

Growth and Development Exam: Problem Set 2

1 Question 1. Praying for Rain: The Welfare Cost of Seasons.

1.1 A.

Seasonality (in food prices and consumption) has shown to be associated with significant intra-annual fluctuations in hunger and nutrition. But substantial seasonality in price movements is still possible even when domestic food markets are better integrated. This can happen, for example, if the timing of production is highly correlated across markets and commodities, and if domestic food markets are poorly integrated with world markets (and/or those in neighboring countries).

Seasonality may also be a non-negligible component of food price volatility as uncertainty might hamper the much needed global supply response. But not all price volatility is stochastic and uncertain. And, to the extent that volatility follows from predictable, intra-annual, i.e. seasonal, price movements, a different policy response is needed. Because seasonal patterns are regular and repeated over time, the contribution of seasonality to overall volatility can also be quantified. To be sure, a certain degree of seasonality in food prices is unavoidable. As production is cyclical, intertemporal arbitrage is needed and storage costs ensue, driven by post harvest loss and the opportunity cost of capital.

	Welfare	Welfare gains
Low	-169.57	0.07
Medium	-197.0	0.15
High	-251.99	0.32
Non-season	-142	.

Table 1: Welfare gains of removing the seasonal component from the stream of consumption separately for each degree of seasonality

Table 1 presents the total welfare associated with each degree of seasonality and welfare gains associated to removing the seasonal component from the stream of consumption for each degree of seasonality. First, we see that the higher the volatility the lower the total welfare. Also, higher degree of seasonality implies higher welfare gains.

1.2 B.

	Welfare	Welfare Non-risk	Welfare gains
Low	-169.57	-99.79	0.19
Medium	-197.05	-127.26	0.19
High	-251.99	-182.21	0.19

Table 2: Welfare gains of removing the nonseasonal consumption risk

1.3 C.

	Welfare	Welfare gains of removing seasonal component	Welfare gains of removing nonseasonal csp risk
Low	-169.57	0.07	0.19
Medium	-197.05	0.15	0.19
High	-251.99	0.32	0.19

Table 3: Comparison of Table 1 against Table 2

It is worthy to note that welfare is always negatively correlated with the level of seasonality. In addition, removal of the seasonality component increases welfare where the increase is equally distributed across households. Interestingly, removing the non-seasonal risk also increases welfare. However, the welfare gains of removing seasonal component is **only higher in high degree of seasonality but lower in low and medium degree of seasonality** when compared to the welfare gains of removing nonseasonal consumption risk. We also see that the welfare gains of removing non-seasonal consumption risk is constant across all degrees of seasonality.

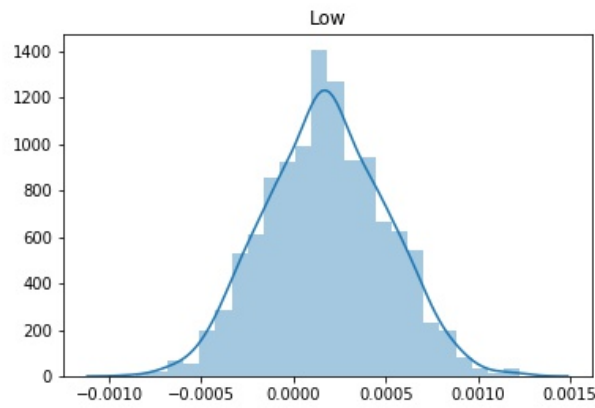


Figure 1: Distribution of welfare gains for low degree seasonality

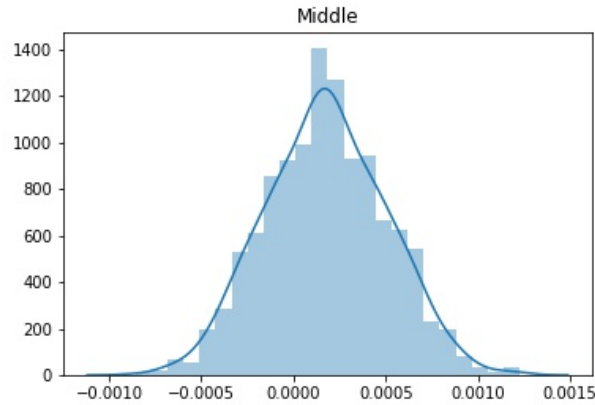


Figure 2: Distribution of welfare gains for medium degree seasonality

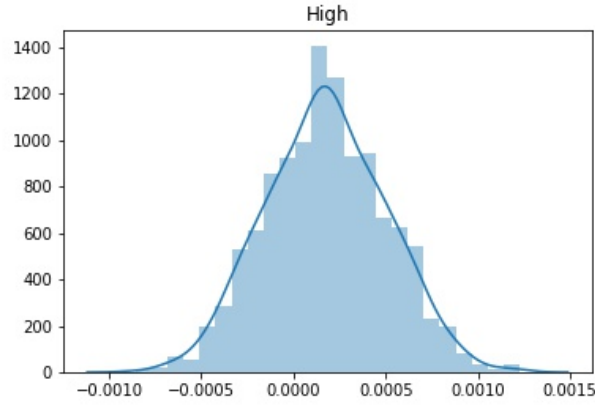


Figure 3: Distribution of welfare gains for high degree seasonality

2 Question 1.2: Adding a stochastic seasonal component to consumption

2.1 A.

	Welfare	Welfare gains
Low	-161.35	0.05
Medium	-69.0	0.17
High	-315.47	0.55
Non-season	-142.1	.

