This work aimed at investigating the effects of blend ratio between styrene butadiene rubber (SBR) and butadiene rubber (BR) and SBR type (E-SBR and S-SBR) on properties of SBR/BR tire tread compounds. Influences of these parameters on properties of the tread compounds reinforced by 80 parts per hundred rubber (phr) of carbon black (CB) and silica were also compared. Results reveal that hardness, strengths, and wet grip efficiency were impaired whereas rolling resistance was improved with increasing BR proportion. Surprisingly, the presence of BR imparted poorer abrasion resistance in most systems, except for the CB-filled E-SBR system in which an enhanced abrasion resistance was observed. Obviously, S-SBR gave superior properties (tire performance) compared to E-SBR, particularly obvious in the silica-filled system. Compared with CB, silica gave comparable strengths, better wet grip efficiency, and lower rolling resistance. Carbon black, however, offered greater abrasion resistance than silica.