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# Marketing Cooperatives in Fisheries

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# MARKETING COOPERATIVES IN FISHERIES

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## INTRODUCTION

This research identifies the impact that the Copper River Fisherman's Cooperative (the CRFC), an Alaskan salmon marketing cooperative, had on salmon prices and salmon quality. Once we establish that the cooperative led to higher prices paid to fishermen and higher fish quality, we proceed to identify the mechanisms through which the cooperative was able to generate a price premium.

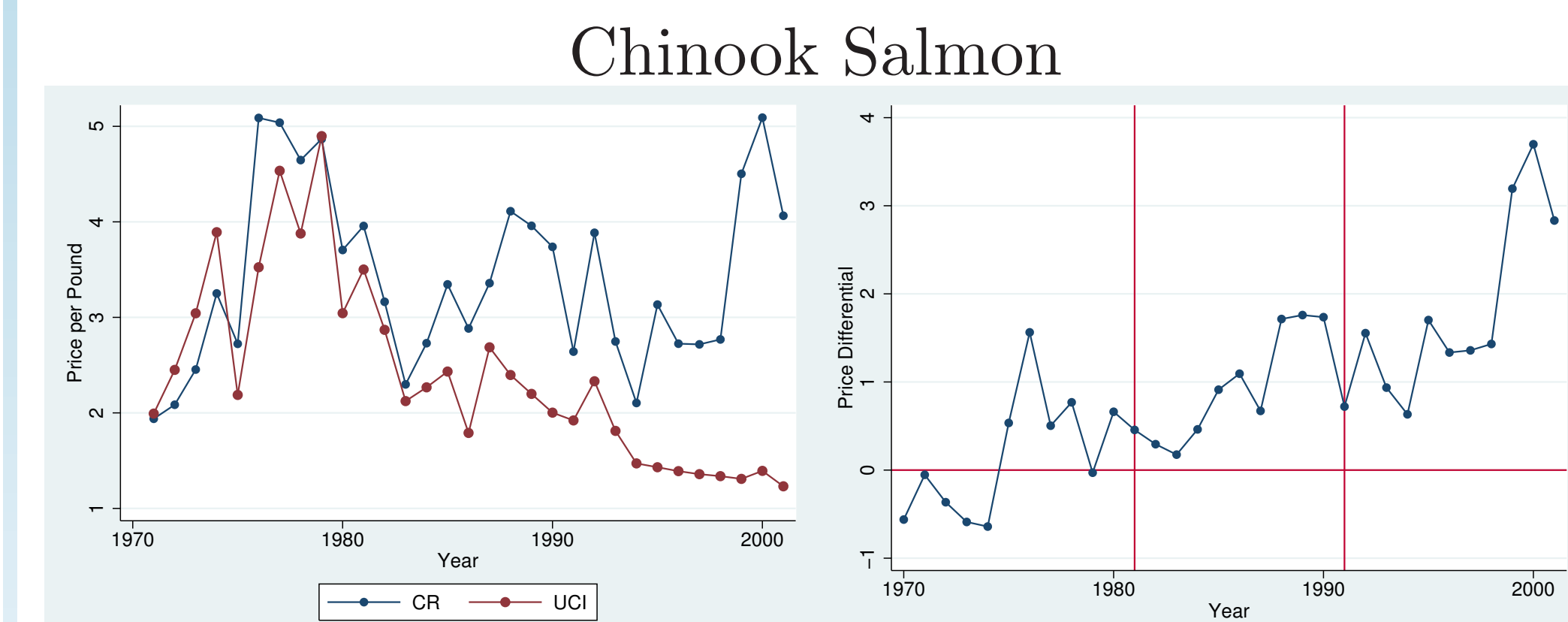
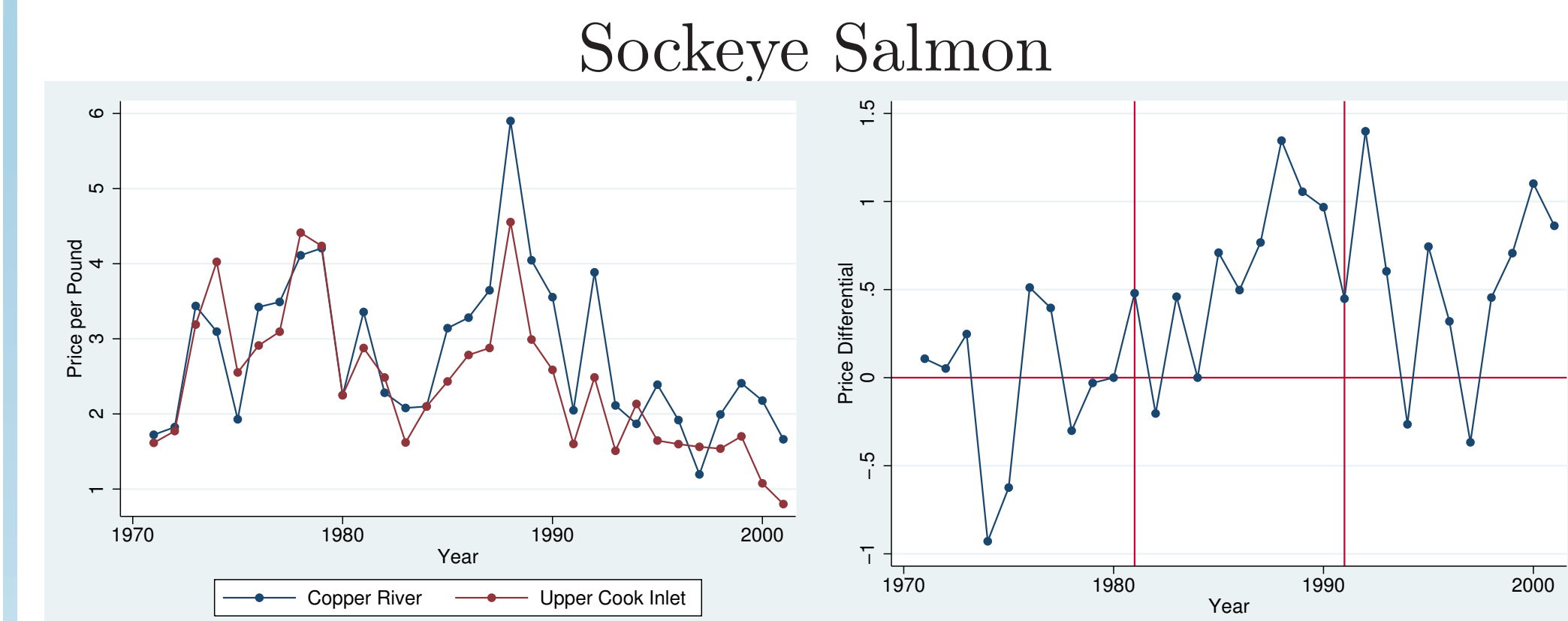
## RESEARCH QUESTIONS

