Intuition on Equivalent Variation and Compensating Variation

- **Compensating Variation (CV):** It's the amount of money we should take away (or give) to the consumer so that, at the initial prices, they reach the same level of utility they would have after the price change. Essentially, it's a measure that tells us how much the consumer values the change in monetary terms **before** the change occurs.
- **Equivalent Variation (EV):** It's the amount of money we should take away (or give) to the consumer after the price change so they reach the same level of utility they had at the initial prices. This measure evaluates how much the consumer values the change in monetary terms **after** the change has occurred.

Case 1: Price increase of a normal good

Let's consider a price increase for a normal good:

1. With a higher price, the consumer is worse off. **When calculating the CV, we determine how much money we should take from them at the old prices so that they are as badly off as with the new price**. Since they have not yet experienced the price change, they have not fully adjusted their consumption of other goods in response to the new price.
2. **When calculating the EV, the amount of money we'd need to give the consumer to bring them back to the initial welfare would be greater, because they've already adjusted their consumption in response to the new price.**

The main reason for this difference between EV and CV in the case of a price increase for a normal good is the *income effect*. When the price of a normal good rises, the real purchasing power of the consumer decreases, leading them to buy less of the good. This income effect is more pronounced in the EV than in the CV because the consumer has already adjusted their consumption in the EV scenario. For normal goods, the income effect makes the equivalent variation greater than the compensating variation when facing a price increase.

Case 2: Price increase of a good when there is no income effect

Suppose we have a quasilinear utility function and see what happens when the price of the good, whose Marshallian demand does not depend on income, increases.

1. The amount the consumer is willing to purchase of x is determined solely by the price of the good, as there's no income effect.
2. The **Compensating Variation would be how much money is needed to compensate the consumer for the price increase of x, keeping them at their original utility level with the initial prices.**
3. The **Equivalent Variation would be how much money we would need to take from the consumer after the price change to bring them back to their original utility level.**
4. Since there's no income effect with the quasilinear utility, the consumer's reassessment of the good x remains the same before and after the price change. Therefore, CV and EV are the same. When increasing or removing income, there are no effects on the quantity demanded; demand reduction effects are solely due to the change in relative prices.

Conclusion

For a normal good, when you face a price increase for such a good, in the CV calculation not only do you need an additional income to compensate for the utility loss due to the higher price, but this compensation must be even greater. **This is because, being a normal good, you'd want to acquire more of this good (despite its increased price) when you receive your compensation**. In other words, your demand for this good increases with an increase in your income. Therefore, the CV for a normal good is greater compared to a good with income-inelastic demand (as in the case of quasilinear preferences) for a given level of EV calculated at the old prices.