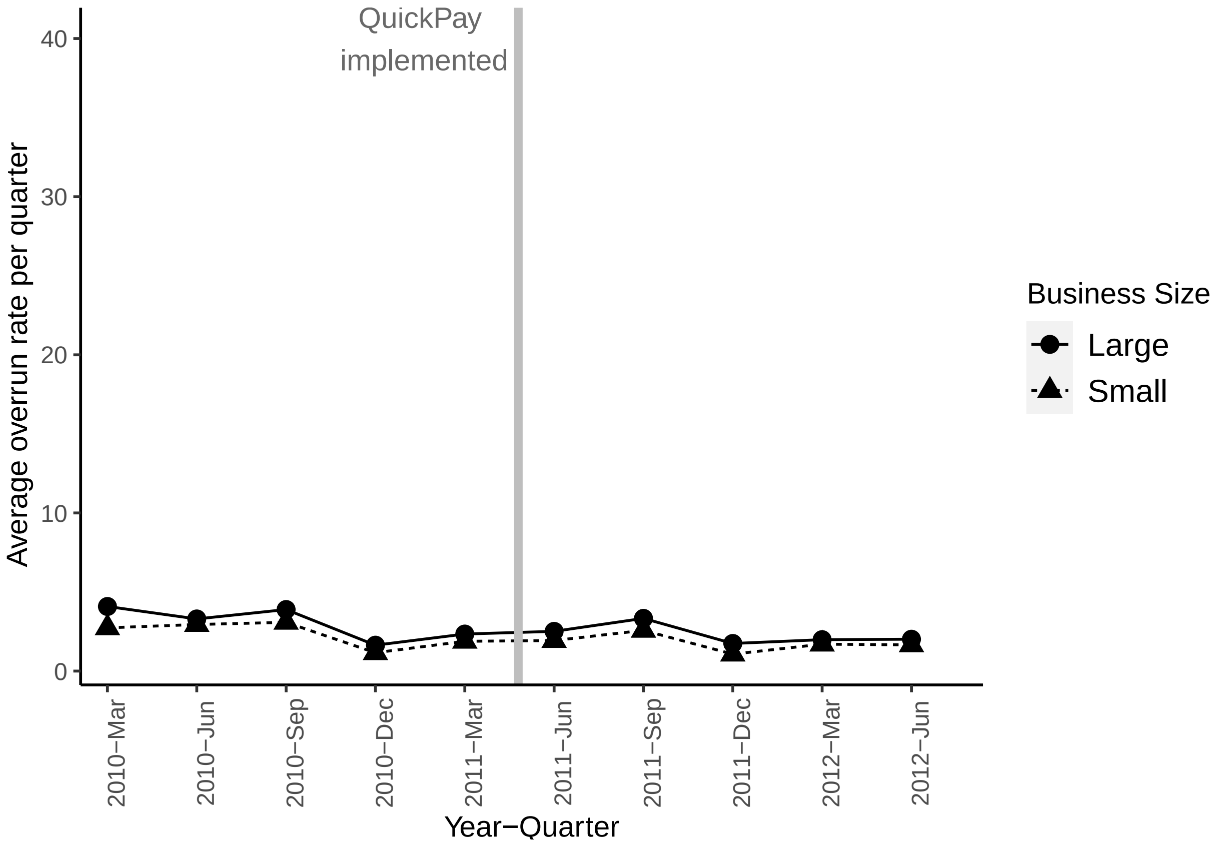
	$PercentOverrun_{it}$				
	(1)	(2)	(3)	(4)	(5)
$Treat_i$	-0.48^{***}	-0.45^{***}	-0.42^{***}	-0.24^{***}	-0.54^{*}
	(0.07)	(0.08)	(0.07)	(0.08)	(0.29)
$Post_t$	-0.29^{***}	-1.01^{***}			
	(0.07)	(0.13)			
$Treat_i \times Post_t$	0.08	0.11	0.08	0.03	0.12
	(0.09)	(0.10)	(0.10)	(0.10)	(0.10)
Constant	2.22^{***}	3.78^{***}			
	(0.05)	(0.10)			
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
Contractor fixed effects	No	No	No	No	Yes
Observations	88,830	82,405	82,405	82,405	82,405
R^2	0.001	0.01	0.01	0.06	0.20
Adjusted R^2	0.001	0.01	0.01	0.05	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.

