APPENDIX 1 – PREVIOUS BEER DISTRIBUTION GAME EXPERIMENTS

Experiment	Characteristics	Results/Conclusions
Sterman 1989	Board Game Retail demand 4 for weeks 1-4. Retail demand 8 for weeks 5-37. Participants have no knowledge of retail demand	Bullwhip effect is noted. Participants anchor their orders on the initial inventory and under weight the supply line
Machuca and del Pozo 1997	Network version of the game Eliminated one and then both information delays in the game	Bullwhip effect is noted. Concluded the best way to demonstrate the value of Electronic Data Exchange was to replace human players with computer subroutines
Kimbrough, Wu and Zhong 2002	Electronic game Tested replacement of human players with artificial agents using several different demand structures: Deterministic (as in Sterman) Uniformly distributed U(0,15) Tested performance of artificial agents when the lead time was changed from fixed 2 weeks to a uniform distribution of o to 4 weeks.	Artificial agents were able to play the beer game effectively. They discovered optimal policies when available and good policies when analytical solutions are not available.
Croson and Donohue 2003 Hypothesis - The bullwhip effect will not occur when the demand distribution is know and stationary. Hypothesis – Participants will not underweight the supply line when demand is known and stationary.	Electronic game Retail Demand U(0,8) Retail demand is known and stationary. Initial inventory = 12.	Bullwhip effect is noted. Hypothesis that the bullwhip effect would not occur when the demand was known and stationary was rejected. Second Hypothesis that participants would not underweight the supply line when demand was known and stationary was also rejected.

Experiment	Characteristics	Results/Conclusions
Croson and Donohue 2003 Hypothesis - Sharing dynamic information across the supply chain will decrease the level of order oscillation. Hypothesis - Sharing dynamic information across the supply chain will decrease the amplification of order oscillation between each supply chain level. Hypothesis - Sharing dynamic information across the supply chain will cause participants to no longer under-weight the supply line Hypothesis – Sharing dynamic information across the supply chain will lead to a greater reduction in order oscillations for manufactures and distributors than for retailers and wholesalers. Hypothesis – Sharing dynamic information across the supply chain will lead to a greater reduction in order oscillations for manufactures and distributors than for retailers and wholesalers.	Electronic game. Retail Demand U(0,8) Retail demand is known and stationary. Initial inventory = 12. Inventory information of all participants was displayed on a bar chart on each players computer screen	Information sharing reduced the bullwhip effect, but it still persisted. Information sharing led to greater reduction for manufactures and distributors than for retailers and wholesalers leading to the conclusion that information sharing was more valuable to upstream nodes.
Croson and Donohue	Electronic game. Retail Demand U(0,8) Retail demand is known and stationary. Initial inventory = 12. Players only saw their own inventory information.	Control Group – Study of effect of information sharing. Bullwhip effect is noted

Experiment	Characteristics	Results/Conclusions
Croson, Donohue, Katok, Sterman 2005 Experiment 1 Constant Demand Hypothesis – The bullwhip effect will not occur when demand is known and constant and the system begins in equilibrium.	Electronic game. Retail demand = 4 Retail demand is known and constant. Initial inventory = 0. No common knowledge of optimal ordering policy	Bullwhip effect persists even though demand is known and constant.
Croson, Donohue, Katok, Sterman 2005 Experiment 1a Constant Demand Hypothesis – experience might enable people to learn the optimal decision rule and eliminate the bullwhip.	Electronic game. Retail demand = 4 Retail demand is known and constant. Initial inventory = 0. No common knowledge of optimal ordering policy Game is played twice with players reassigned to different teams after a break to test for robustness of bullwhip effect in the face of experiences.	Bullwhip effect persists. Improvement is noted between games. Uncertainty about the behavior of others motivated many to hold additional inventory as a buffer against the risk of errors by their teammates.
Croson, Donohue, Katok, Sterman 2005 Experiment 2 Adding Coordination Stock Hypothesis – Excess initial inventory will decrease order variability. Electronic game.	Retail demand = 4 Retail demand is known and constant. Initial inventory = 0. No common knowledge of optimal ordering policy Game is played twice with players reassigned to different teams after a break to test for robustness of bullwhip effect in the face of experiences.	Bullwhip effect persists. Improvement is noted, coordination stock reduces order oscillation.

Experiment	Characteristics	Results/Conclusions
Croson, Donohue, Katok, Sterman 2005 Experiment 3 Creating Common Knowledge Hypothesis - The provision if common information through the announcement of the optimal policy will decrease order variability. Hypothesis – The provision of common information through the announcement of the optimal policy will eliminate supply line underweighting.	Electronic game. Retail demand = 4 Retail demand is known and constant. Initial inventory = 0. Common knowledge of optimal ordering policy	Bullwhip effect is persistent, announcing optimal policy reduces order variation, Improvement does not appear to come from a reduction in supply line underweighting
Croson, Donohue, Katok, Sterman 2005 Experiment 4 Eliminating Coordination Risk Hypothesis – Eliminating coordination risk will decrease order variability for the human players relative to the retailers in experiment 1. Hypothesis – Eliminating coordination risk will decrease order variability for the human player relative to the retailers in experiment 3. Hypothesis – eliminating coordination risk will eliminate supply chain underweighting.	Electronic game. Retail demand = 4 Retail demand is known and constant. Initial inventory = 0. Common knowledge of optimal ordering policy and automated optimal agents.	Eliminating coordination risk does decrease order variability relative to the retailers in experiment 1. Eliminating coordination risk did not significantly decrease order variability relative to the retailers in experiment 3. Eliminating coordination risk did not decrease supply chain underweighting.