

# Conference Paper Title\*

\*Note: Sub-titles are not captured in Xplore and should not be used

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***Index Terms***—component, formatting, style, styling, insert

***Abstract***—This document is a model and instructions for L<sup>A</sup>T<sub>E</sub>X. This and the IEEEtran.cls file define the components of your paper [title, text, heads, etc.]. \*CRITICAL: Do Not Use Symbols, Special Characters, Footnotes, or Math in Paper Title or Abstract.

## I. INTRODUCTION

## II. RESULTS AND DISCUSSION

## III. CONCLUSION

## ACKNOWLEDGMENT

The preferred spelling of the word “acknowledgment” in America is without an “e” after the “g”. Avoid the stilted expression “one of us (R. B. G.) thanks . . .”. Instead, try “R. B. G. thanks . . .”. Put sponsor acknowledgments in the unnumbered footnote on the first page.

## REFERENCES

#### IV. SUPPLEMENTAL MATERIALS

##### A. *Weak Scaling*

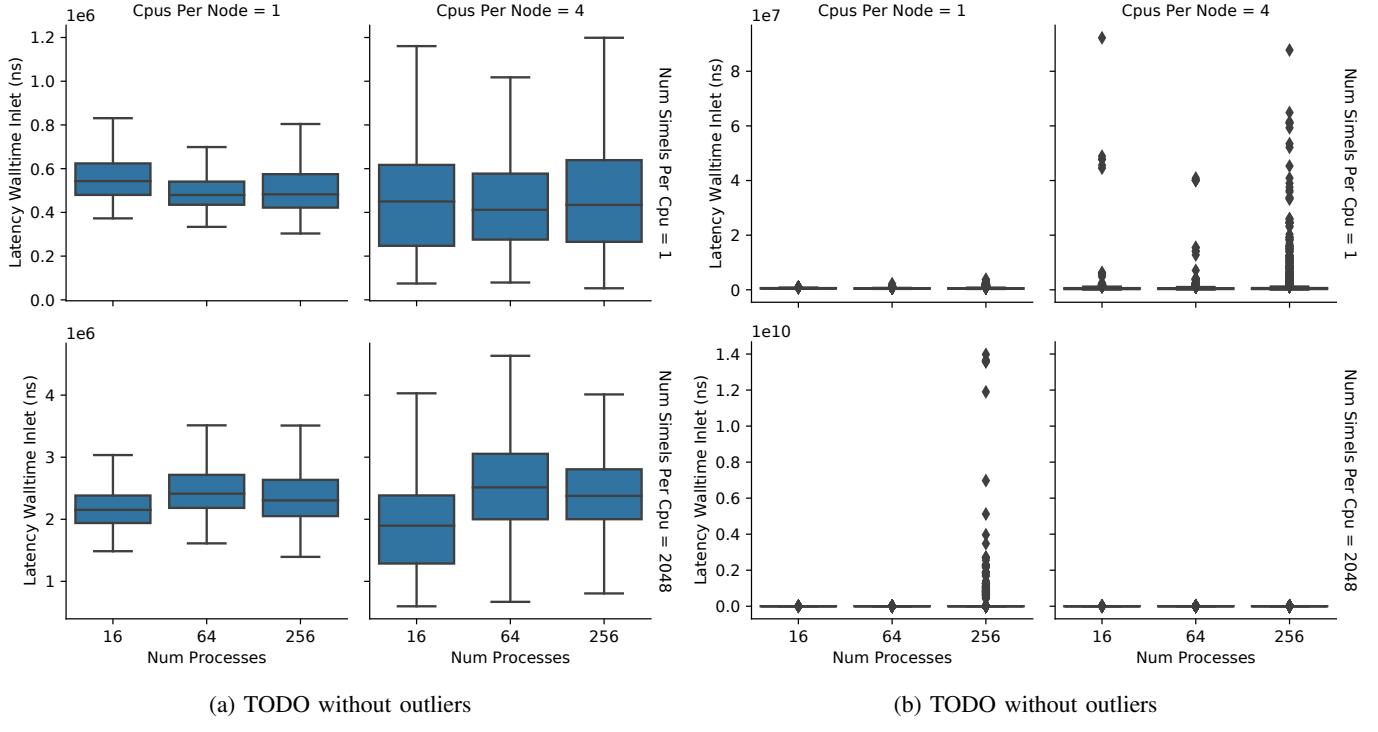


Fig. 1: weak scaling Latency Walltime Inlet (ns) TODO

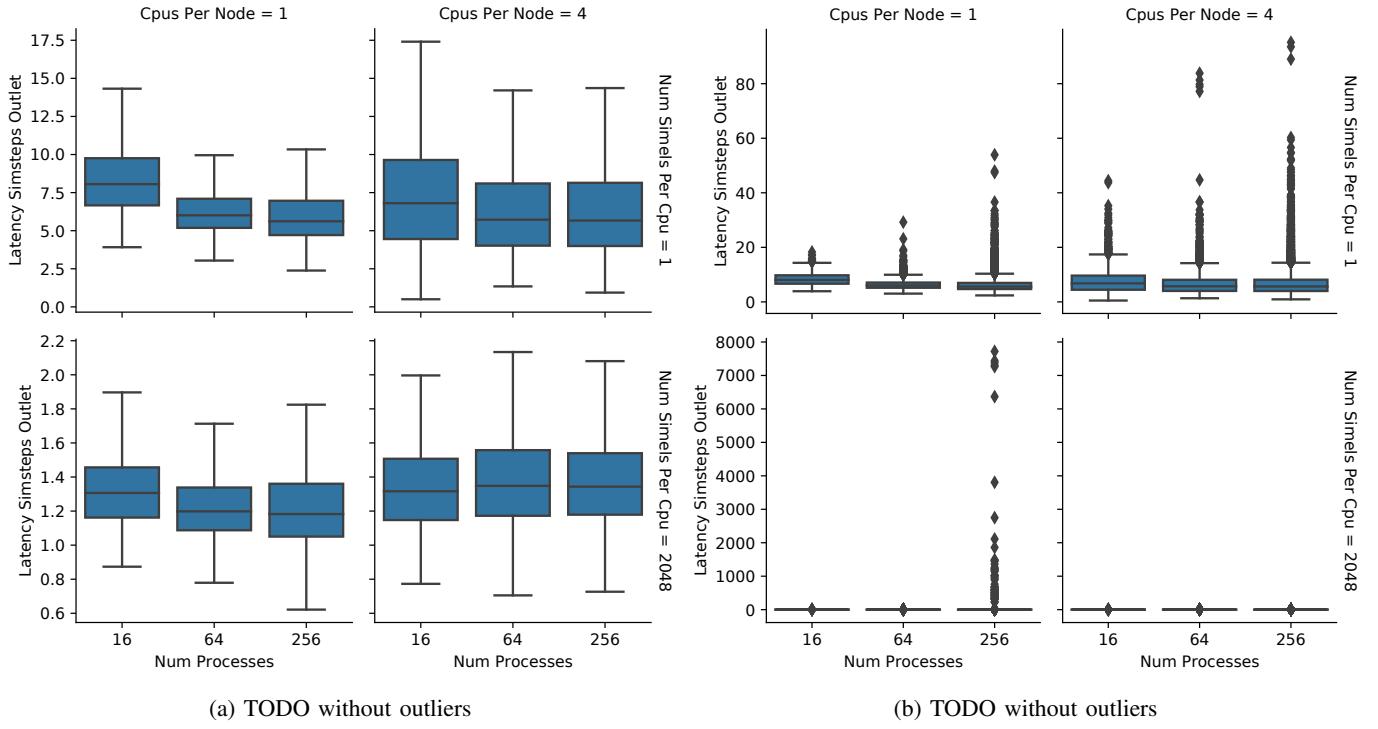


Fig. 2: weak scaling Latency Simsteps Outlet TODO

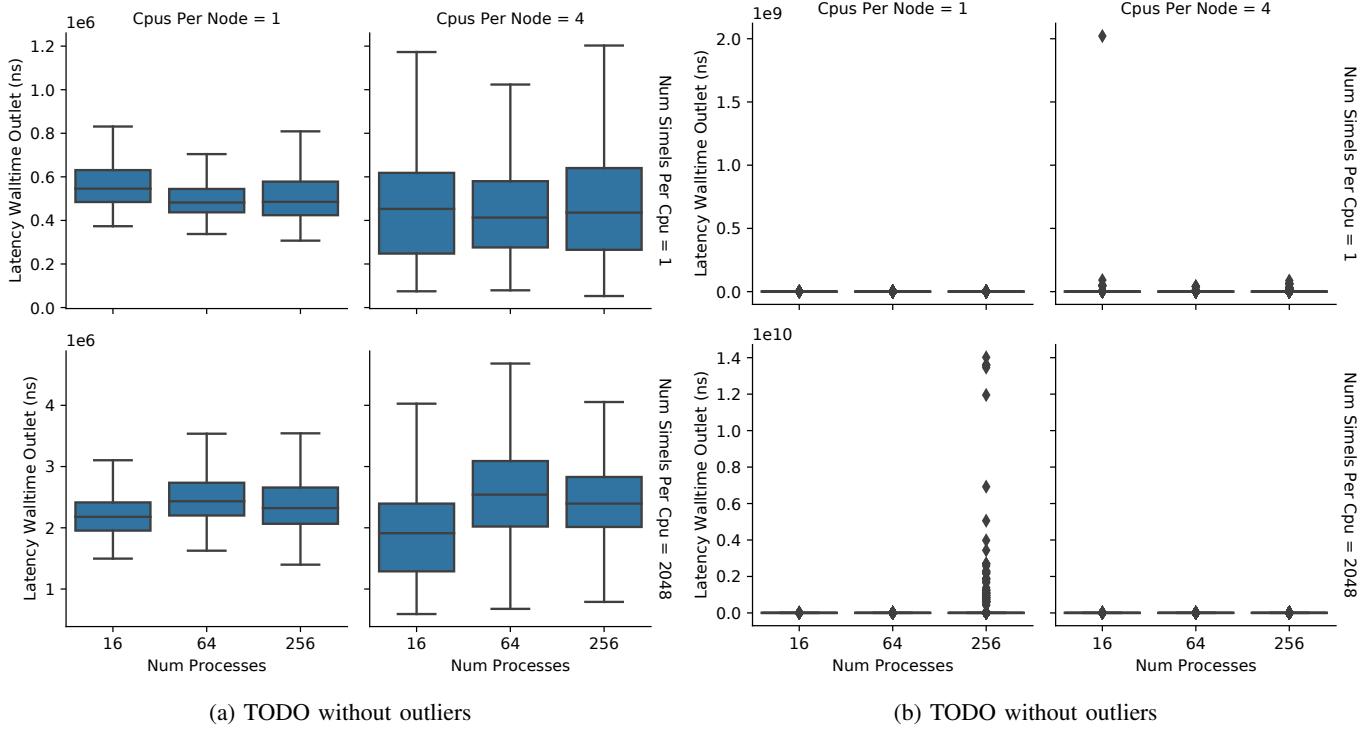


Fig. 3: weak scaling Latency Walltime Outlet (ns) TODO

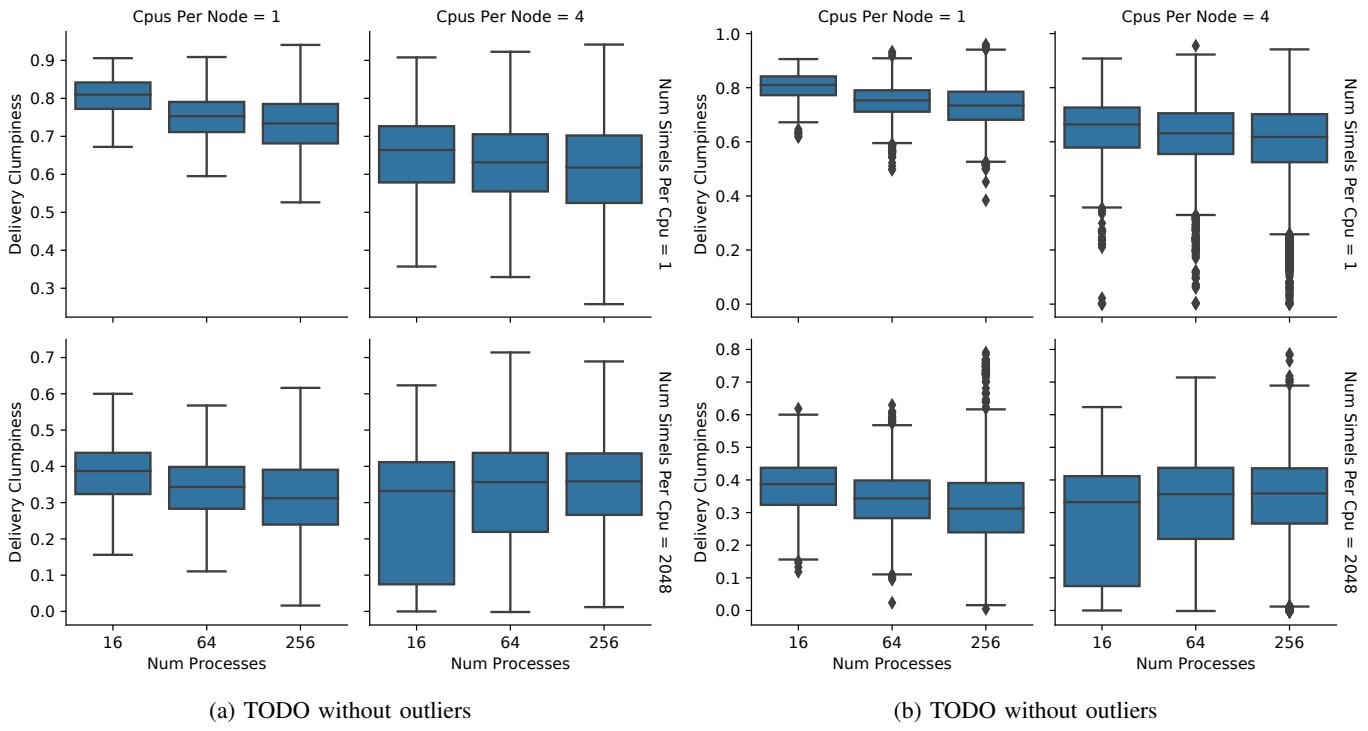


Fig. 4: weak scaling Delivery Clumpiness TODO

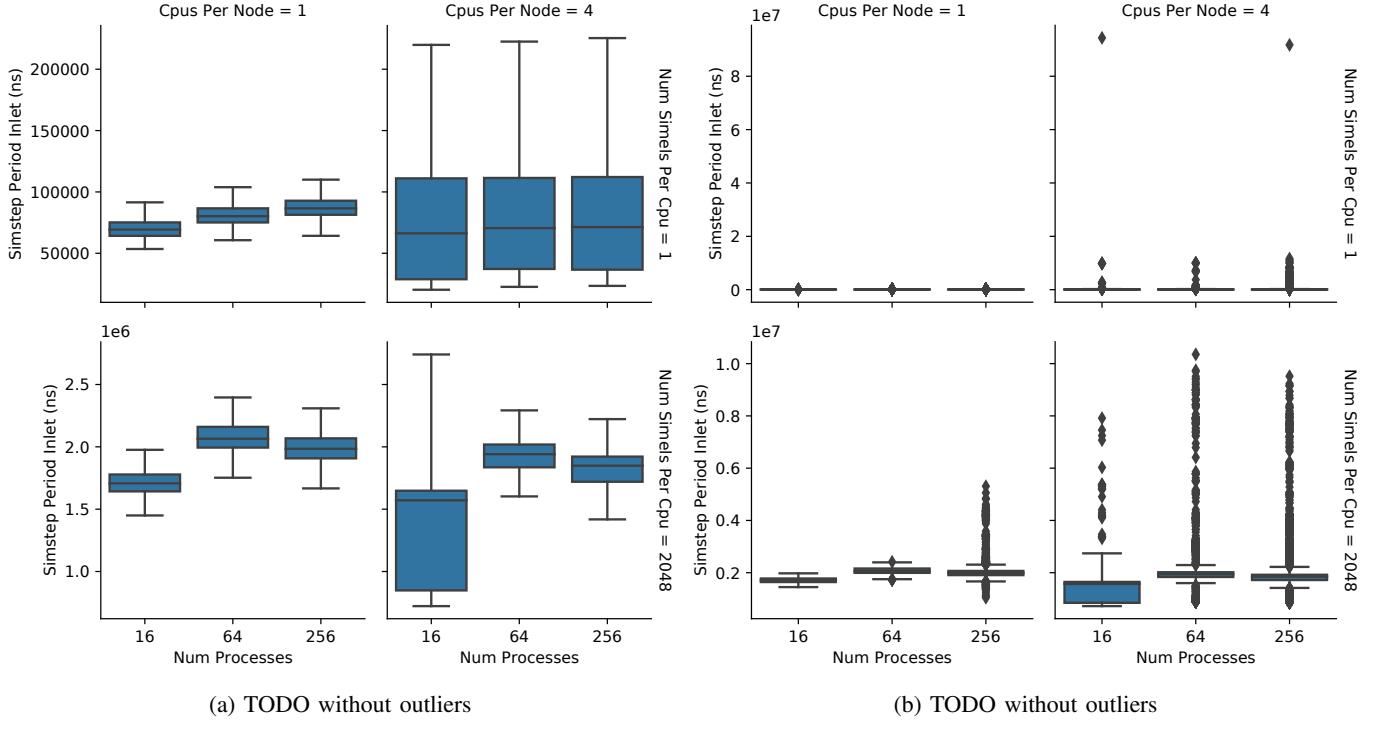


Fig. 5: weak scaling Simstep Period Inlet (ns) TODO

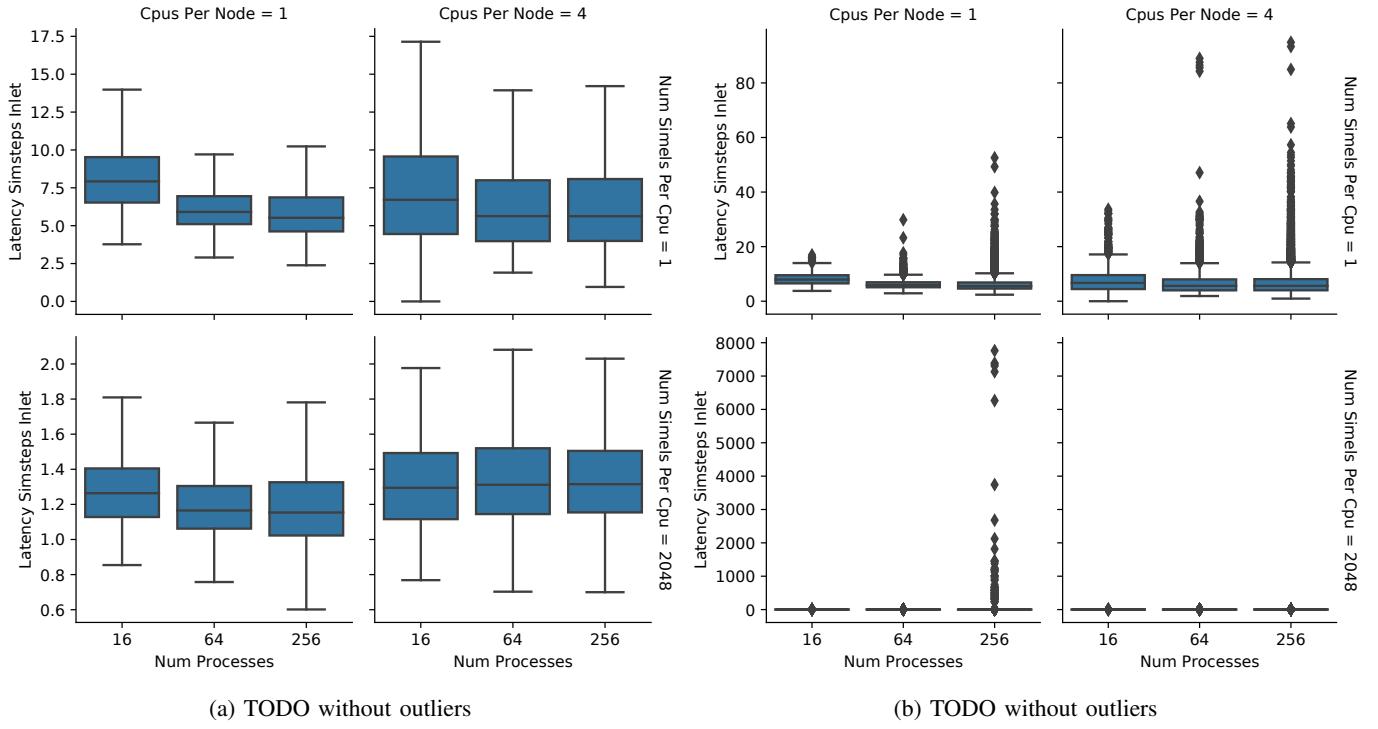


Fig. 6: weak scaling Latency Simsteps Inlet TODO

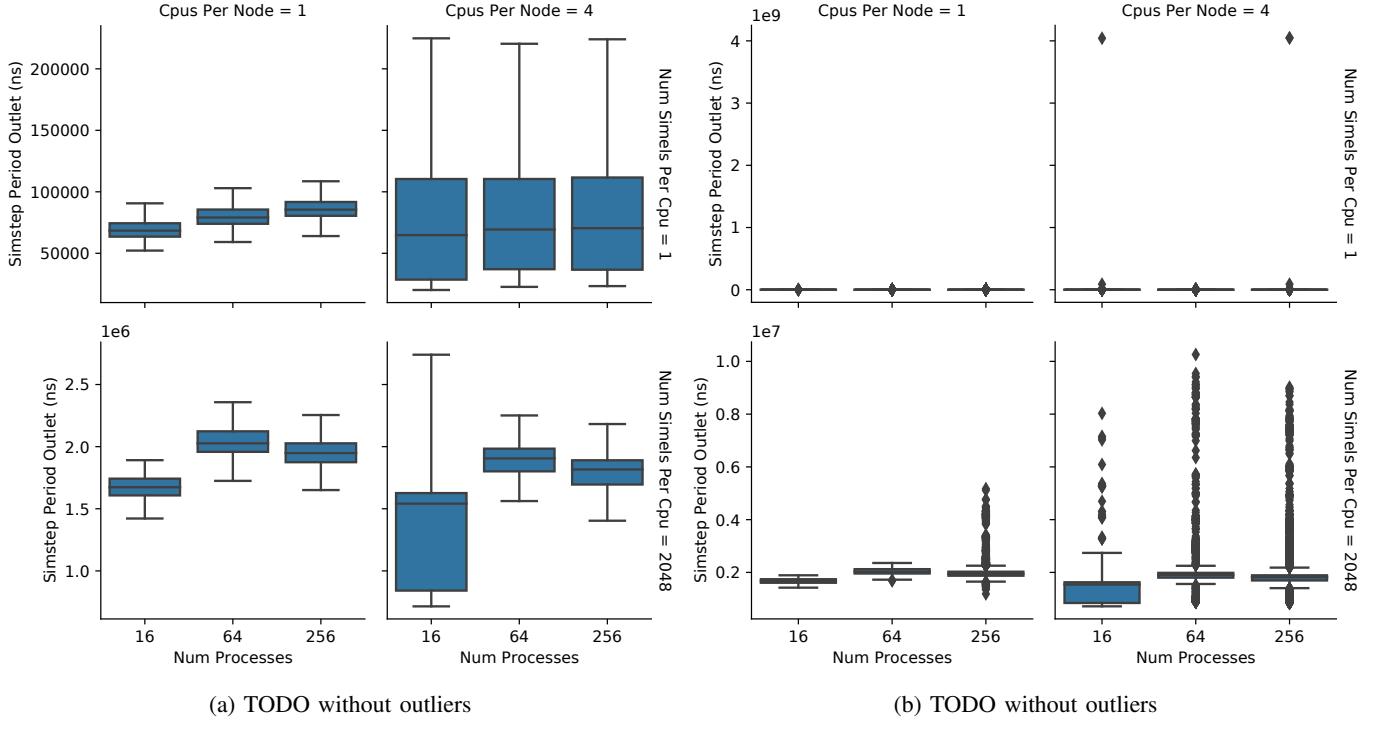


Fig. 7: weak scaling Simstep Period Outlet (ns) TODO

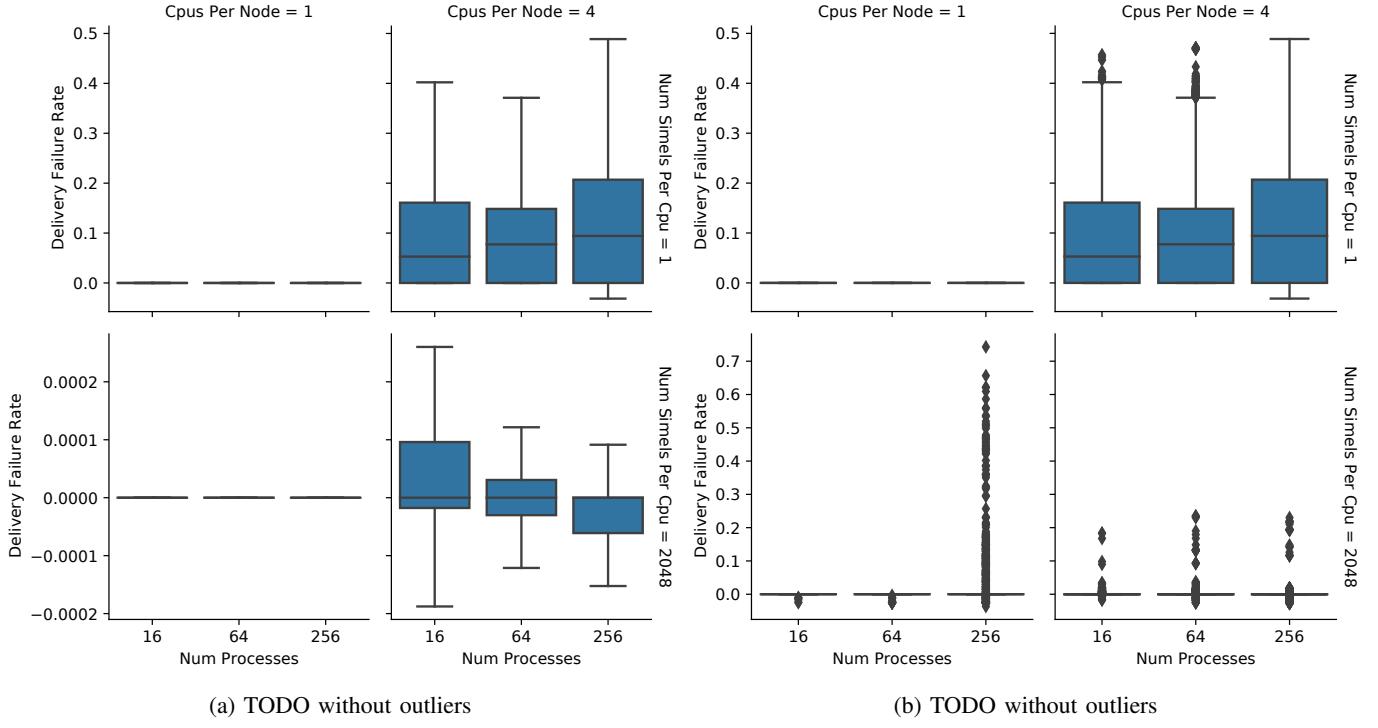
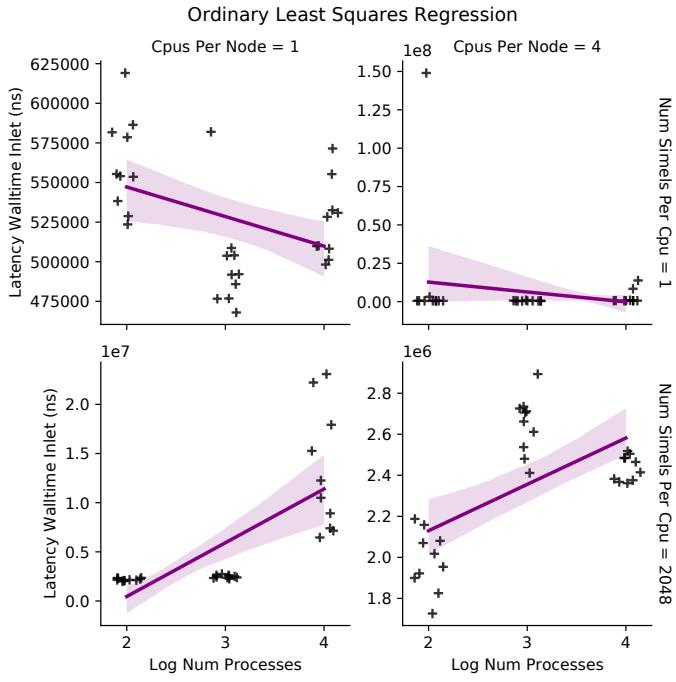
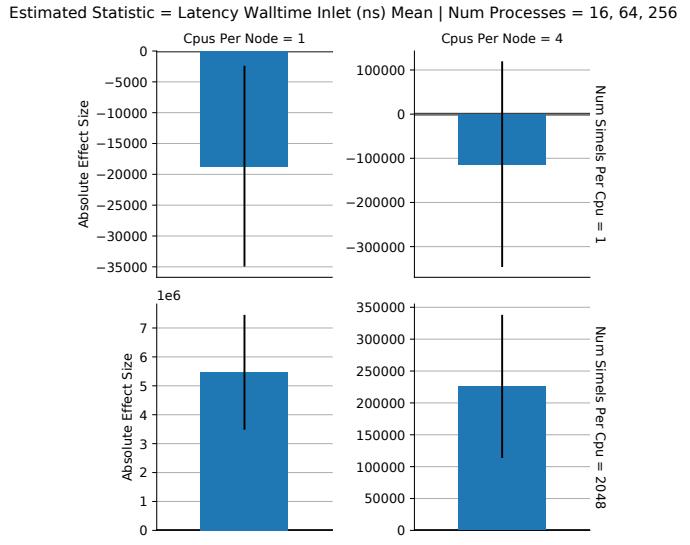


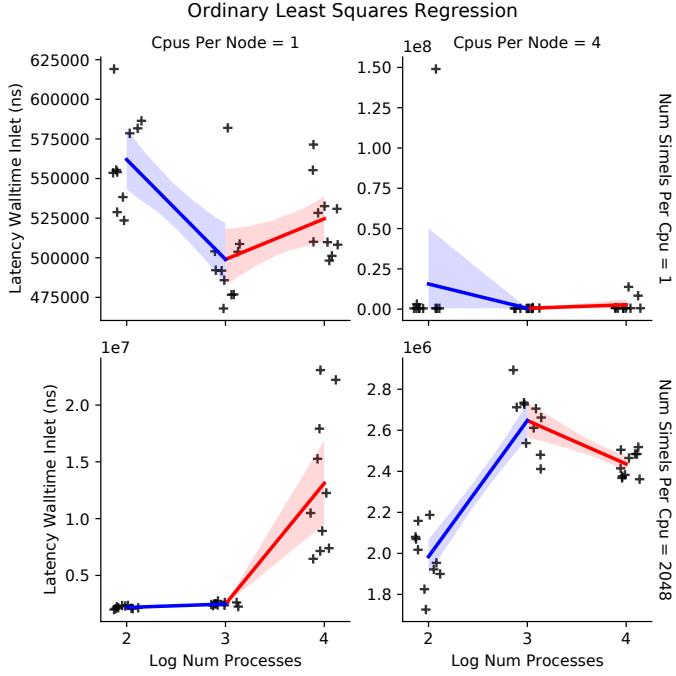
Fig. 8: weak scaling Delivery Failure Rate TODO



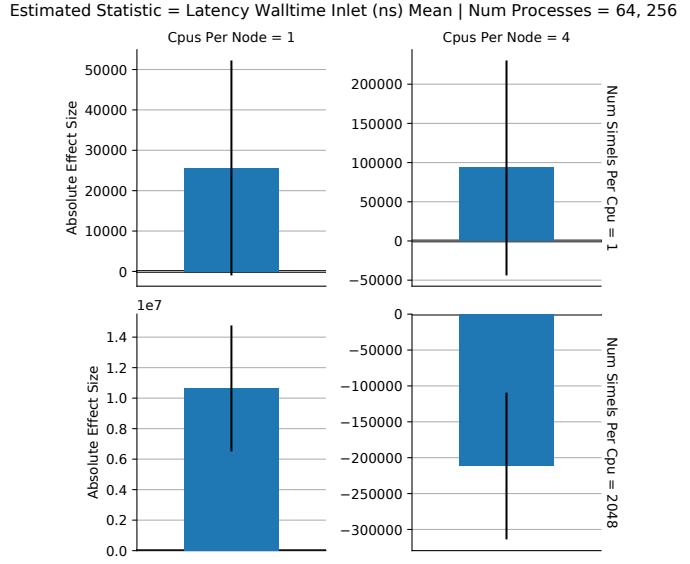
(a) TODO complete ordinary regression



(b) TODO complete regression effect size



(c) TODO partial regression



(d) TODO partial regression effect size

Fig. 9: weak scaling Latency Walltime Inlet (ns) ordinary least squares regression to estimate mean

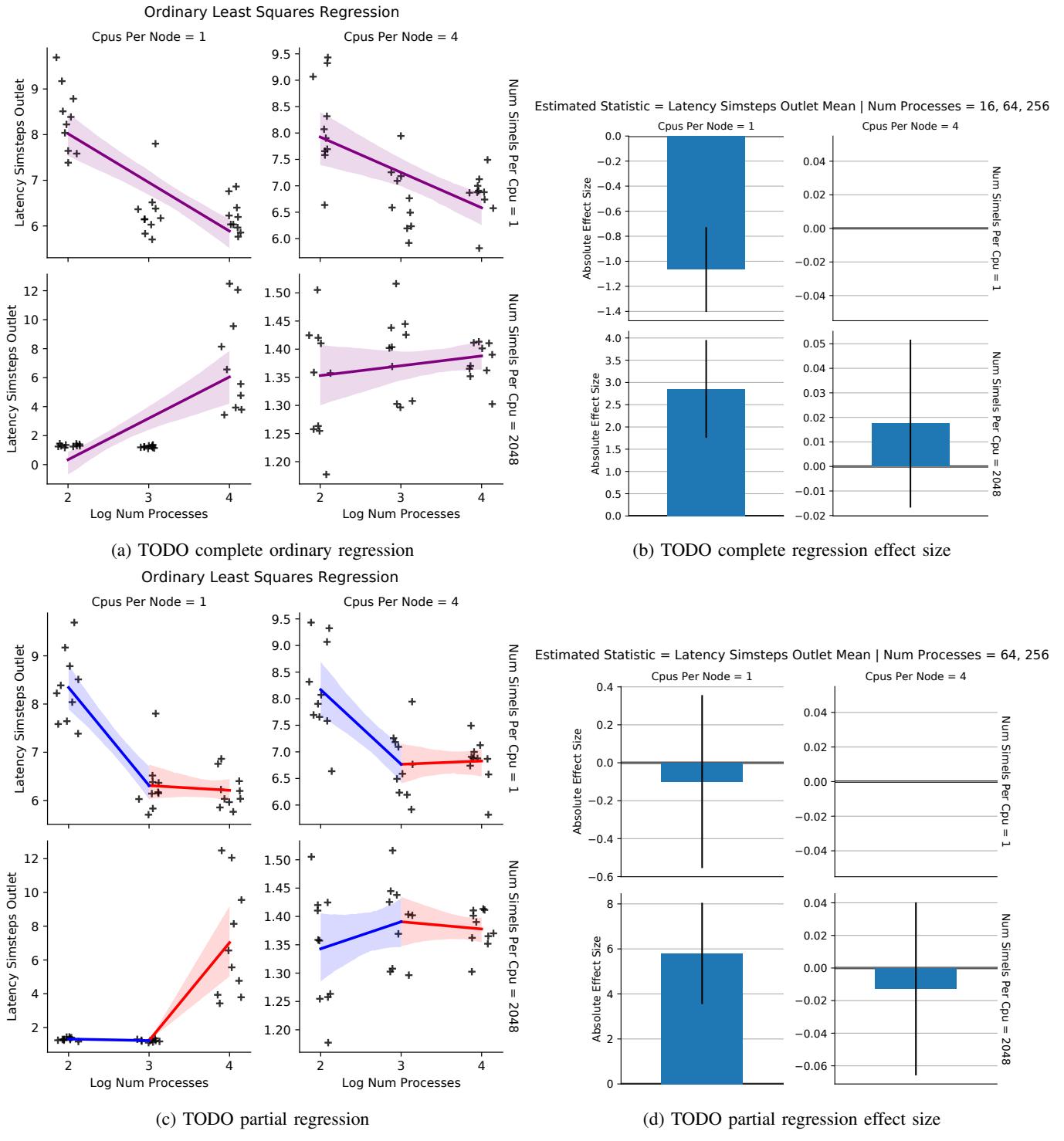
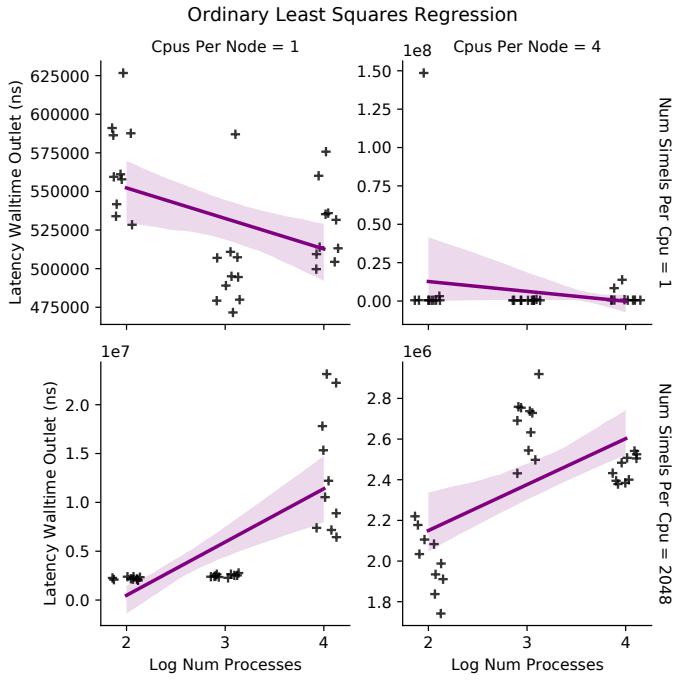
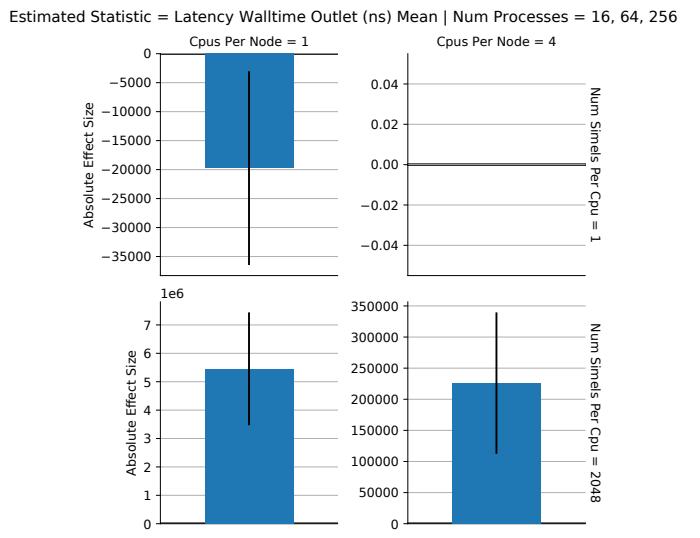


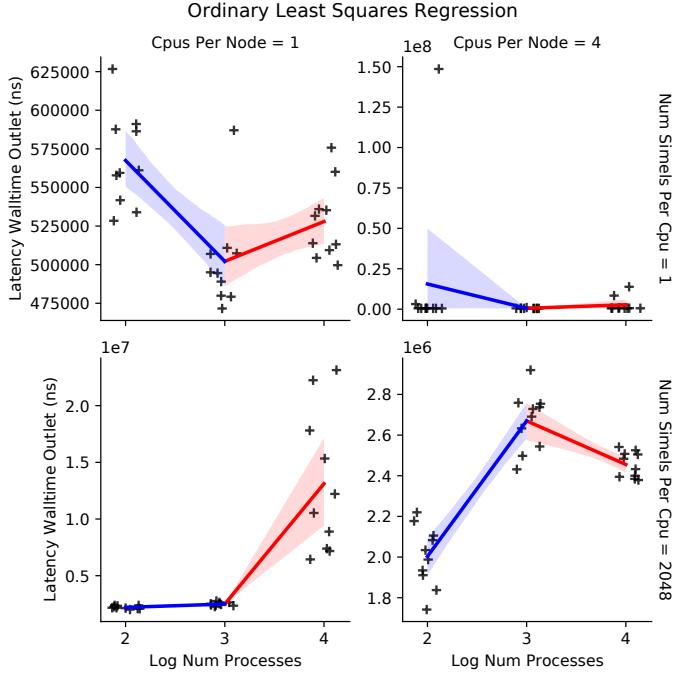
Fig. 10: weak scaling Latency Simsteps Outlet ordinary least squares regression to estimate mean



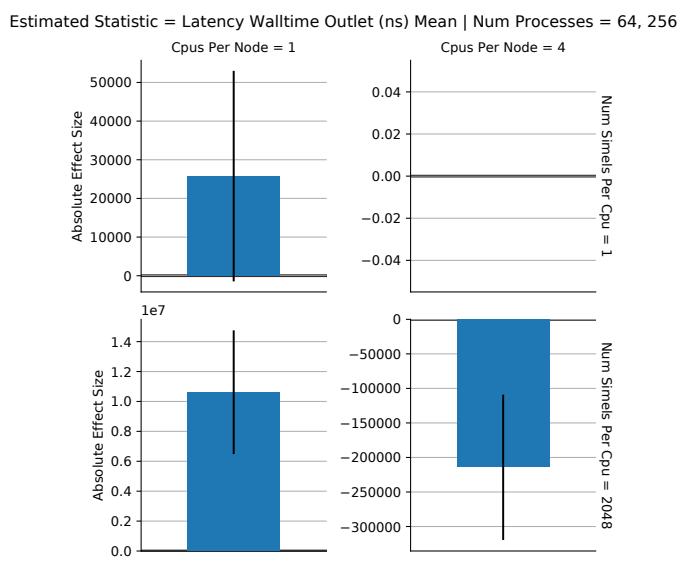
(a) TODO complete ordinary regression



(b) TODO complete regression effect size

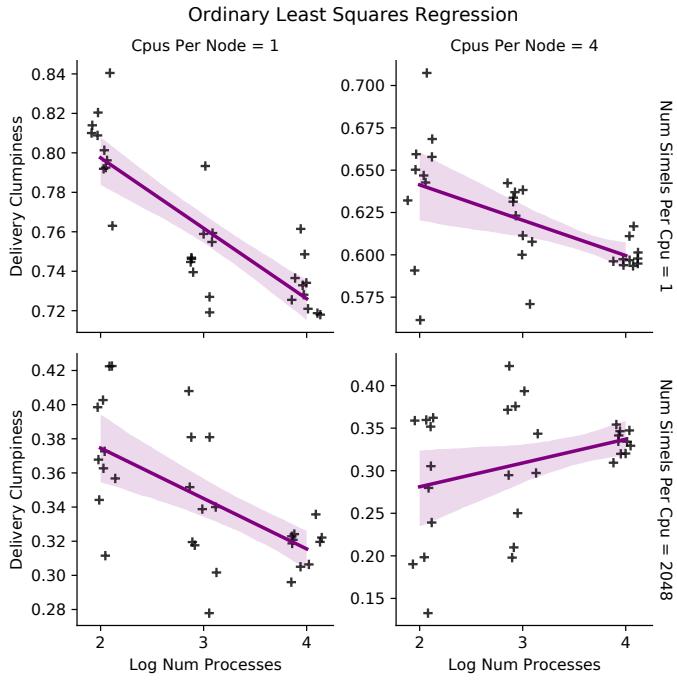


(c) TODO partial regression

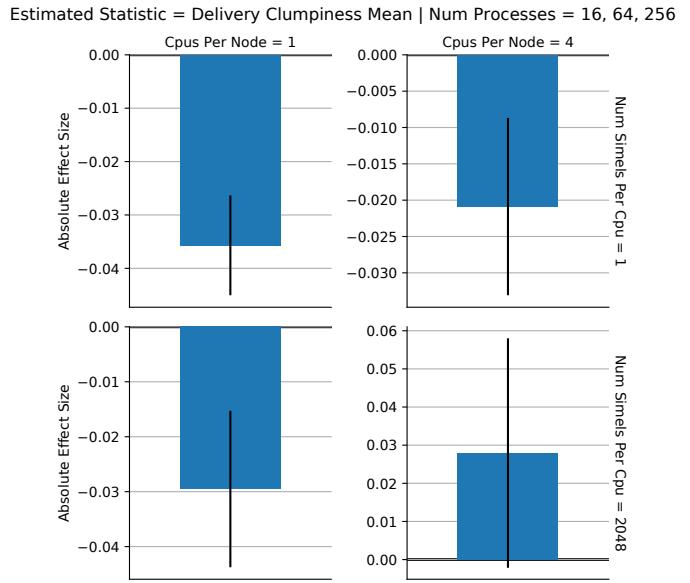


(d) TODO partial regression effect size

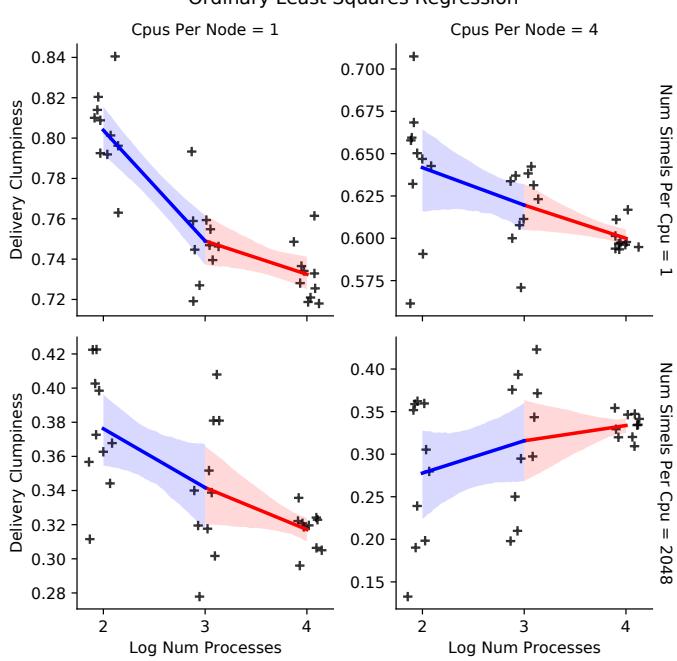
Fig. 11: weak scaling Latency Walltime Outlet (ns) ordinary least squares regression to estimate mean



