

Homework 2

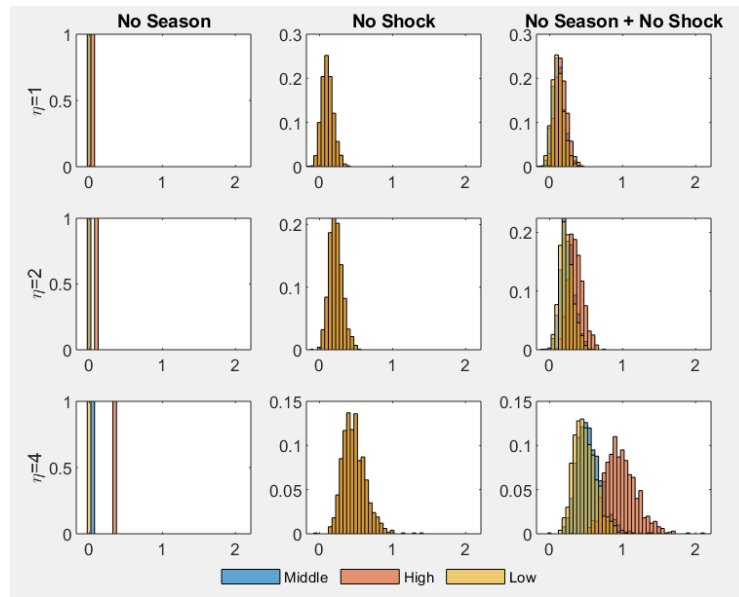
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Question 1: Praying for rain: the welfare cost of season

1. (a) The result is in the first column of the table below. We can see that welfare gains increase with the degree of seasonality. This is because the household is risk averse, so the higher seasonality risks we eliminate result in the higher welfare gains.
- (b) The result is in the second column of the table below. Removing nonseasonal risks generate the same welfare gains, as it is not related to seasonality. We can also notice from the histogram that a small number of households have negative welfare gains, which means their risk is beneficial, so eliminating the risk reduces their welfare.
- (c) Compared with (a), some households received higher gains than others when nonseasonal risks are eliminated. Also, if we eliminate seasonal and nonseasonal risks simultaneously, the welfare gains are higher, which is consistent with risk aversion.
- (d) η measures the degree of risk aversion, and higher η suggests more risk aversion, and the welfare gains are higher for higher η .

Welfare gains: median

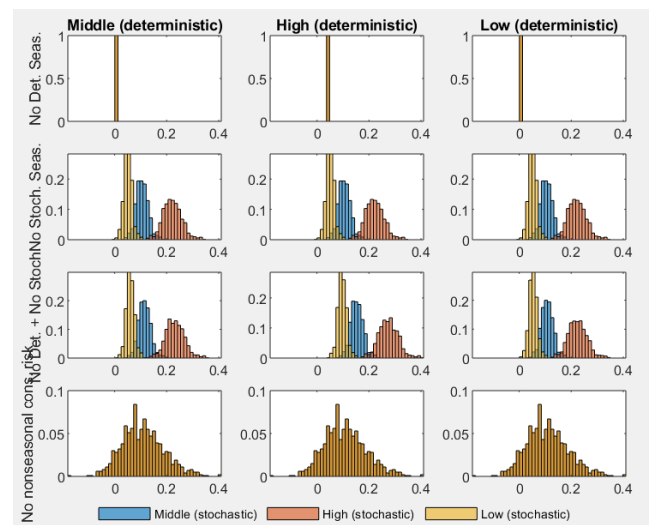
Low	No Shock	Non seasonal	Both
$\eta = 1$	0.1027	0.002	0.1049
$\eta = 2$	0.2142	0.004	0.2192
$\eta = 4$	0.4563	0.0087	0.4690
Middle	No Shock	Non seasonal	Both
$\eta = 1$	0.1027	0.0085	0.1121
$\eta = 2$	0.2142	0.0184	0.2365
$\eta = 4$	0.4563	0.0425	0.5182
High	No Shock	Non seasonal	Both
$\eta = 1$	0.1027	0.0437	0.1508
$\eta = 2$	0.2142	0.1115	0.3496
$\eta = 4$	0.4563	0.3465	0.961



