Example 4 (Conditional probability, two-way table)

A retail store made recently available for its customers the online purchase service (as well as traditional shopping in the store). Regarding delivery, customers can choose between picking up their purchases directly at the store, arranging a delivery at a pick-up point or at home delivery. The following probabilities have been calculated based on information provided by the store:

PURCHASE	DELIVERY		
	Store	**Pick-up point**	**Home**
Store	0.15	0.05	0.20
Online	0.05	0.25	0.30

A customer placed and online (verified) purchase. Calculate the probability the customer asked to pick up the items at the store.

Answer:

Consider the following events:

DS: delivery at the store; PO: online purchase

We need to calculate the probability the asked to pick up his purchase at the store, given the fact we already it was placed online,

$$P(DS|PO) = \frac{P(DS \cap PO)}{P(PO)} = \frac{0.05}{0.05 + 0.25 + 0.30} = 8.33\%$$