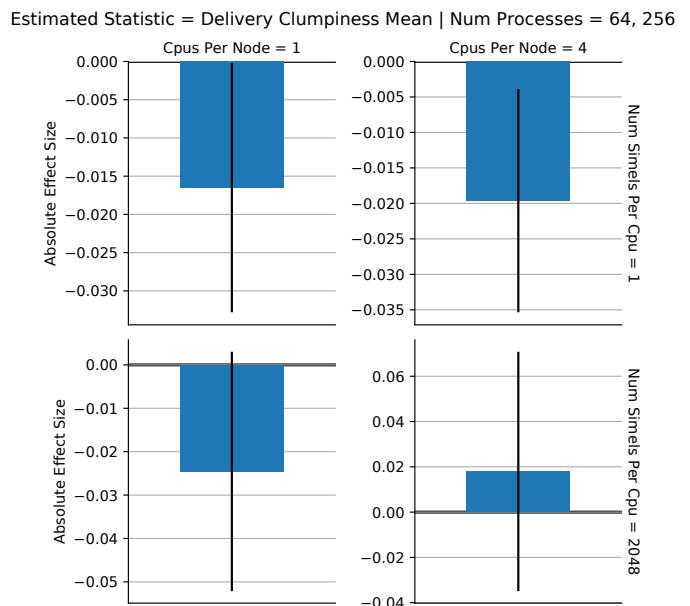
(a) TODO complete ordinary regression



(b) TODO complete regression effect size



(c) TODO partial regression



(d) TODO partial regression effect size

Fig. 12: weak scaling Delivery Clumpiness ordinary least squares regression to estimate mean

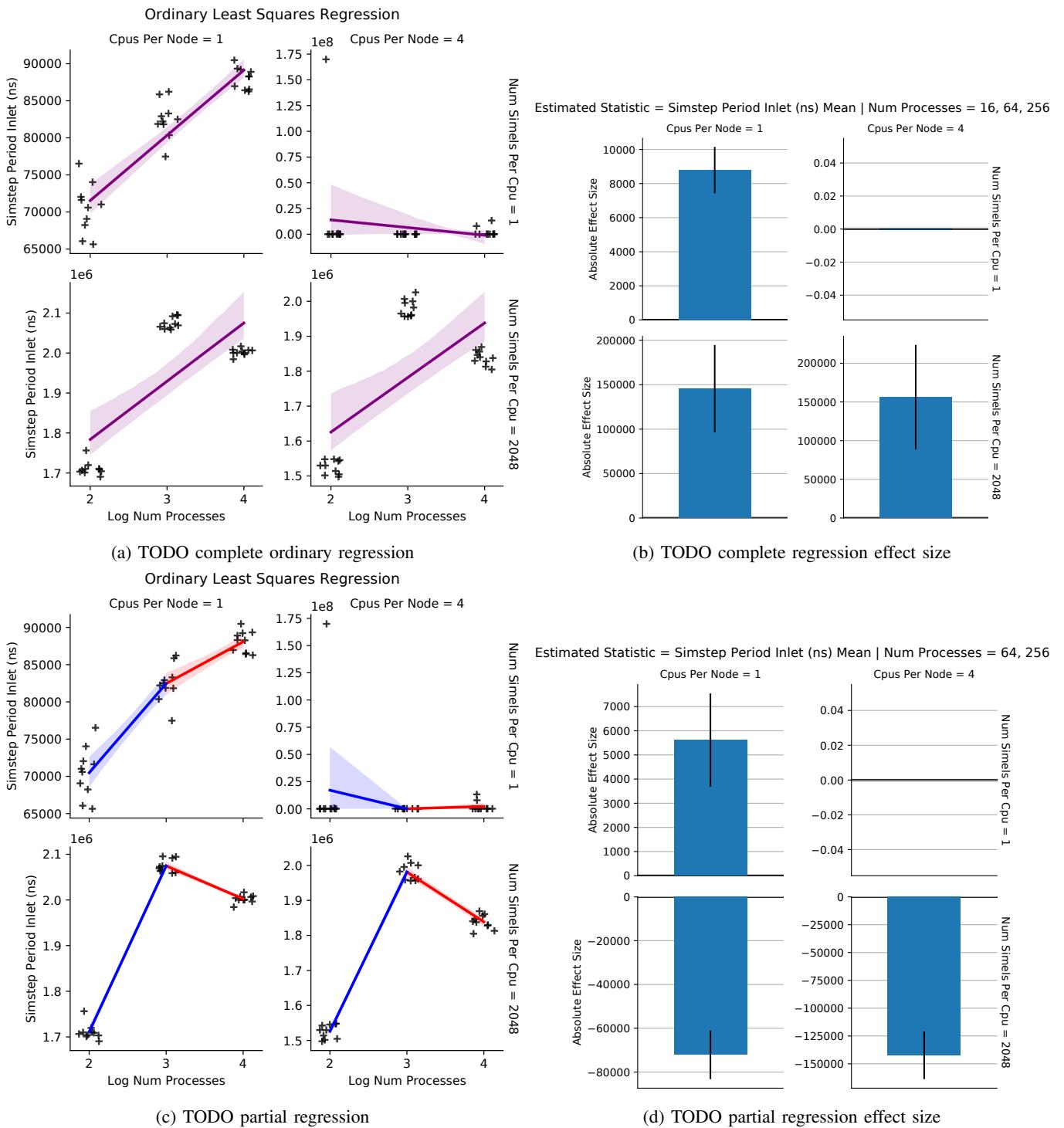


Fig. 13: weak scaling Simstep Period Inlet (ns) ordinary least squares regression to estimate mean

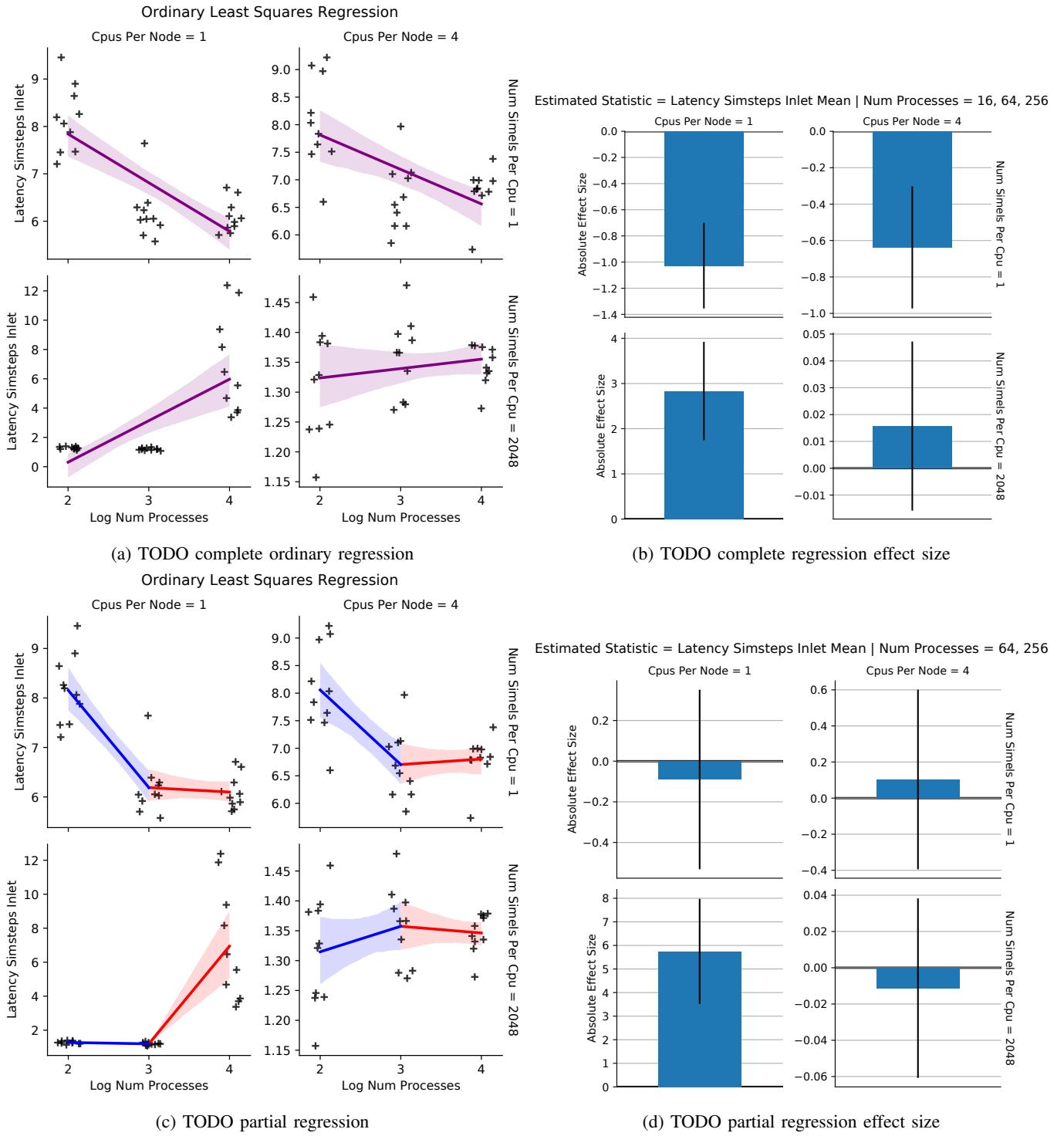


Fig. 14: weak scaling Latency Simsteps Inlet ordinary least squares regression to estimate mean

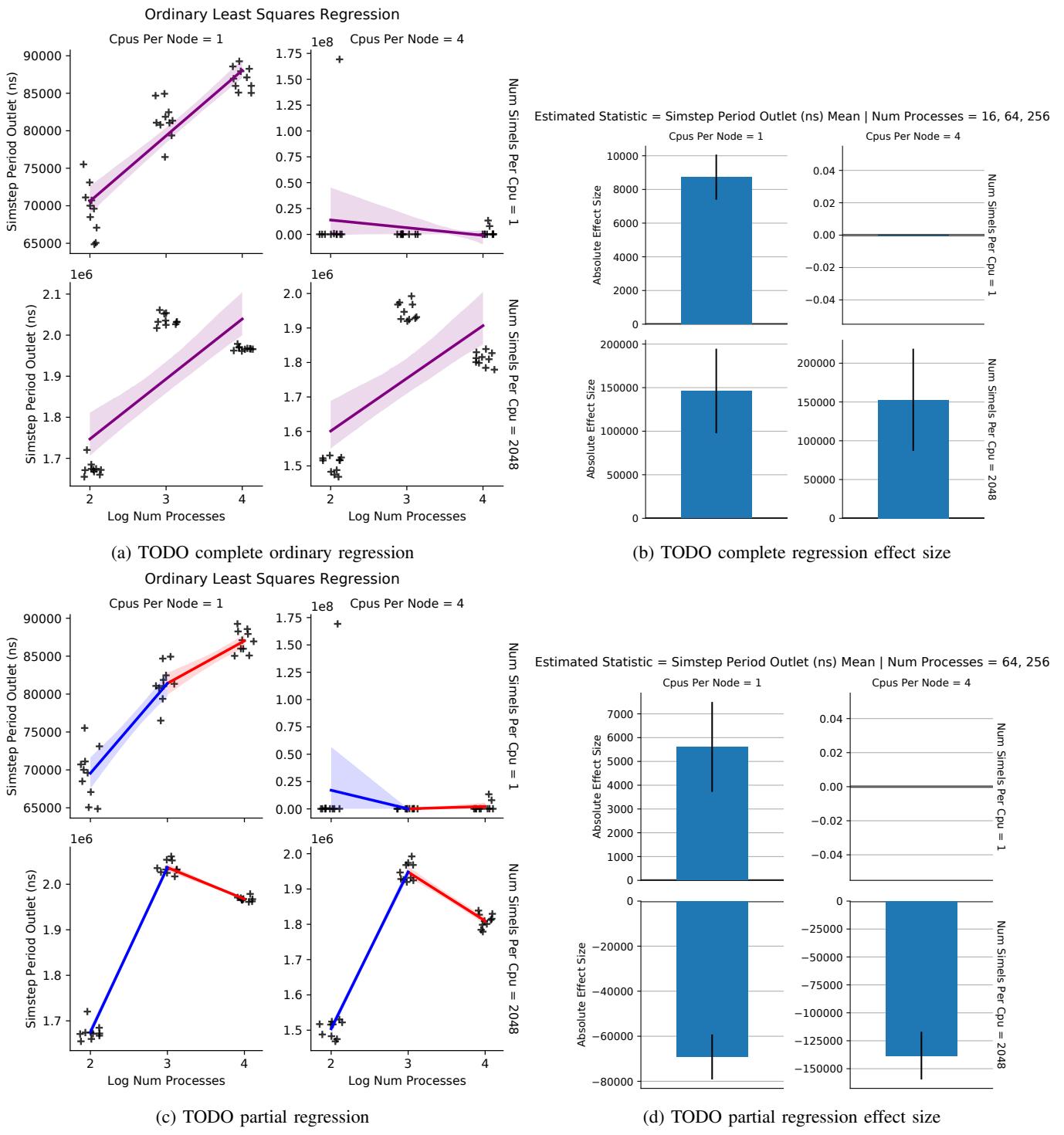


Fig. 15: weak scaling Simstep Period Outlet (ns) ordinary least squares regression to estimate mean

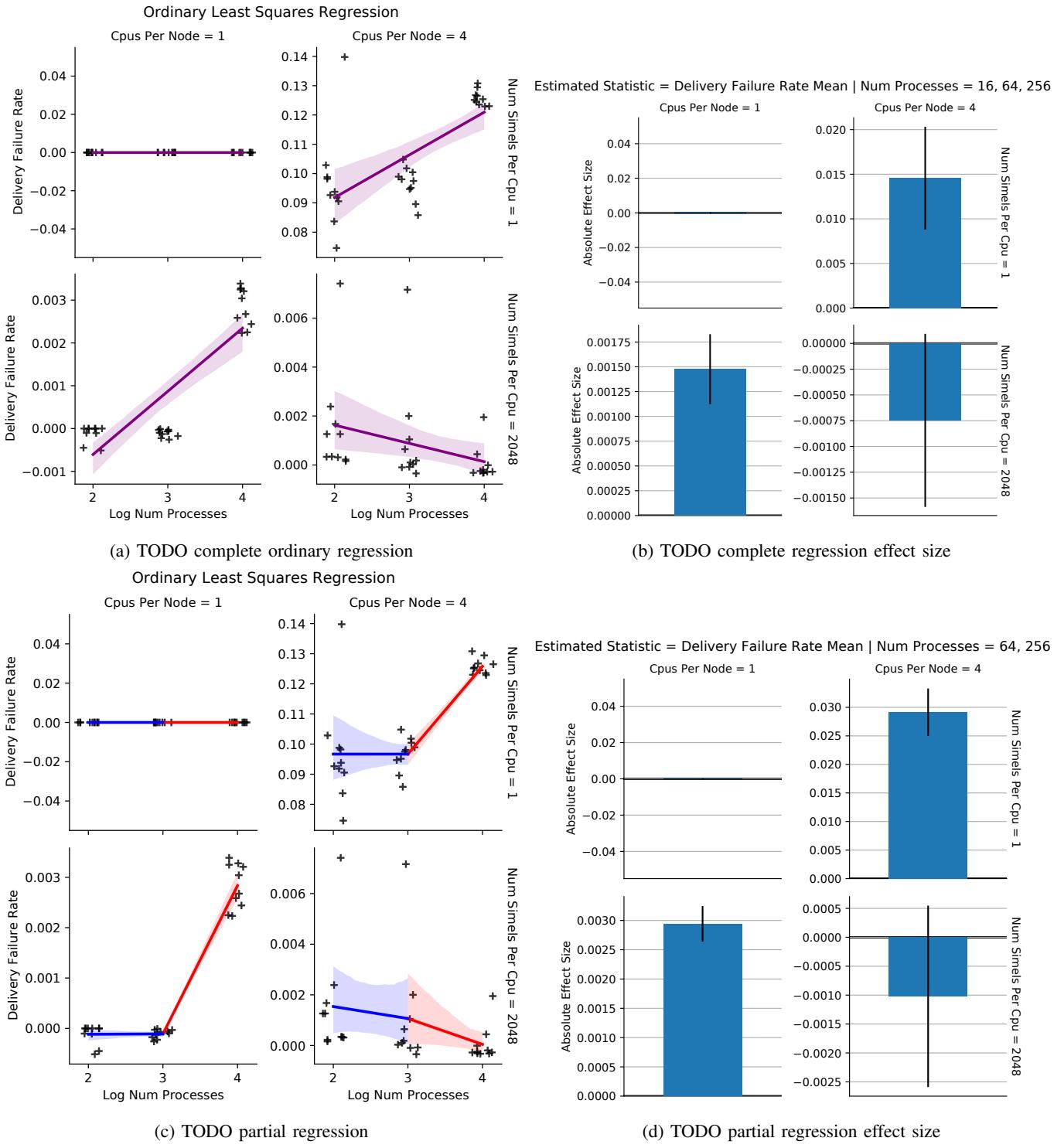


Fig. 16: weak scaling Delivery Failure Rate ordinary least squares regression to estimate mean

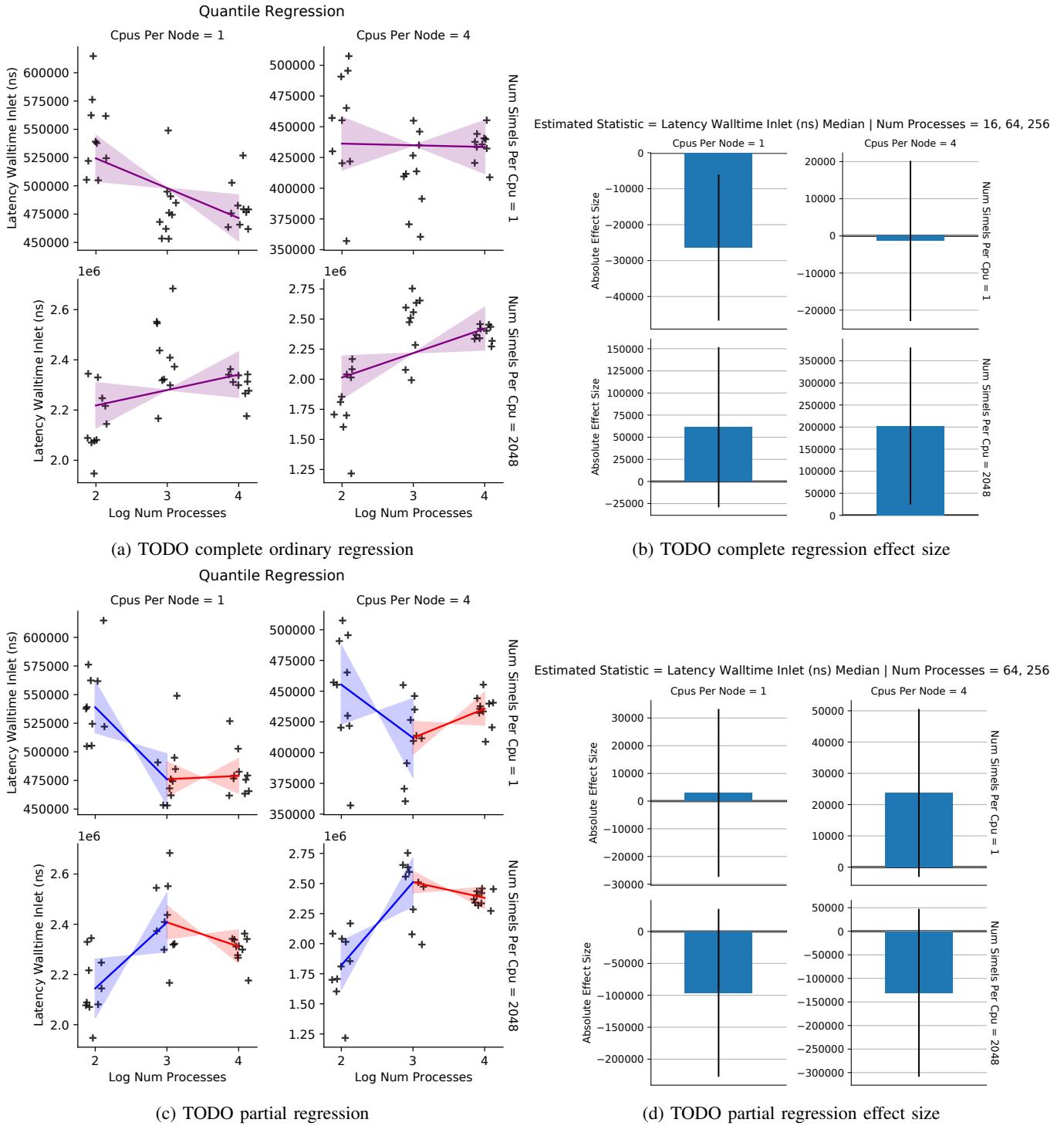


Fig. 17: weak scaling Latency Walltime Inlet (ns) quantile regression to estimate median

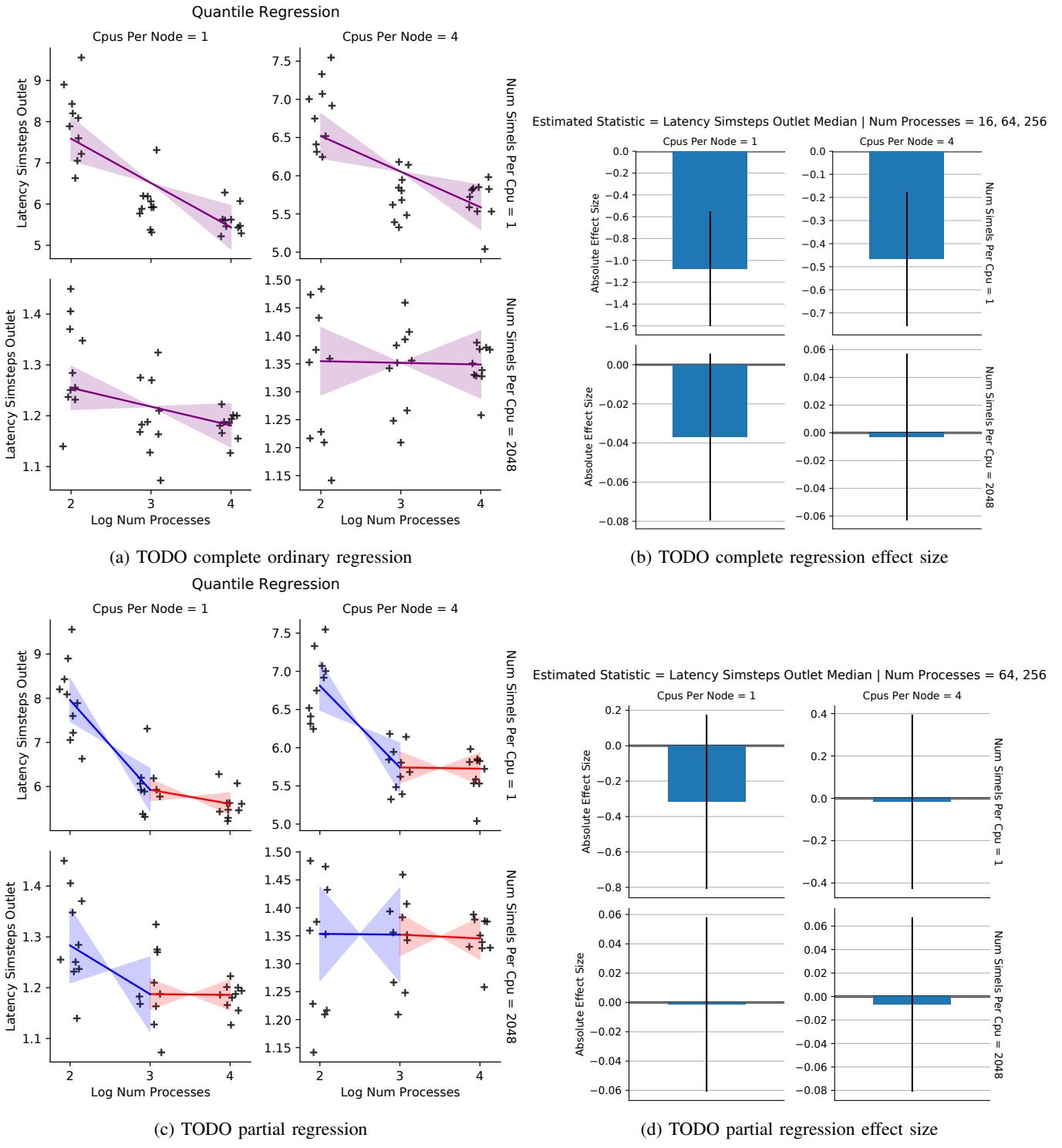


Fig. 18: weak scaling Latency Simsteps Outlet quantile regression to estimate median

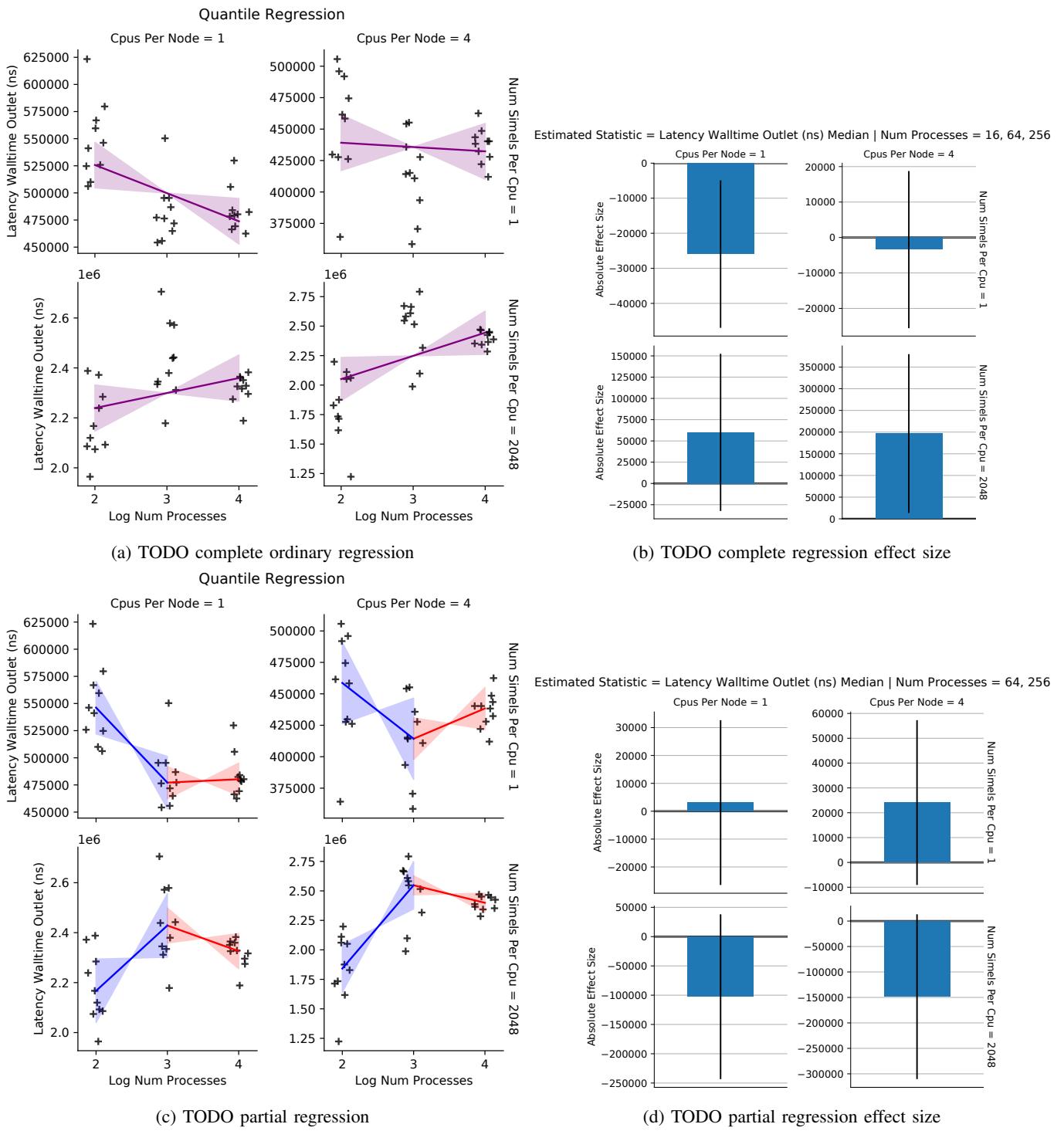


Fig. 19: weak scaling Latency Walltime Outlet (ns) quantile regression to estimate median

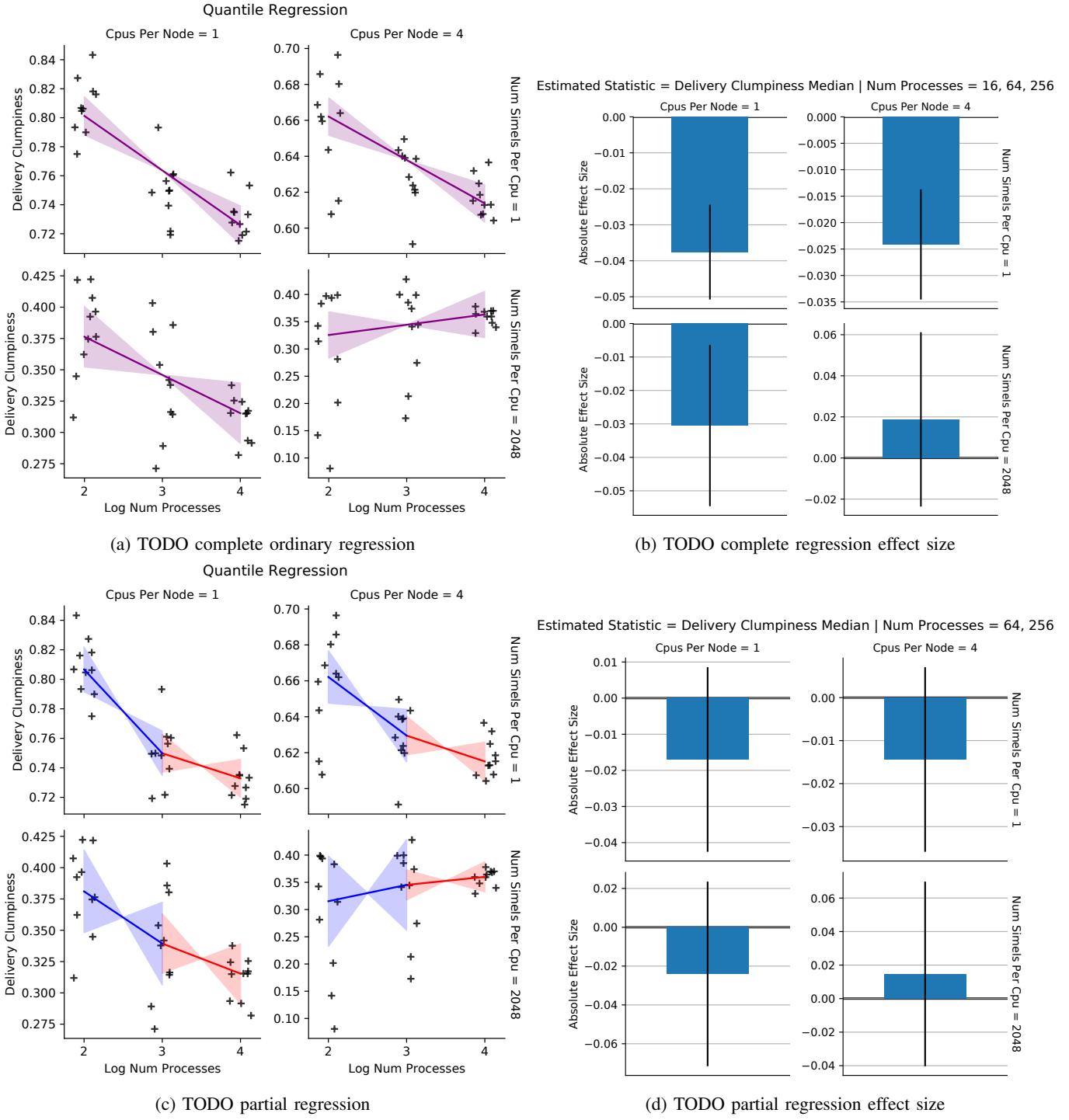


Fig. 20: weak scaling Delivery Clumpiness quantile regression to estimate median

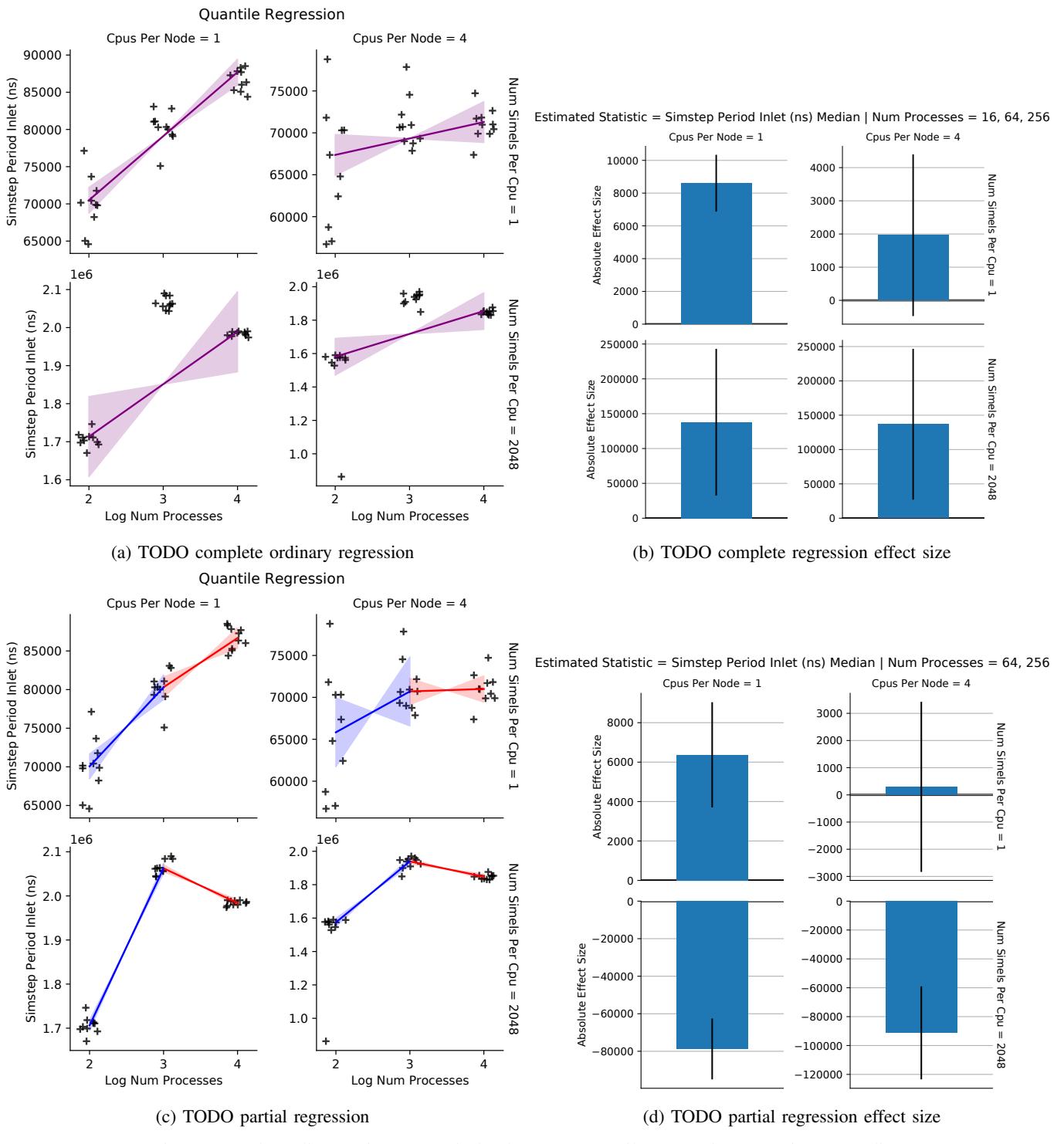


Fig. 21: weak scaling Simstep Period Inlet (ns) quantile regression to estimate median

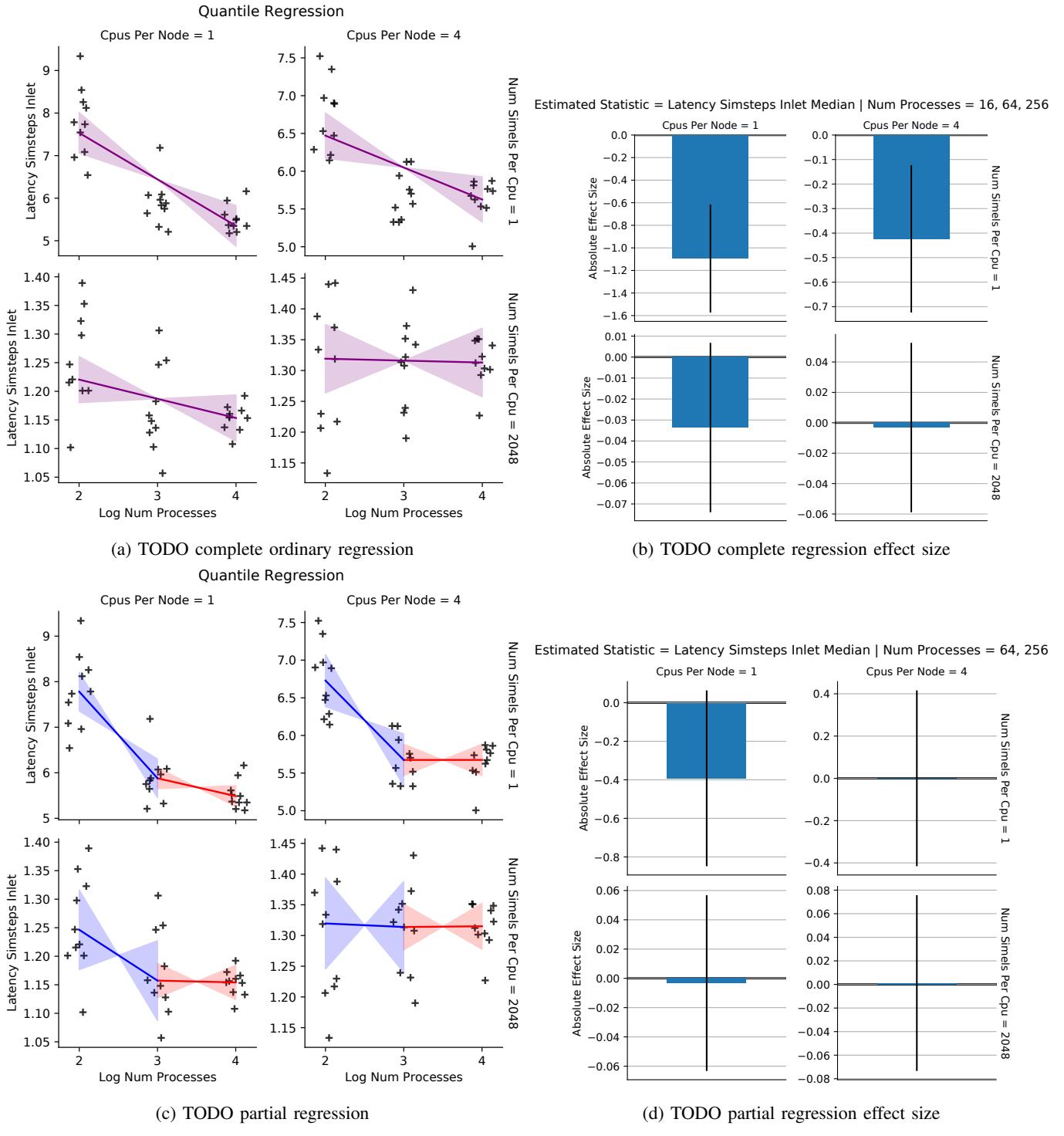


Fig. 22: weak scaling Latency Simsteps Inlet quantile regression to estimate median

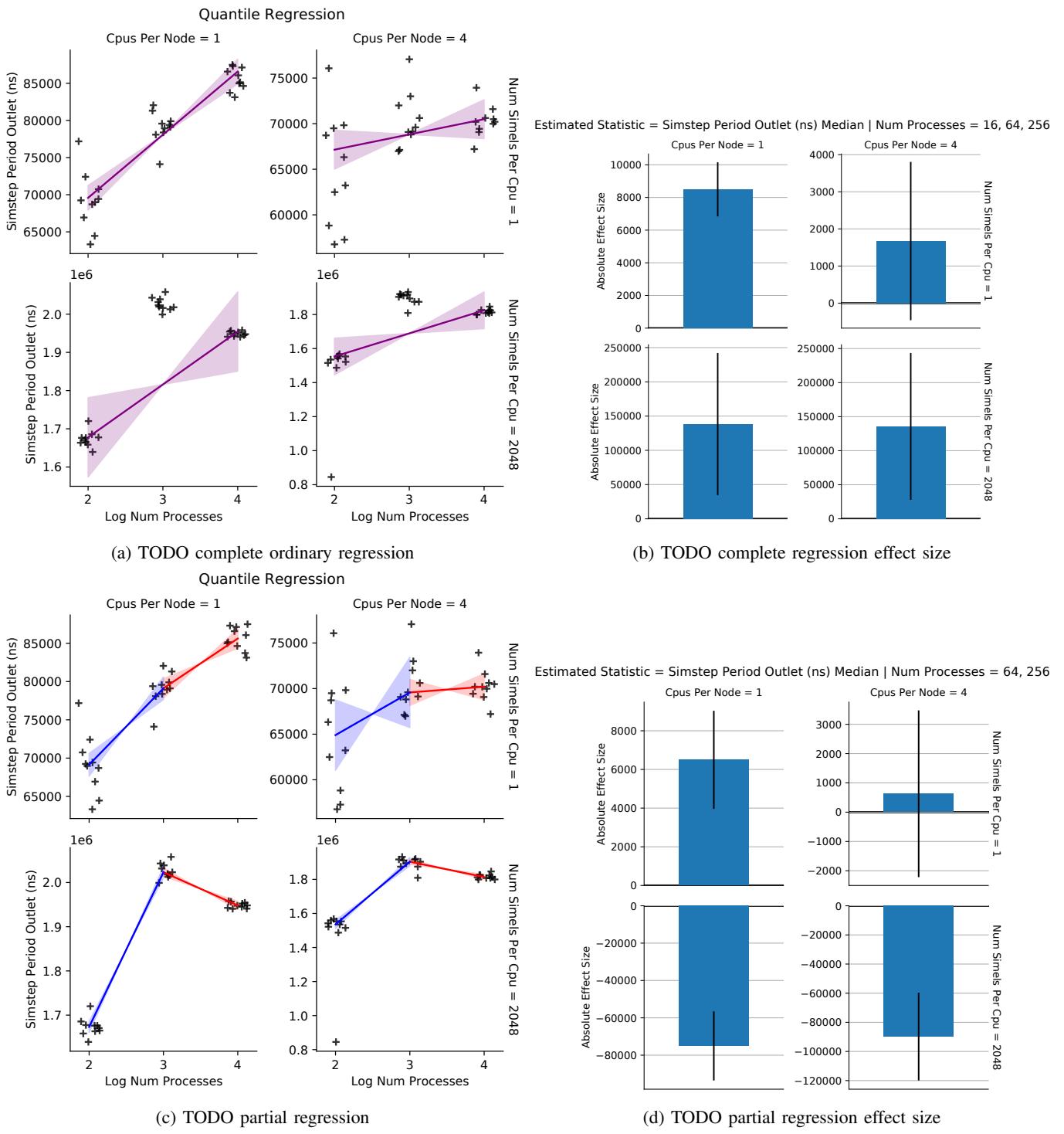


Fig. 23: weak scaling Simstep Period Outlet (ns) quantile regression to estimate median

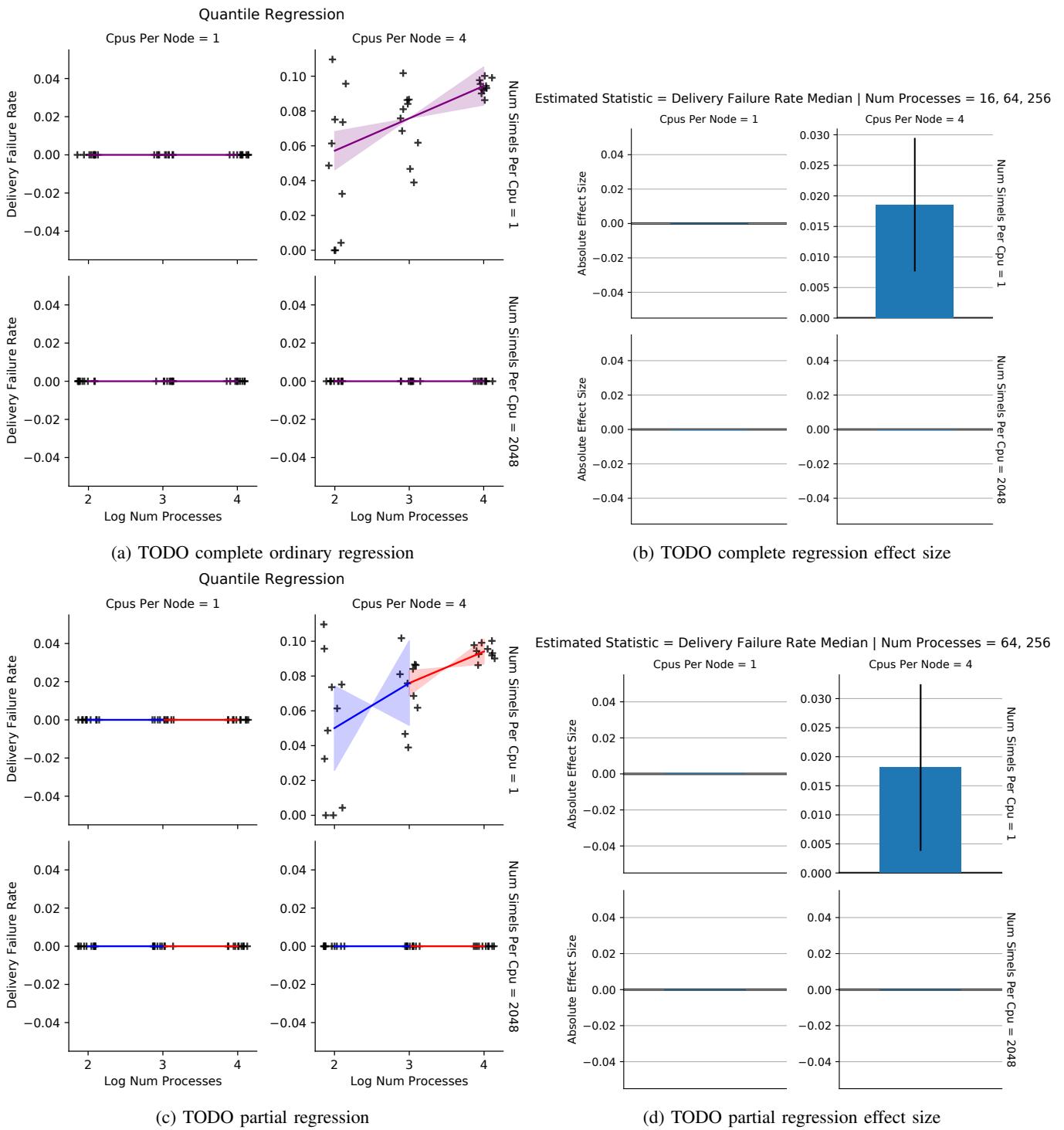


Fig. 24: weak scaling Delivery Failure Rate quantile regression to estimate median

TABLE I: Latency Walltime Inlet (ns) Weak Scaling Ordinary Least Squares Regression.

