This dissertation has three main tasks. Firstly, it calculates the amount of rail infrastructure charge for European high speed lines/services based on the marginal cost. Secondly, it characterises the rail infrastructure charging systems applied to European high speed lines/services, in order to detect if mark ups above the marginal cost of wear and tear are being applied to those services and if so, how they are applied. Finally, it quantifies the impacts on traffic volumes and mode split resulting from bringing the current levels of rail infrastructure charges (applied in the European high speed network) to the level of marginal cost of maintenance and renewals and to the optimal Ramsey mark up. According to the results obtained, current levels of rail infrastructure charges implemented in Europe have a negative impact on the competitiveness of the high speed passenger services that run on the European railway network, particularly in the cases where the rail market share is currently low (below 80-85%). These mark ups would not have been imposed after careful consideration of their consequences on the market position of railway undertakings in the market segment in question. European railways have been immersed since...