1. What was the impact of the CFEC on salmon prices?
2. What was the impact of the CFEC on salmon quality?
3. How do changes to salmon demand and salmon supply work together to change the equilibrium price of salmon?
4. What lessons can be learned?

## MOTIVATION

1. Growing interest in cooperatives as a business model, e.g. the UN declares 2012 as the International Year of Cooperatives.
2. Growing consensus in the agricultural economics literature that there are new opportunities for cooperatives (Mèrel et al., 2009).
3. To our knowledge, there has been no analyses of marketing cooperatives in fisheries.

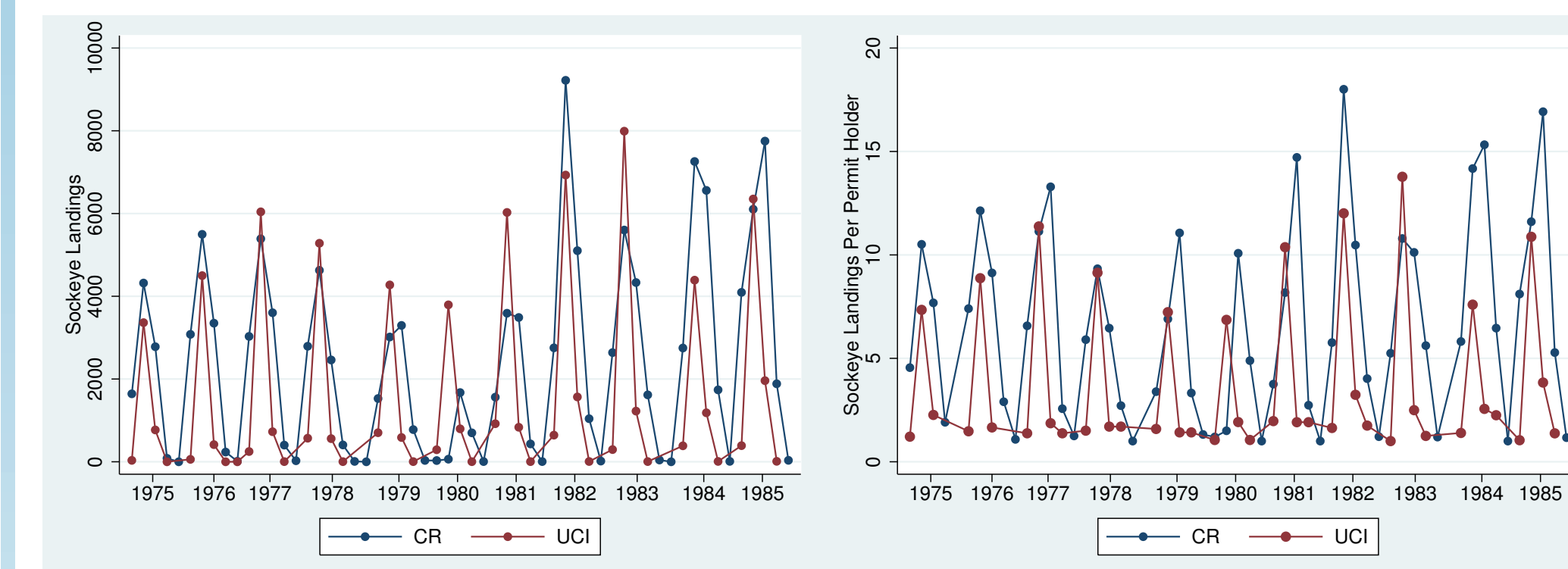
## PRICE ANALYSIS



Dependent Variable:	Sockeye		Chinook	