Metric	Statistic	Cpus Per Node	Num Slices Per Cpu	Num Processes	Absolute Effect Size	Absolute Effect Size 95% CI Lower Bound	Absolute Effect Size 95% CI Upper Bound	Relative Effect Size	Relative Effect Size 95% CI Lower Bound	Relative Effect Size 95% CI Upper Bound	n	p	
Latency Walltime Inlet (ns)	mean	-	1	1	16/64/256	-19'000	-35'000	-2'400	-0.033	-0.062	-0.0043	30	0.026
Latency Walltime Inlet (ns)	mean	+	1	2048	16/64/256	5.5e+06	3.5e+06	7.5e+06	2.5	1.6	3.4	30	4.8e-06
Latency Walltime Inlet (ns)	mean	0	4	1	16/64/256	-110'000	-350'000	120'000	-0.13	-0.4	0.14	30	0.33
Latency Walltime Inlet (ns)	mean	+	4	2048	16/64/256	230'000	110'000	340'000	0.11	0.057	0.17	30	0.0003
Latency Walltime Inlet (ns)	mean	-	1	16/64	-63'000	-92'000	-34'000	-0.11	-0.16	-0.061	20	0.00024	
Latency Walltime Inlet (ns)	mean	+	1	2048	16/64	300'000	170'000	430'000	0.14	0.077	0.2	20	0.00014
Latency Walltime Inlet (ns)	mean	0	4	1	16/64	-320'000	-900'000	260'000	-0.37	-1	0.3	20	0.26
Latency Walltime Inlet (ns)	mean	+	4	2048	16/64	660'000	530'000	800'000	0.33	0.27	0.4	20	5.5e-09
Latency Walltime Inlet (ns)	mean	0	1	1	64/256	26'000	-990	52'000	0.046	-0.0018	0.093	20	0.058
Latency Walltime Inlet (ns)	mean	+	1	2048	64/256	1.1e+07	6.5e+06	1.5e+07	4.9	3	6.8	20	3.9e-05
Latency Walltime Inlet (ns)	mean	0	4	1	64/256	93'000	-44'000	230'000	0.11	-0.051	0.27	20	0.17
Latency Walltime Inlet (ns)	mean	-	4	2048	64/256	-310'000	-210'000	-110'000	-0.11	-0.16	-0.055	20	0.00039

TABLE II: Latency Simsteps Outlet Weak Scaling Ordinary Least Squares Regression.

Metric	Statistic	Cpus Per Node	Num Simles Per Cpu	Num Processes	Absolute Effect Size	Relative Effect Size 95% CI Lower Bound	Relative Effect Size 95% CI Upper Bound	n	$\Delta$				
Latency Simsteps Outlet	mean	-	1	1	16/64/256	-1.1	-0.73	-0.13	-0.17	-0.087			
Latency Simsteps Outlet	mean	+	1	2048	16/64/256	2.9	1.8	4	2.2	1.3	3	30	1.1e-05
Latency Simsteps Outlet	mean	NaN	4	1	16/64/256	inf	nan	inf	nan	nan	30	nan	
Latency Simsteps Outlet	mean	0	4	2048	16/64/256	0.0117	-0.0117	0.052	0.013	-0.012	0.038	30	0.3
Latency Simsteps Outlet	mean	-	1	16/64	-2	-2.7	-1.4	-0.24	-0.32	-0.17	20	1.9e-06	
Latency Simsteps Outlet	mean	-	1	2048	16/64	-0.092	-0.17	-0.013	-0.069	-0.13	-0.0097	20	0.025
Latency Simsteps Outlet	mean	-	4	1	16/64	-1.4	-2.1	-0.71	-0.17	-0.26	-0.087	20	0.00053
Latency Simsteps Outlet	mean	0	4	2048	16/64	0.048	-0.035	0.13	0.036	-0.026	0.097	20	0.24
Latency Simsteps Outlet	mean	0	1	1	64/256	-0.099	-0.56	0.36	-0.012	-0.067	0.043	20	0.65
Latency Simsteps Outlet	mean	+	1	2048	64/256	5.8	3.6	8	4.4	2.7	6.1	20	3.8e-05
Latency Simsteps Outlet	mean	NaN	4	1	64/256	inf	nan	inf	nan	nan	20	nan	
Latency Simsteps Outlet	mean	0	4	2048	64/256	-0.013	-0.066	0.04	-0.0095	-0.049	0.03	20	0.62

TABLE III: Latency Walltime Outlet (ns) Weak Scaling Ordinary Least Squares Regression.

Metric	Statistic	Cpus Per Node	Num Similes Per Cpu	Num Processes	Absolute Effect Size	Relative Effect Size	Absolute Effect Size 95% CI Lower Bound	Relative Effect Size 95% CI Lower Bound	Absolute Effect Size 95% CI Upper Bound	Relative Effect Size 95% CI Upper Bound	n	$\Delta$	
Latency Walltime Outlet (ns)	mean	-	1	1	16/64/256	-20'000	-36'000	-3'000	-0.035	-0.064	-0.0054	30	0.022
Latency Walltime Outlet (ns)	mean	+	1	2048	16/64/256	5.5e+06	3.5e+06	7.4e+06	2.5	1.6	3.4	30	5e-06
Latency Walltime Outlet (ns)	mean	NaN	4	1	16/64/256	inf	nan	inf	nan	nan	nan	30	nan
Latency Walltime Outlet (ns)	mean	+	4	2048	16/64/256	230'000	110'000	340'000	0.11	0.056	0.17	30	0.00034
Latency Walltime Outlet (ns)	mean	-	1	1	16/64	-65'000	-95'000	-36'000	-0.12	-0.17	-0.063	20	0.00021
Latency Walltime Outlet (ns)	mean	+	1	2048	16/64	290'000	160'000	430'000	0.13	0.073	0.19	20	0.00021
Latency Walltime Outlet (ns)	mean	0	4	1	16/64	-2.5e+06	-7.2e+06	2.2e+06	-0.82	-2.4	0.73	20	0.28
Latency Walltime Outlet (ns)	mean	+	4	2048	16/64	670'000	530'000	810'000	0.33	0.26	0.4	20	8e-09
Latency Walltime Outlet (ns)	mean	0	1	1	64/256	26'000	-1'500	53'000	0.045	-0.0026	0.093	20	0.062
Latency Walltime Outlet (ns)	mean	+	1	2048	64/256	1.1e+07	6.5e+06	1.5e+07	4.8	2.9	6.7	20	4e-05
Latency Walltime Outlet (ns)	mean	NaN	4	1	64/256	inf	nan	inf	nan	nan	nan	20	nan
Latency Walltime Outlet (ns)	mean	-	4	2048	64/256	-210'000	-320'000	-110'000	-0.11	-0.16	-0.054	20	0.00045

TABLE IV: Delivery Clumpiness Weak Scaling Ordinary Least Squares Regression.

Metric	Statistic	Cpus Per Node	Signedfloat Effect Sign	Num Similes Per Cpu	Num Processes	Absolute Effect Size	Absolute Effect Size 95% CI Lower Bound	Absolute Effect Size 95% CI Upper Bound	Relative Effect Size	Relative Effect Size 95% CI Lower Bound	Relative Effect Size 95% CI Upper Bound	n	D
Delivery Clumpiness	mean	-	1	1	16/64/256	-0.036	-0.045	-0.026	-0.044	-0.056	-0.033	30	1.6e-08
Delivery Clumpiness	mean	-	1	2048	16/64/256	-0.03	-0.044	-0.015	-0.078	-0.12	-0.041	30	0.00021
Delivery Clumpiness	mean	-	4	1	16/64/256	-0.021	-0.033	-0.0087	-0.033	-0.052	-0.014	30	0.0016
Delivery Clumpiness	mean	0	4	2048	16/64/256	0.028	-0.0021	0.058	0.1	-0.077	0.21	30	0.067
Delivery Clumpiness	mean	-	1	16/64	-0.055	-0.074	-0.036	-0.068	-0.092	-0.044	-0.044	20	1.1e-05
Delivery Clumpiness	mean	0	1	2048	16/64	-0.034	-0.07	0.001	-0.092	-0.19	0.0027	20	0.056
Delivery Clumpiness	mean	0	4	1	16/64	-0.022	-0.053	0.0087	-0.034	-0.082	0.013	20	0.15
Delivery Clumpiness	mean	0	4	2048	16/64	0.038	-0.038	0.11	0.14	-0.14	0.41	20	0.31
Delivery Clumpiness	mean	-	1	1	64/256	-0.017	-0.033	-0.0002	-0.021	-0.041	-0.00025	20	0.048
Delivery Clumpiness	mean	0	1	2048	64/256	-0.025	-0.052	0.003	-0.065	-0.14	0.008	20	0.078
Delivery Clumpiness	mean	-	4	1	64/256	-0.02	-0.035	-0.0039	-0.031	-0.055	-0.0061	20	0.017
Delivery Clumpiness	mean	0	4	2048	64/256	0.018	-0.035	0.071	0.065	-0.13	0.25	20	0.48

TABLE V: Simstep Period Inlet (ns) Weak Scaling Ordinary Least Squares Regression.

Metric	Statistic	Cpus Per Node	Num Similes Per Cpu	Num Processes	Absolute Effect Size	Absolute Effect Size 95% CI Lower Bound	Absolute Effect Size 95% CI Upper Bound	Relative Effect Size	Relative Effect Size 95% CI Lower Bound	Relative Effect Size 95% CI Upper Bound	n	p	
Simstep Period Inlet (ns)	mean	+	1	16/64/256	8'800	7'400	10'000	0.12	0.11	0.14	30	1.4e-13	
Simstep Period Inlet (ns)	mean	+	1	2048	16/64/256	150'000	97'000	190'000	0.085	0.056	0.11	30	1.5e-06
Simstep Period Inlet (ns)	mean	NaN	4	1	16/64/256	nan	nan	nan	nan	nan	30	nan	
Simstep Period Inlet (ns)	mean	+	4	2048	16/64/256	160'000	89'000	220'000	0.1	0.058	0.15	30	5.6e-05
Simstep Period Inlet (ns)	mean	+	1	1	16/64	12'000	9'200	15'000	0.17	0.13	0.21	20	4.5e-08
Simstep Period Inlet (ns)	mean	+	1	2048	16/64	360'000	350'000	380'000	0.21	0.2	0.22	20	7e-21
Simstep Period Inlet (ns)	mean	NaN	4	1	16/64	-inf	nan	nan	nan	nan	20	nan	
Simstep Period Inlet (ns)	mean	+	4	2048	16/64	450'000	430'000	480'000	0.3	0.28	0.31	20	6.2e-20
Simstep Period Inlet (ns)	mean	+	1	1	64/256	5'600	3'700	7'500	0.08	0.052	0.11	20	8.8e-06
Simstep Period Inlet (ns)	mean	-	1	2048	64/256	-72'000	-83'000	-61'000	-0.042	-0.049	-0.036	20	5.8e-11
Simstep Period Inlet (ns)	mean	NaN	4	1	64/256	inf	nan	nan	nan	nan	20	nan	
Simstep Period Inlet (ns)	mean	-	4	2048	64/256	-140'000	-160'000	-120'000	-0.093	-0.11	-0.079	20	4.4e-11

TABLE VI: Latency Simsteps Inlet Weak Scaling Ordinary Least Squares Regression.

Metric	Statistic	Cpus Per Node	Num Simes Per Cpu	Num Processes	Absolute Effect Size	Absolute Effect Size 95% CI Lower Bound	Absolute Effect Size 95% CI Upper Bound	Relative Effect Size	Relative Effect Size 95% CI Lower Bound	Relative Effect Size 95% CI Upper Bound	n	$\alpha$	
Latency Simsteps Inlet	mean	-	1	1	16/64/256	-1	-1.4	-0.7	-0.13	-0.17	-0.086	30	5.7e-07
Latency Simsteps Inlet	mean	+	1	2048	16/64/256	2.8	1.7	3.9	2.2	1.4	3.1	30	1.1e-05
Latency Simsteps Inlet	mean	-	4	1	16/64/256	-0.64	-0.97	-0.3	-0.079	-0.12	-0.037	30	0.00055
Latency Simsteps Inlet	mean	0	4	2048	16/64/256	0.016	-0.016	0.047	0.012	-0.012	0.036	30	0.32
Latency Simsteps Inlet	mean	-	1	1	16/64	-2	-2.6	-1.4	-0.24	-0.31	-0.17	20	2e-06
Latency Simsteps Inlet	mean	-	1	2048	16/64	-0.081	-0.16	-0.0058	-0.064	-0.12	-0.0045	20	0.036
Latency Simsteps Inlet	mean	-	4	1	16/64	-1.4	-2.1	-0.69	-0.17	-0.26	-0.085	20	0.00055
Latency Simsteps Inlet	mean	0	4	2048	16/64	0.043	-0.033	0.12	0.032	-0.025	0.09	20	0.25
Latency Simsteps Inlet	mean	0	1	1	64/256	-0.09	-0.53	0.35	-0.011	-0.065	0.043	20	0.67
Latency Simsteps Inlet	mean	+	1	2048	64/256	5.7	3.5	8	4.5	2.8	6.2	20	3.8e-05
Latency Simsteps Inlet	mean	0	4	1	64/256	0.1	-0.39	0.6	0.013	-0.049	0.074	20	0.67
Latency Simsteps Inlet	mean	0	4	2048	64/256	-0.011	-0.061	0.038	-0.0086	-0.046	0.029	20	0.64

TABLE VII: Simstep Period Outlet (ns) Weak Scaling Ordinary Least Squares Regression.

Metric	Statistic									
	Significant Effect Sign		Cpus Per Node		Num Simes Per Cpu		Num Processes		Absolute Effect Size	
	+/-	1	1	16/64/256	8'700	7'400	10'000	0.13	0.11	0.14
Simstep Period Outlet (ns)	mean	+	1	1	16/64/256	8'700	7'400	10'000	0.13	0.14
Simstep Period Outlet (ns)	mean	+	1	2048	16/64/256	150'000	98'000	190'000	0.087	0.058
Simstep Period Outlet (ns)	mean	NaN	4	1	16/64/256	nan	nan	nan	nan	0.12
Simstep Period Outlet (ns)	mean	+	4	2048	16/64/256	150'000	87'000	220'000	0.1	0.058
Simstep Period Outlet (ns)	mean	+	1	1	16/64	12'000	9'100	15'000	0.17	0.13
Simstep Period Outlet (ns)	mean	+	1	2048	16/64	360'000	350'000	380'000	0.22	0.21
Simstep Period Outlet (ns)	mean	NaN	4	1	16/64	-inf	nan	nan	nan	0.22
Simstep Period Outlet (ns)	mean	+	4	2048	16/64	440'000	420'000	470'000	0.3	0.28
Simstep Period Outlet (ns)	mean	+	1	1	64/256	5'600	3'700	7'500	0.081	0.053
Simstep Period Outlet (ns)	mean	-	1	2048	64/256	-69'000	-79'000	-59'000	-0.041	-0.047
Simstep Period Outlet (ns)	mean	NaN	4	1	64/256	inf	nan	nan	nan	-0.035
Simstep Period Outlet (ns)	mean	-	4	2048	64/256	-140'000	-160'000	-120'000	-0.092	-0.11
Simstep Period Outlet (ns)	mean	-	4	2048	64/256	-140'000	-160'000	-120'000	-0.078	-0.078

TABLE VIII: Delivery Failure Rate Weak Scaling Ordinary Least Squares Regression.

Metric	Statistic	Cpus Per Node	Num Slices Per Cpu	Num Processes	Absolute Effect Size	Absolute Effect Size 95% CI Lower Bound	Absolute Effect Size 95% CI Upper Bound	Relative Effect Size	Relative Effect Size 95% CI Lower Bound	Relative Effect Size 95% CI Upper Bound	$\Delta$
Delivery Failure Rate	mean	NaN	1	16/64/256	0	0	nan	nan	nan	nan	30
Delivery Failure Rate	mean	+	1	2048	16/64/256	0.0015	0.0011	0.0018	-13	-9.6	-16
Delivery Failure Rate	mean	+	4	1	16/64/256	0.015	0.0088	0.02	0.15	0.091	0.21
Delivery Failure Rate	mean	0	4	2048	16/64/256	-0.00075	-0.0016	9.3e-05	-0.49	-1	0.06
Delivery Failure Rate	mean	NaN	1	16/64	0	0	0	nan	nan	nan	20
Delivery Failure Rate	mean	0	1	2048	16/64	8.6e-06	-0.00013	0.00015	-0.073	1.1	-1.3
Delivery Failure Rate	mean	0	4	1	16/64	-5.7e-08	-0.012	0.012	-5.8e-07	-0.12	0.12
Delivery Failure Rate	mean	0	4	2048	16/64	-0.00047	-0.0026	0.0016	-0.31	-1.7	1.1
Delivery Failure Rate	mean	NaN	1	1	64/256	0	0	0	nan	nan	20
Delivery Failure Rate	mean	+	1	2048	64/256	0.0029	0.0026	0.0032	-25	-23	-28
Delivery Failure Rate	mean	+	4	1	64/256	0.029	0.025	0.033	0.3	0.26	0.34
Delivery Failure Rate	mean	0	4	2048	64/256	-0.001	-0.0026	0.00055	-0.66	-1.7	0.36

TABLE IX: Latency Walltime Inlet (ns) Weak Scaling Quantile Regression.

Metric	Significance Effect Size	Number of Processes	p
Latency	Cpus Per Node	1	~0.0002
Latency	Cpus Per Node	4	~0.0005
Latency	Cpus Per Node	16	~0.001
Latency	Cpus Per Node	64	~0.002
Latency	Num Slices Per Cpu	1	~0.0003
Latency	Num Slices Per Cpu	4	~0.0008
Latency	Num Slices Per Cpu	16	~0.0015
Latency	Num Slices Per Cpu	64	~0.0025
Walltime	Cpus Per Node	1	~0.0004
Walltime	Cpus Per Node	4	~0.0009
Walltime	Cpus Per Node	16	~0.0018
Walltime	Cpus Per Node	64	~0.003
Walltime	Num Slices Per Cpu	1	~0.0005
Walltime	Num Slices Per Cpu	4	~0.0012
Walltime	Num Slices Per Cpu	16	~0.0025
Walltime	Num Slices Per Cpu	64	~0.004
Inlet	Cpus Per Node	1	~0.0006
Inlet	Cpus Per Node	4	~0.0015
Inlet	Cpus Per Node	16	~0.003
Inlet	Cpus Per Node	64	~0.005
Inlet	Num Slices Per Cpu	1	~0.0007
Inlet	Num Slices Per Cpu	4	~0.002
Inlet	Num Slices Per Cpu	16	~0.004
Inlet	Num Slices Per Cpu	64	~0.007

TABLE X: Latency Simsteps Outlet Weak Scaling Quantile Regression.

Metric	Statistic																			
	Sigmoid			Num Simles Per Cpu			Num Processes			Absolute Effect Size			Relative Effect Size 95% CI Lower Bound			Relative Effect Size 95% CI Upper Bound			$\alpha$	
				Cpus Per Node	16/64	2048	16/64	16/64	2048	16/64	16/64	16/64/256	-1.1	-1.6	-0.55	-0.13	-0.2	-0.069	30	0.00025
Latency Simsteps Outlet	median	-	1	1	16/64/256	-1.1	-0.08	0.0057	-0.029	-0.063	0.0045	30	0.087							
Latency Simsteps Outlet	median	0	1	2048	16/64/256	-0.037	-0.08	0.0057	-0.029	-0.063	0.0045	30	0.087							
Latency Simsteps Outlet	median	-	4	1	16/64/256	-0.47	-0.76	-0.18	-0.068	-0.11	-0.026	30	0.0027							
Latency Simsteps Outlet	median	0	4	2048	16/64/256	-0.003	-0.063	0.057	-0.0022	-0.047	0.042	30	0.92							
Latency Simsteps Outlet	median	-	1	1	16/64	-2	-3	-1.1	-0.25	-0.38	-0.13	20	0.00033							
Latency Simsteps Outlet	median	0	1	2048	16/64	-0.096	-0.24	0.051	-0.075	-0.19	0.04	20	0.19							
Latency Simsteps Outlet	median	-	4	1	16/64	-1.1	-1.7	-0.43	-0.16	-0.25	-0.063	20	0.0025							
Latency Simsteps Outlet	median	0	4	2048	16/64	-0.0014	-0.17	0.17	-0.001	-0.12	0.12	20	0.99							
Latency Simsteps Outlet	median	0	1	1	64/256	-0.32	-0.81	0.18	-0.04	-0.1	0.022	20	0.19							
Latency Simsteps Outlet	median	0	1	2048	64/256	-0.0014	-0.061	0.058	-0.0011	-0.048	0.046	20	0.96							
Latency Simsteps Outlet	median	0	4	1	64/256	-0.017	-0.43	0.4	-0.0024	-0.063	0.058	20	0.93							
Latency Simsteps Outlet	median	0	4	2048	64/256	-0.0068	-0.081	0.068	-0.005	-0.06	0.05	20	0.85							

TABLE XI: Latency Walltime Outlet (ns) Weak Scaling Quantile Regression.

Metric	Statistic	Cpus Per Node	Num Slices Per Cpu	Num Processes	Absolute Effect Size	Absolute Effect Size 95% CI Lower Bound	Absolute Effect Size 95% CI Upper Bound	Relative Effect Size	Relative Effect Size 95% CI Lower Bound	Relative Effect Size 95% CI Upper Bound	n	p	
Latency Walltime Outlet (ns)	median	-	1	16/64/256	-26'000	-47'000	-4'900	-0.048	-0.086	-0.0091	30	0.017	
Latency Walltime Outlet (ns)	median	0	1	2048	16/64/256	60'000	-32'000	150'000	0.028	-0.015	0.071	30	0.19
Latency Walltime Outlet (ns)	median	0	4	1	16/64/256	-3'400	-26'000	19'000	-0.0074	-0.056	0.041	30	0.75
Latency Walltime Outlet (ns)	median	+	4	2048	16/64/256	200'000	13'000	380'000	0.11	0.0073	0.21	30	0.036
Latency Walltime Outlet (ns)	median	-	1	16/64	-69'000	-120'000	-21'000	-0.13	-0.22	-0.038	20	0.0077	
Latency Walltime Outlet (ns)	median	+	1	2048	16/64	260'000	7'700	520'000	0.12	0.0036	0.24	20	0.044
Latency Walltime Outlet (ns)	median	0	4	1	16/64	-44'000	-110'000	20'000	-0.096	-0.24	0.044	20	0.17
Latency Walltime Outlet (ns)	median	+	4	2048	16/64	710'000	300'000	1.1e+06	0.38	0.16	0.6	20	0.0017
Latency Walltime Outlet (ns)	median	0	1	64/256	3'100	-26'000	33'000	0.0057	-0.049	0.06	20	0.83	
Latency Walltime Outlet (ns)	median	0	1	2048	64/256	-100'000	-240'000	38'000	-0.048	-0.11	0.018	20	0.14
Latency Walltime Outlet (ns)	median	0	4	1	64/256	24'000	-9'100	57'000	0.052	-0.02	0.12	20	0.14
Latency Walltime Outlet (ns)	median	0	4	2048	64/256	-150'000	-310'000	13'000	-0.08	-0.17	0.0072	20	0.07

TABLE XII: Delivery Clumpiness Weak Scaling Quantile Regression.

Metric	Statistic	Cpus Per Node	Num Slices Per Cpu	Num Processes	Absolute Effect Size	Absolute Effect Size 95% CI Lower Bound	Absolute Effect Size 95% CI Upper Bound	Relative Effect Size	Relative Effect Size 95% CI Lower Bound	Relative Effect Size 95% CI Upper Bound	n	D	
Delivery Clumpiness	median	-	1	16/64/256	-0.038	-0.051	-0.024	-0.047	-0.063	-0.03	30	2.7e-06	
Delivery Clumpiness	median	-	1	20/48	16/64/256	-0.031	-0.055	-0.064	-0.079	-0.14	-0.017	30	0.015
Delivery Clumpiness	median	-	4	1	16/64/256	-0.024	-0.035	-0.014	-0.036	-0.052	-0.021	30	5.5e-05
Delivery Clumpiness	median	0	4	20/48	16/64/256	0.019	-0.024	0.061	0.057	-0.072	0.19	30	0.37
Delivery Clumpiness	median	-	1	16/64	-0.057	-0.087	-0.027	-0.07	-0.11	-0.033	20	0.00091	
Delivery Clumpiness	median	0	1	20/48	16/64	-0.042	-0.11	0.024	-0.11	-0.28	0.063	20	0.2
Delivery Clumpiness	median	-	4	1	16/64	-0.033	-0.062	-0.034	-0.049	-0.093	-0.0052	20	0.031
Delivery Clumpiness	median	0	4	20/48	16/64	0.03	-0.14	0.2	0.091	-0.41	0.6	20	0.71
Delivery Clumpiness	median	0	1	1	64/256	-0.017	-0.043	0.0085	-0.021	-0.053	0.011	20	0.18
Delivery Clumpiness	median	0	1	20/48	64/256	-0.024	-0.072	0.024	-0.063	-0.19	0.061	20	0.3
Delivery Clumpiness	median	0	4	1	64/256	-0.014	-0.036	0.0071	-0.022	-0.054	0.011	20	0.18
Delivery Clumpiness	median	0	4	20/48	64/256	0.015	-0.04	0.07	0.045	-0.12	0.21	20	0.58

TABLE XIII: Simsteps Period Inlet (ns) Weak Scaling Quantile Regression.

Metric	Statistic											
	Sigmoidal Effect Size			Cpus Per Node			Num Simles Per Cpu			Num Processes		
	Absolute Effect Size		Relative Effect Size		Absolute Effect Size		Relative Effect Size		Absolute Effect Size		Relative Effect Size	
Simstep Period Inlet (ns)	median	+	1	1	16/64/256	8'600	6'900	10'000	0.12	0.098	0.15	30
Simstep Period Inlet (ns)	median	+	1	2048	16/64/256	140'000	33'000	240'000	0.081	0.019	0.14	30
Simstep Period Inlet (ns)	median	0	4	1	16/64/256	2'000	-470	4'400	0.03	-0.0072	0.067	30
Simstep Period Inlet (ns)	median	+	4	2048	16/64/256	140'000	27'000	250'000	0.087	0.017	0.16	30
Simstep Period Inlet (ns)	median	+	1	1	16/64	10'000	7'000	13'000	0.15	0.1	0.19	20
Simstep Period Inlet (ns)	median	+	1	2048	16/64	360'000	330'000	380'000	0.21	0.2	0.22	20
Simstep Period Inlet (ns)	median	0	4	1	16/64	4'900	-3'300	13'000	0.074	-0.051	0.2	20
Simstep Period Inlet (ns)	median	+	4	2048	16/64	370'000	320'000	410'000	0.23	0.2	0.26	20
Simstep Period Inlet (ns)	median	+	1	1	64/256	6'400	3'700	9'000	0.091	0.053	0.13	20
Simstep Period Inlet (ns)	median	-	1	2048	64/256	-79'000	-95'000	-63'000	-0.046	-0.056	-0.037	20
Simstep Period Inlet (ns)	median	0	4	1	64/256	300	-2'800	3'400	0.0045	-0.043	0.052	20
Simstep Period Inlet (ns)	median	-	4	2048	64/256	-91'000	-120'000	-59'000	-0.058	-0.078	-0.037	20

TABLE XIV: Latency Simsteps Inlet Weak Scaling Quantile Regression.

Metric		Statistic		Significant Effect Sign		Num Simles per Cpu		Num Procceses		Absolute Effect Size		Relative Effect Size 95% CI Lower Bound	
												Relative Effect Size 95% CI Upper Bound	
												Relative Effect Size 95% CI Lower Bound	
												Relative Effect Size 95% CI Upper Bound	
												n	
												$\alpha$	
Latency Simsteps Inlet	median	-	1	1	16/64/256	-1.1	-1.6	-0.62	-0.14	-0.2	-0.079	30	6.6e-05
Latency Simsteps Inlet	median	0	1	2048	16/64/256	-0.034	-0.074	0.0068	-0.027	-0.06	0.0055	30	0.1
Latency Simsteps Inlet	median	-	4	1	16/64/256	-0.42	-0.72	-0.12	-0.063	-0.11	-0.018	30	0.0074
Latency Simsteps Inlet	median	0	4	2048	16/64/256	-0.0031	-0.059	0.053	-0.0023	-0.044	0.04	30	0.91
Latency Simsteps Inlet	median	-	1	1	16/64	-1.9	-2.7	-1.1	-0.24	-0.35	-0.14	20	0.00017
Latency Simsteps Inlet	median	0	1	2048	16/64	-0.089	-0.23	0.051	-0.072	-0.19	0.041	20	0.2
Latency Simsteps Inlet	median	-	4	1	16/64	-1.1	-1.7	-0.36	-0.16	-0.26	-0.054	20	0.005
Latency Simsteps Inlet	median	0	4	2048	16/64	-0.0057	-0.15	0.14	-0.0043	-0.12	0.11	20	0.94
Latency Simsteps Inlet	median	0	1	64/256	-0.39	-0.85	0.064	-0.051	-0.11	0.0082	20	0.088	
Latency Simsteps Inlet	median	0	1	2048	64/256	-0.0032	-0.063	0.057	-0.0026	-0.051	0.046	20	0.91
Latency Simsteps Inlet	median	0	4	1	64/256	0.00035	-0.42	0.42	5.2e-05	-0.062	0.062	20	1
Latency Simsteps Inlet	median	0	4	2048	64/256	0.0012	-0.073	0.076	0.00089	-0.055	0.057	20	0.97

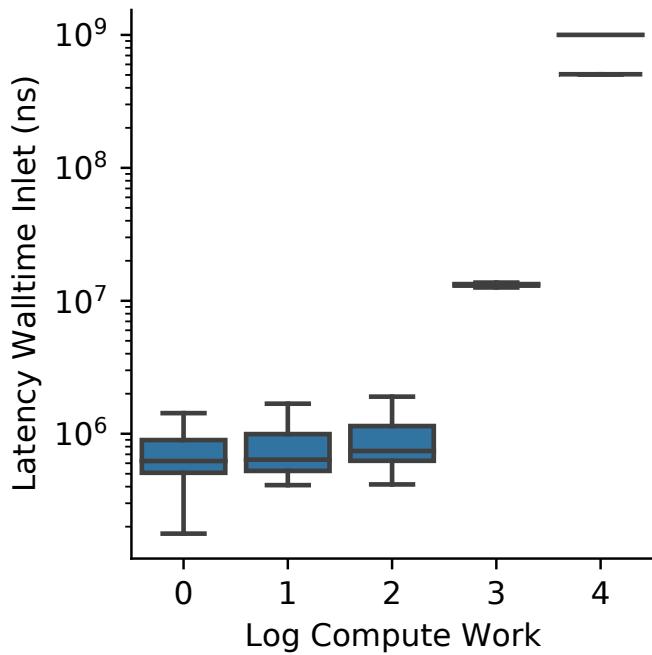
TABLE XV: Simstep Period Outlet (ns) Weak Scaling Quantile Regression.

Metric	Statistic			
	Cpus Per Node	Num Simles Per Cpu	Num Processes	Absolute Effect Size
Simstep Period Outlet (ns)	median	+	1	16/64/256
Simstep Period Outlet (ns)	median	+	1	2048
Simstep Period Outlet (ns)	median	0	4	1
Simstep Period Outlet (ns)	median	+	4	2048
Simstep Period Outlet (ns)	median	+	1	16/64
Simstep Period Outlet (ns)	median	+	1	2048
Simstep Period Outlet (ns)	median	0	4	1
Simstep Period Outlet (ns)	median	+	4	2048
Simstep Period Outlet (ns)	median	+	1	16/64
Simstep Period Outlet (ns)	median	-	1	2048
Simstep Period Outlet (ns)	median	0	4	1
Simstep Period Outlet (ns)	median	-	4	2048
Relative Effect Size 95% CI Lower Bound				
Relative Effect Size 95% CI Upper Bound				
Relative Effect Size 95% CI Lower Bound				
Relative Effect Size 95% CI Upper Bound				
Relative Effect Size 95% CI Lower Bound				
Relative Effect Size 95% CI Upper Bound				
n				
p				

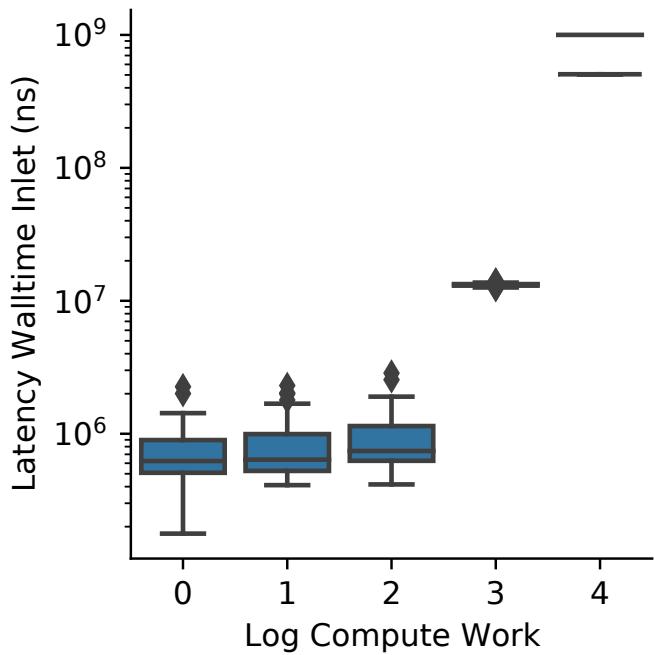
TABLE XVI: Delivery Failure Rate Weak Scaling Quantile Regression.

Metric	Statistic	Cpus Per Node	Num Simles Per Cpu	Num Processes	Absolute Effect Size	Relative Effect Size	Absolute Effect Size 95% CI Lower Bound	Relative Effect Size 95% CI Lower Bound	Absolute Effect Size 95% CI Upper Bound	Relative Effect Size 95% CI Upper Bound	CI Lower Bound	CI Upper Bound	Effect Size 95%	Relative Effect Size 95%	Effect Size	
Delivery Failure Rate	median	NaN	1	16/64/256	0	nan	nan	nan	nan	nan	30	nan	30	nan	30	nan
Delivery Failure Rate	median	NaN	1	2048	16/64/256	0	nan	nan	nan	nan	30	nan	30	nan	30	nan
Delivery Failure Rate	median	+	4	1	16/64/256	0.019	0.0076	0.029	0.34	0.14	0.54	30	0.0016	0.54	30	0.0016
Delivery Failure Rate	median	NaN	4	2048	16/64/256	0	nan	nan	nan	nan	30	nan	30	nan	30	nan
Delivery Failure Rate	median	NaN	1	1	16/64	0	nan	nan	nan	nan	20	nan	20	nan	20	nan
Delivery Failure Rate	median	NaN	1	2048	16/64	0	nan	nan	nan	nan	20	nan	20	nan	20	nan
Delivery Failure Rate	median	0	4	1	16/64	0.026	-0.023	0.074	0.47	-0.41	1.4	20	0.28	1.4	20	0.28
Delivery Failure Rate	median	NaN	4	2048	16/64	0	nan	nan	nan	nan	20	nan	20	nan	20	nan
Delivery Failure Rate	median	NaN	1	1	64/256	0	nan	nan	nan	nan	20	nan	20	nan	20	nan
Delivery Failure Rate	median	NaN	1	2048	64/256	0	nan	nan	nan	nan	20	nan	20	nan	20	nan
Delivery Failure Rate	median	+	4	1	64/256	0.018	0.0038	0.032	0.33	0.069	0.59	20	0.016	0.59	20	0.016
Delivery Failure Rate	median	NaN	4	2048	64/256	0	nan	nan	nan	nan	20	nan	20	nan	20	nan

