

Service efficiency evaluation of automatic teller machines – a study of Taiwan financial institutions with the application of queuing theory

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Abstract

This study examines the service efficiency of 26 banking institutions in Taiwan (including the postal banking services) through the application of queuing theory by evaluating service efficiency of ATMs functions composed of cash withdrawal, fund transferring, password alternations and balance inquiry. Firstly, we apply design of experiment to collect the service times of four major ATMs functions and use goodness of fit to test the distribution of collected data. Then, the fitted queuing model is utilized to calculate average number of customers presented in the queuing system, average number of people waiting in the queue, average time a customer spends in the system and average time a customer spends in queue for evaluating the service efficiency of ATMs. Data was collected on field from July to August 2004. Study results found the most efficient banks and least efficient banks. This study also suggest some bank should add more ATMs to reduce customer waiting time and conclude some banks have installed too many ATMs for their current users.

Keywords : Automatic Teller Machines (ATMs), queuing theory, service efficiency.

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