	coef	se	coef	se
Salmon Price				
$\tau$	0.0604	(0.0360)	0.0979	(0.0687)
T	-0.0968	(0.240)	-0.505	(0.393)
A	-0.884*	(0.342)	-2.617**	(0.787)
TA	0.715**	(0.238)	1.428**	(0.497)
Observations	62		62	

\*\* p<0.01, \* p<0.05

## QUALITY ANALYSIS



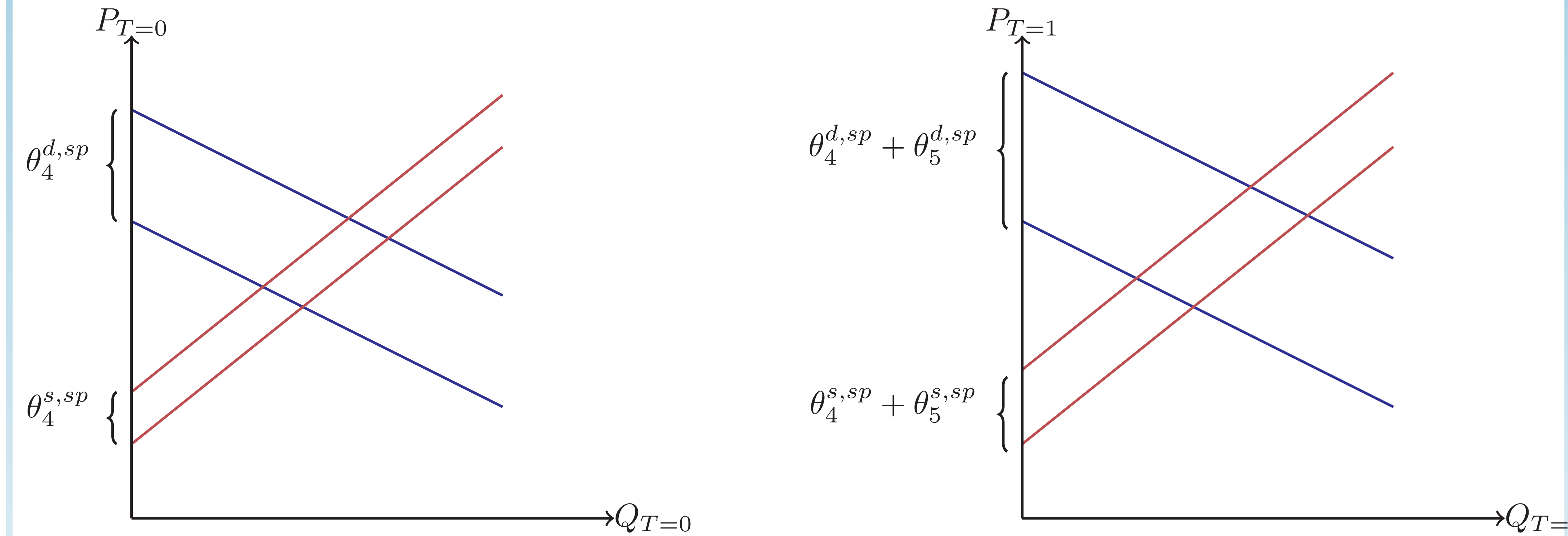
Dependent Variable:	Landings		Landings per Permit	
	coef.	s.e.	coef.	s.e.
T	1197	(1327)	3.548	(2.418)
A	583.7**	(222.7)	1.138**	(0.374)
TA	764.9**	(285.3)	1.202*	(0.567)
Quantity	236.7**	(59.46)	0.345**	(0.0896)
Escapement Goals	-0.00203**	(0.000738)	-5.07e-06**	(1.47e-06)
Month FEs	Yes		Yes	
Fishing Month FEs	Yes		Yes	
Weather Controls	Yes		Yes	
IV for Quantity	Yes		Yes	
Observations	80		80	
First Stage F stat.	13.71		13.71	