*B. Computation vs. Communication*

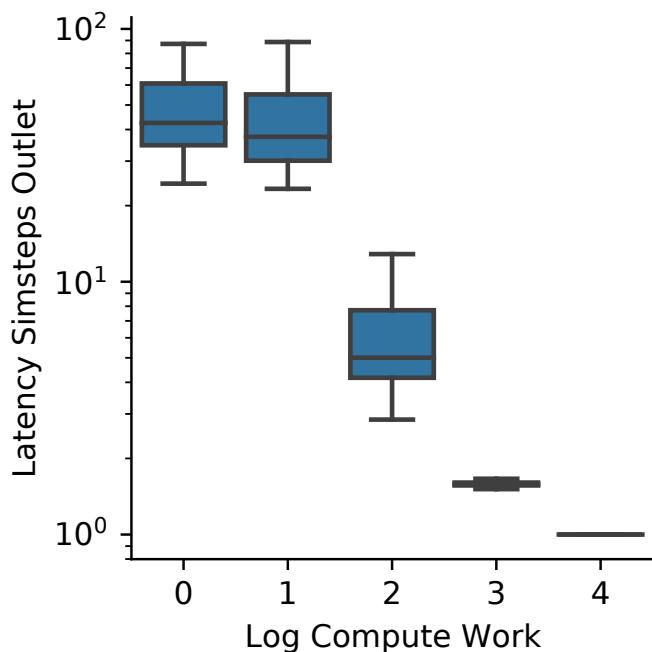


(a) TODO without outliers

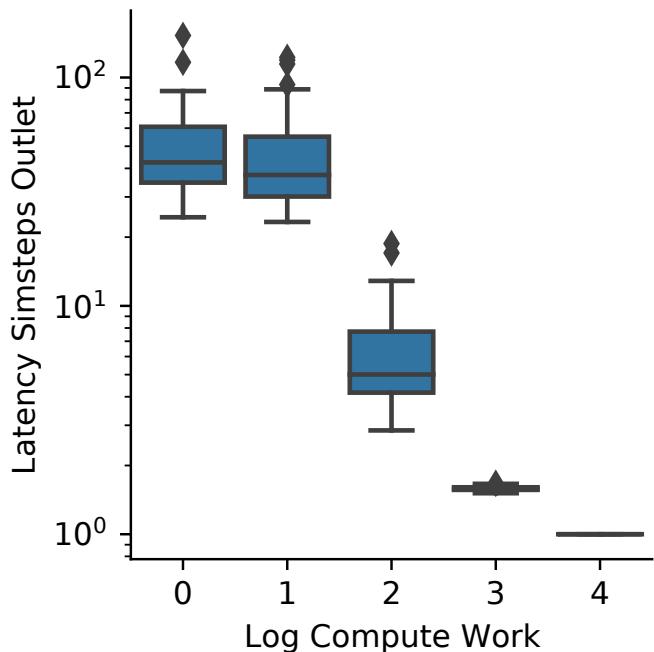


(b) TODO without outliers

Fig. 25: computation vs communication Latency Walltime Inlet (ns) TODO

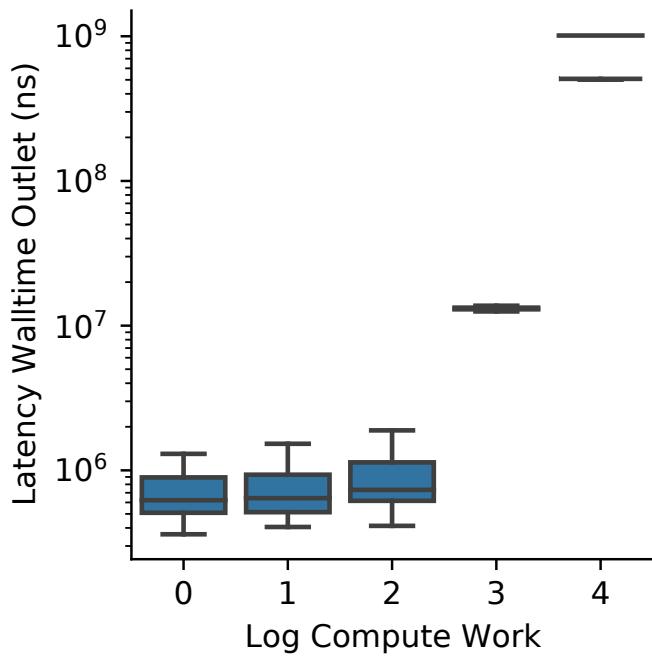


(a) TODO without outliers

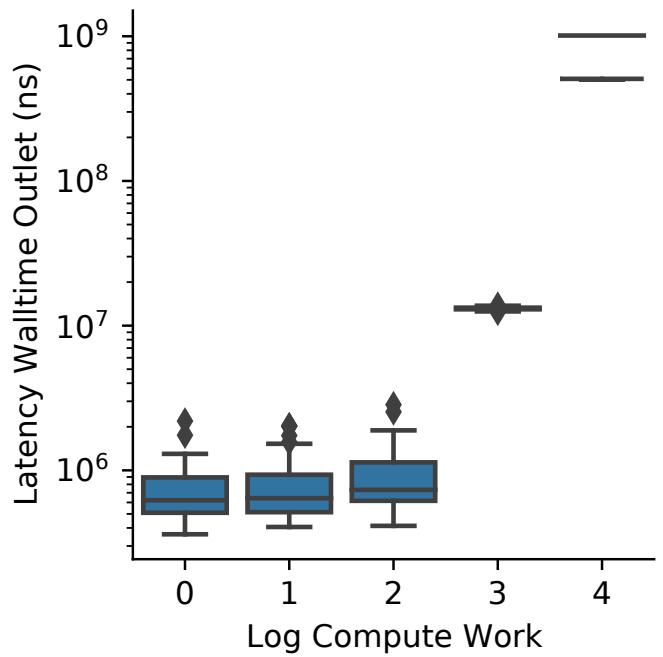


(b) TODO without outliers

Fig. 26: computation vs communication Latency Simsteps Outlet TODO

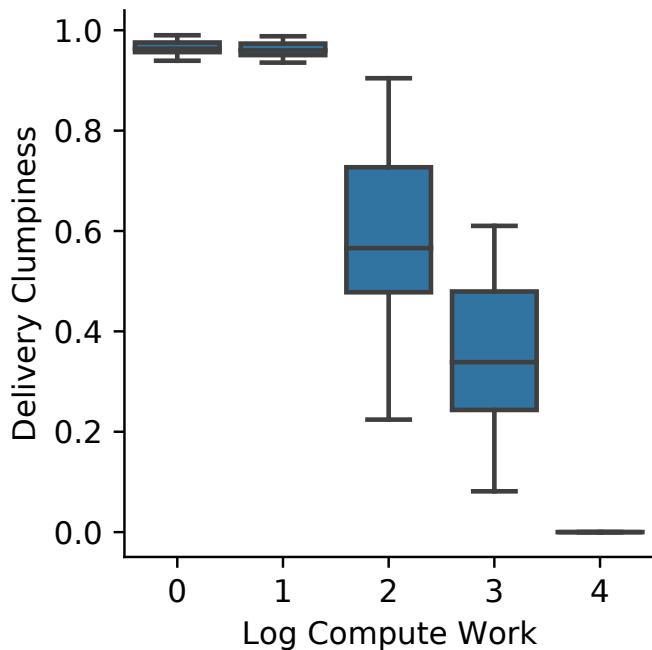


(a) TODO without outliers

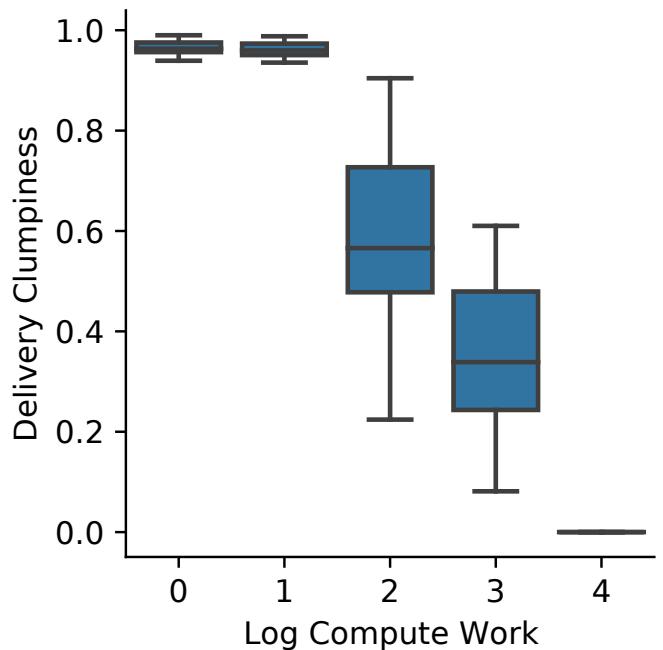


(b) TODO without outliers

Fig. 27: computation vs communication Latency Walltime Outlet (ns) TODO

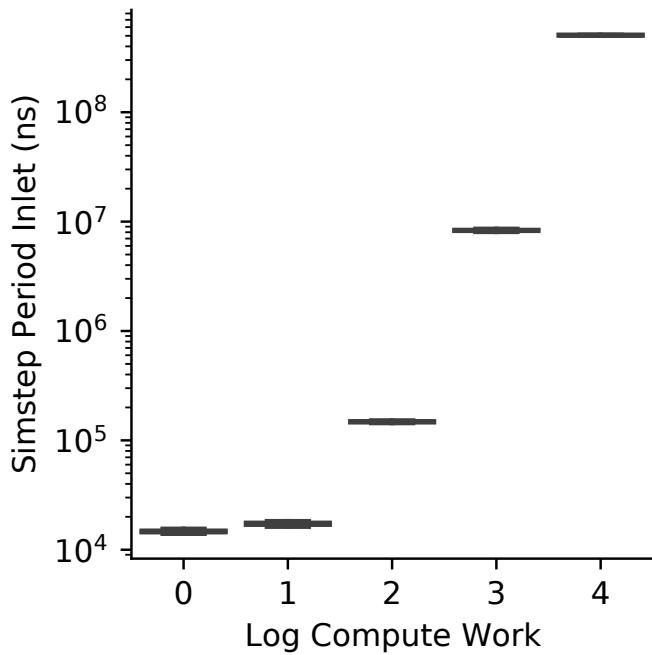


(a) TODO without outliers

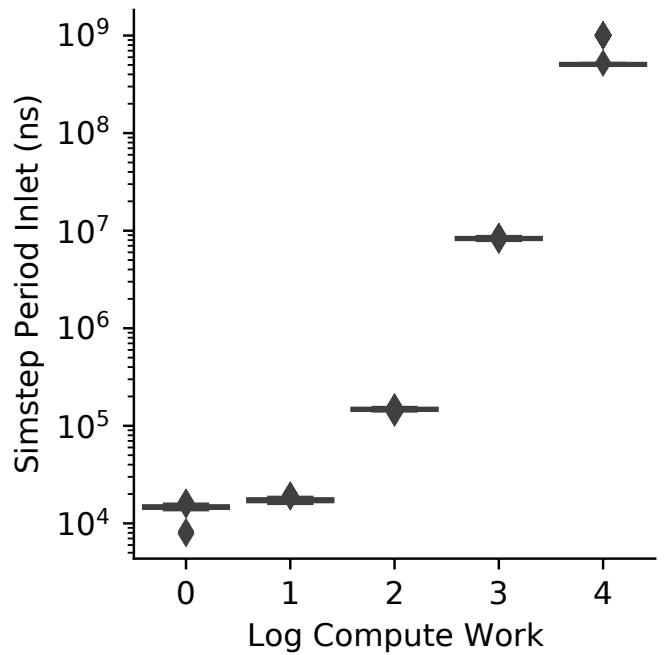


(b) TODO without outliers

Fig. 28: computation vs communication Delivery Clumpiness TODO

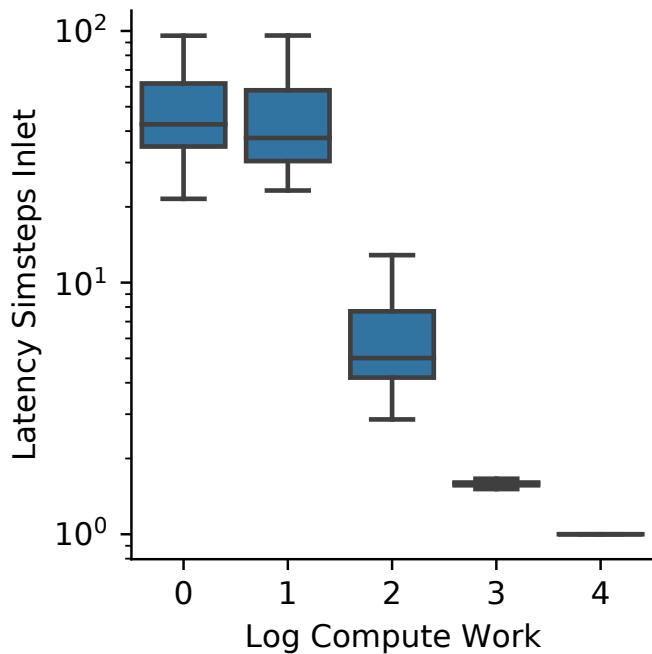


(a) TODO without outliers

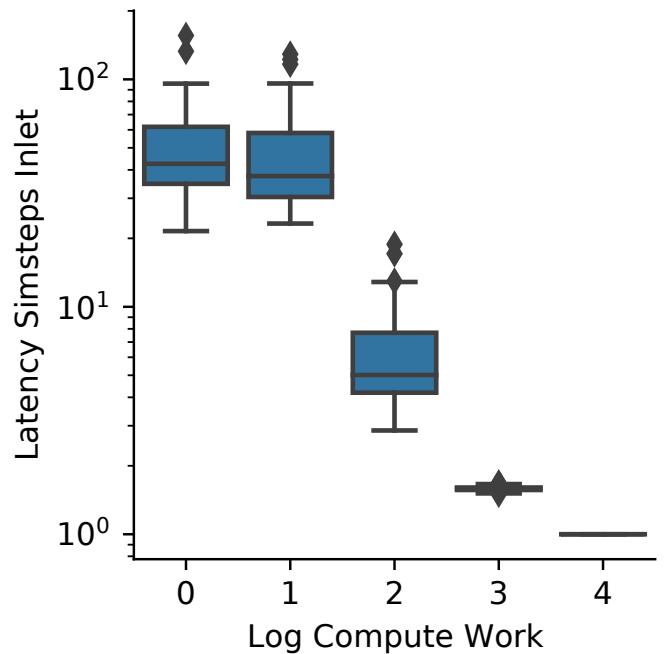


(b) TODO without outliers

Fig. 29: computation vs communication Simstep Period Inlet (ns) TODO

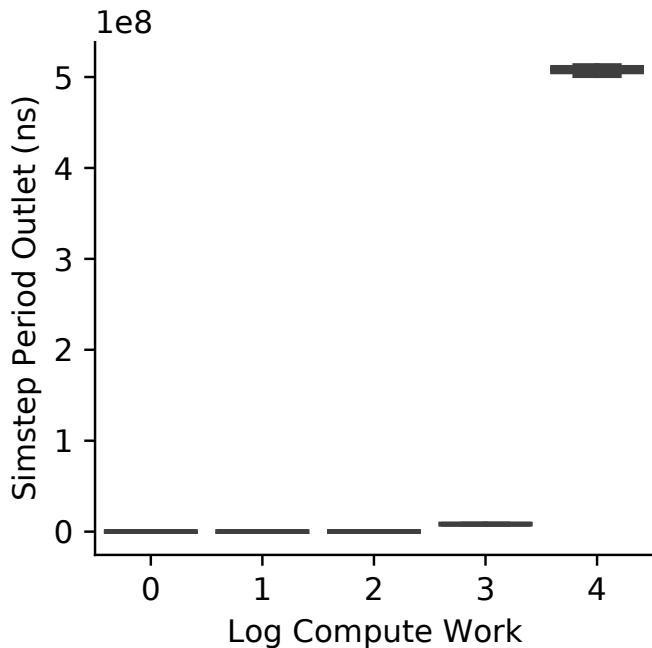


(a) TODO without outliers

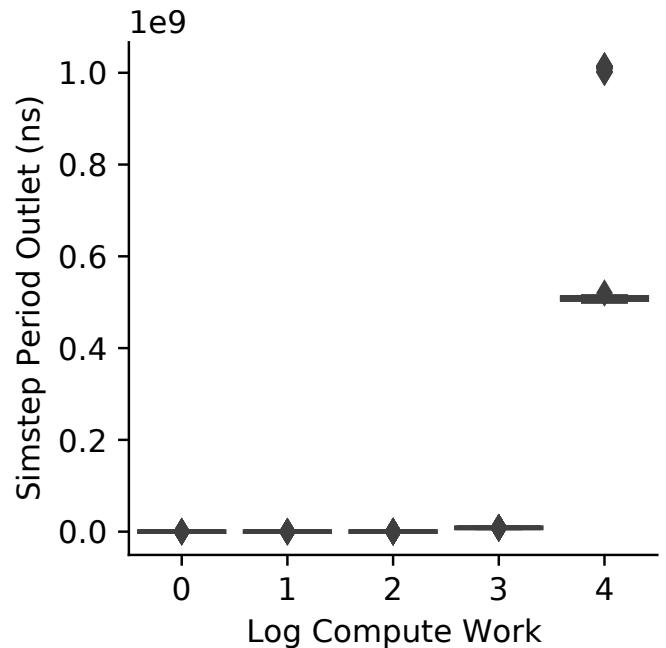


(b) TODO without outliers

Fig. 30: computation vs communication Latency Simsteps Inlet TODO

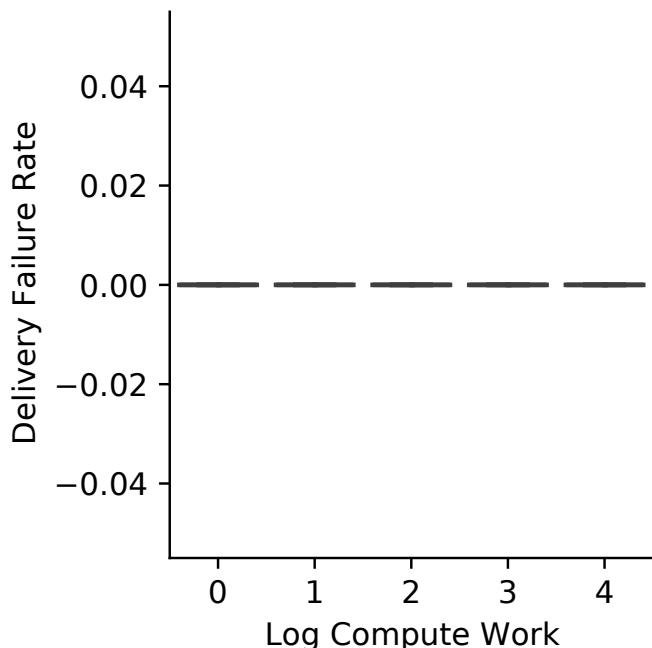


(a) TODO without outliers

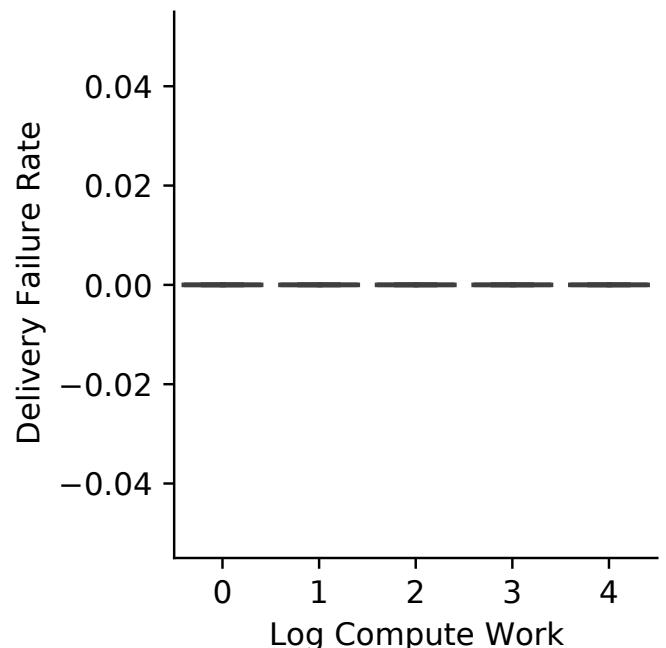


(b) TODO without outliers

Fig. 31: computation vs communication Simstep Period Outlet (ns) TODO



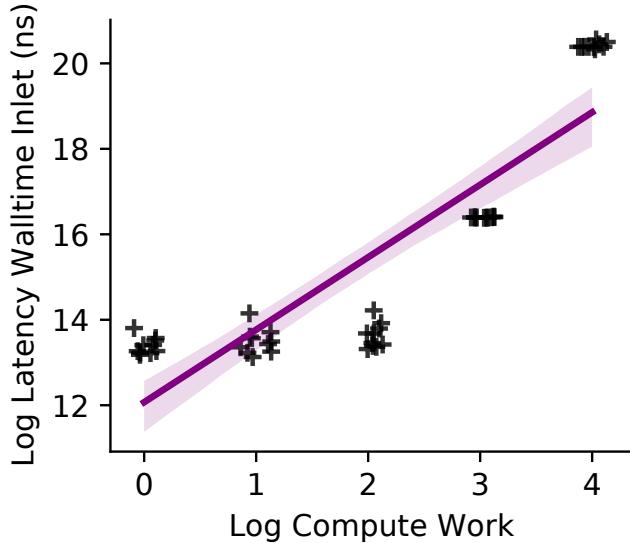
(a) TODO without outliers



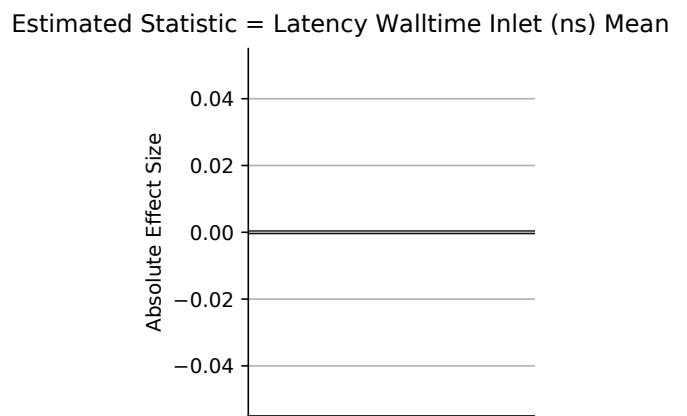
(b) TODO without outliers

Fig. 32: computation vs communication Delivery Failure Rate TODO

## Ordinary Least Squares Regression

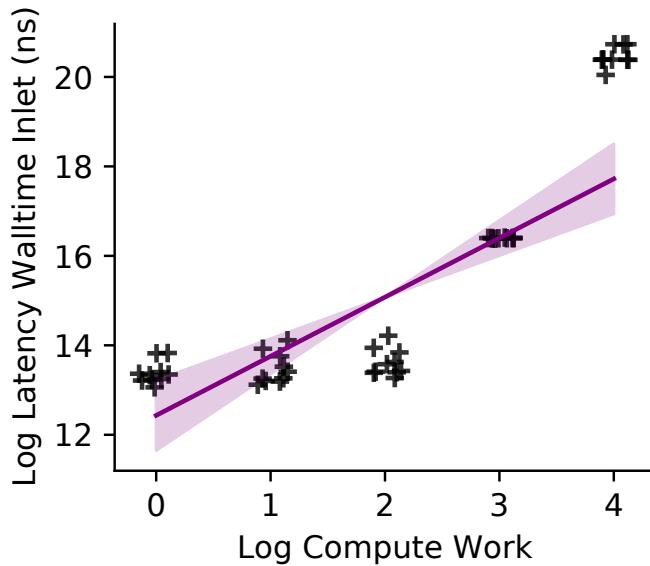


(a) TODO complete ordinary regression

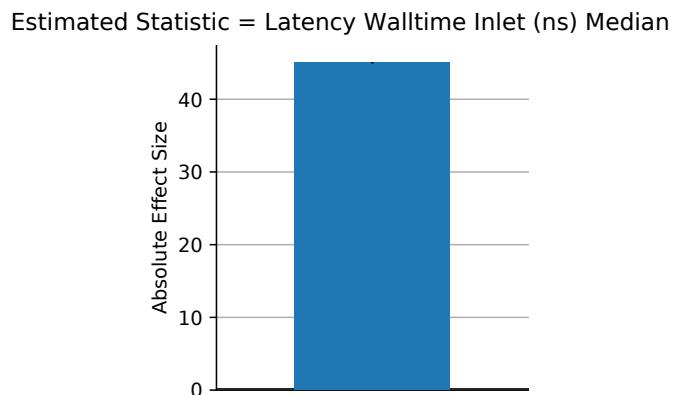


(b) TODO complete ols regression effect size

## Quantile Regression



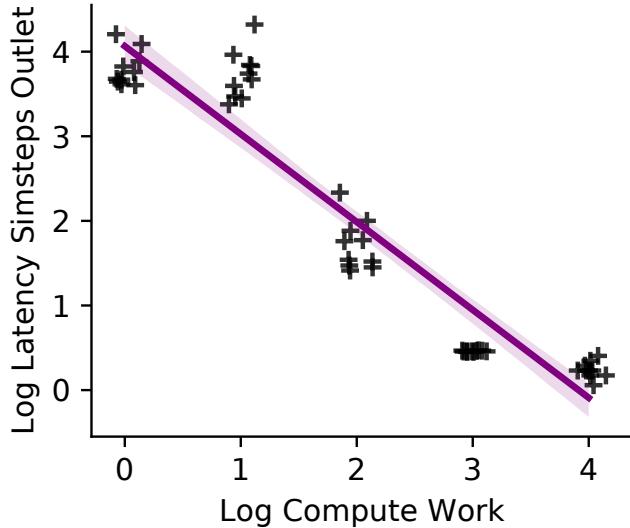
(c) TODO quantile regression



(d) TODO complete quantile regression effect size

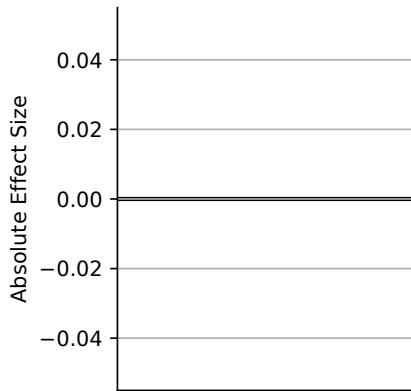
Fig. 33: computation vs communication Latency Walltime Inlet (ns) ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression



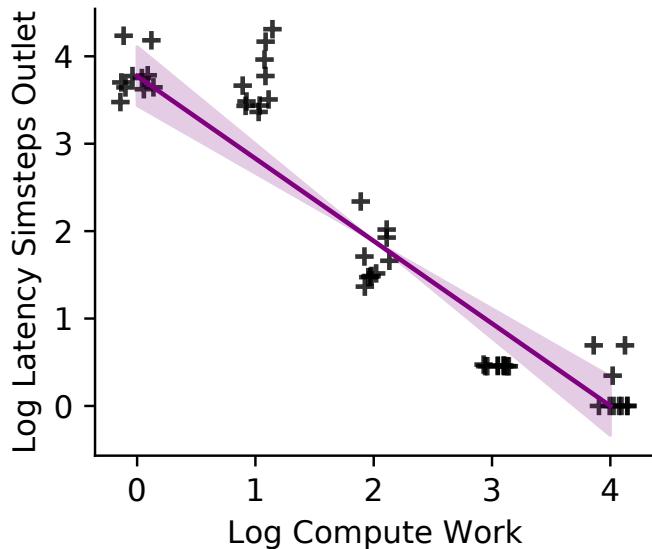
(a) TODO complete ordinary regression

Estimated Statistic = Latency Simsteps Outlet Mean



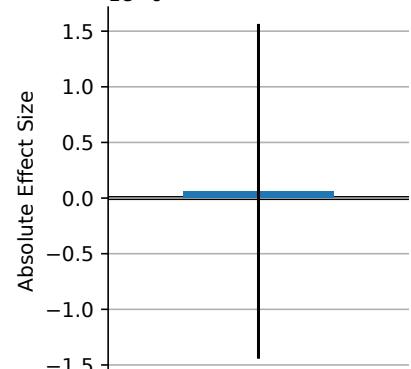
(b) TODO complete ols regression effect size

## Quantile Regression



(c) TODO quantile regression

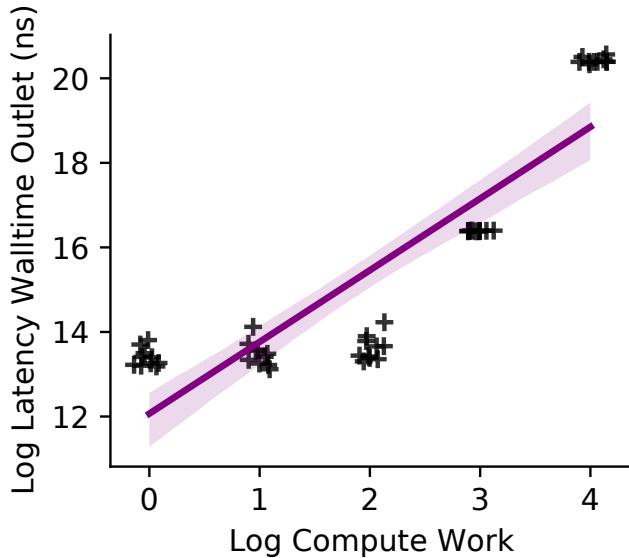
Estimated Statistic = Latency Simsteps Outlet Median



(d) TODO complete quantile regression effect size

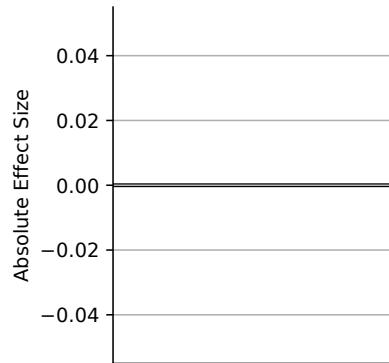
Fig. 34: computation vs communication Latency Simsteps Outlet ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression



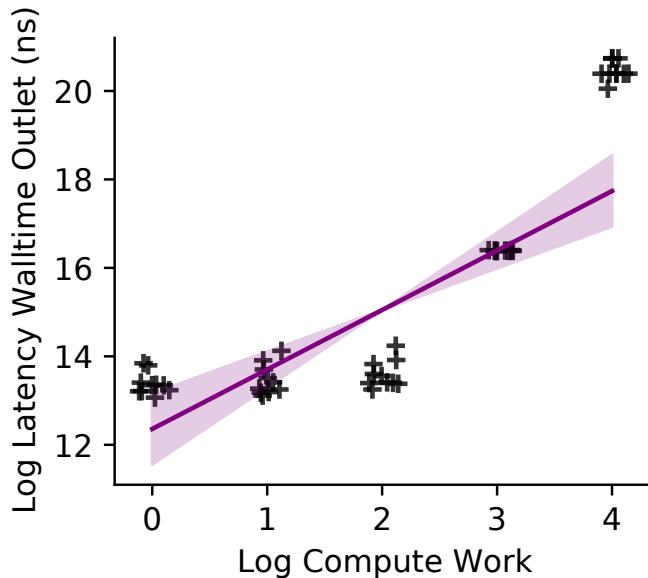
(a) TODO complete ordinary regression

Estimated Statistic = Latency Walltime Outlet (ns) Mean



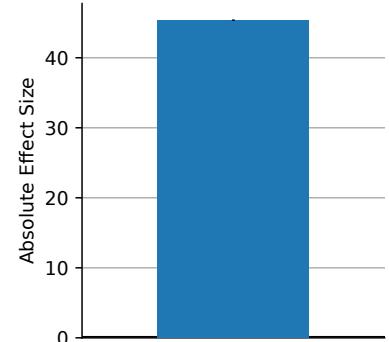
(b) TODO complete ols regression effect size

## Quantile Regression



(c) TODO quantile regression

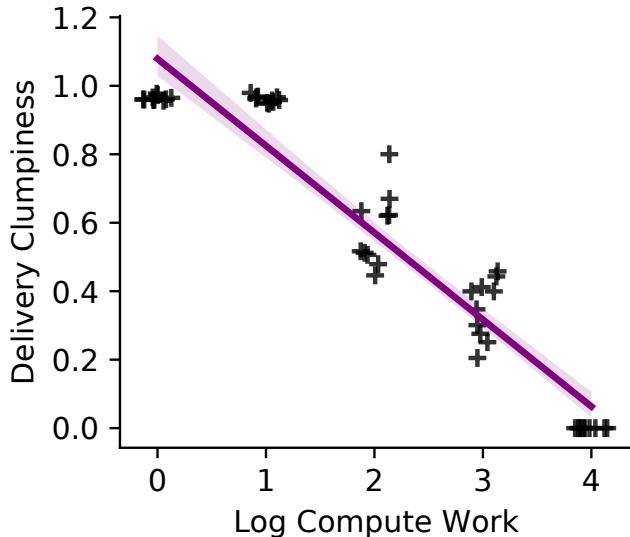
Estimated Statistic = Latency Walltime Outlet (ns) Median



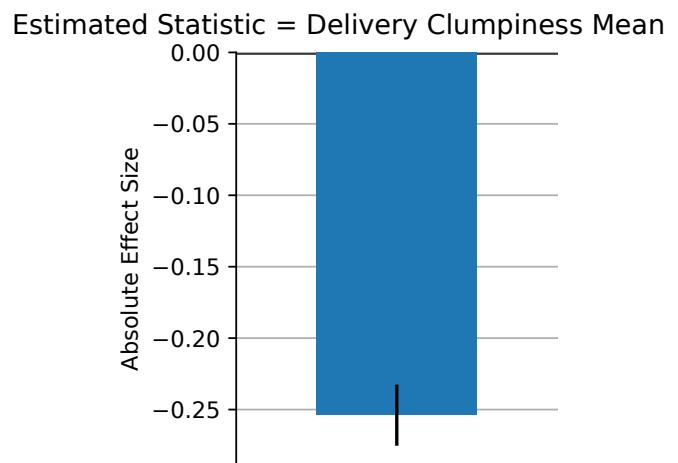
(d) TODO complete quantile regression effect size

Fig. 35: computation vs communication Latency Walltime Outlet (ns) ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression

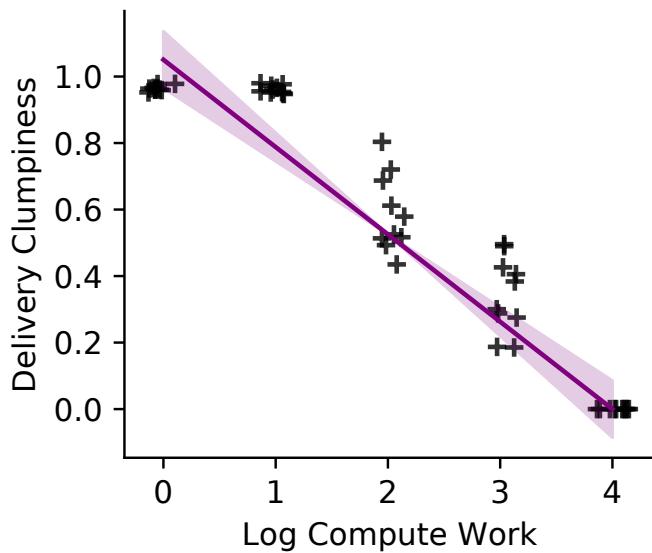


(a) TODO complete ordinary regression

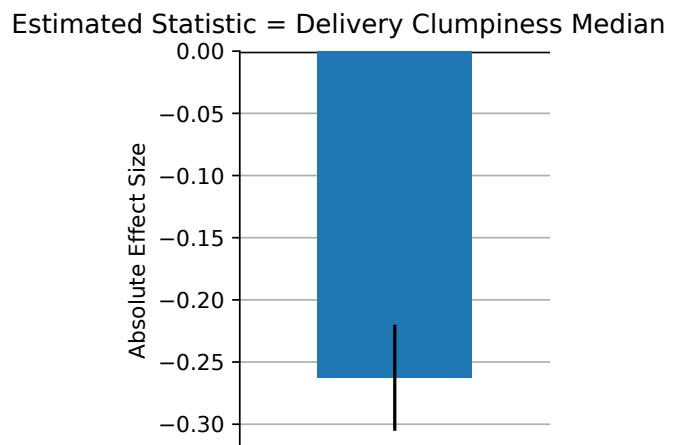


(b) TODO complete ols regression effect size

## Quantile Regression



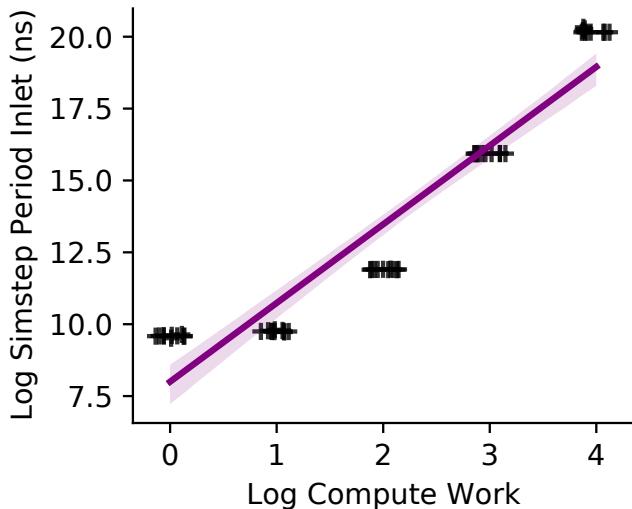
(c) TODO quantile regression



(d) TODO complete quantile regression effect size

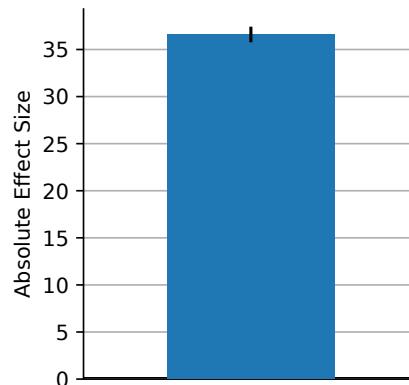
Fig. 36: computation vs communication Delivery Clumpiness ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression



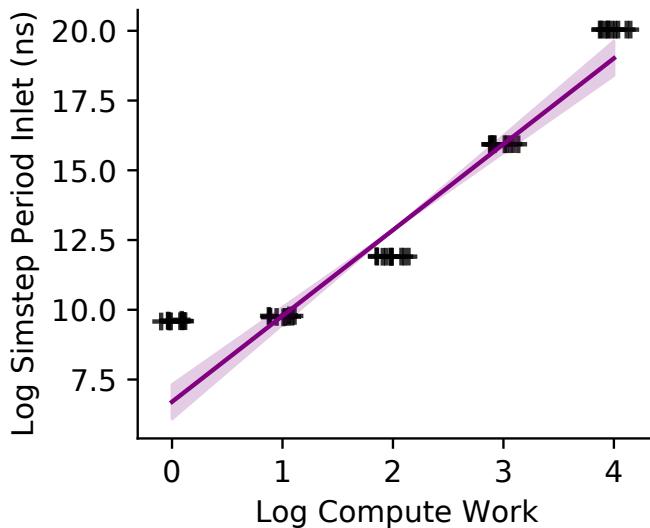
(a) TODO complete ordinary regression

Estimated Statistic = Simstep Period Inlet (ns) Mean



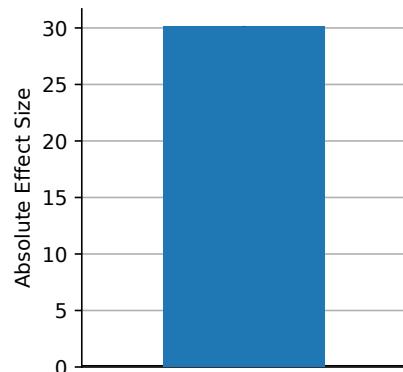
(b) TODO complete ols regression effect size

## Quantile Regression



(c) TODO quantile regression

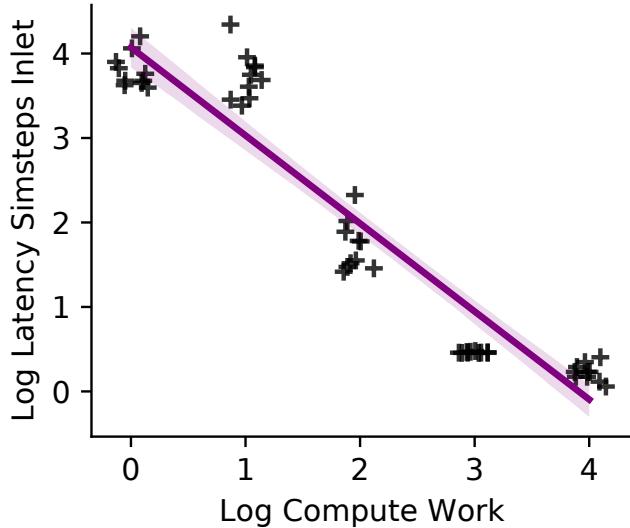
Estimated Statistic = Simstep Period Inlet (ns) Median



(d) TODO complete quantile regression effect size

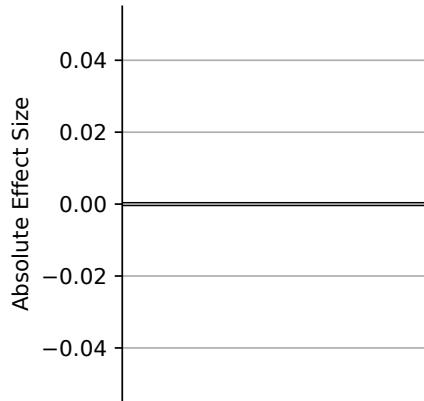
Fig. 37: computation vs communication Simstep Period Inlet (ns) ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression



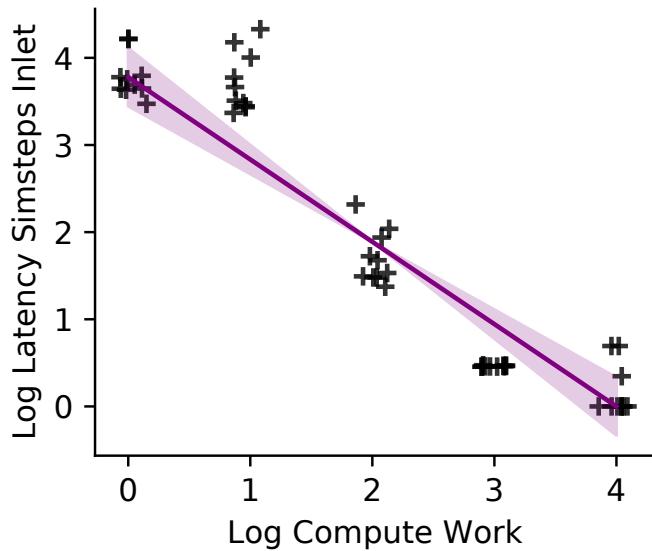
(a) TODO complete ordinary regression

Estimated Statistic = Latency Simsteps Inlet Mean



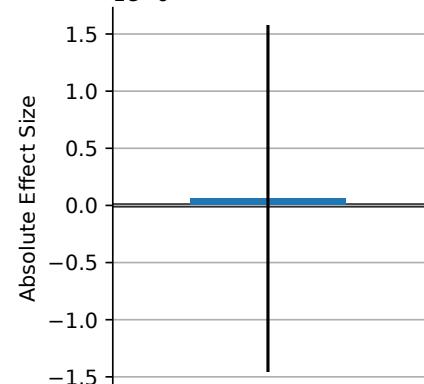
(b) TODO complete ols regression effect size

## Quantile Regression



(c) TODO quantile regression

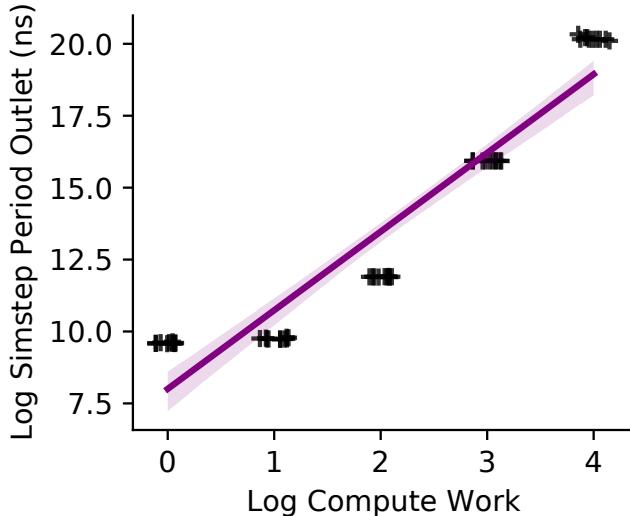
Estimated Statistic  $f_{e=6}$  = Latency Simsteps Inlet Median



(d) TODO complete quantile regression effect size

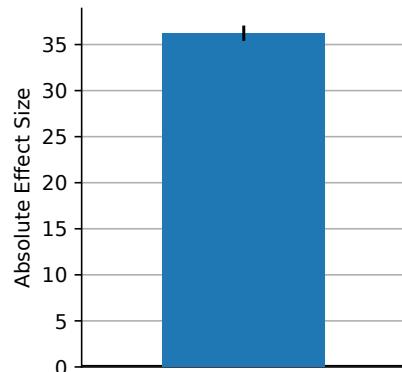
Fig. 38: computation vs communication Latency Simsteps Inlet ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression



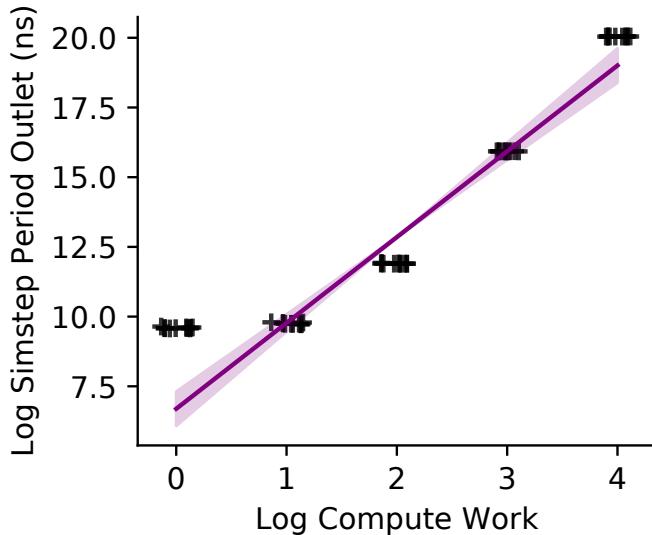
(a) TODO complete ordinary regression

Estimated Statistic = Simstep Period Outlet (ns) Mean



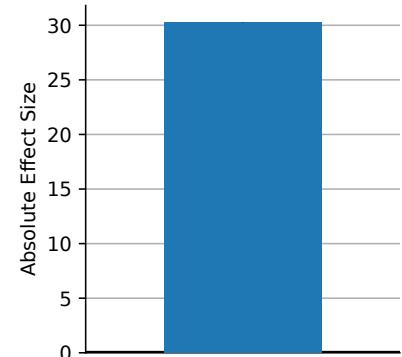
(b) TODO complete ols regression effect size

## Quantile Regression



(c) TODO quantile regression

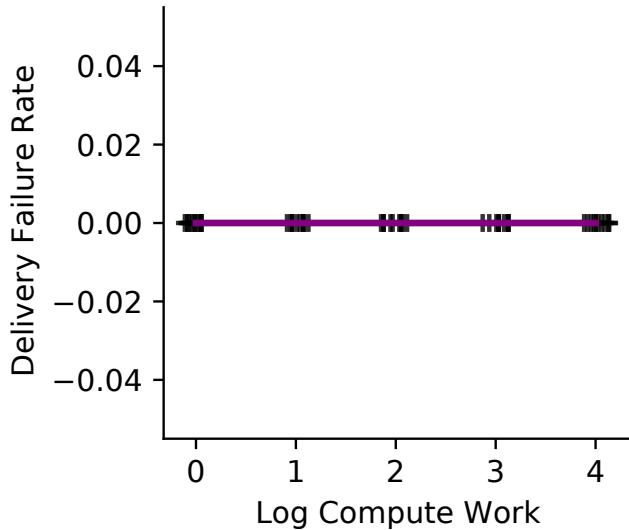
Estimated Statistic = Simstep Period Outlet (ns) Median



(d) TODO complete quantile regression effect size

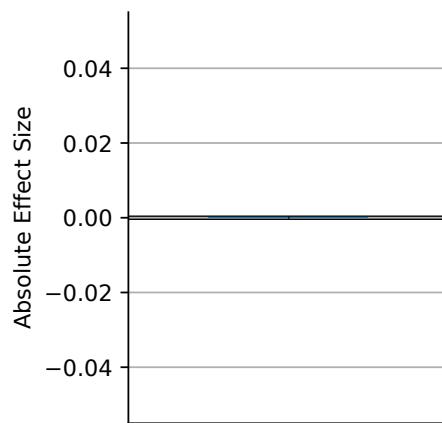
Fig. 39: computation vs communication Simstep Period Outlet (ns) ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression



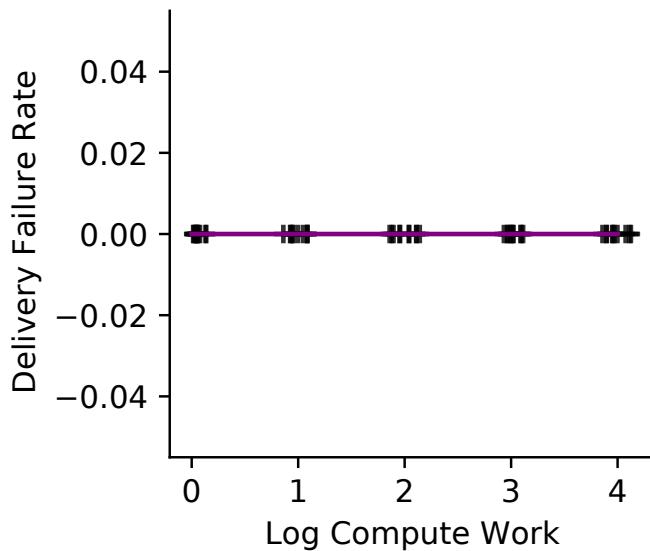
(a) TODO complete ordinary regression

Estimated Statistic = Delivery Failure Rate Mean



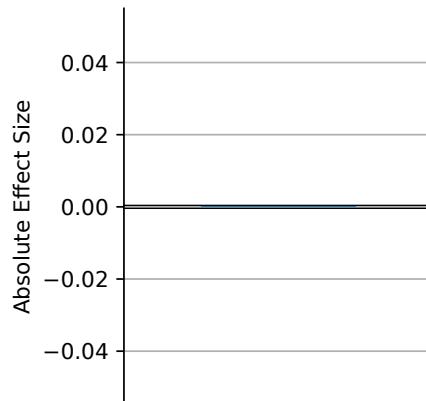
(b) TODO complete ols regression effect size

## Quantile Regression



(c) TODO quantile regression

Estimated Statistic = Delivery Failure Rate Median



(d) TODO complete quantile regression effect size

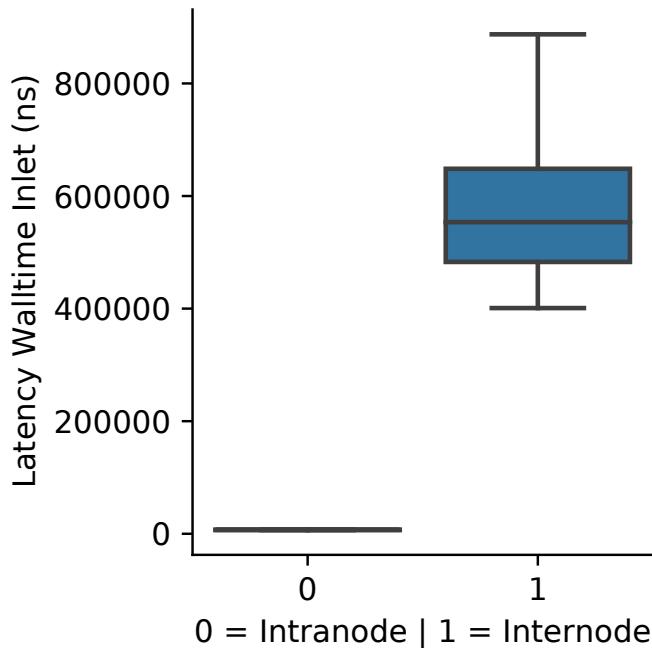
Fig. 40: computation vs communication Delivery Failure Rate ordinary least squares regression to estimate mean and quantile regression to estimate median

TABLE XVII: Computation vs. communication Ordinary Least Squares Regression.