Table 4: Welfare gains of removing the seasonal component (all combinations of deterministic and stochastic) from the stream of consumption

Table 4 presents the welfare gains of removing the seasonal component (all combinations of deterministic and stochastic) from the stream of consumption separately for each degree of seasonality. We see that as the volatility increases, the total welfare decreases. However, removing the seasonal component yields lower utility. It would not be uncommon to infer that seasonality is not really a good thing as we also see that the higher welfare gain comes from the higher degree of seasonality.

2.2 B.

	Welfare	Welfare Non-risk	Welfare gains
Low	-161.35	-91.56	0.19
Medium	-69.10	0.69	0.19
High	-315.47	-245.68	0.19

Table 5: Welfare gains of removing the nonseasonal consumption risk

2.3 C.

	Welfare	Welfare gains of removing seasonal component	Welfare gains of removing non-seasonal csp risk
Low	-161.35	0.05	0.19
Medium	-69.10	0.69	0.19
High	-315.47	0.55	0.19

Table 6: Comparison of Table 4 against Table 5

It is worthy to note that welfare is always negatively correlated with the level of seasonality. In addition, removal of the seasonality component increases welfare where the increase is equally distributed across households. Interestingly, removing the non-seasonal risk also increases welfare. However, the welfare gains of removing seasonal component is **higher in medium and high degree of seasonality but lower in low degree of seasonality** when compared to the welfare gains of removing nonseasonal consumption risk. We also see that the welfare gains of removing non-seasonal consumption risk is constant across all degrees of seasonality.

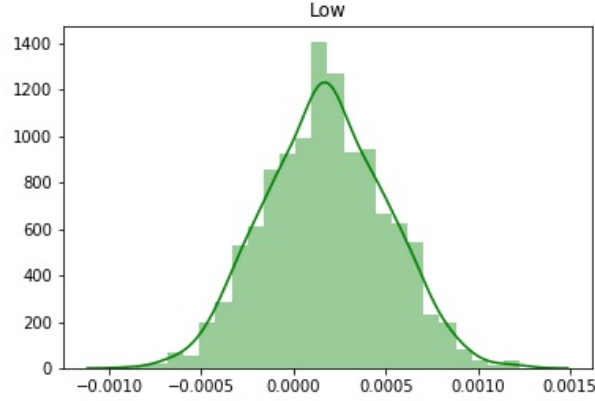


Figure 4: Distribution of welfare gains for low degree seasonality

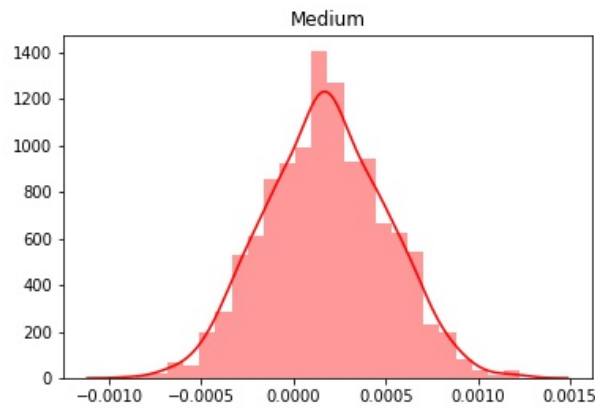


Figure 5: Distribution of welfare gains for medium degree seasonality

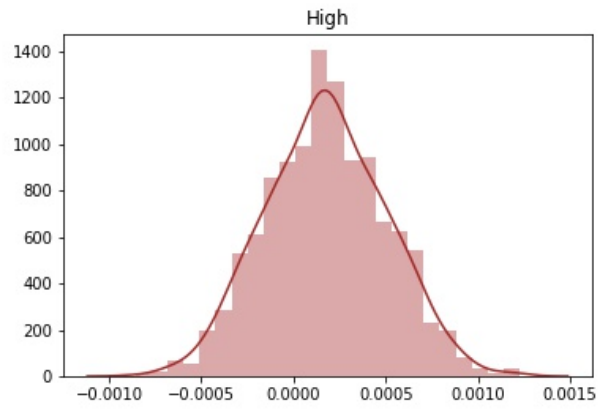


Figure 6: Distribution of welfare gains for high degree seasonality