\*\* p<0.01, \* p<0.05

## 3SLS ANALYSIS

$$p_{f,t}^{d,sp} = \theta_0^d + q_{f,t}^{d,sp} \theta_1^d + \tau_t^d \theta_2^{d,sp} + T_f \theta_3^{d,sp} + A_t \theta_4^{d,sp} + T A_{f,t} \theta_5^{d,sp} + X_{f,t}^{d,sp} \gamma^{d,sp} + \epsilon_{f,t}^{d,sp} \quad (1)$$

$$p_{f,t}^{s,sp} = \theta_0^s + q_{f,t}^{s,sp} \theta_1^s + \tau_t^s \theta_2^{s,sp} + T_f \theta_3^{s,sp} + A_t \theta_4^{s,sp} + T A_{f,t} \theta_5^{s,sp} + X_{f,t}^{s,sp} \gamma^{s,sp} + \epsilon_{f,t}^{s,sp} \quad (2)$$



Dependent Variable:	Sockeye				Chinook			
	Demand		Supply		Demand		Supply	
Salmon Price	coef	se	coef	se	coef	se	coef	se
Quantity	-0.00165	(0.00737)	0.110*	(0.0424)	-1.792*	(0.733)	0.499	(0.742)
$\tau$	-0.202	(0.125)	-0.0446	(0.0349)	-0.0549	(0.235)	-0.0737**	(0.0258)
T	-0.0658	(0.181)	1.874*	(0.699)	0.677	(0.356)	0.233	(0.393)
A	-0.648*	(0.288)	-1.865*	(0.801)	-1.380*	(0.537)	-2.387**	(0.540)
TA	0.612**	(0.231)	2.038**	(0.741)	1.470**	(0.417)	1.049*	(0.492)
Observations	62		62		62		62	

\*\* p<0.01, \* p<0.05

## DISCUSSION

We find impacts to salmon supply and salmon demand attributable to the CRFC. We use a differences-in-differences model with annual data to estimate that the CRFC increased per-pound prices paid to fishermen for sockeye and chinook salmon by approximately \$0.625-\$0.698 and \$1.286-\$1.428 respectively. Additionally we estimate a differences-in-differences model using monthly data and find that the number of monthly delivery trips for a given quantity of sockeye salmon increased by 1,190 or 44% after the CRFC's formation in the treatment fishery. To test the hypothesis that the CRFC led to supply

and demand changes we construct a three-stage least squares differences-in-differences (3SLS DiD) model. The 3SLS DiD model is able to separately identify shifts in demand and supply attributable to the cooperative. For sockeye salmon we find that the supply effect outweighs the demand effect, i.e. sockeye demand shifts upwards by \$0.69-0.74 and sockeye supply shifts upwards by \$2.41-2.49. The opposite is true for chinook salmon where demand shifts upwards by more than supply, \$1.45-1.49 compared to \$1.21-1.14. The results are significant and robust to placebo tests.

## REFERENCES

Mèrel, P., Saitone, T., and Sexton, R. (2009). Cooperatives and quality-differentiated markets: Strengths, weaknesses, and modeling approaches. *Journal of Rural Cooperation*, 37(2):201-224.