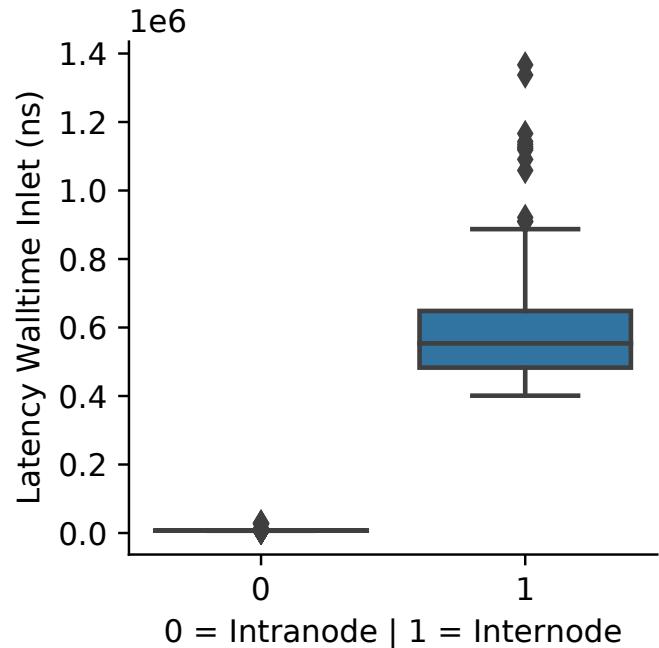
Metric	Statistic	Cpus Per Node	Num Similes Per Cpu	Absolute Effect Size	Absolute Effect Size 95% CI Lower Bound	Absolute Effect Size 95% CI Upper Bound	Relative Effect Size	Relative Effect Size 95% CI Lower Bound	Relative Effect Size 95% CI Upper Bound	$\beta_1$
Latency Walltime Inlet (ns)	mean	NaN	1	1	2	inf	nan	nan	inf	50
Latency Walltime Outlet (ns)	mean	NaN	1	1	2	inf	nan	nan	inf	50
Latency Simsteps Inlet	mean	NaN	1	1	2	inf	nan	nan	inf	50
Latency Simsteps Outlet	mean	NaN	1	1	2	inf	nan	nan	inf	50
Delivery Failure Rate	mean	NaN	1	1	2	0	0	0	nan	50
Delivery Clumpiness	mean	-	1	1	2	-0.25	-0.28	-0.23	-0.26	-0.29
Simstep Period Inlet (ns)	mean	+	1	1	2	37	36	37	0.0025	0.0024
Simstep Period Outlet (ns)	mean	+	1	1	2	36	35	37	0.0025	0.0024

TABLE XVIII: Computation vs. communication Quantile Regression.

Metric	Statistic	Cpus Per Node	Sigmoidal Effect Size	Absolute Effect Size	Absolute Effect Size 95% CI Lower Bound	Absolute Effect Size 95% CI Upper Bound	Relative Effect Size	Relative Effect Size 95% CI Lower Bound	Relative Effect Size 95% CI Upper Bound	n	$\alpha$	
Latency Walltime Inlet (ns)	median	+	1	1	2	45	45	7.2e-05	7.2e-05	50	5.8e-107	
Latency Walltime Outlet (ns)	median	+	1	1	2	45	45	7.2e-05	7.2e-05	50	1.8e-103	
Latency Simsteps Inlet	median	0	1	1	2	6.1e-08	-1.5e-06	1.6e-06	1.5e-09	3.8e-08	50	0.94
Latency Simsteps Outlet	median	0	1	1	2	6.1e-08	-1.4e-06	1.6e-06	1.4e-09	3.5e-08	50	0.94
Delivery Failure Rate	median	NaN	1	1	2	0	nan	nan	nan	nan	50	nan
Delivery Clumpiness	median	-	1	1	2	-0.26	-0.31	-0.22	-0.27	-0.32	50	1.5e-16
Simstep Period Inlet (ns)	median	+	1	1	2	30	30	30	0.0021	0.0021	50	1.9e-139
Simstep Period Outlet (ns)	median	+	1	1	2	30	30	30	0.0021	0.0021	50	1.1e-143

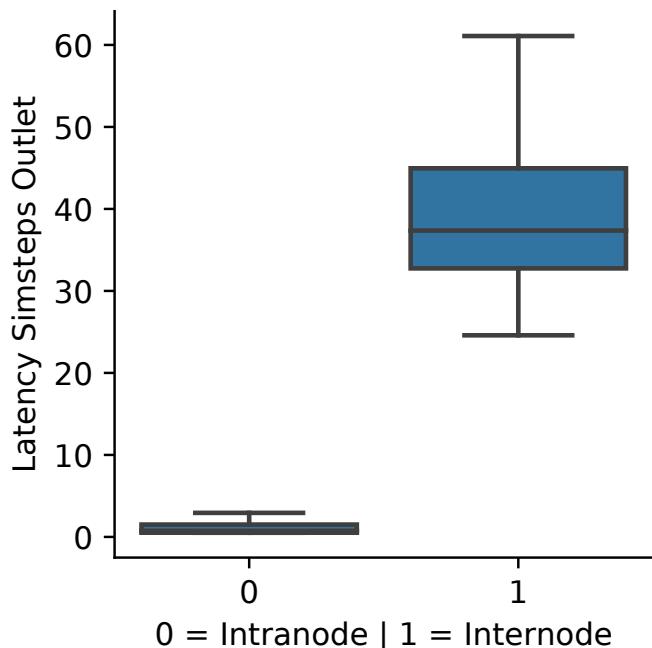


(a) TODO without outliers

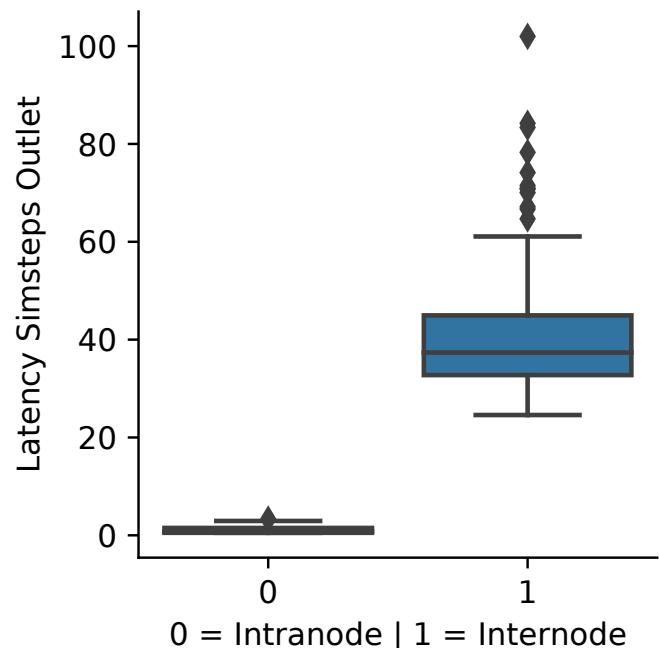


(b) TODO without outliers

Fig. 41: intranode vs internode Latency Walltime Inlet (ns) TODO

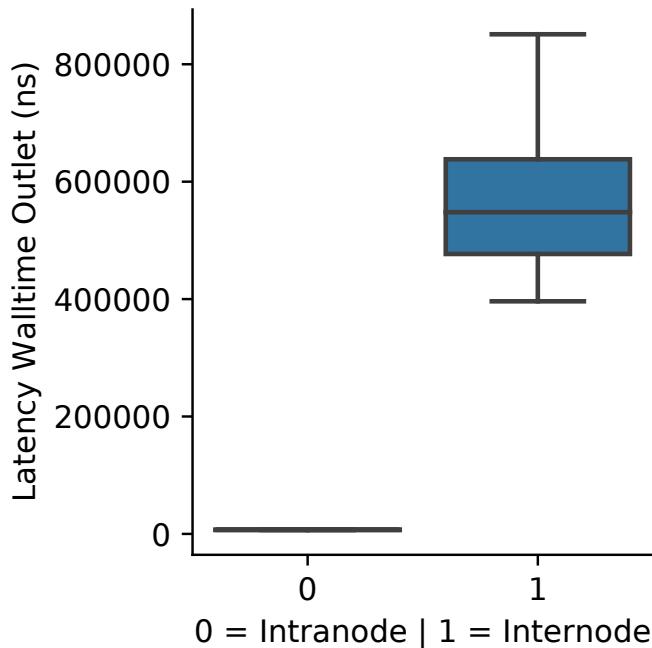


(a) TODO without outliers

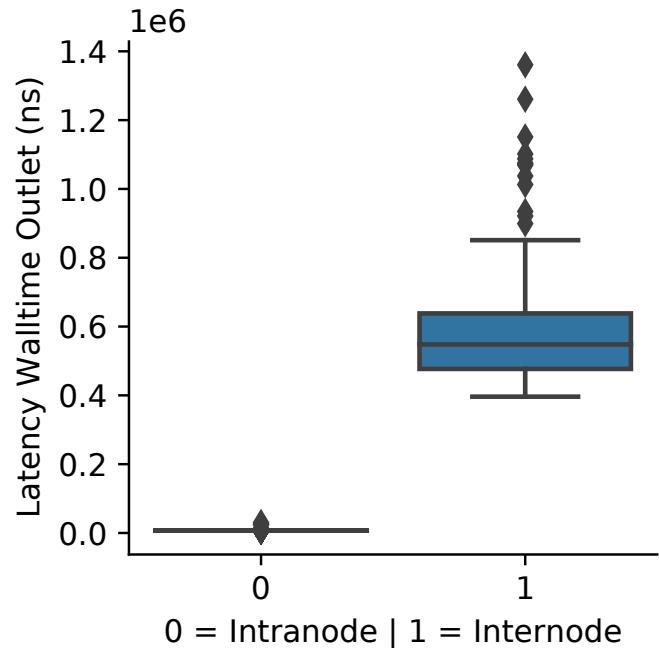


(b) TODO without outliers

Fig. 42: intranode vs internode Latency Simsteps Outlet TODO

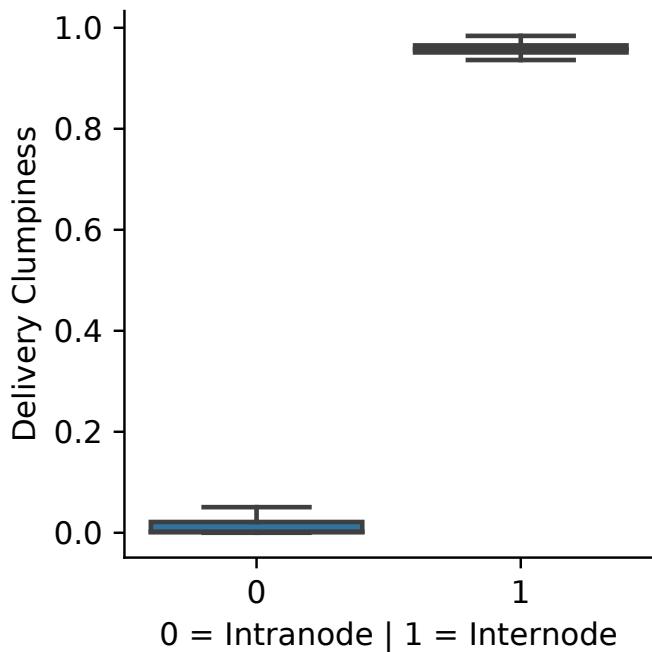


(a) TODO without outliers

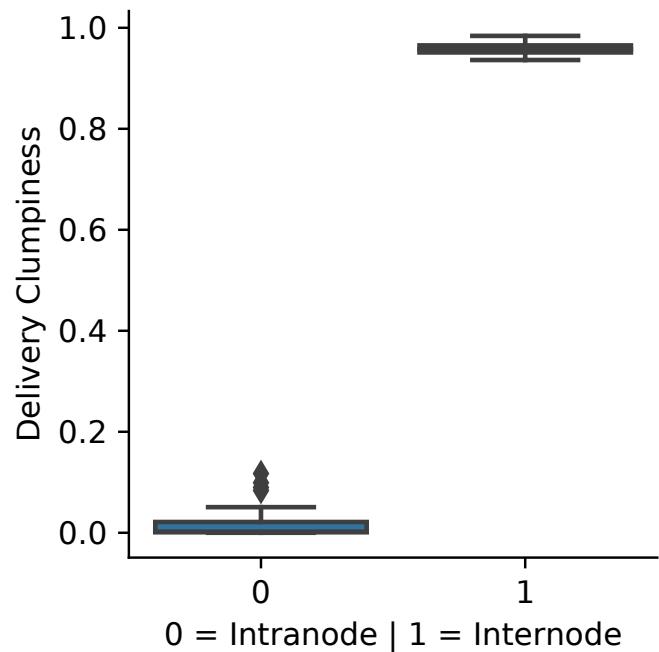


(b) TODO without outliers

Fig. 43: intranode vs internode Latency Walltime Outlet (ns) TODO

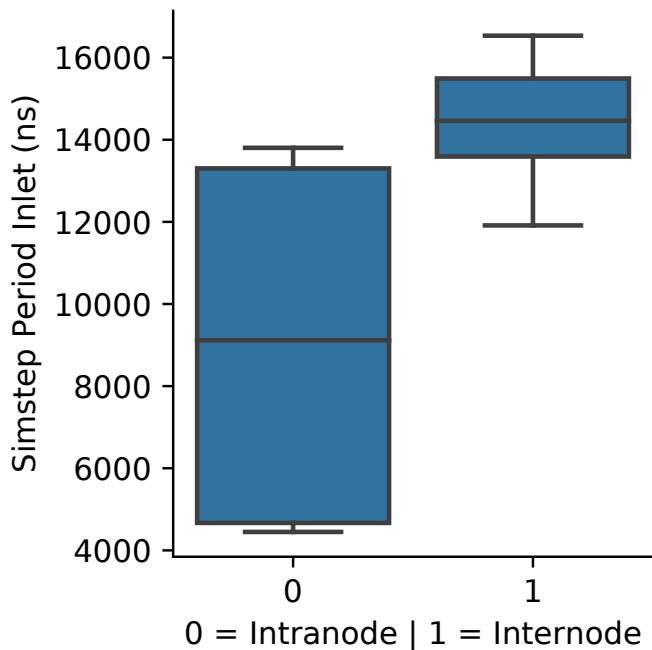


(a) TODO without outliers



(b) TODO without outliers

Fig. 44: intranode vs internode Delivery Clumpiness TODO



(a) TODO without outliers

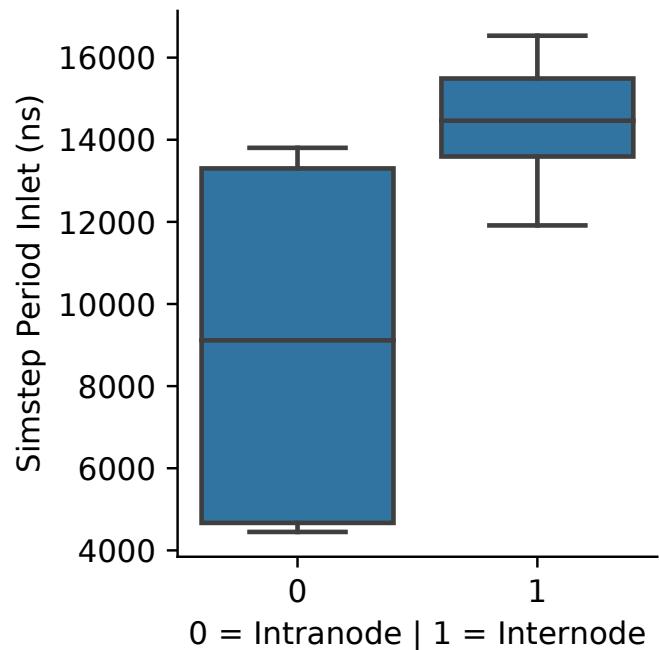
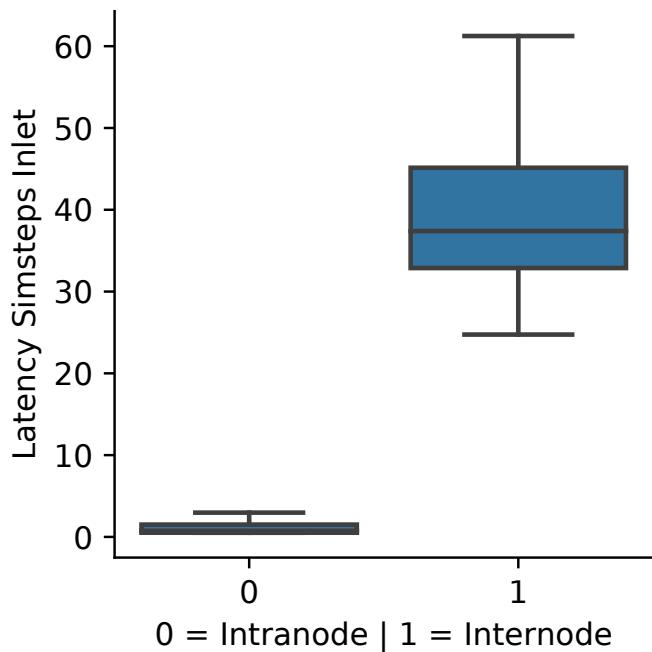


Fig. 45: intranode vs internode Simstep Period Inlet (ns) TODO

(b) TODO without outliers



(a) TODO without outliers

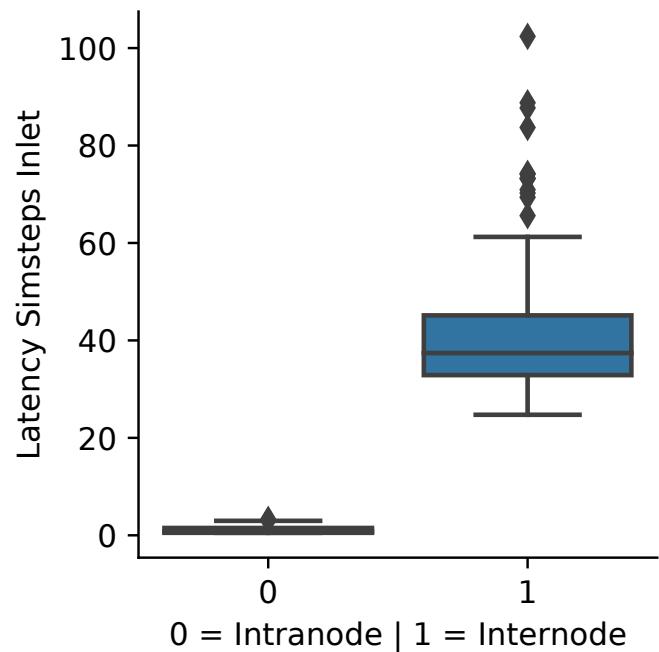
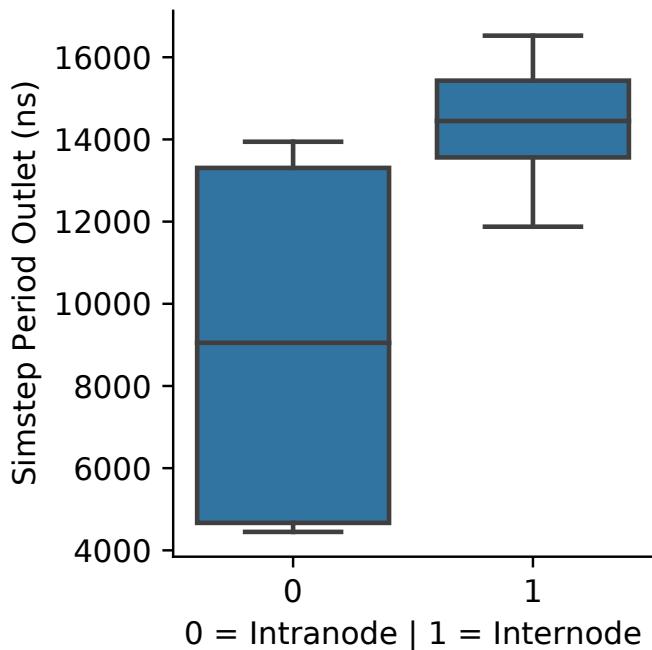
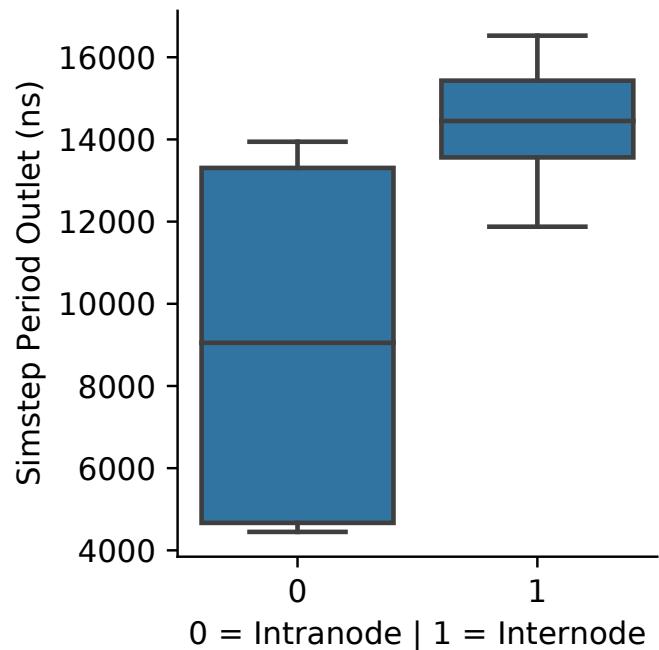


Fig. 46: intranode vs internode Latency Simsteps Inlet TODO

(b) TODO without outliers

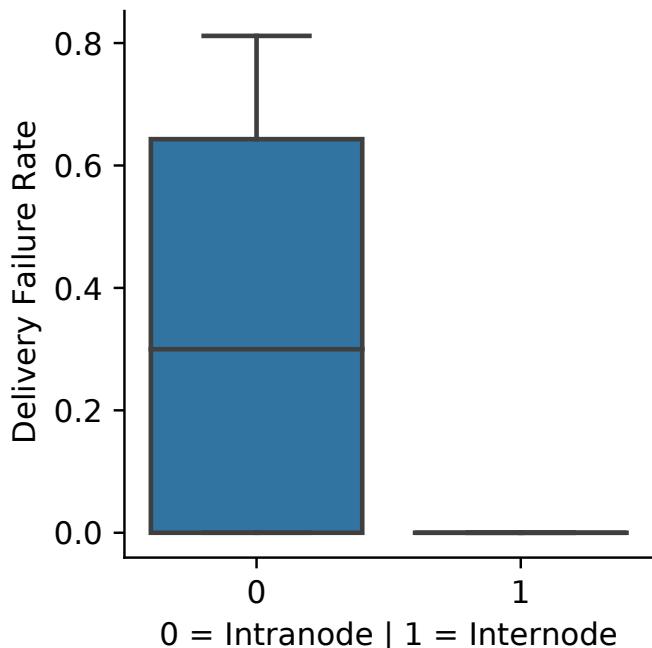


(a) TODO without outliers

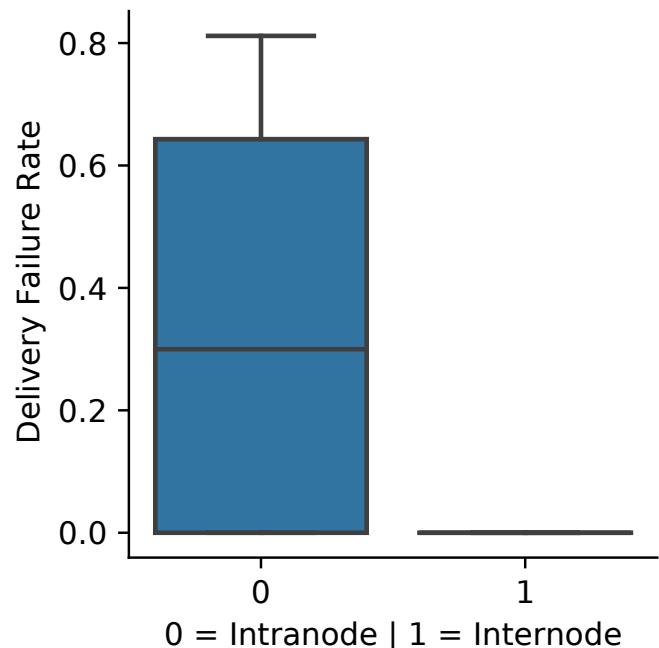


(b) TODO without outliers

Fig. 47: intranode vs internode Simstep Period Outlet (ns) TODO



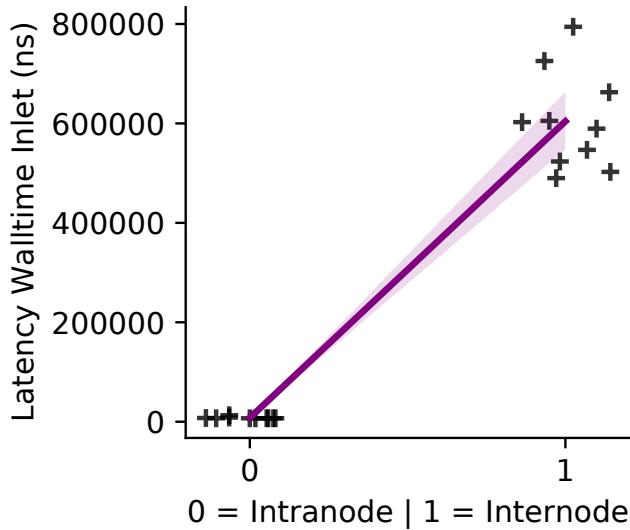
(a) TODO without outliers



(b) TODO without outliers

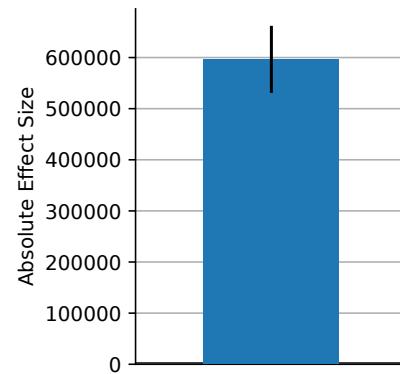
Fig. 48: intranode vs internode Delivery Failure Rate TODO

## Ordinary Least Squares Regression



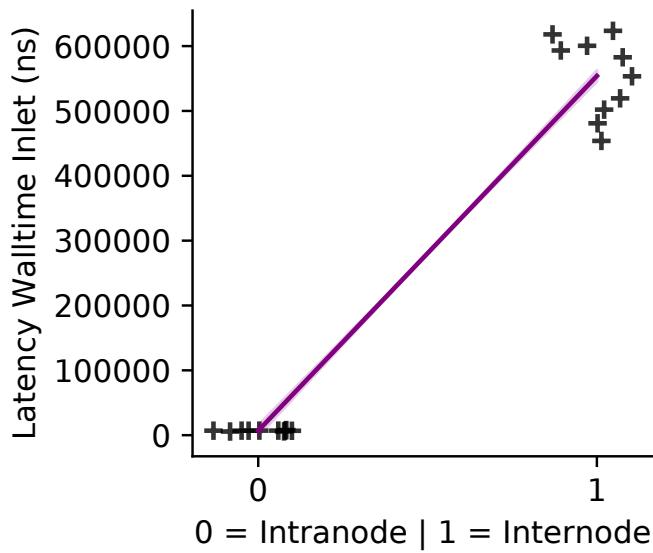
(a) TODO complete ordinary regression

Estimated Statistic = Latency Walltime Inlet (ns) Mean



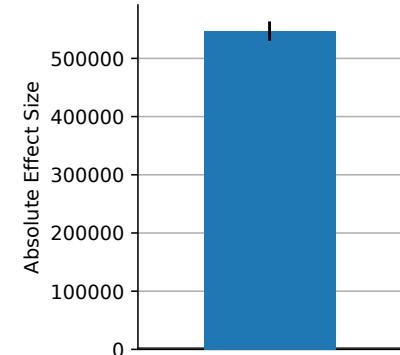
(b) TODO complete ols regression effect size

## Quantile Regression



(c) TODO quantile regression

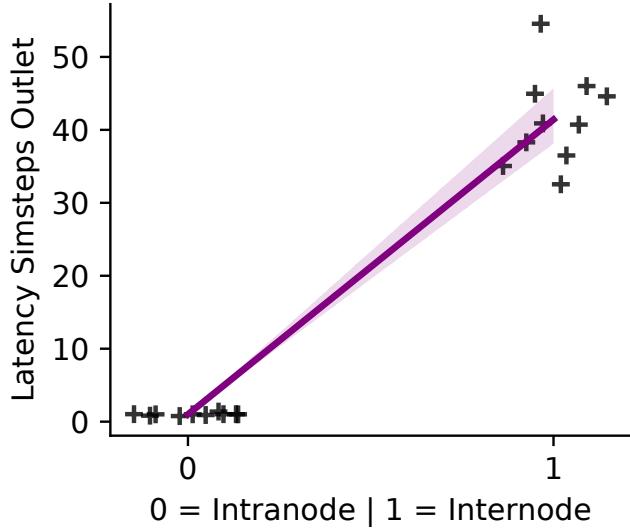
Estimated Statistic = Latency Walltime Inlet (ns) Median



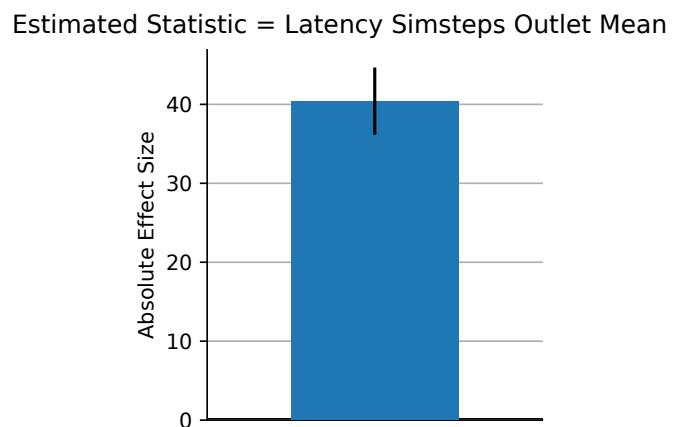
(d) TODO complete quantile regression effect size

Fig. 49: computation vs communication Latency Walltime Inlet (ns) ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression

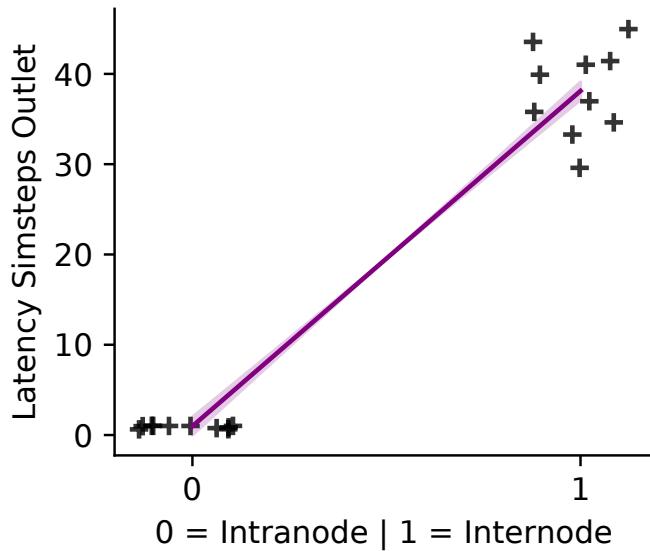


(a) TODO complete ordinary regression

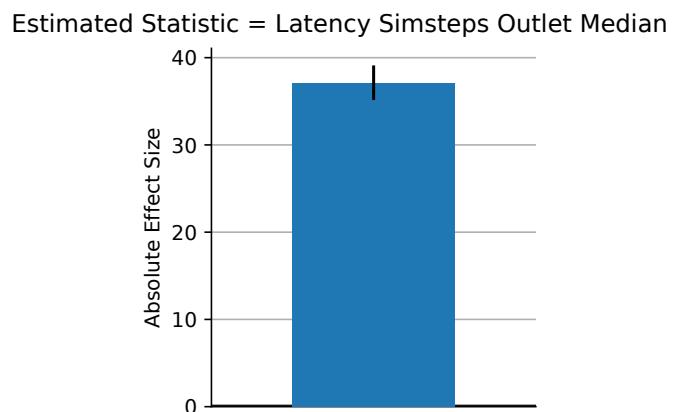


(b) TODO complete ols regression effect size

## Quantile Regression



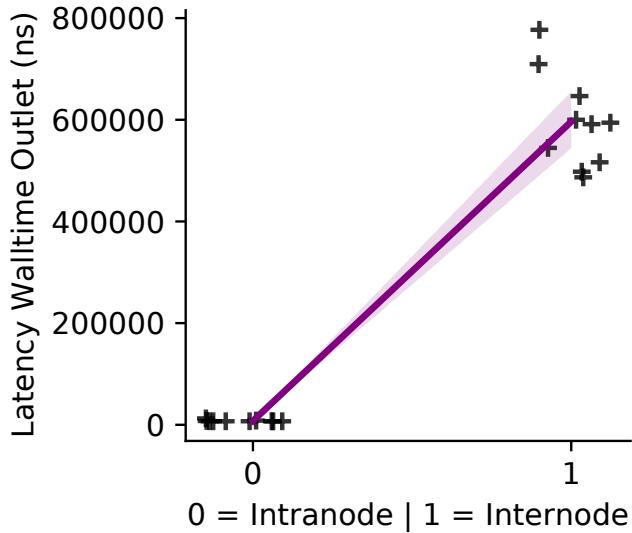
(c) TODO quantile regression



(d) TODO complete quantile regression effect size

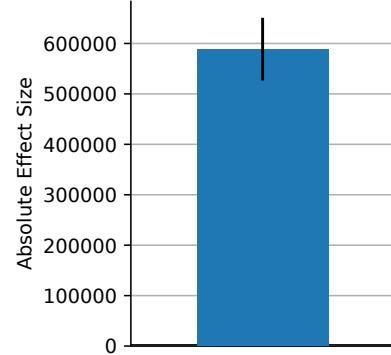
Fig. 50: computation vs communication Latency Simsteps Outlet ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression



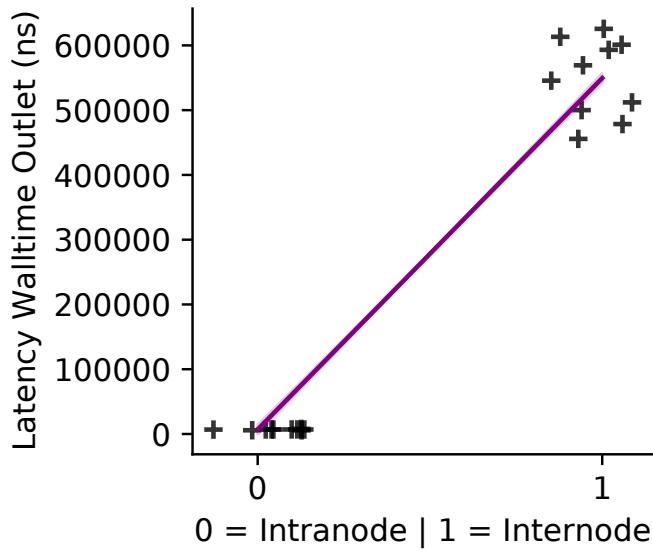
(a) TODO complete ordinary regression

Estimated Statistic = Latency Walltime Outlet (ns) Mean



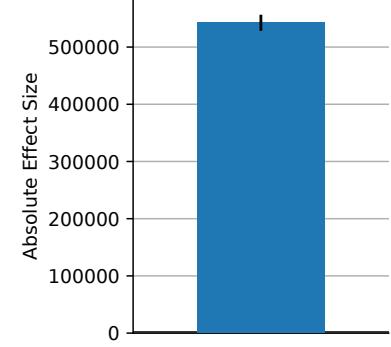
(b) TODO complete ols regression effect size

## Quantile Regression



(c) TODO quantile regression

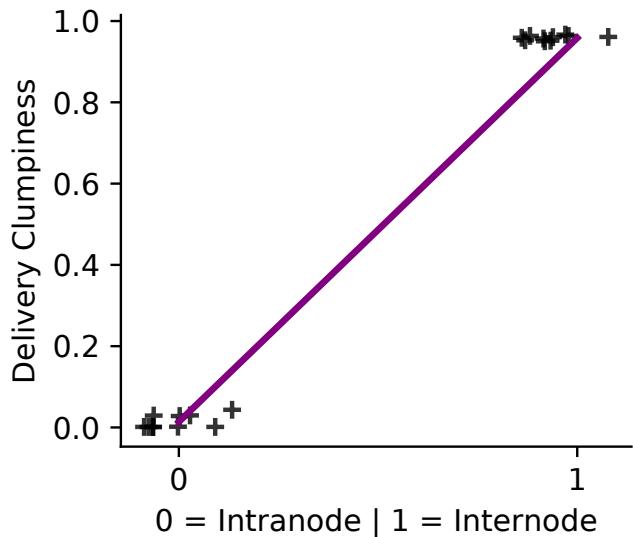
Estimated Statistic = Latency Walltime Outlet (ns) Median



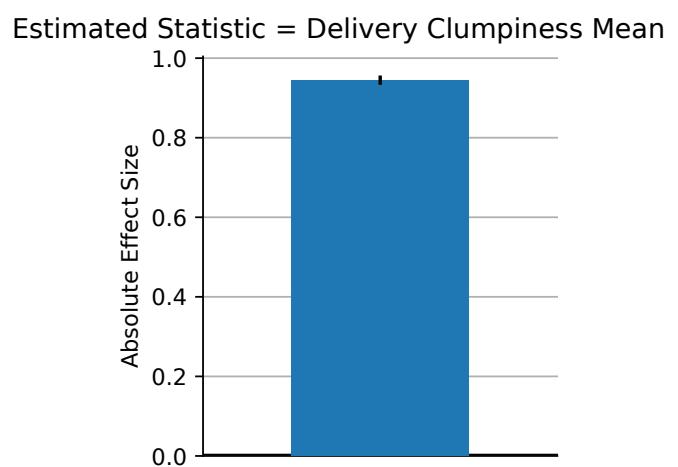
(d) TODO complete quantile regression effect size

Fig. 51: computation vs communication Latency Walltime Outlet (ns) ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression

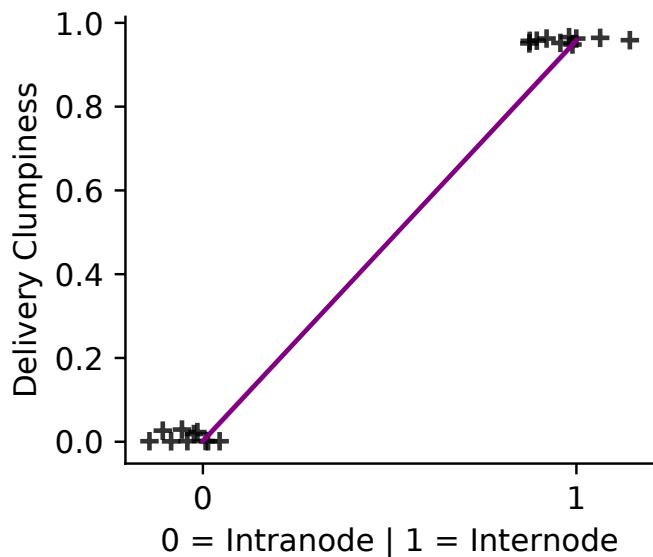


(a) TODO complete ordinary regression

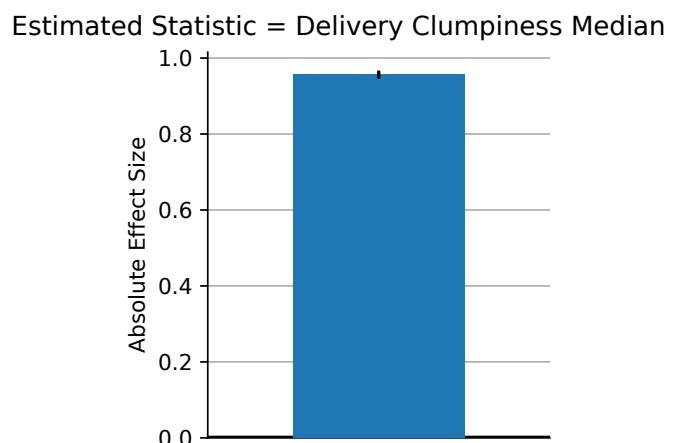


(b) TODO complete ols regression effect size

## Quantile Regression



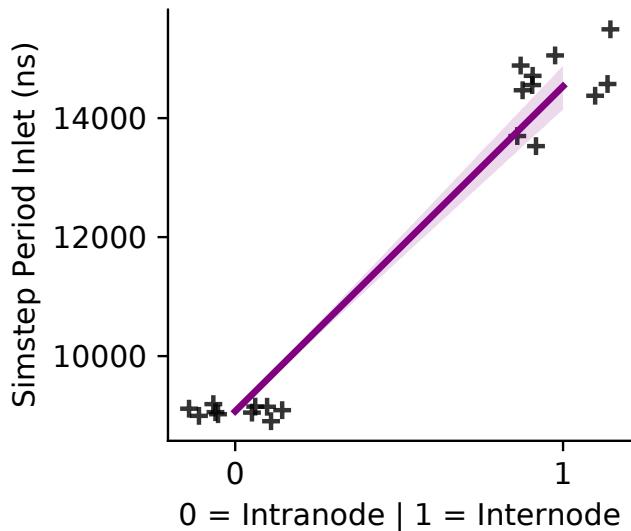
(c) TODO quantile regression



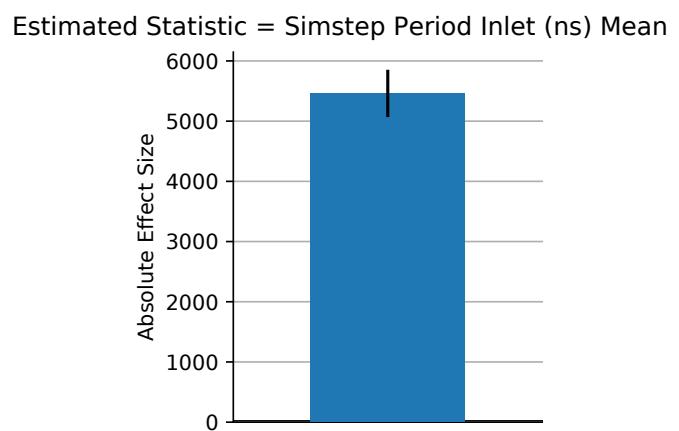
(d) TODO complete quantile regression effect size

