

Optimal Technology Adoption when the Arrival Rate of New Technologies Changes

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Abstract

Our paper contributes to the literature of technology adoption. In most of these models it is assumed that after the arrival of a new technology the probability of the next arrival is constant. We extend this approach by assuming that after the last technology jump the probability of a new arrival can change. Right after the arrival of a new technology the intensity equals a specific value that switches if no new technology arrival has taken place within a certain period after the last technology arrival. We look at different scenarios, dependent on whether the firm is threatened by a drop in the arrival rate after a certain time period or expects the rate of new arrivals to rise.

We analyze the effect of variance of time between two consecutive arrivals on the optimal investment timing and show that larger variance accelerates investment in a new technology. We find that firms often adopt a new technology a time lag after its introduction, which is a phenomenon frequently observed in practice. Regarding a firm's technology releasing strategy we explain why clear signals set by regular and steady release of new product generations stimulates customers buying behavior. Depending on whether the arrival rate is assumed to change or be constant over time, the optimal technology adoption timing changes significantly. In a further step we add an additional source of uncertainty to the problem and assume that the length of the time period after which the arrival intensity changes is not known to the firm in advance. Here, we find that increasing uncertainty accelerates investment, a result that is

opposite to the standard real options theory.