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
0
10
20
30
40
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

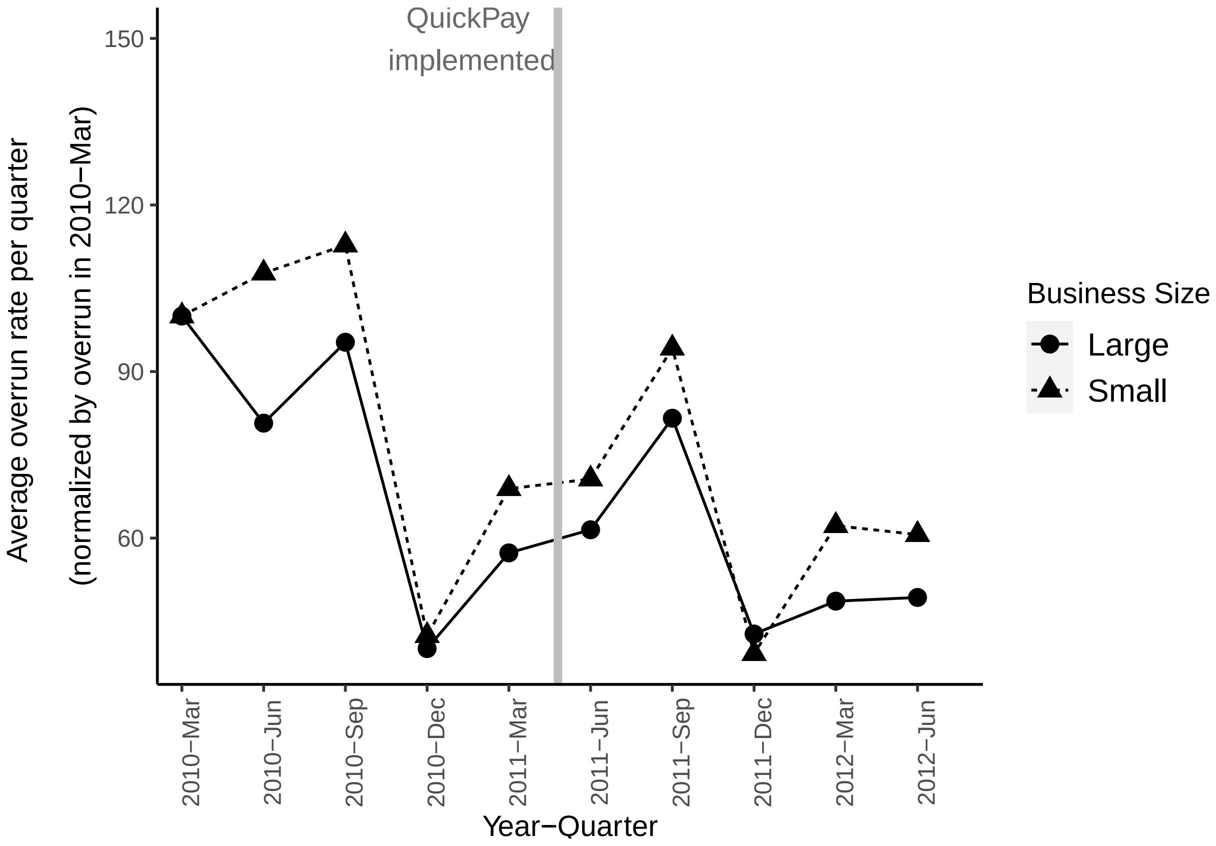


Table 3: Effect of QuickPay on project overrun rates

	$RelativeOverrun_{it}$				
	(1)	(2)	(3)	(4)	(5)
$Treat_i$	-0.59^{***}	-0.52^{***}	-0.50^{***}	-0.23^{**}	-0.73^{**}
	(0.09)	(0.09)	(0.09)	(0.09)	(0.37)
$Post_t$	-0.20^{**}	-0.91^{***}			
	(0.09)	(0.16)			
$Treat_i \times Post_t$	0.02	0.02	-0.01	-0.07	0.04
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Constant	2.65^{***}	4.36^{***}			
	(0.06)	(0.12)			
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
Contractor fixed effects	No	No	No	No	Yes
Observations	89,813	82,661	82,661	82,661	82,661
R^2	0.001	0.01	0.01	0.07	0.21
Adjusted R^2	0.001	0.01	0.01	0.06	0.13

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.