Fig. 52: computation vs communication Delivery Clumpiness ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression

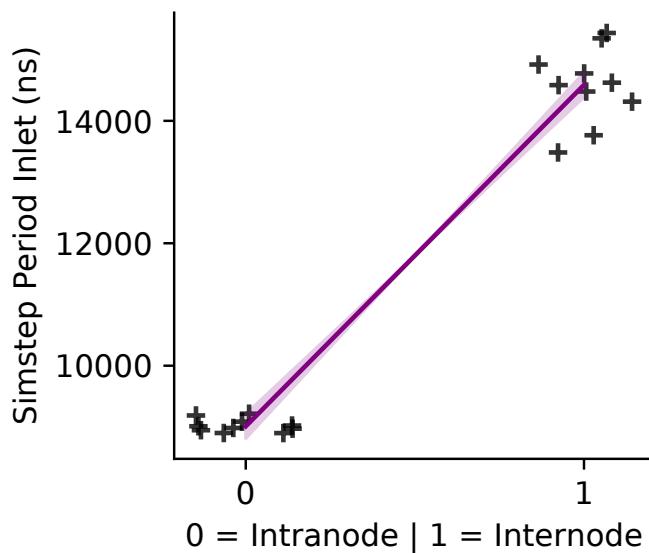


(a) TODO complete ordinary regression

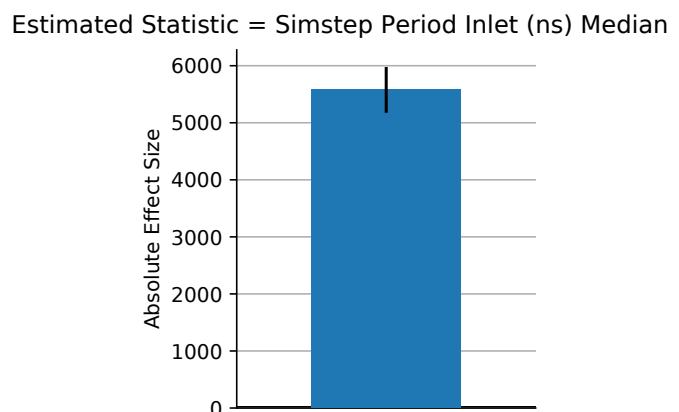


(b) TODO complete ols regression effect size

## Quantile Regression



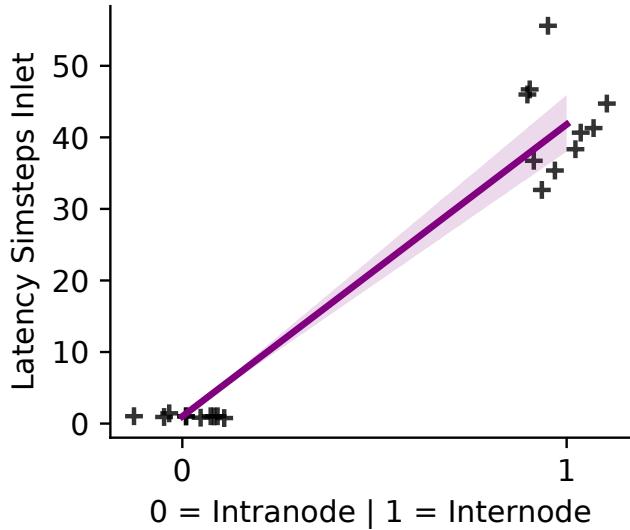
(c) TODO quantile regression



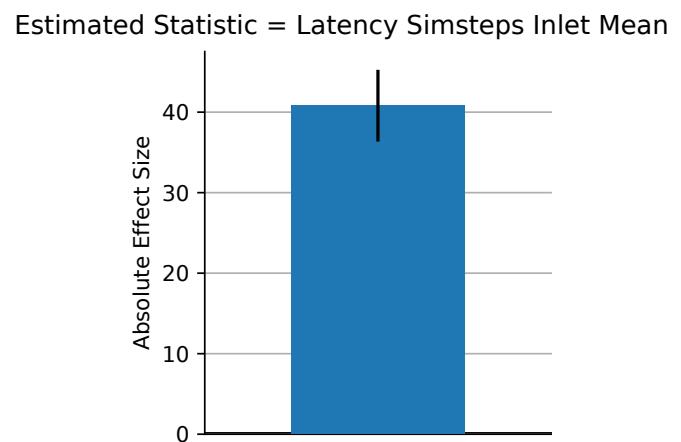
(d) TODO complete quantile regression effect size

Fig. 53: computation vs communication Simstep Period Inlet (ns) ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression

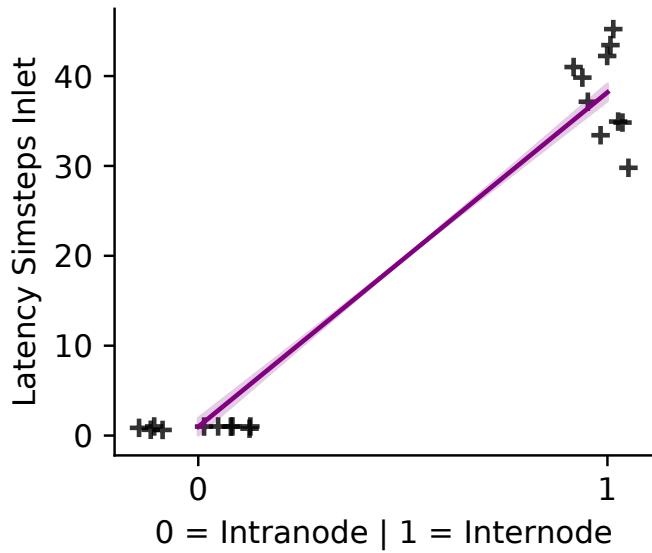


(a) TODO complete ordinary regression

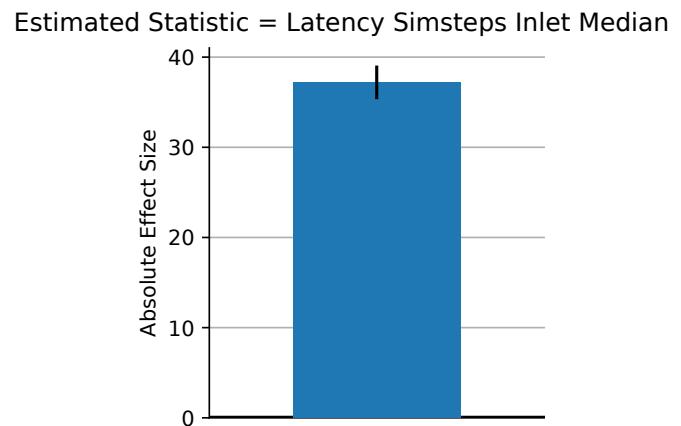


(b) TODO complete ols regression effect size

## Quantile Regression



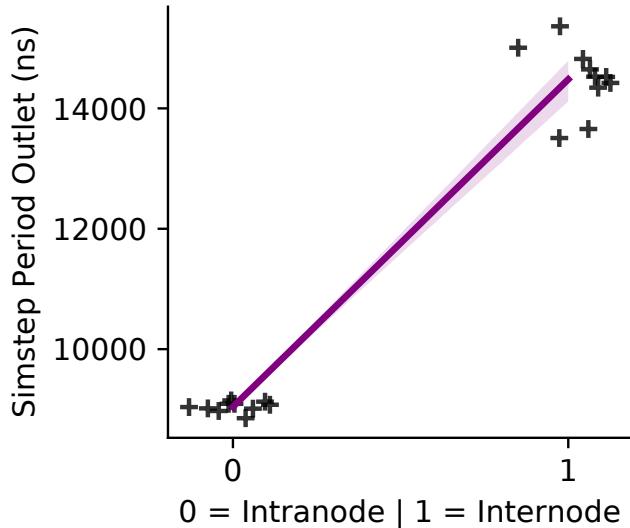
(c) TODO quantile regression



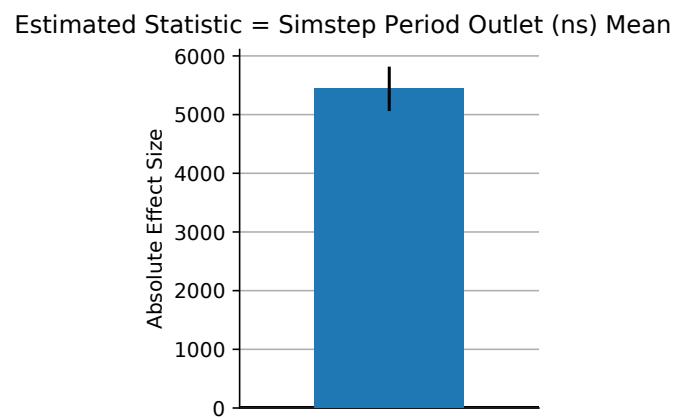
(d) TODO complete quantile regression effect size

Fig. 54: computation vs communication Latency Simsteps Inlet ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression

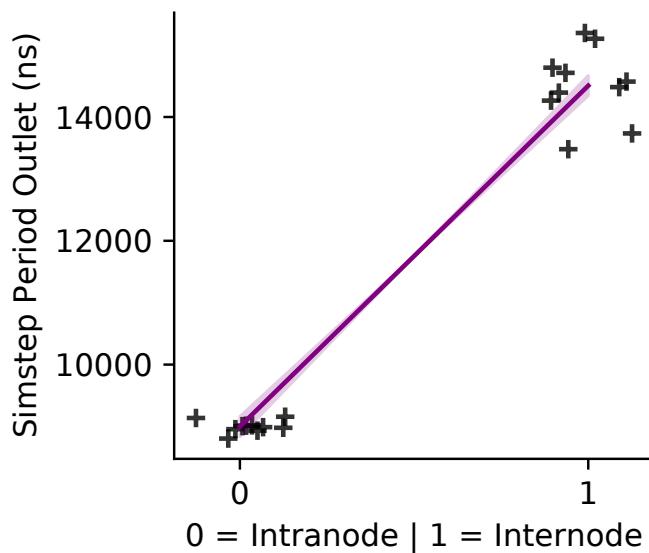


(a) TODO complete ordinary regression

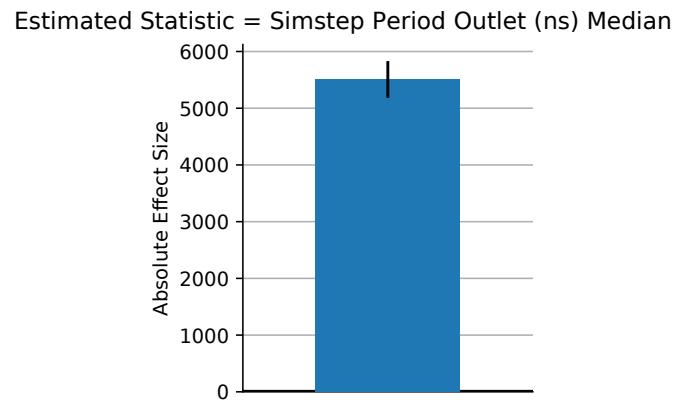


(b) TODO complete ols regression effect size

## Quantile Regression



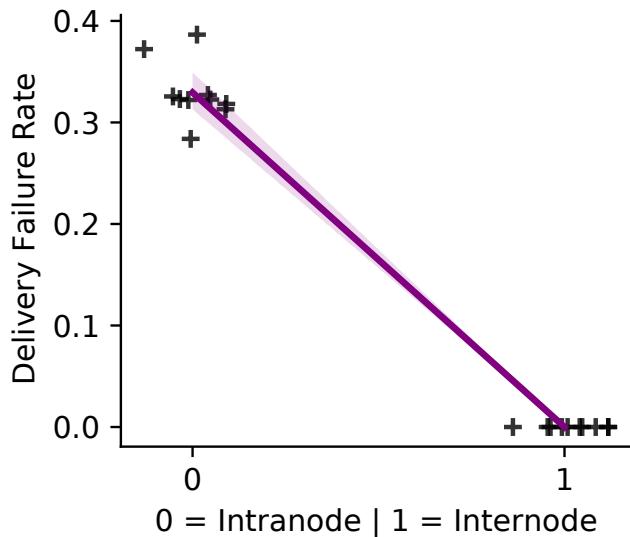
(c) TODO quantile regression



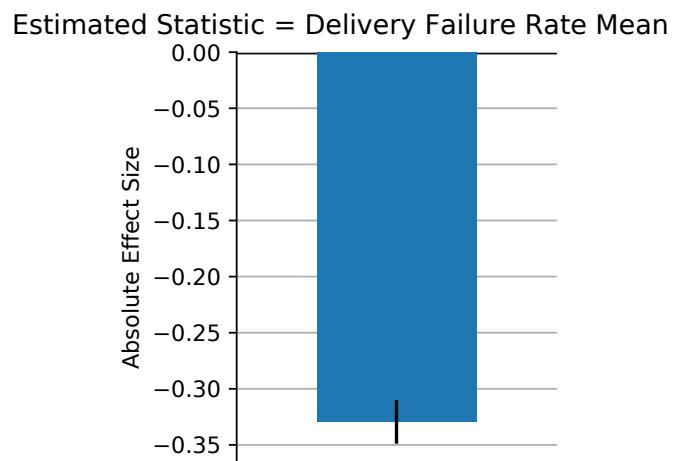
(d) TODO complete quantile regression effect size

Fig. 55: computation vs communication Simstep Period Outlet (ns) ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression

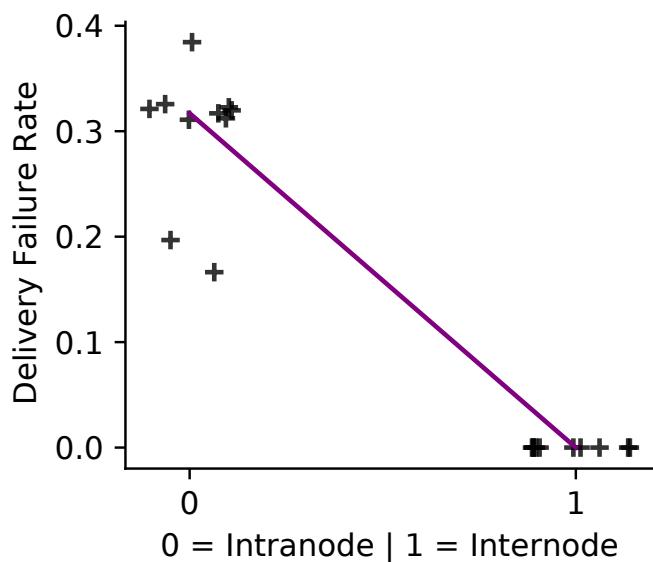


(a) TODO complete ordinary regression

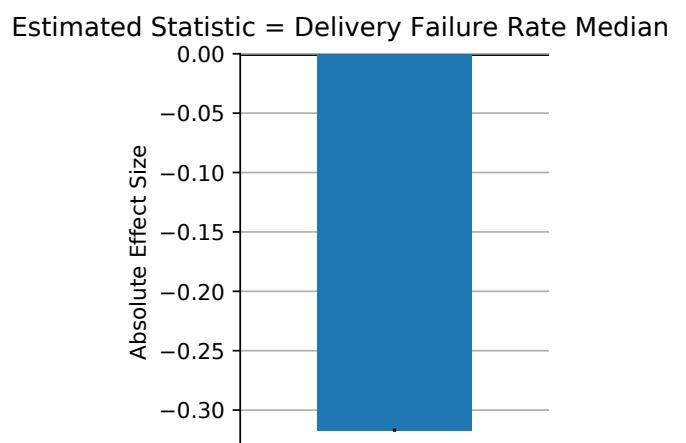


(b) TODO complete ols regression effect size

## Quantile Regression



(c) TODO quantile regression



(d) TODO complete quantile regression effect size

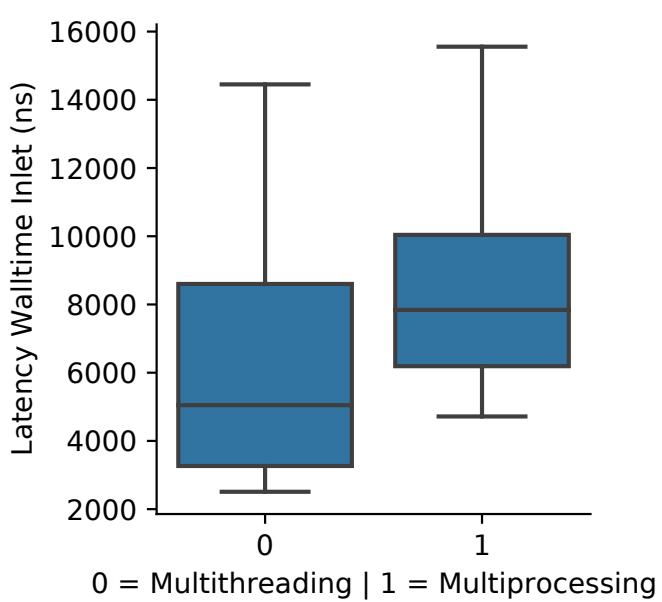
Fig. 56: computation vs communication Delivery Failure Rate ordinary least squares regression to estimate mean and quantile regression to estimate median

TABLE XIX: Computation vs. communication Ordinary Least Squares Regression.

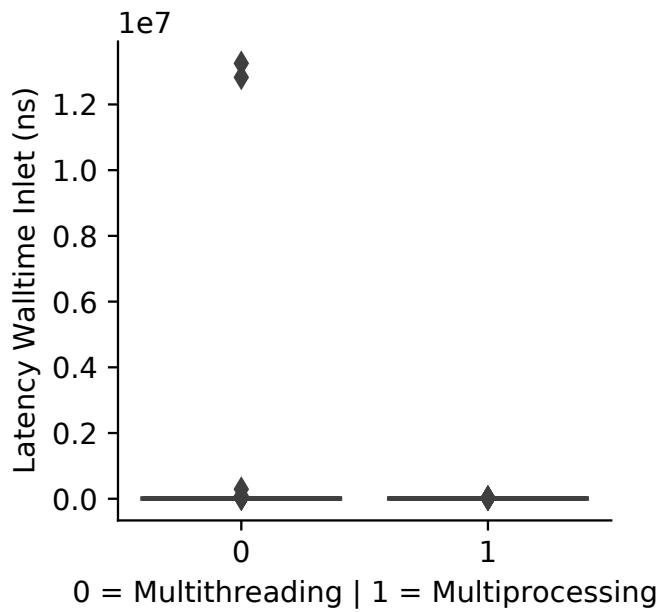
Metric	Statistic	Cpus Per Node	Num Similes Per Cpu	Absolute Effect Size	Relative Effect Size 95% CI Lower Bound	Relative Effect Size 95% CI Upper Bound	n	d
Latency Walltime Inlet (ns)	mean	NaN	1	1	2	inf	nan	inf
Latency Walltime Outlet (ns)	mean	NaN	1	1	2	inf	nan	nan
Latency Simsteps Inlet	mean	NaN	1	1	2	inf	nan	nan
Latency Simsteps Outlet	mean	NaN	1	1	2	inf	nan	nan
Delivery Failure Rate	mean	NaN	1	1	2	0	0	nan
Delivery Clumpiness	mean	-	1	1	2	-0.25	-0.28	-0.23
Simstep Period Inlet (ns)	mean	+	1	1	2	37	36	37
Simstep Period Outlet (ns)	mean	+	1	1	2	36	35	37

TABLE XXX: Computation vs. communication Quantile Regression.

Metric	Statistic	Cpus Per Node	Sigmoid Function Effect Size	Absolute Effect Size	Absolute Effect Size 95% CI Lower Bound	Absolute Effect Size 95% CI Upper Bound	Relative Effect Size	Relative Effect Size 95% CI Lower Bound	Relative Effect Size 95% CI Upper Bound	n
Latency Walltime Inlet (ns)	median	+	1	1	2	45	45	7.2e-05	7.2e-05	50
Latency Walltime Outlet (ns)	median	+	1	1	2	45	45	7.2e-05	7.2e-05	50
Latency Simsteps Inlet	median	0	1	1	2	6.1e-08	-1.5e-06	1.6e-06	1.5e-09	0.94
Latency Simsteps Outlet	median	0	1	1	2	6.1e-08	-1.4e-06	1.6e-06	1.4e-09	0.94
Delivery Failure Rate	median	NaN	1	1	2	0	nan	nan	nan	50
Delivery Clumpiness	median	-	1	1	2	-0.26	-0.31	-0.22	-0.27	0.23
Simstep Period Inlet (ns)	median	+	1	1	2	30	30	0.0021	0.0021	50
Simstep Period Outlet (ns)	median	+	1	1	2	30	30	0.0021	0.0021	50

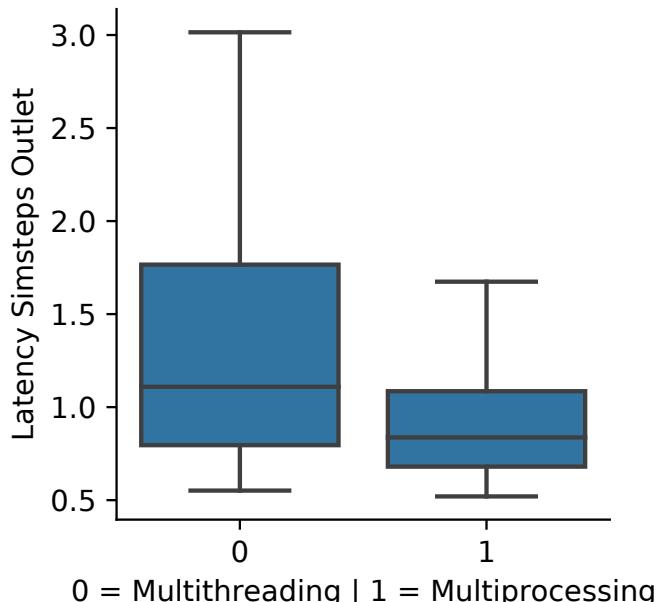


(a) TODO without outliers

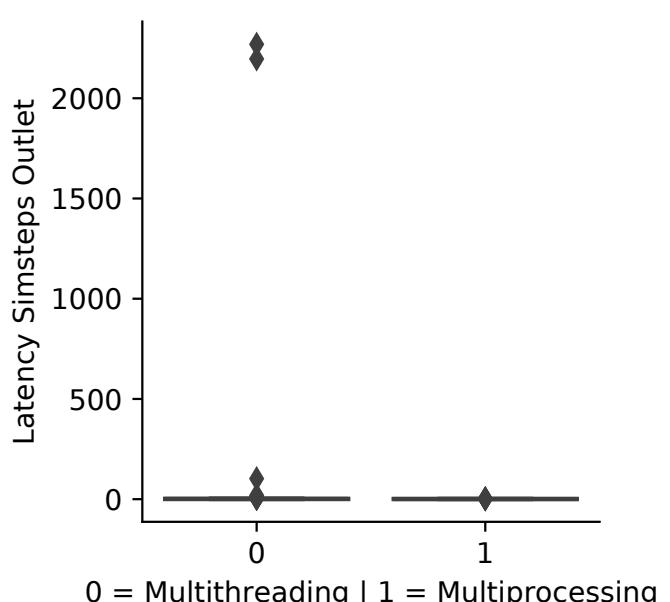


(b) TODO without outliers

Fig. 57: multithreading vs multiprocessing Latency Walltime Inlet (ns) TODO

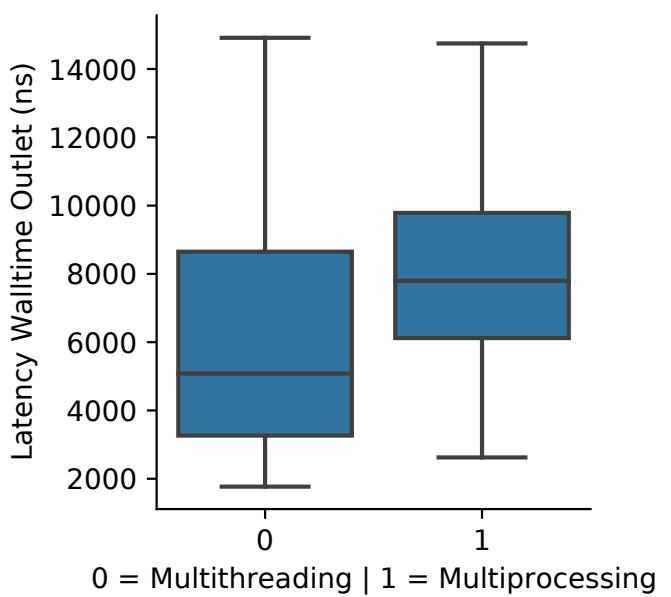


(a) TODO without outliers



(b) TODO without outliers

Fig. 58: multithreading vs multiprocessing Latency Simsteps Outlet TODO



(a) TODO without outliers

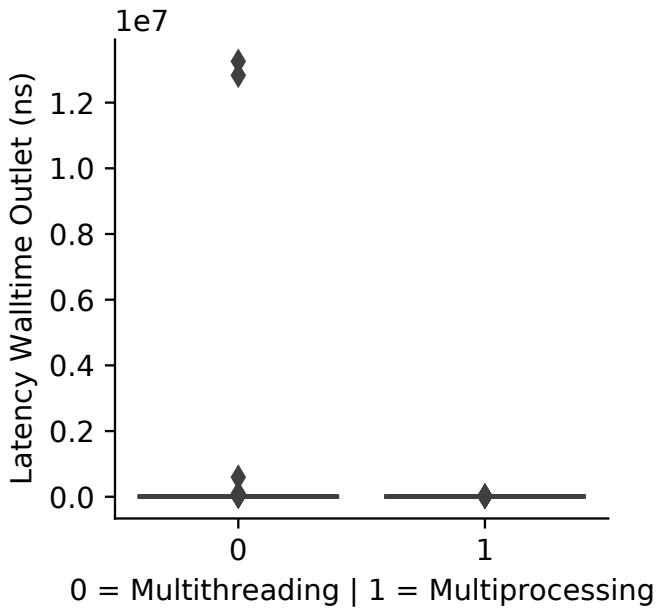
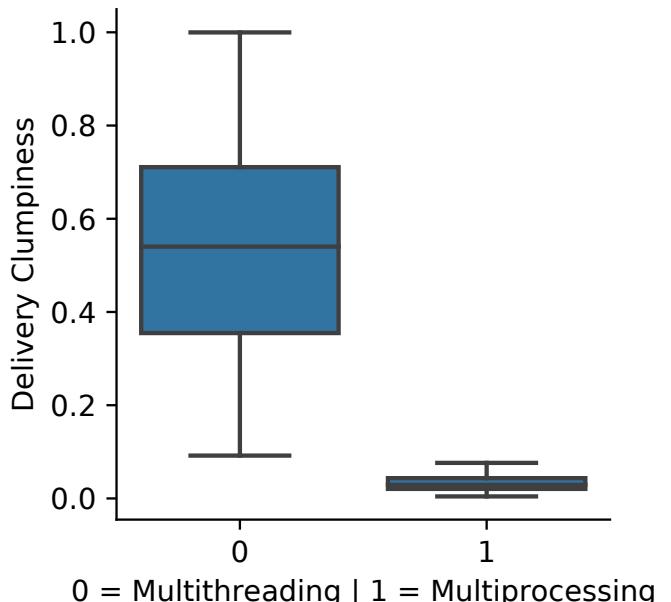
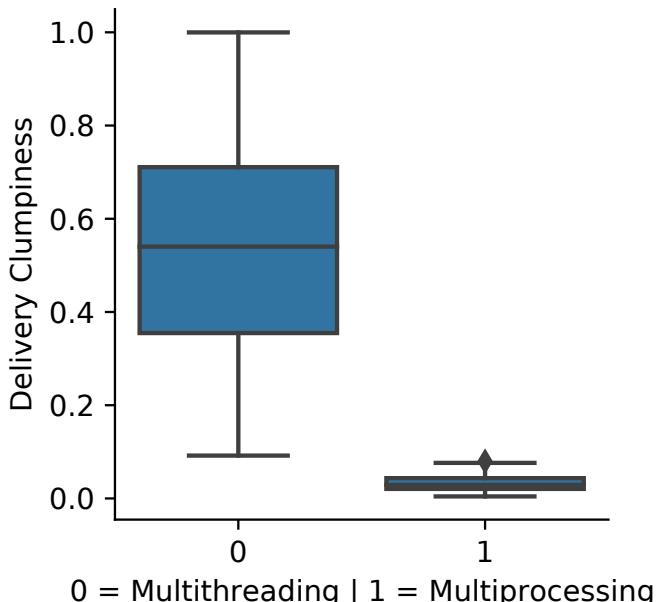


Fig. 59: multithreading vs multiprocessing Latency Walltime Outlet (ns) TODO

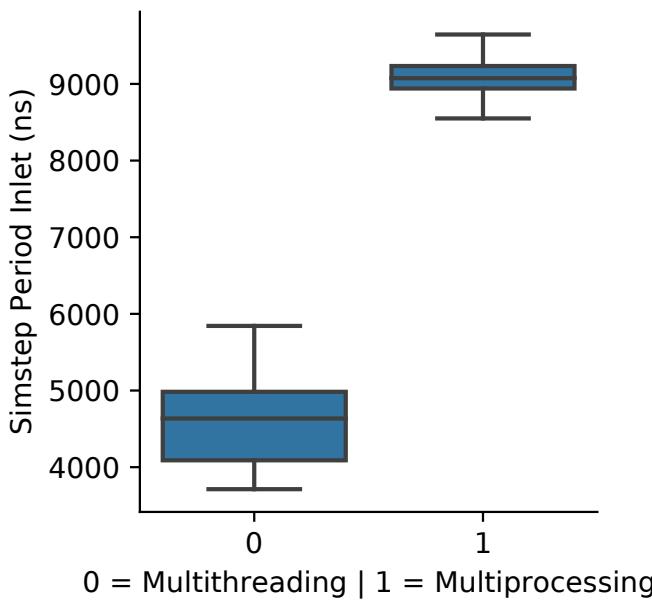


(a) TODO without outliers

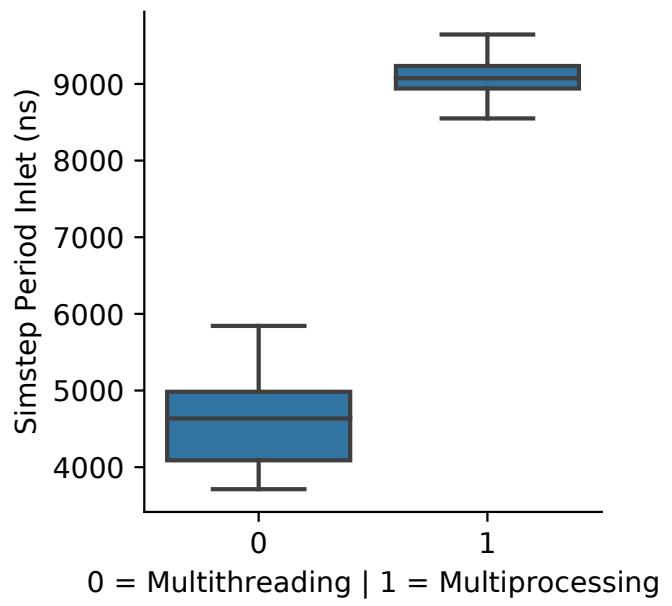


(b) TODO without outliers

Fig. 60: multithreading vs multiprocessing Delivery Clumpiness TODO

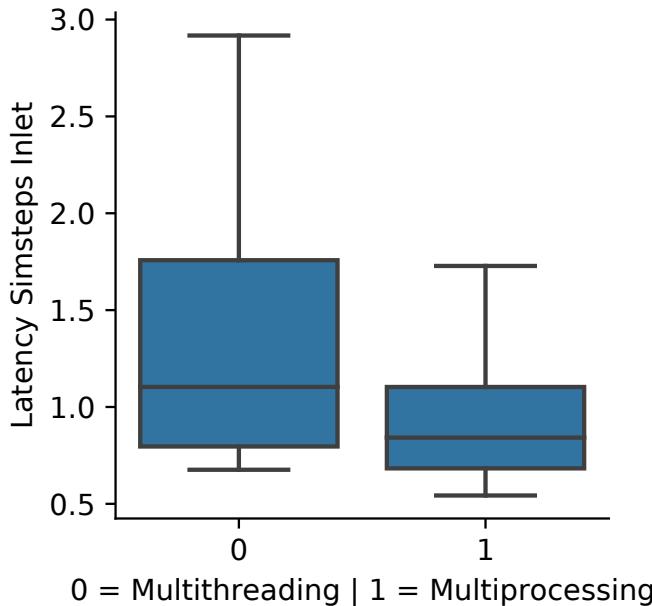


(a) TODO without outliers

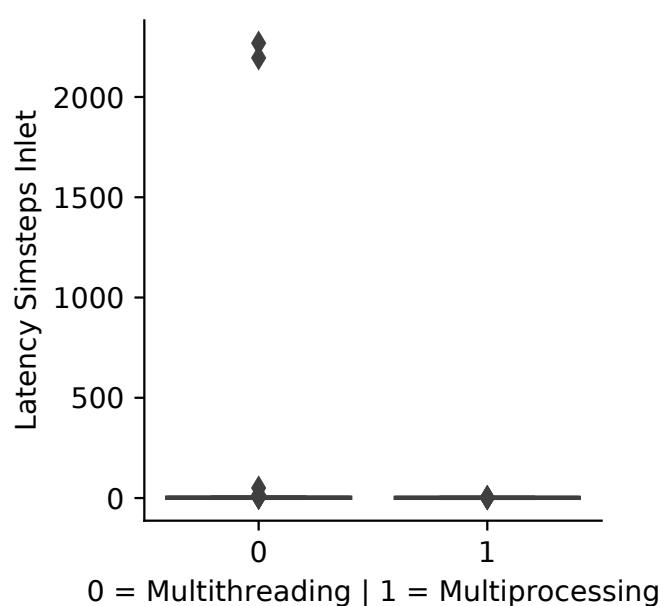


(b) TODO without outliers

Fig. 61: multithreading vs multiprocessing Simstep Period Inlet (ns) TODO

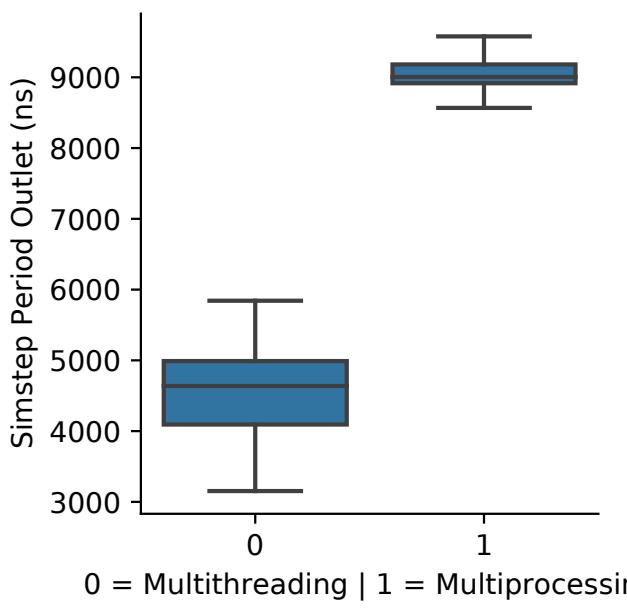


(a) TODO without outliers

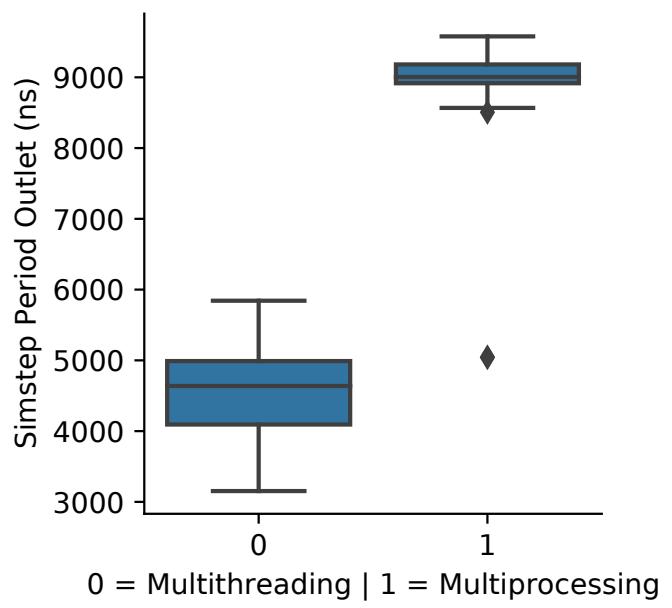


(b) TODO without outliers

Fig. 62: multithreading vs multiprocessing Latency Simsteps Inlet TODO

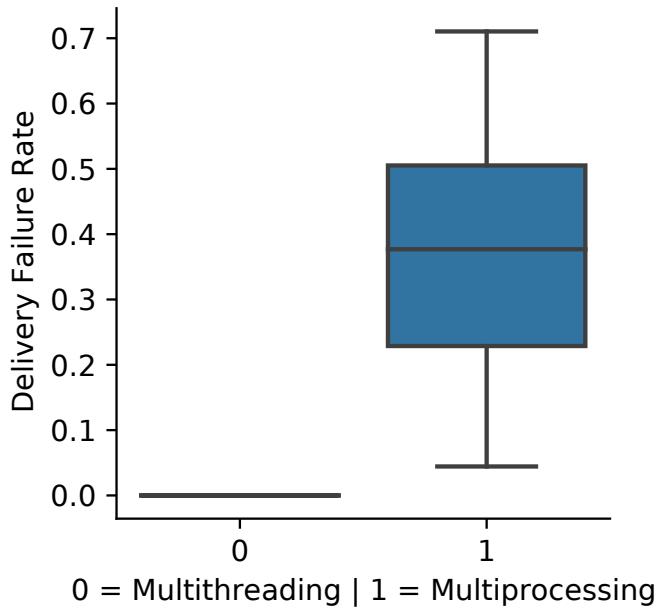


(a) TODO without outliers

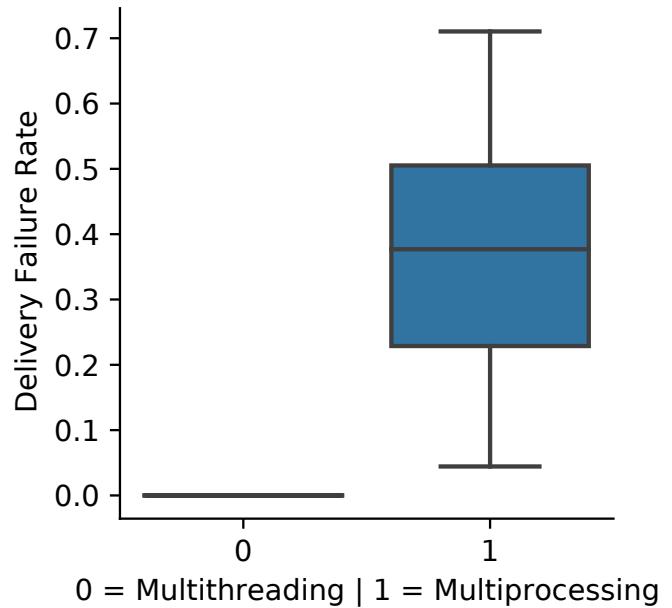


(b) TODO without outliers

Fig. 63: multithreading vs multiprocessing Simstep Period Outlet (ns) TODO



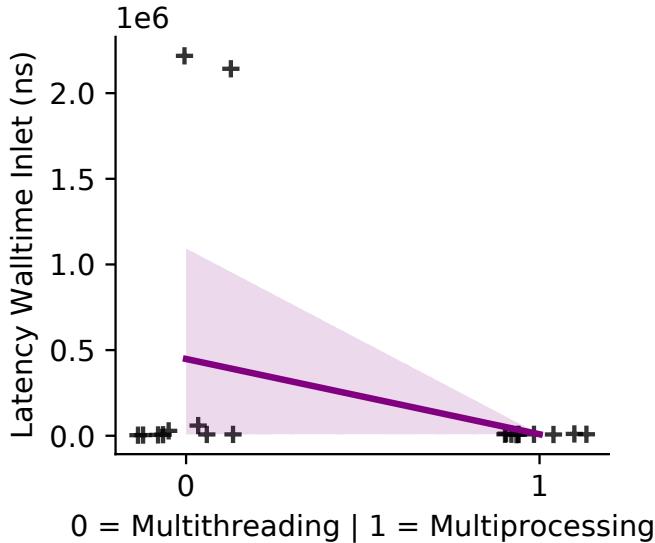
(a) TODO without outliers



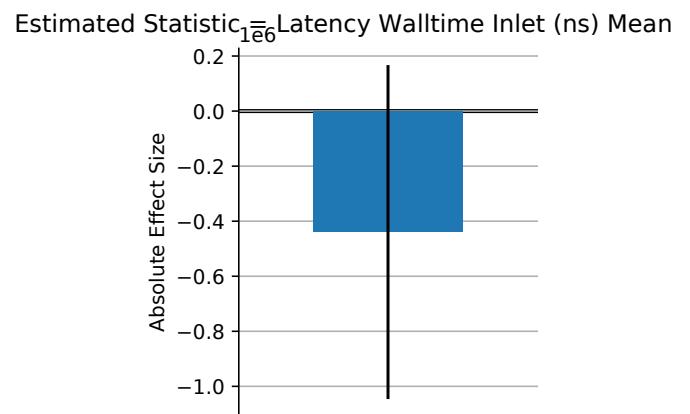
(b) TODO without outliers

Fig. 64: multithreading vs multiprocessing Delivery Failure Rate TODO

## Ordinary Least Squares Regression

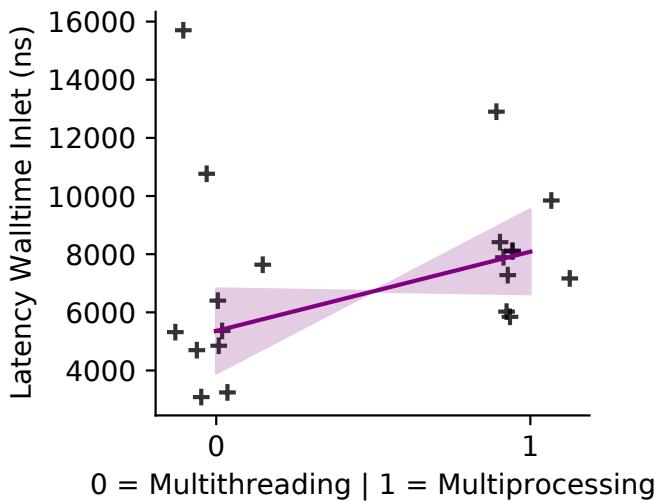


(a) TODO complete ordinary regression

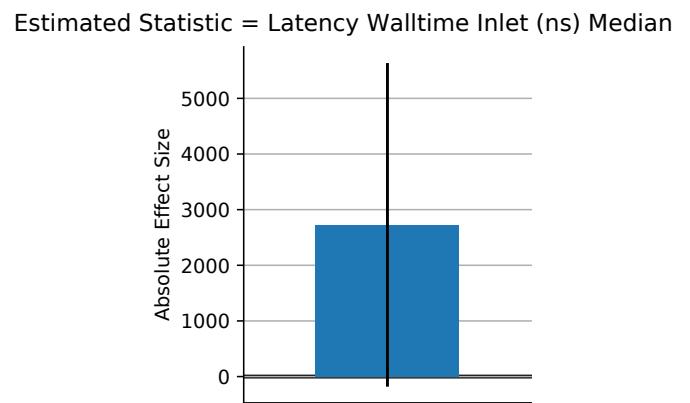


(b) TODO complete ols regression effect size

## Quantile Regression



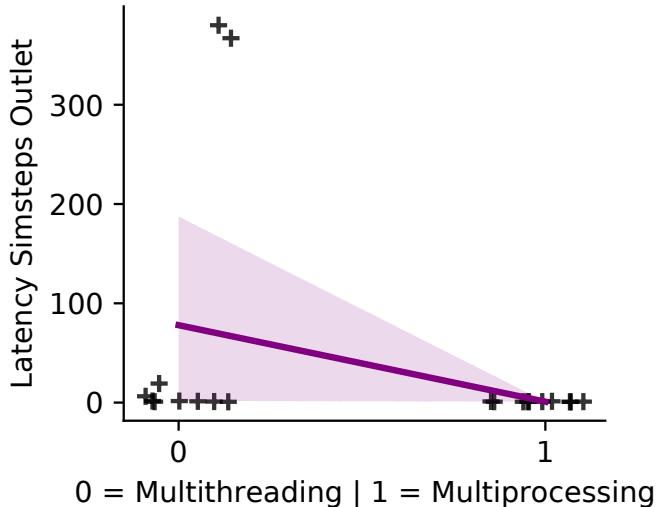
(c) TODO quantile regression



(d) TODO complete quantile regression effect size

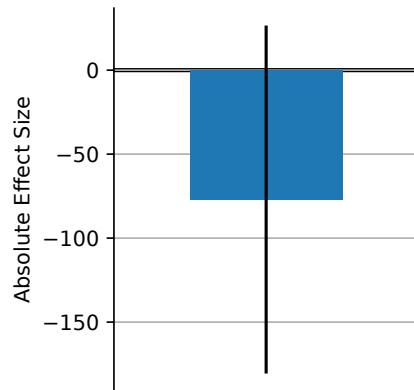
Fig. 65: computation vs communication Latency Walltime Inlet (ns) ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression