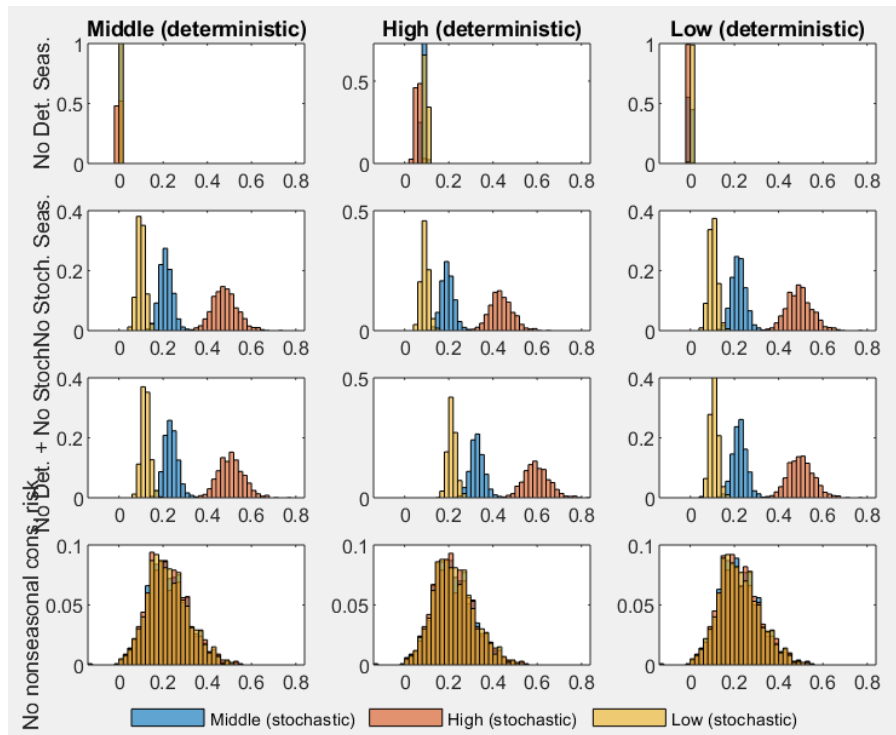
2. (a) After removing both stochastic and deterministic seasonal risks, the gains increase with the degree of seasonality. Also, welfare gains from degrees of stochastic seasonal risks increase only with the degree of stochastic seasonality, and the same is for deterministic risks. Removing both risks result in higher welfare gains than removing only one of them.
- (b) Removing nonseasonal risks generate the same welfare gains, as it is not related to seasonality.
- (c) Both (a) and (b) provide similar results are in question 1 that welfare gains increase with seasonality, and the effect of nonseasonal risks is independent of seasonality.
- (d) The result is similar to question 1, where higher η and more risk aversion leads to higher welfare gains when certain risks are removed.

Figures:

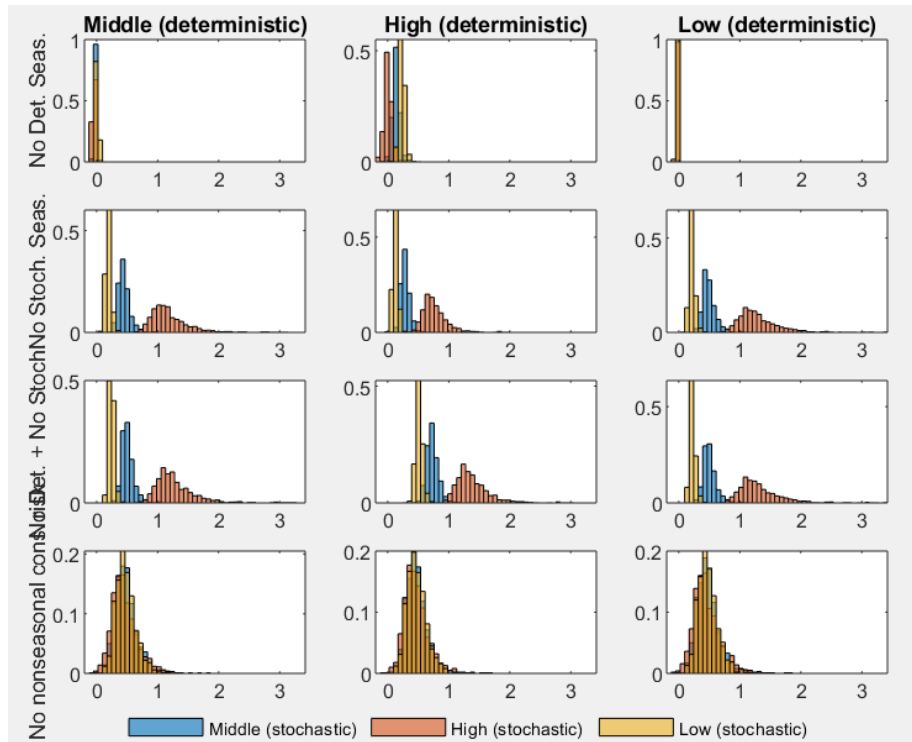
$\eta=1$



$\eta=2$



$\eta=4$



Question 2: Adding seasonal labor supply

1.

(a) The table shows that the welfare gains increase with the degree of deterministic and stochastic seasonal risk. Also, labor supply (which is negatively correlated with leisure) contributes more to the welfare gains than consumption.

(b) The welfare gains still increase with the degree of deterministic and stochastic seasonal risk. Compared with (a), the welfare gains from labor is slightly higher, in which the negative correlation of labor supply and consumption may play a role. As labor supply bring negative utility, labor supply and consumption may affect the utility in the same direction when there's seasonality risks. The welfare gains from consumption is unchanged compared with (a).

(c) To summarize, the results are similar to (a) and (b), because we did not eliminated nonseasonal risks here, so the gains are contributed by the correlation between seasonal components of consumption and labor supply.

	Middle	High	Low
(a) Positive correlation			
Consumption Contribution	0.1140	0.2739	0.0530
Labor Contribution	0.1553	0.4603	0.0625
Total	0.2948	0.8693	0.1221
(b) Negative correlation			
Consumption Contribution	0.1140	0.2739	0.0530
Labor Contribution	0.1788	0.7938	0.0680
Total	0.3118	1.2930	0.1262
(a) + non-seasonal stoch. pos. correlated			
Consumption Contribution	0.1140	0.2739	0.0530
Labor Contribution	0.1644	0.4628	0.0652
Total	0.2948	0.8529	0.1229
(b) + non-seasonal stoch. neg. correlated			
Consumption Contribution	0.1140	0.2739	0.0530
Labor Contribution	0.1735	0.8094	0.0664
Total	0.3089	1.3184	0.1252