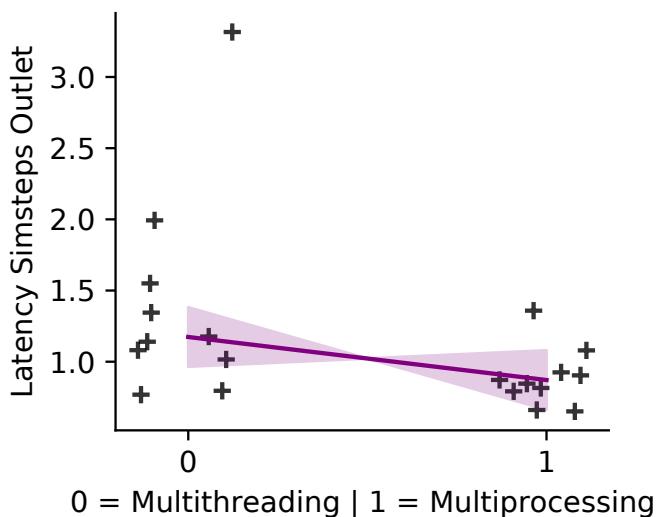
(a) TODO complete ordinary regression

Estimated Statistic = Latency Simsteps Outlet Mean



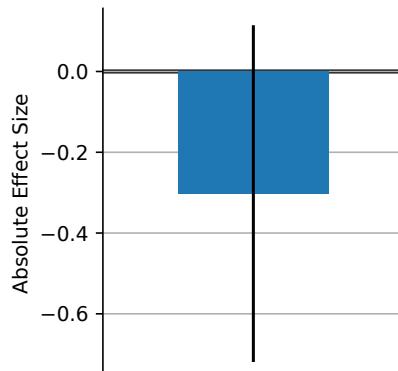
(b) TODO complete ols regression effect size

## Quantile Regression



(c) TODO quantile regression

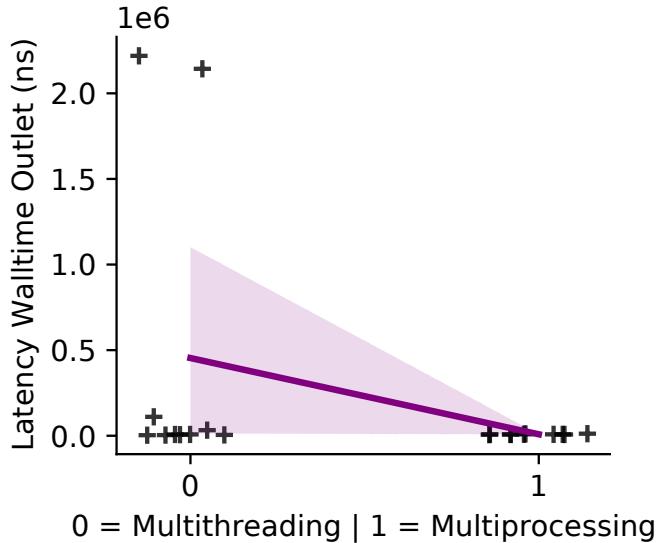
Estimated Statistic = Latency Simsteps Outlet Median



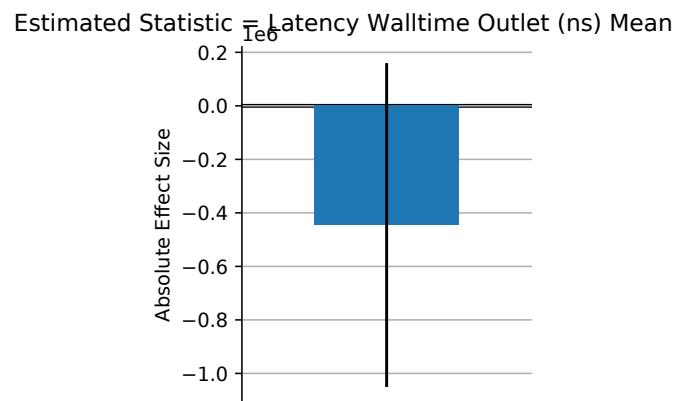
(d) TODO complete quantile regression effect size

Fig. 66: computation vs communication   Latency Simsteps Outlet   ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression

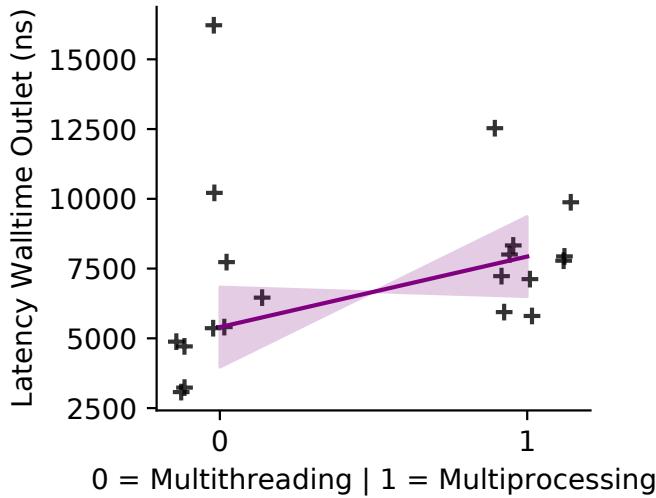


(a) TODO complete ordinary regression

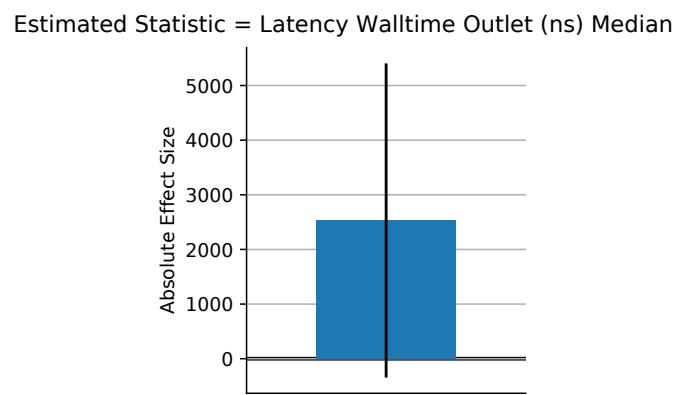


(b) TODO complete ols regression effect size

## Quantile Regression



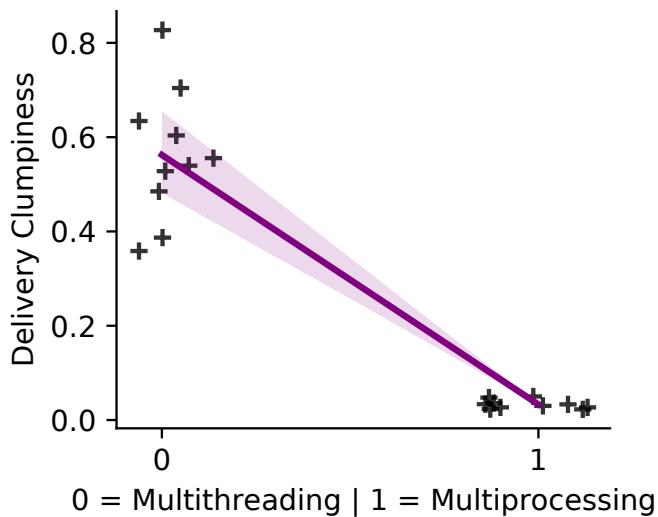
(c) TODO quantile regression



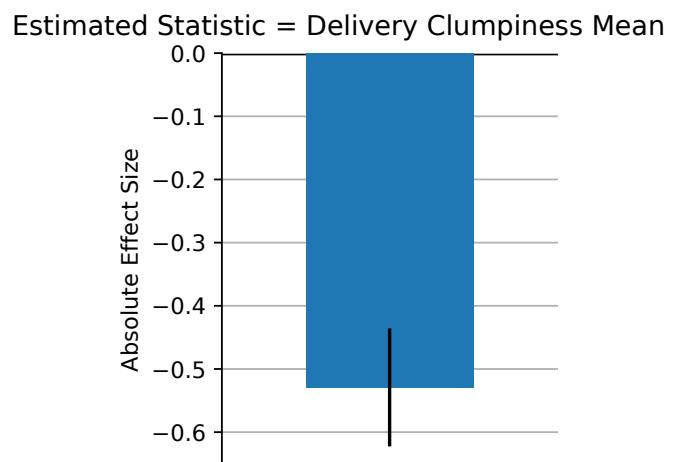
(d) TODO complete quantile regression effect size

Fig. 67: computation vs communication Latency Walltime Outlet (ns) ordinary least squares regression to estimate mean and quantile regression to estimate median

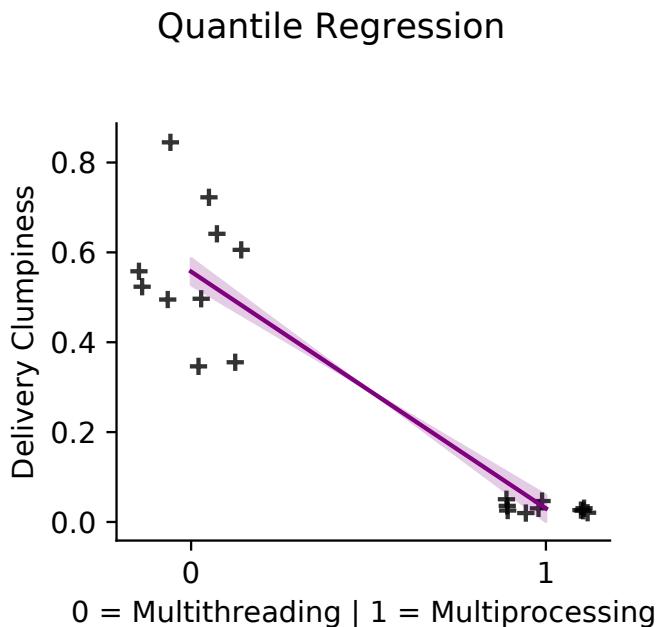
## Ordinary Least Squares Regression



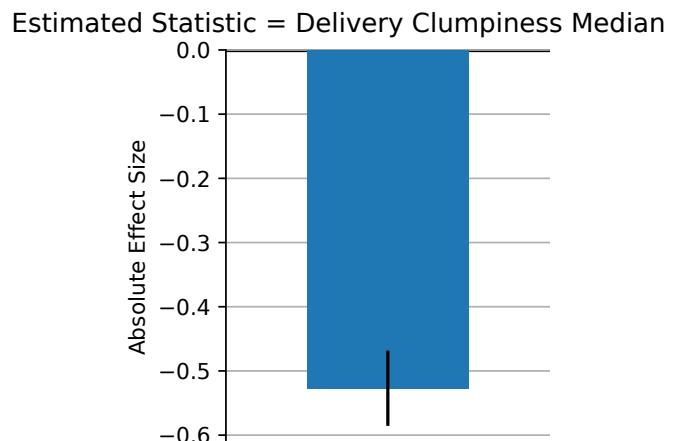
(a) TODO complete ordinary regression



(b) TODO complete ols regression effect size



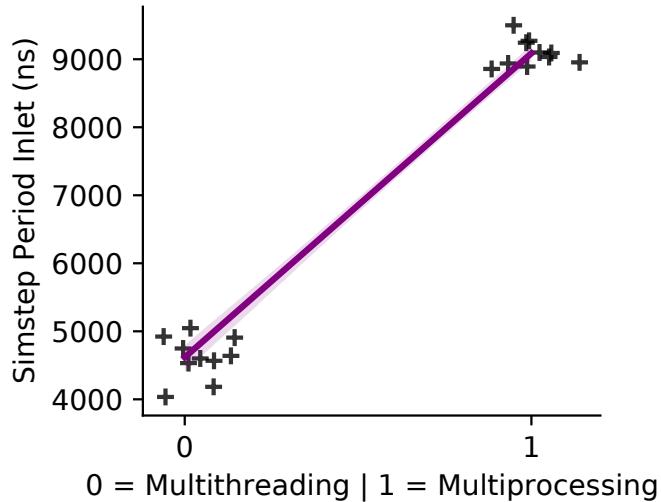
(c) TODO quantile regression



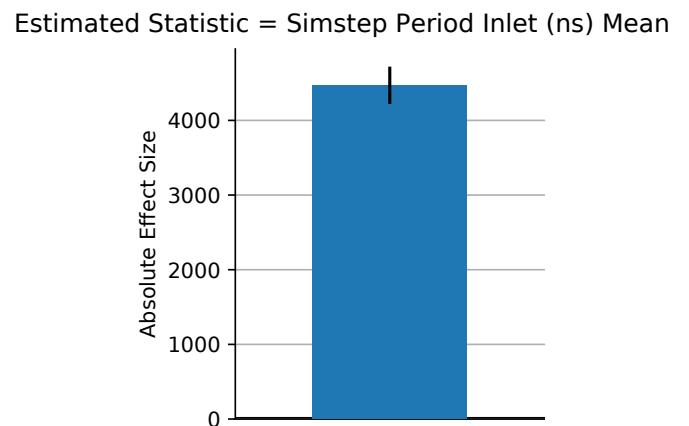
(d) TODO complete quantile regression effect size

Fig. 68: computation vs communication Delivery Clumpiness ordinary least squares regression to estimate mean and quantile regression to estimate median

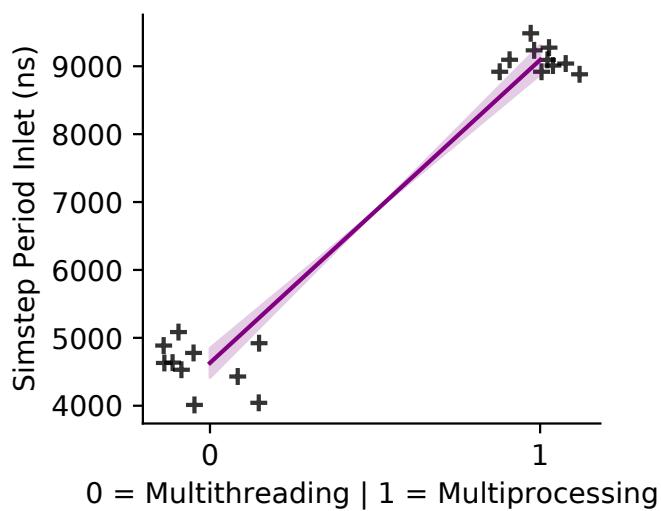
## Ordinary Least Squares Regression



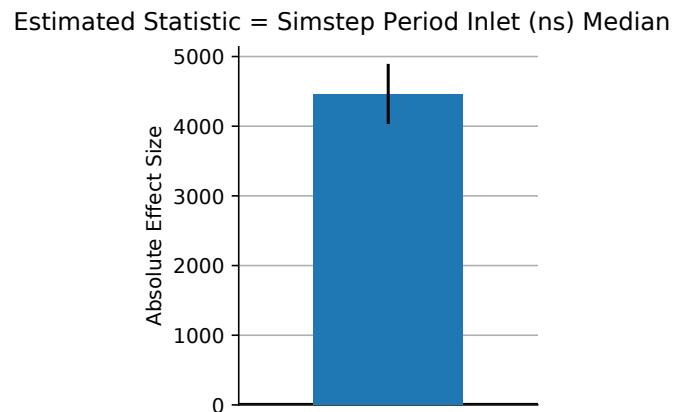
(a) TODO complete ordinary regression



(b) TODO complete ols regression effect size



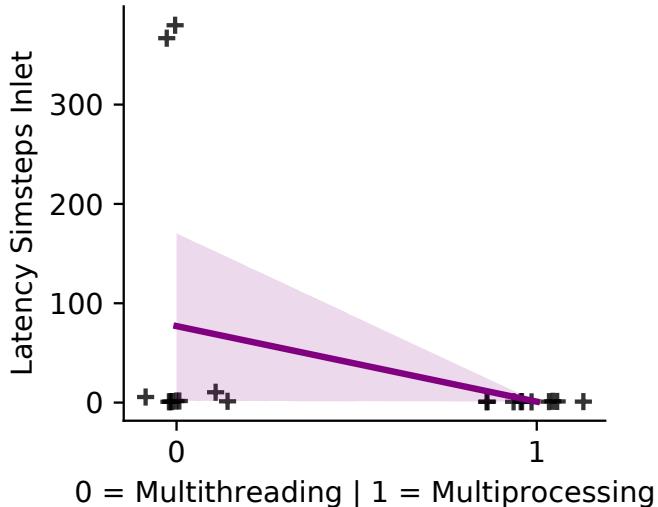
(c) TODO quantile regression



(d) TODO complete quantile regression effect size

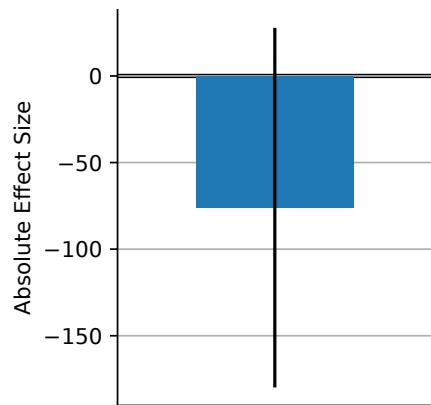
Fig. 69: computation vs communication    Simstep Period Inlet (ns)    ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression



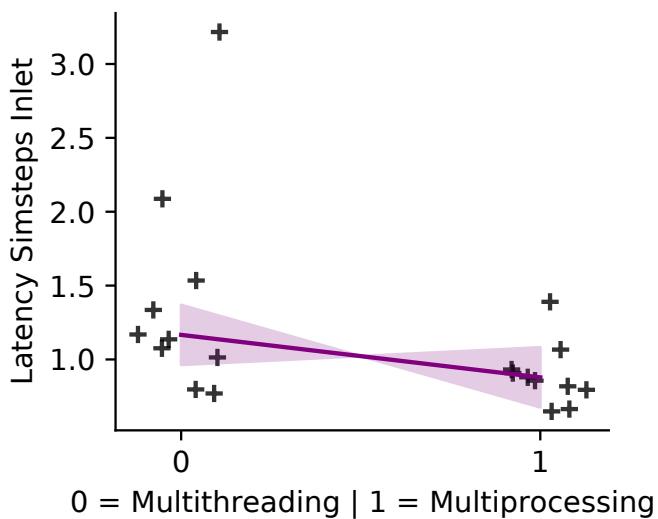
(a) TODO complete ordinary regression

Estimated Statistic = Latency Simsteps Inlet Mean



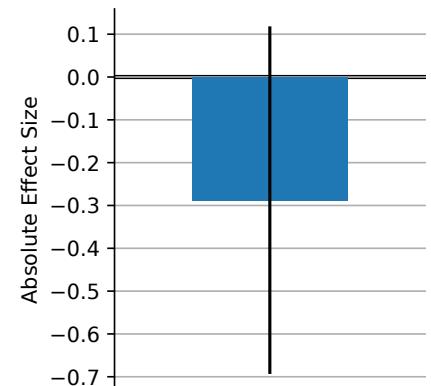
(b) TODO complete ols regression effect size

## Quantile Regression



(c) TODO quantile regression

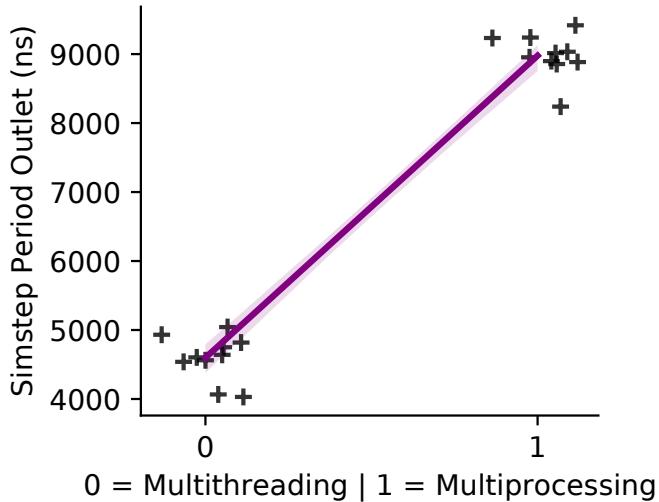
Estimated Statistic = Latency Simsteps Inlet Median



(d) TODO complete quantile regression effect size

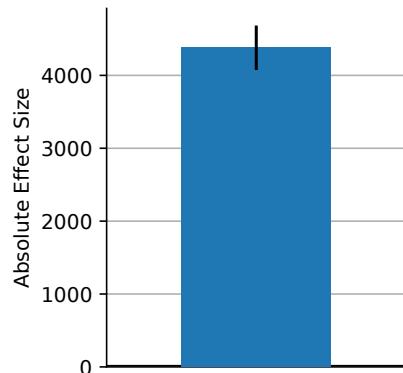
Fig. 70: computation vs communication Latency Simsteps Inlet ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression



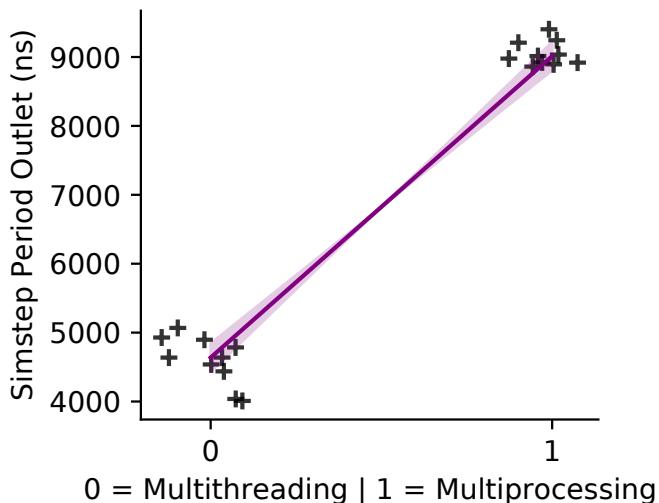
(a) TODO complete ordinary regression

Estimated Statistic = Simstep Period Outlet (ns) Mean



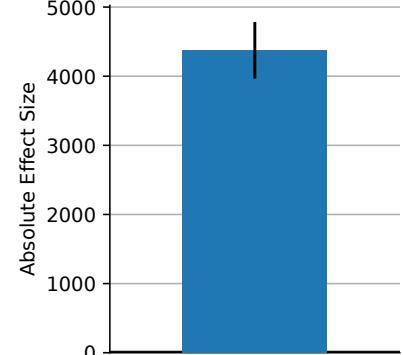
(b) TODO complete ols regression effect size

## Quantile Regression



(c) TODO quantile regression

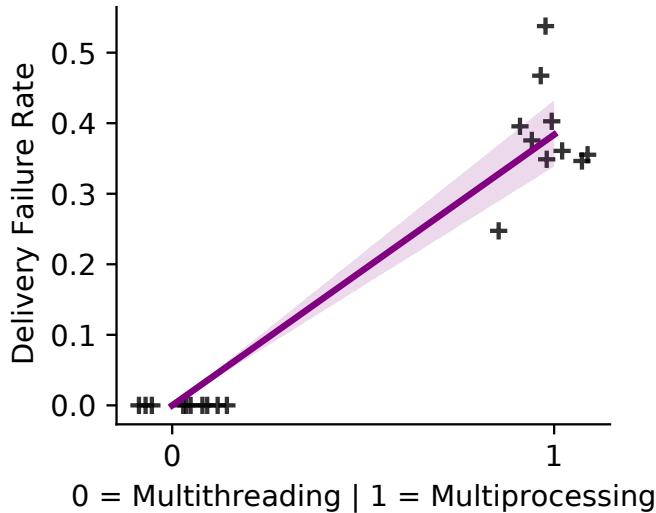
Estimated Statistic = Simstep Period Outlet (ns) Median



(d) TODO complete quantile regression effect size

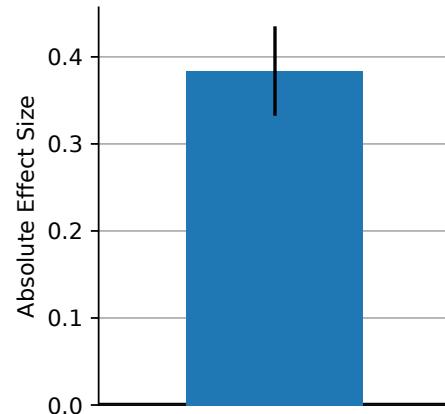
Fig. 71: computation vs communication Simstep Period Outlet (ns) ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression



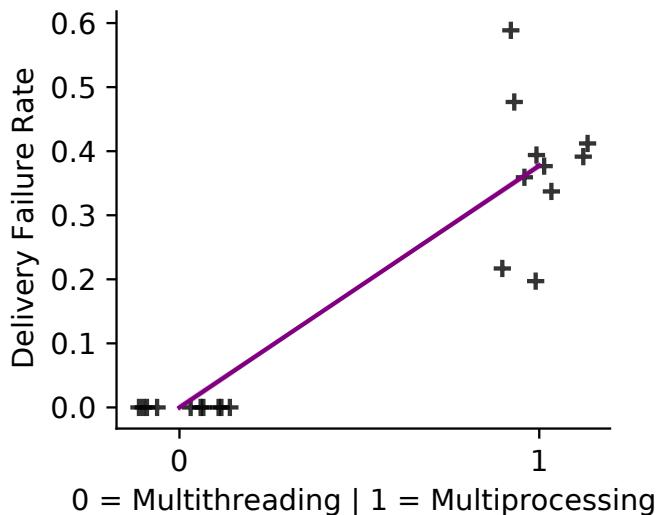
(a) TODO complete ordinary regression

Estimated Statistic = Delivery Failure Rate Mean



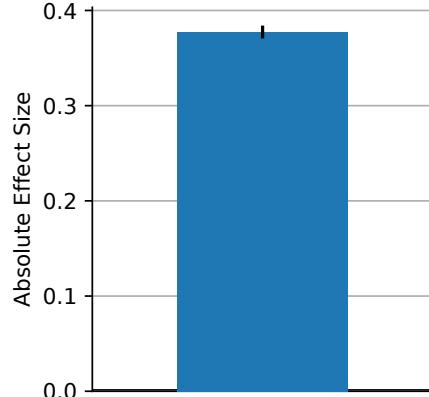
(b) TODO complete ols regression effect size

## Quantile Regression



(c) TODO quantile regression

Estimated Statistic = Delivery Failure Rate Median



(d) TODO complete quantile regression effect size

Fig. 72: computation vs communication Delivery Failure Rate ordinary least squares regression to estimate mean and quantile regression to estimate median

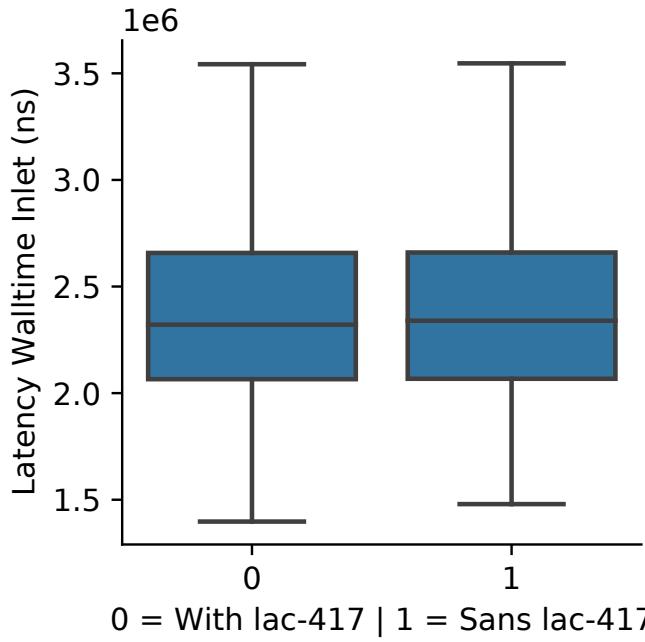
TABLE XXXI: Multithreading vs. multiprocessing Ordinary Least Squares Regression.

Metric		Signdificant Effect Sign	Cpus per Node	Num Simles Per Cpu	Num Processes	Absolute Effect Size	Absolute Effect Size 95% CI Lower Bound	Absolute Effect Size 95% CI Upper Bound	Relative Effect Size	Relative Effect Size 95% CI Lower Bound	Relative Effect Size 95% CI Upper Bound	$\alpha$	
Latency Walltime Inlet (ns)	mean	0	2	1	1/2	-440'000	-1e+06	170'000	-0.98	-2.3	0.37	20	0.15
Latency Walltime Outlet (ns)	mean	0	2	1	1/2	-450'000	-1.1e+06	160'000	-0.98	-2.3	0.35	20	0.14
Latency Simsteps Inlet	mean	0	2	1	1/2	-76	-180	28	-0.99	-2.3	0.36	20	0.14
Latency Simsteps Outlet	mean	0	2	1	1/2	-77	-180	27	-0.99	-2.3	0.34	20	0.14
Delivery Failure Rate	mean	+	2	1	1/2	0.38	0.33	0.44	-1.4e+06	-1.2e+06	-1.5e+06	20	6e-12
Delivery Clumpiness	mean	-	2	1	1/2	-0.53	-0.62	-0.44	-0.94	-1.1	-0.78	20	5.8e-10
Simstep Period Inlet (ns)	mean	+	2	1	1/2	4'500	4'200	4'700	0.97	0.91	1	20	1.5e-18
Simstep Period Outlet (ns)	mean	+	2	1	1/2	4'400	4'100	4'700	0.95	0.89	1	20	7.4e-17

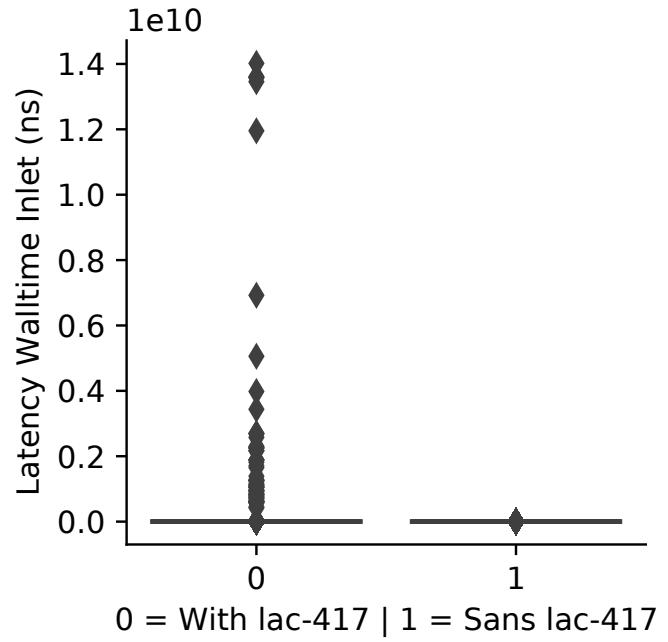
TABLE XXII: Multithreading vs. multiprocessing Quantile Regression.

Metric	Statistic	Sigmoidal Effect Size						Absolute Effect Size						Relative Effect Size					
		CI Lower Bound	CI Upper Bound	CI Lower Bound	CI Upper Bound	CI Lower Bound	CI Upper Bound	CI Lower Bound	CI Upper Bound	CI Lower Bound	CI Upper Bound	CI Lower Bound	CI Upper Bound	CI Lower Bound	CI Upper Bound	CI Lower Bound	CI Upper Bound		
Latency Walltime Inlet (ns)	median	0	2	1	1/2	2'700	-180	5'600	0.51	-0.034	1.1	20	0.064						
Latency Walltime Outlet (ns)	median	0	2	1	1/2	2'500	-350	5'400	0.47	-0.064	1	20	0.081						
Latency Simsteps Inlet	median	0	2	1	1/2	-0.29	-0.69	0.12	-0.25	-0.6	0.1	20	0.15						
Latency Simsteps Outlet	median	0	2	1	1/2	-0.3	-0.72	0.11	-0.26	-0.62	0.099	20	0.14						
Delivery Failure Rate	median	+	2	1	1/2	0.38	0.37	0.38	inf	inf	inf	20	2e-27						
Delivery Clumpiness	median	-	2	1	1/2	-0.53	-0.59	-0.47	-0.97	-1.1	-0.87	20	2.6e-13						
Simstep Period Inlet (ns)	median	+	2	1	1/2	4'500	4'000	4'900	0.96	0.87	1.1	20	2.3e-14						
Simstep Period Outlet (ns)	median	+	2	1	1/2	4'400	4'000	4'800	0.94	0.86	1	20	1.3e-14						

*C. With lac-417 vs. Sans lac-417*

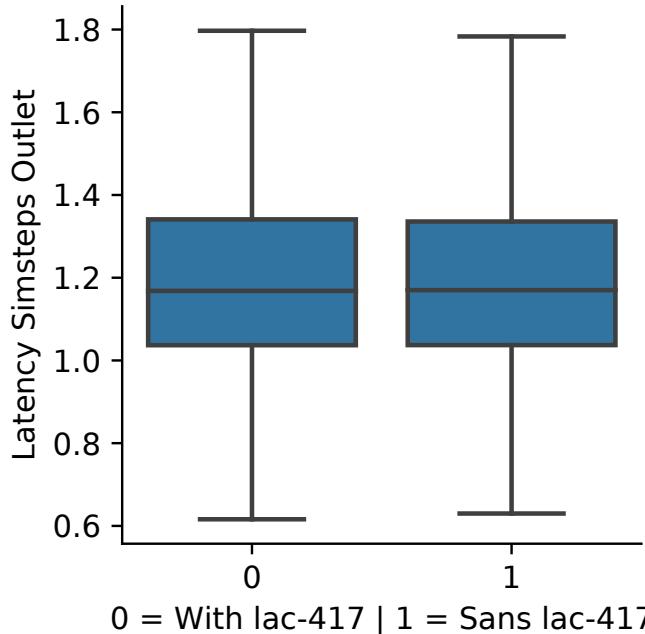


(a) TODO without outliers

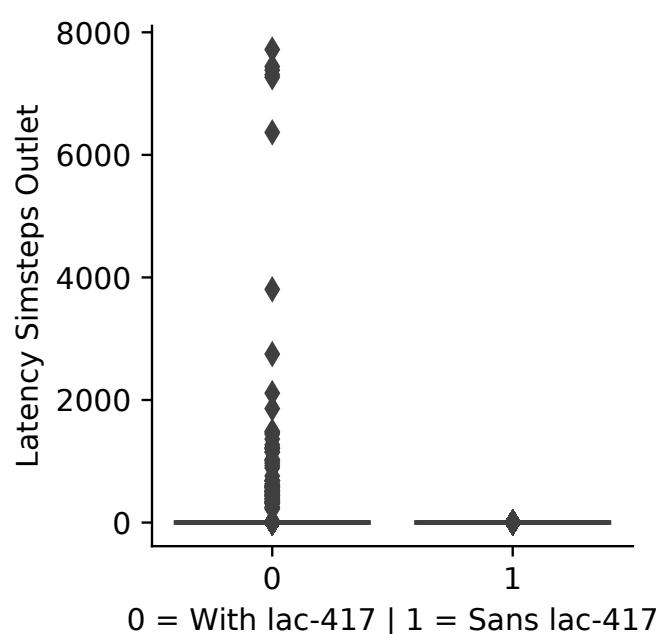


(b) TODO without outliers

Fig. 73: with-lac-417 vs sans-lac-417 Latency Walltime Inlet (ns) TODO

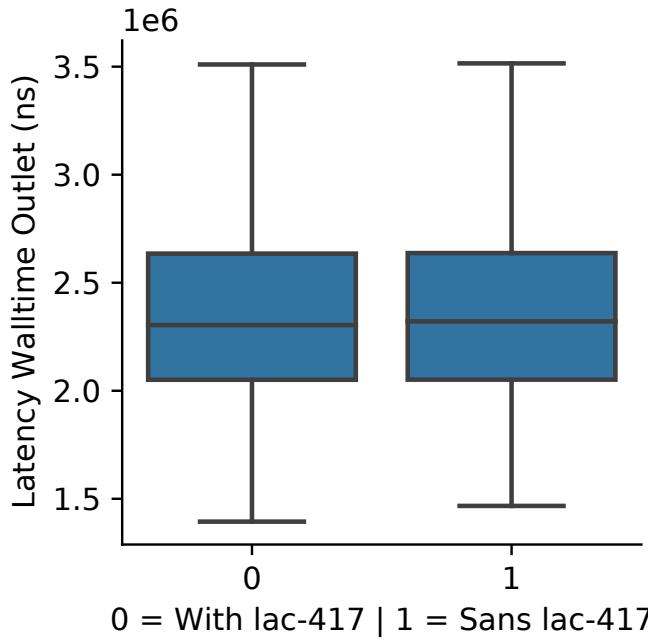


(a) TODO without outliers



(b) TODO without outliers

Fig. 74: with-lac-417 vs sans-lac-417 Latency Simsteps Outlet TODO



(a) TODO without outliers

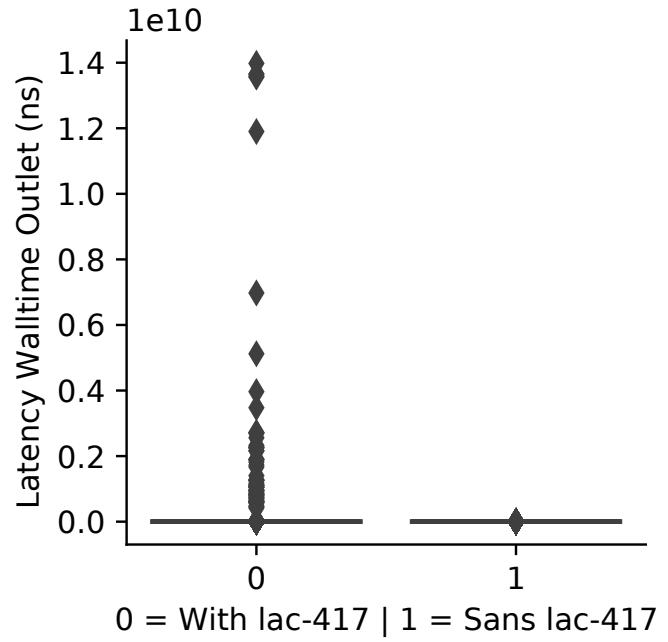
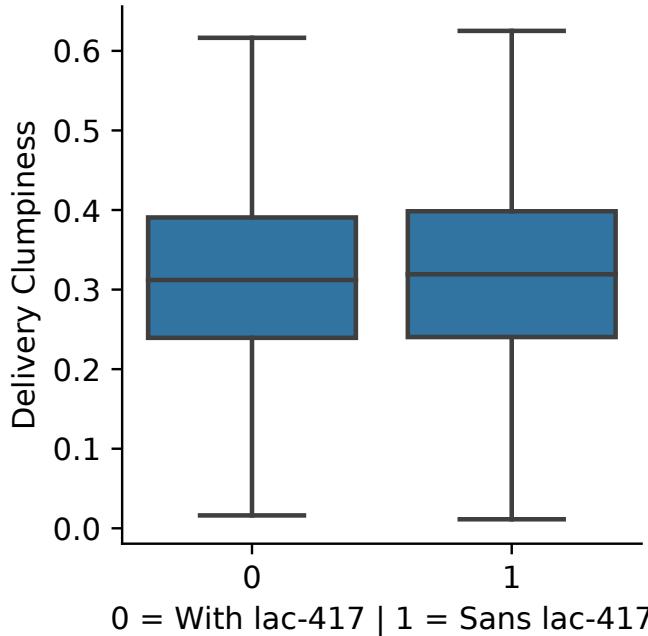


Fig. 75: with-lac-417 vs sans-lac-417 Latency Walltime Outlet (ns) TODO



(a) TODO without outliers

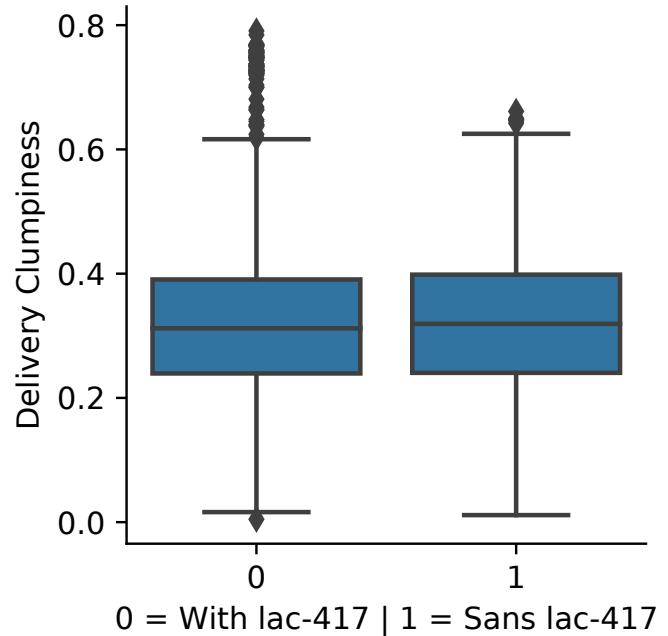
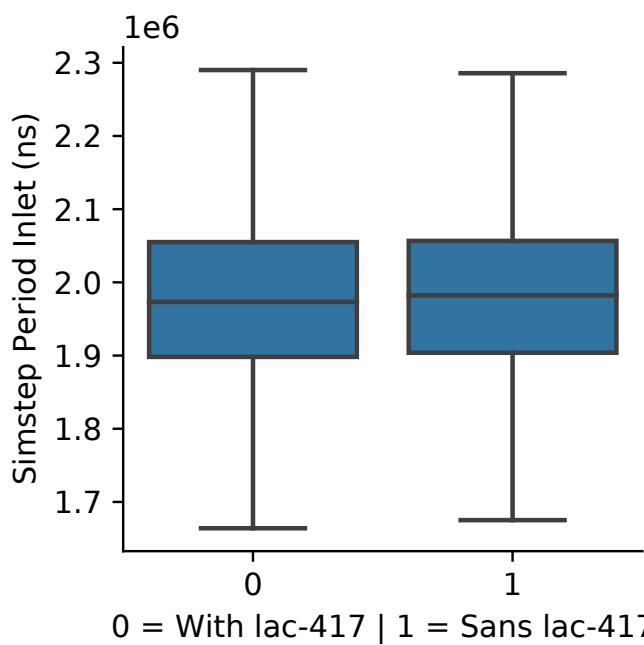
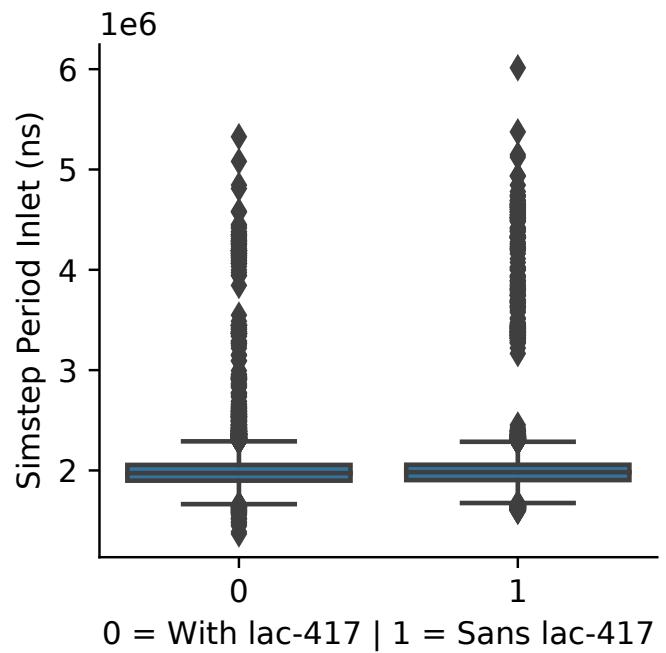


Fig. 76: with-lac-417 vs sans-lac-417 Delivery Clumpiness TODO

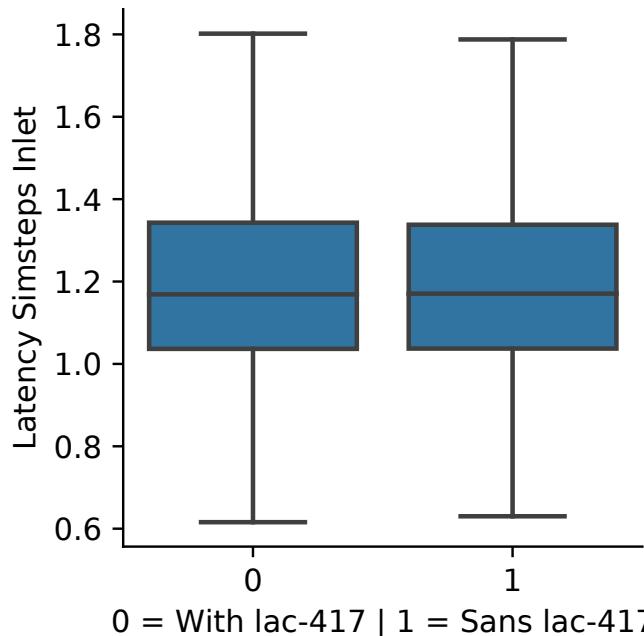


(a) TODO without outliers

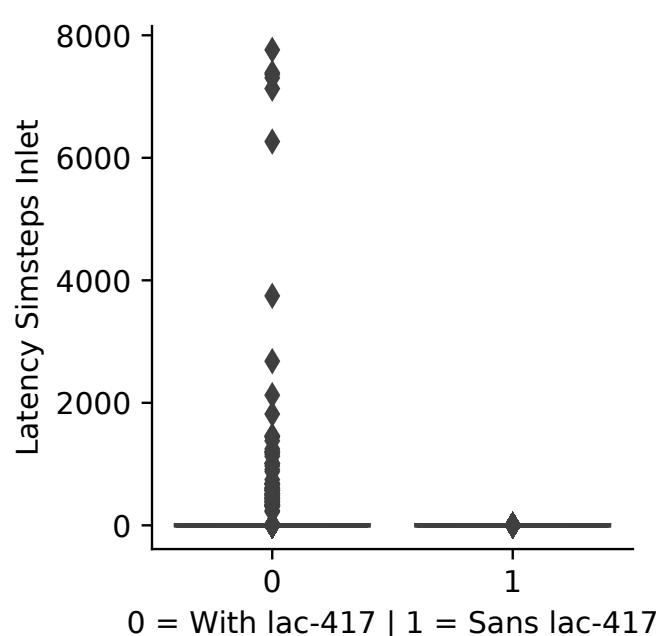


(b) TODO without outliers

Fig. 77: with-lac-417 vs sans-lac-417 Simstep Period Inlet (ns) TODO

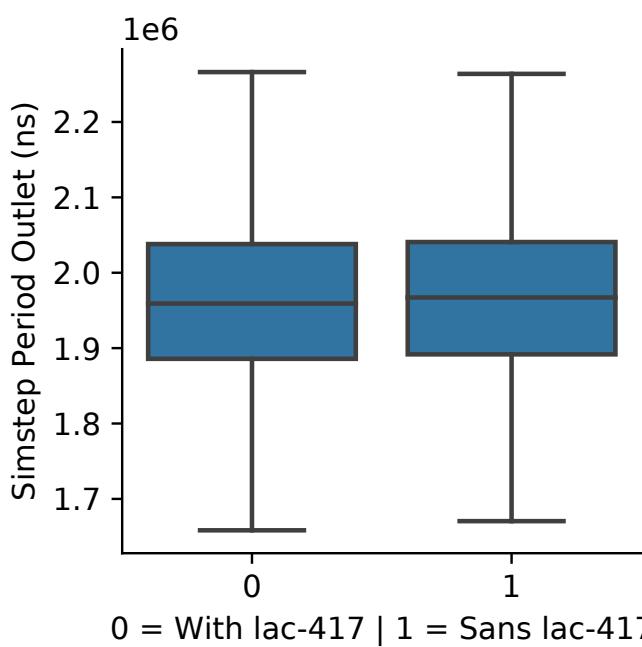


(a) TODO without outliers

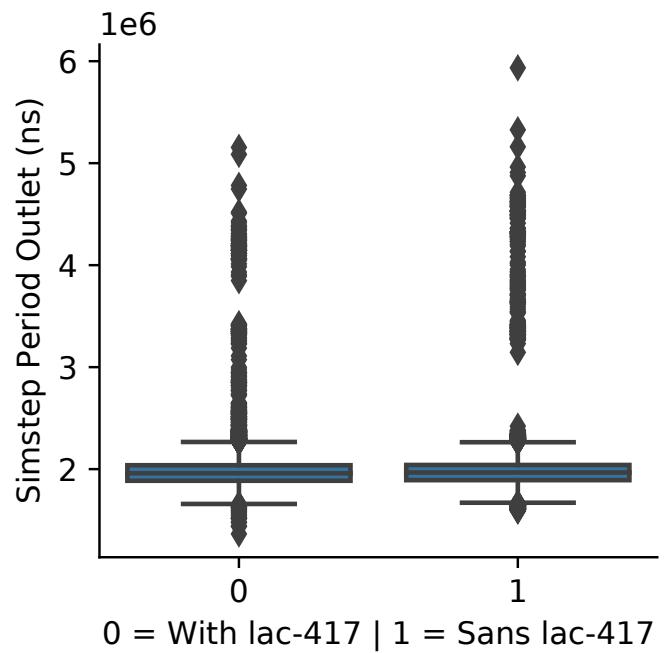


(b) TODO without outliers

Fig. 78: with-lac-417 vs sans-lac-417 Latency Simsteps Inlet TODO

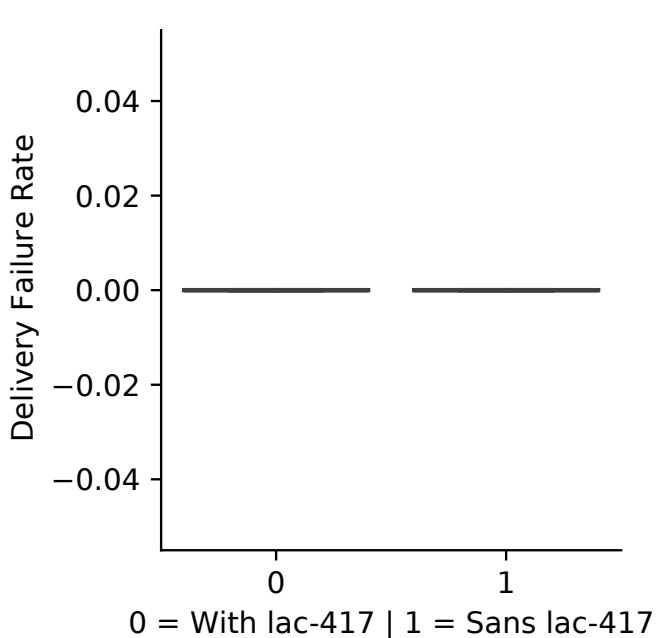


(a) TODO without outliers

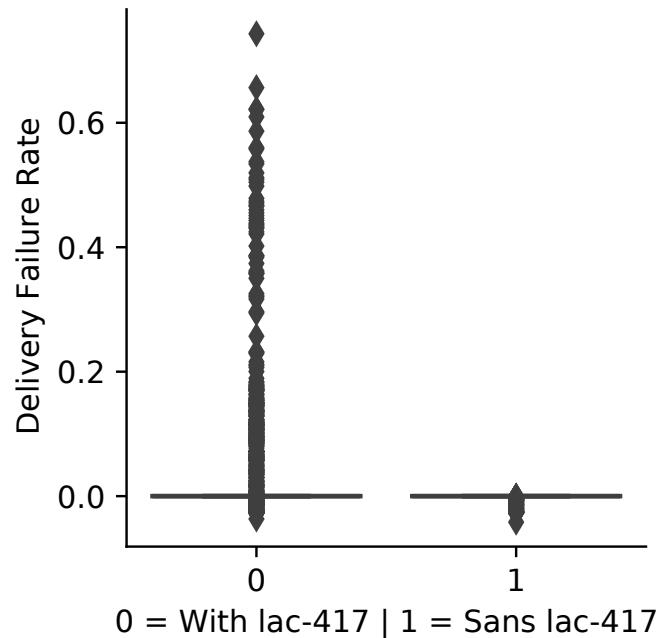


(b) TODO without outliers

Fig. 79: with-lac-417 vs sans-lac-417 Simstep Period Outlet (ns) TODO



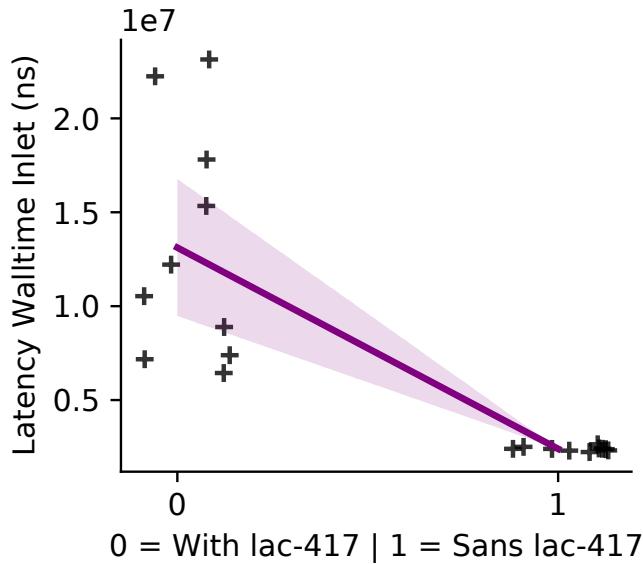
(a) TODO without outliers



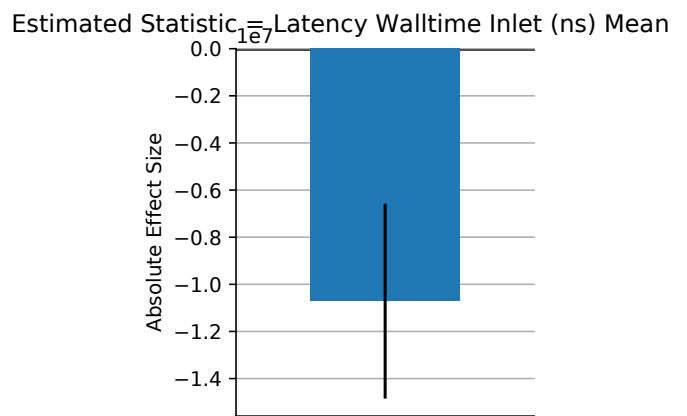
(b) TODO without outliers

Fig. 80: with-lac-417 vs sans-lac-417 Delivery Failure Rate TODO

## Ordinary Least Squares Regression

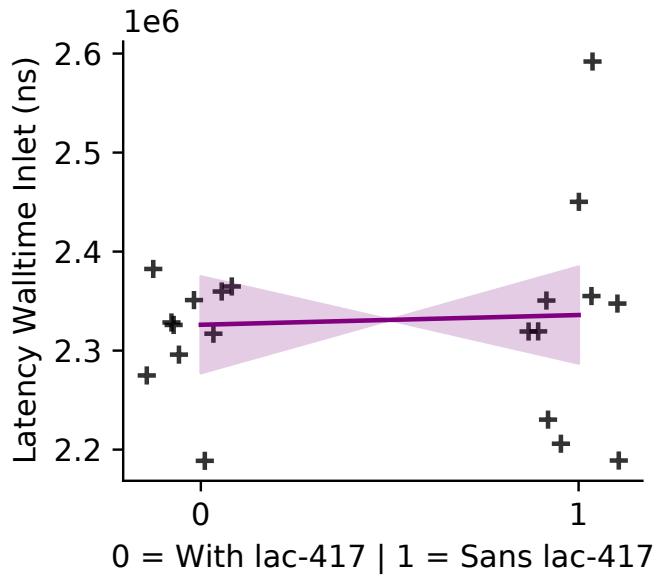


(a) TODO complete ordinary regression

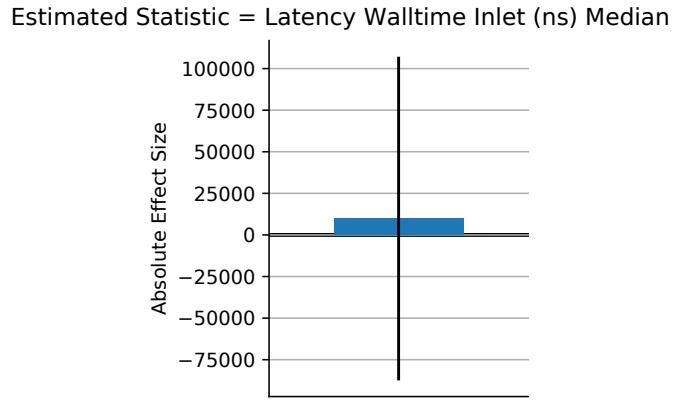


(b) TODO complete ols regression effect size

## Quantile Regression



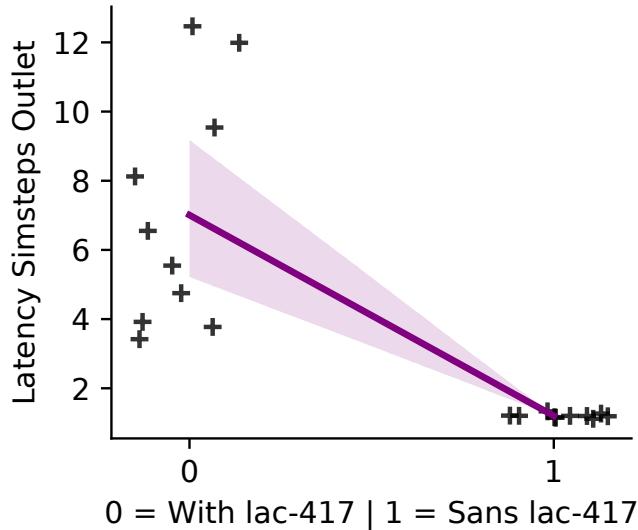
(c) TODO quantile regression



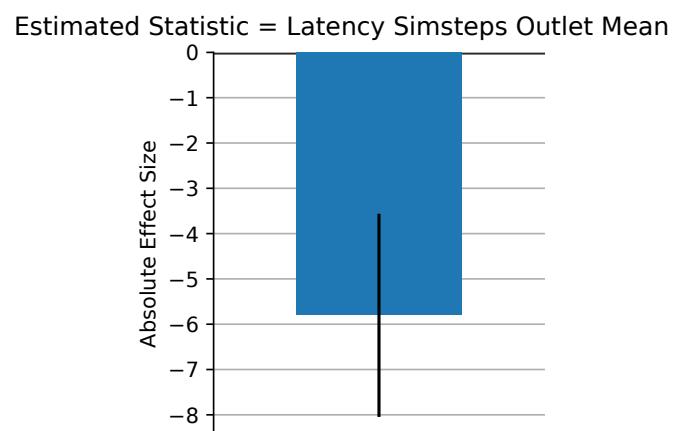
(d) TODO complete quantile regression effect size

Fig. 81: computation vs communication Latency Walltime Inlet (ns) ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression

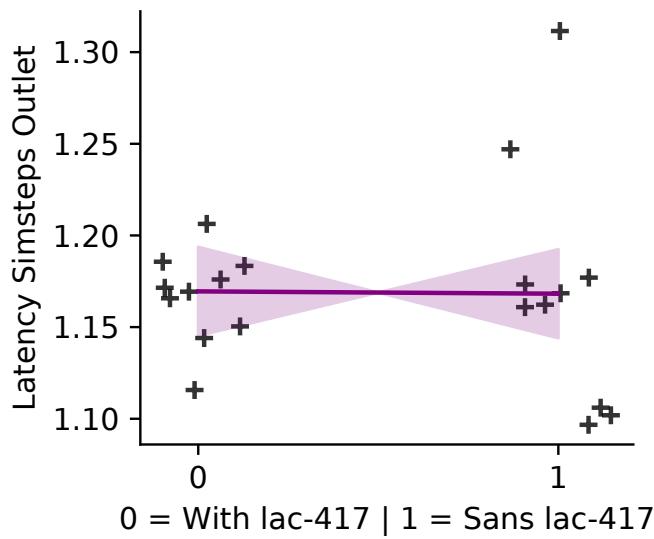


(a) TODO complete ordinary regression

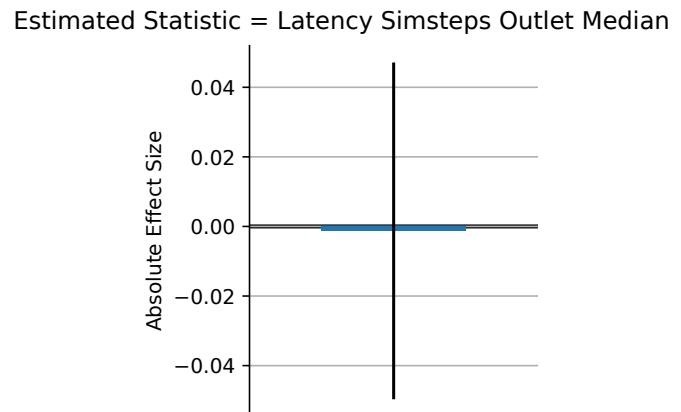


(b) TODO complete ols regression effect size

## Quantile Regression



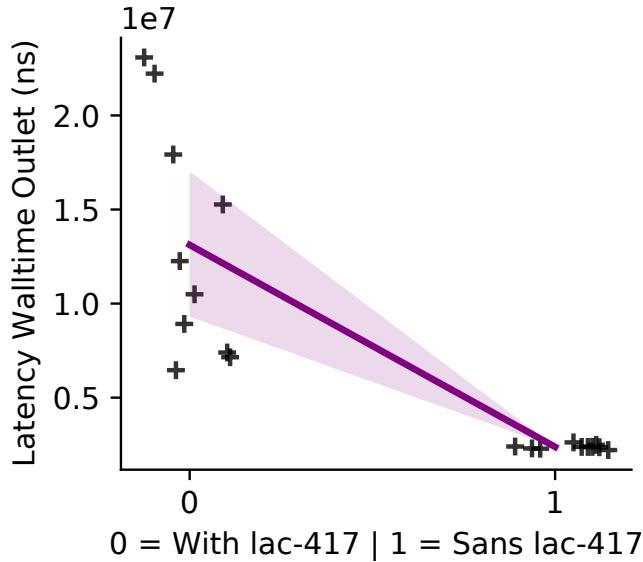
(c) TODO quantile regression



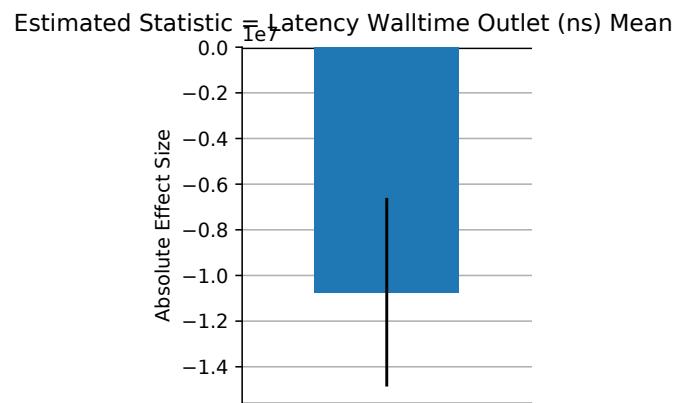
(d) TODO complete quantile regression effect size

Fig. 82: computation vs communication Latency Simsteps Outlet ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression

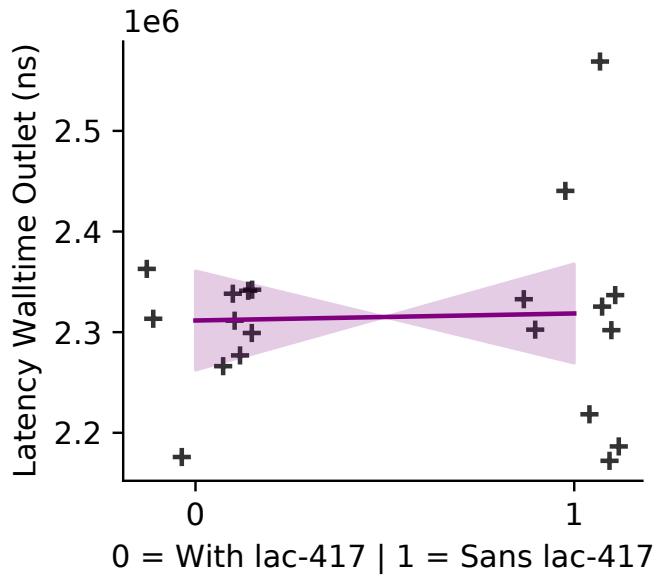


(a) TODO complete ordinary regression

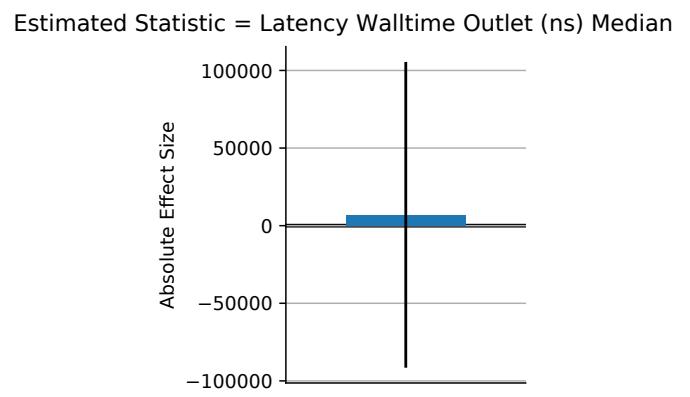


(b) TODO complete ols regression effect size

## Quantile Regression



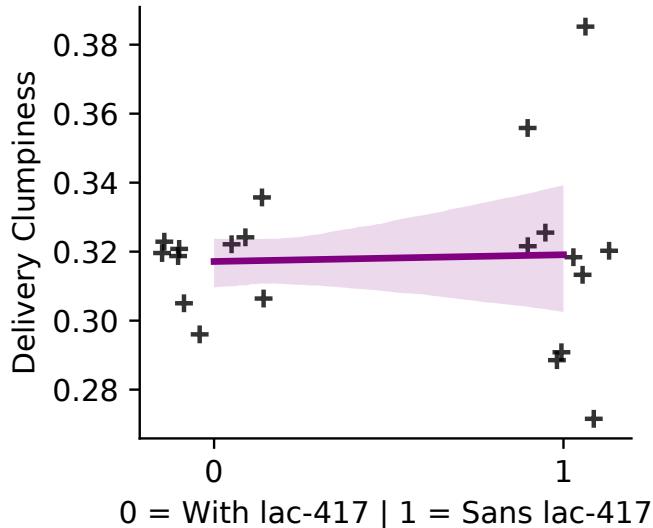
(c) TODO quantile regression



(d) TODO complete quantile regression effect size

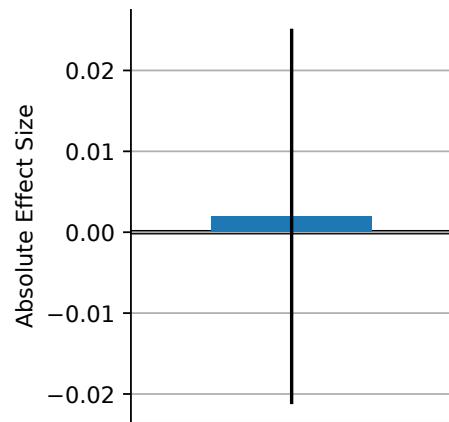
Fig. 83: computation vs communication Latency Walltime Outlet (ns) ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression



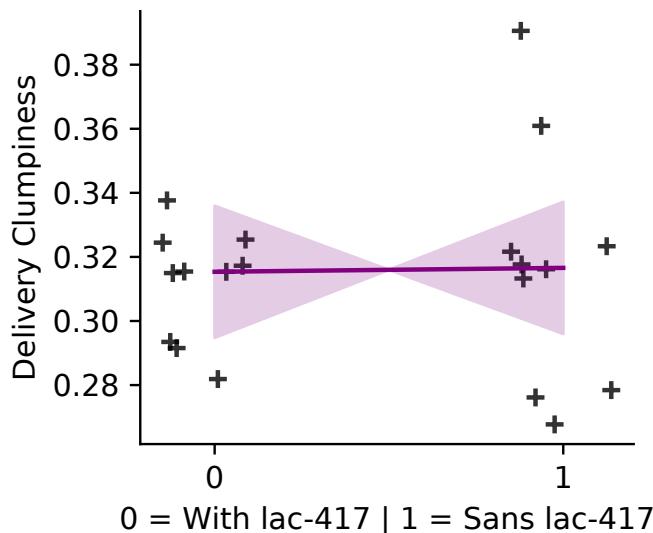
(a) TODO complete ordinary regression

Estimated Statistic = Delivery Clumpiness Mean



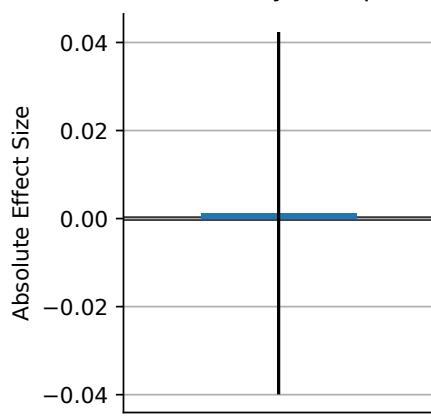
(b) TODO complete ols regression effect size

## Quantile Regression



(c) TODO quantile regression

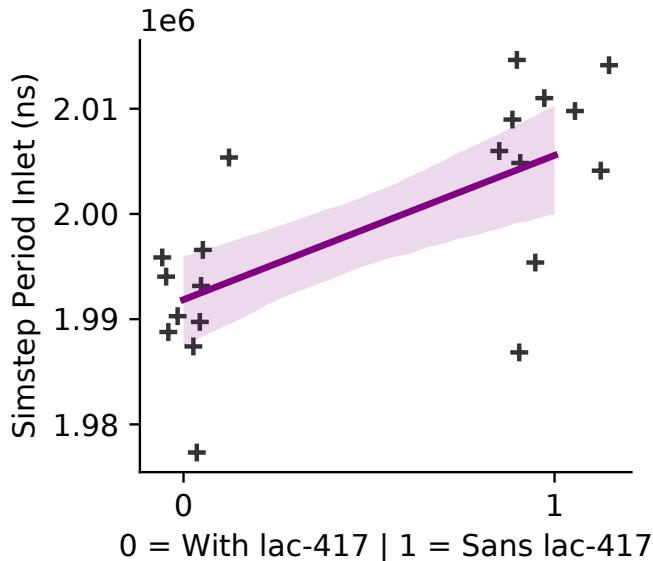
Estimated Statistic = Delivery Clumpiness Median



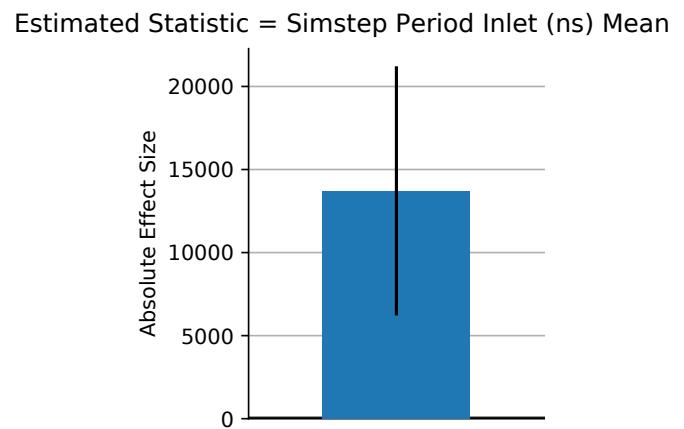
(d) TODO complete quantile regression effect size

Fig. 84: computation vs communication Delivery Clumpiness ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression

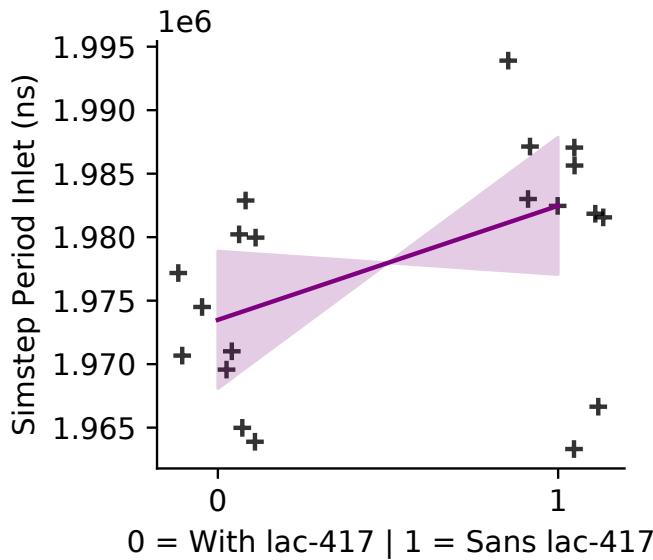


(a) TODO complete ordinary regression

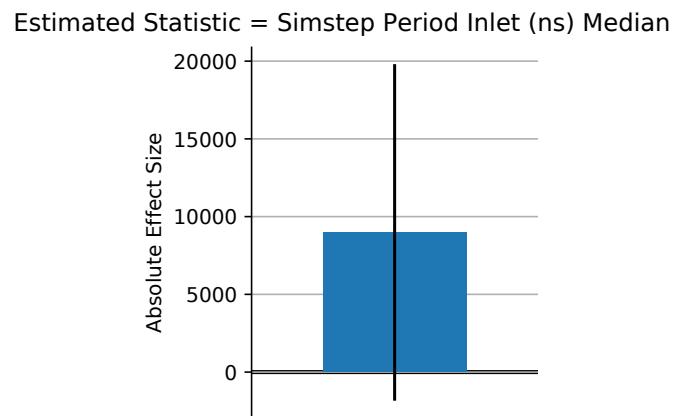


(b) TODO complete ols regression effect size

## Quantile Regression



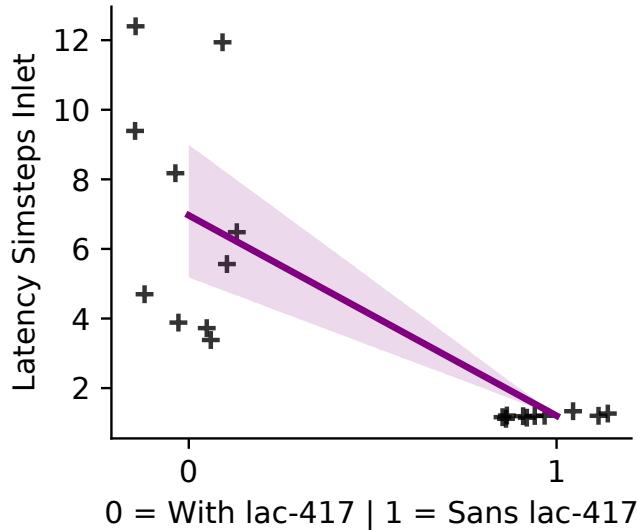
(c) TODO quantile regression



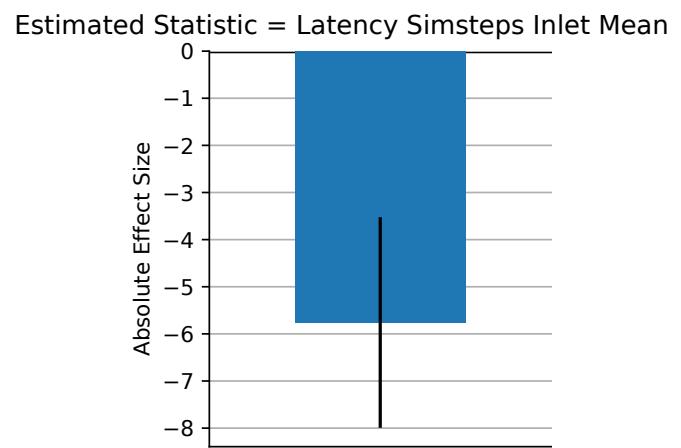
(d) TODO complete quantile regression effect size

Fig. 85: computation vs communication Simstep Period Inlet (ns) ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression

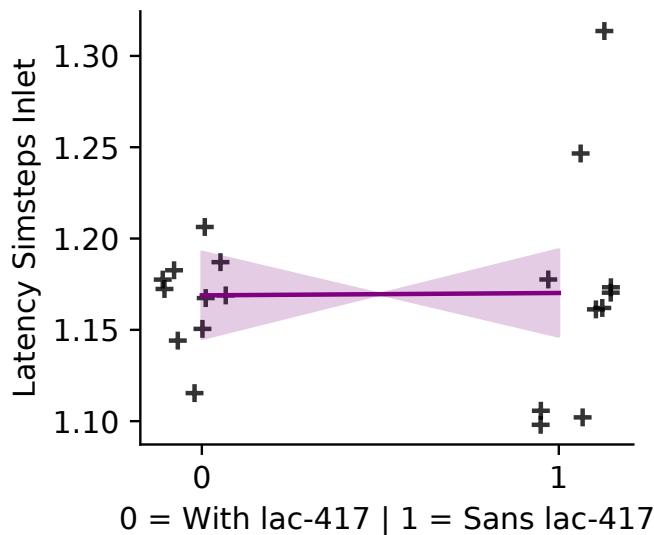


(a) TODO complete ordinary regression

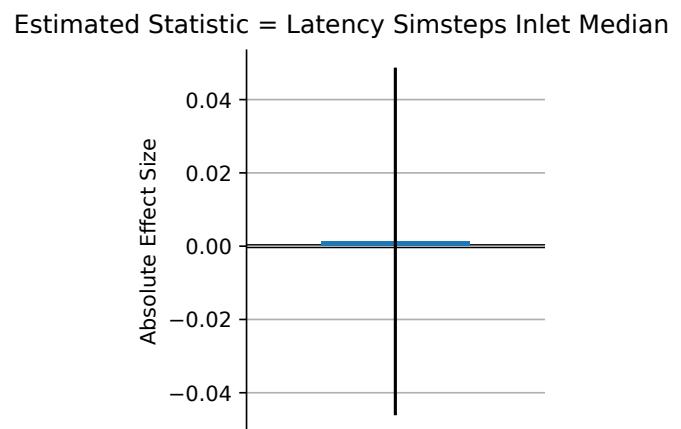


(b) TODO complete ols regression effect size

## Quantile Regression



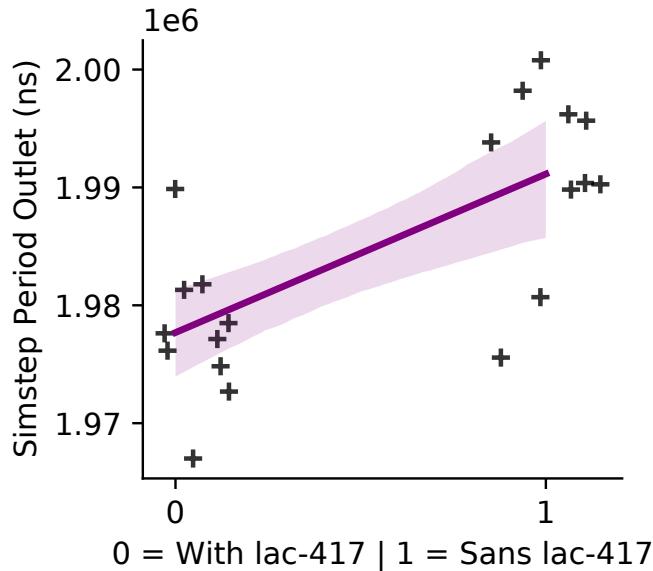
(c) TODO quantile regression



(d) TODO complete quantile regression effect size

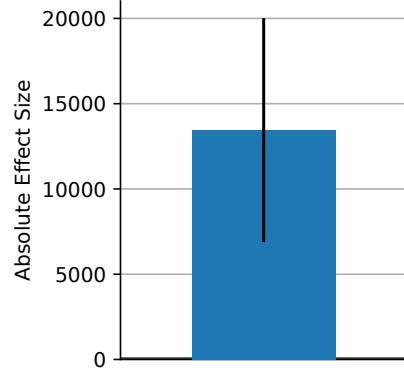
Fig. 86: computation vs communication Latency Simsteps Inlet ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression



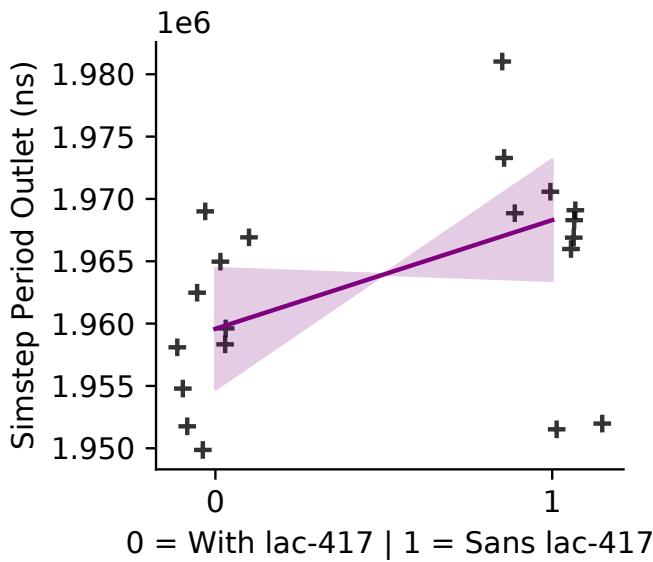
(a) TODO complete ordinary regression

Estimated Statistic = Simstep Period Outlet (ns) Mean



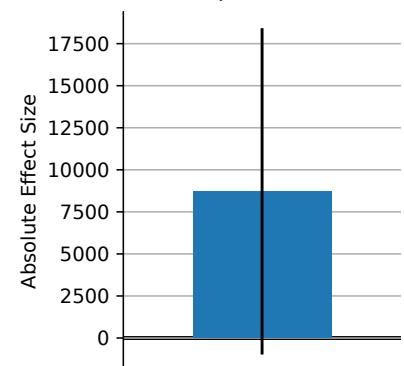
(b) TODO complete ols regression effect size

## Quantile Regression



(c) TODO quantile regression

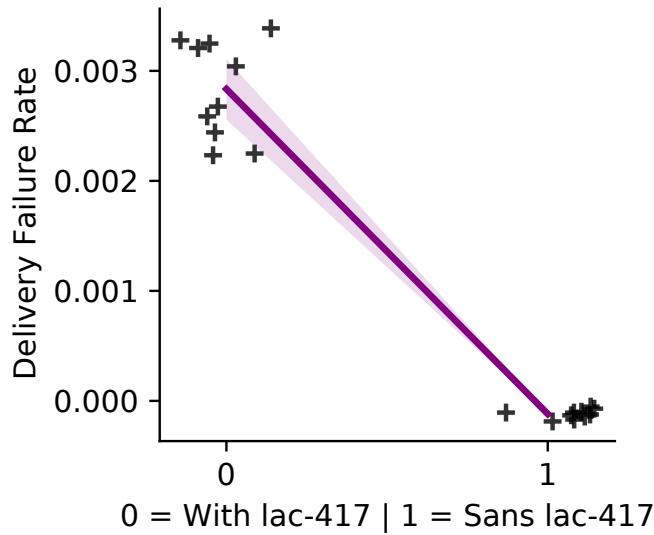
Estimated Statistic = Simstep Period Outlet (ns) Median



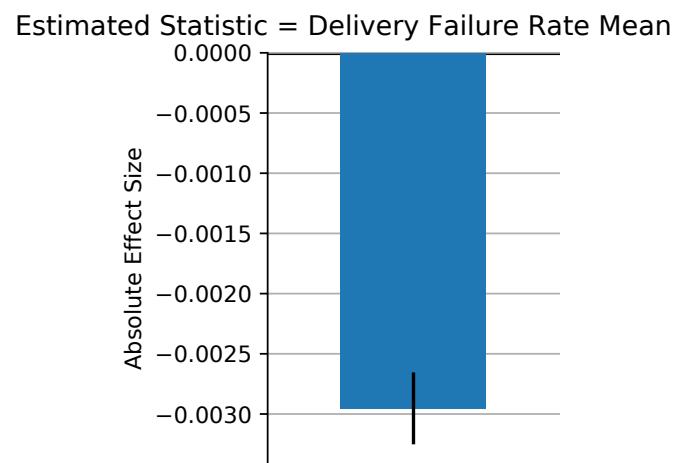
(d) TODO complete quantile regression effect size

Fig. 87: computation vs communication Simstep Period Outlet (ns) ordinary least squares regression to estimate mean and quantile regression to estimate median

## Ordinary Least Squares Regression

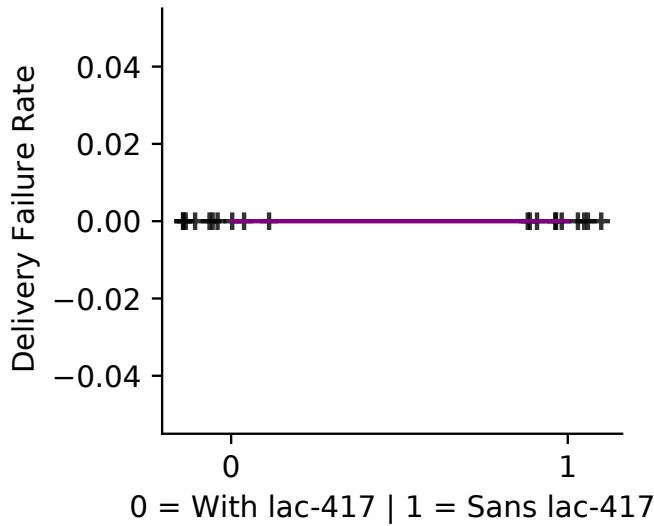


(a) TODO complete ordinary regression



(b) TODO complete ols regression effect size

## Quantile Regression



(c) TODO quantile regression



(d) TODO complete quantile regression effect size

Fig. 88: computation vs communication Delivery Failure Rate ordinary least squares regression to estimate mean and quantile regression to estimate median

TABLE XXIII: With lac-417 vs. sans lac-417 Ordinary Least Squares Regression.

Metric	Statistic	Cpus Per Node	Num Simsteps Per Cpu	Num Processeses	Absolute Effect Size	Absolute Effect Size 95% CI Lower Bound	Absolute Effect Size 95% CI Upper Bound	Relative Effect Size	Relative Effect Size 95% CI Lower Bound	Relative Effect Size 95% CI Upper Bound	n	D
Latency Walltime Inlet (ns)	mean	-	2048	256	-1.1e+07	-1.5e+07	-6.6e+06	-0.82	-1.1	-0.5	20	3.6e-05
Latency Walltime Outlet (ns)	mean	-	2048	256	-1.1e+07	-1.5e+07	-6.6e+06	-0.82	-1.1	-0.5	20	3.5e-05
Latency Simsteps Inlet	mean	-	2048	256	-5.8	-8	-3.5	-0.83	-1.1	-0.51	20	3.8e-05
Latency Simsteps Outlet	mean	-	2048	256	-5.8	-8	-3.6	-0.83	-1.1	-0.51	20	3.6e-05
Delivery Failure Rate	mean	-	2048	256	-0.003	-0.0033	-0.0027	-1	-1.1	-0.94	20	4.9e-14
Delivery Clumpiness	mean	0	2048	256	0.002	-0.021	0.025	0.0062	-0.067	0.079	20	0.86
Simstep Period Inlet (ns)	mean	+	2048	256	14'000	6'200	21'000	0.0069	0.0031	0.011	20	0.0012
Simstep Period Outlet (ns)	mean	+	2048	256	13'000	6'900	20'000	0.0068	0.0035	0.01	20	0.00043

TABLE XXIV: With lac-417 vs. sans lac-417 Quantile Regression.

Metric	Statistic	Cpus Per Node	Num Similes Per Cpu	Num Processes	Absolute Effect Size	Relative Effect Size	Relative Effect Size 95% CI Lower Bound	Relative Effect Size 95% CI Upper Bound	Relative Effect Size 95% CI Lower Bound	Relative Effect Size 95% CI Upper Bound	Relative Effect Size 95% CI Lower Bound	Relative Effect Size 95% CI Upper Bound	
Latency Walltime Inlet (ns)	median	0	1	2048	256	9'800	-87'000	110'000	0.0042	-0.038	0.046	20	0.83
Latency Walltime Outlet (ns)	median	0	1	2048	256	7'000	-91'000	110'000	0.003	-0.04	0.046	20	0.88
Latency Simsteps Inlet	median	0	1	2048	256	0.0013	-0.046	0.049	0.0011	-0.039	0.042	20	0.95
Latency Simsteps Outlet	median	0	1	2048	256	-0.0013	-0.05	0.047	-0.0011	-0.042	0.04	20	0.96
Delivery Failure Rate	median	NaN	1	2048	256	0	nan	nan	nan	nan	nan	20	nan
Delivery Clumpiness	median	0	1	2048	256	0.0012	-0.04	0.042	0.0039	-0.13	0.13	20	0.95
Simstep Period Inlet (ns)	median	0	1	2048	256	9'000	-1'800	20'000	0.0046	-0.00093	0.01	20	0.098
Simstep Period Outlet (ns)	median	0	1	2048	256	8'700	-980	18'000	0.0045	-0.0005	0.0094	20	0.075