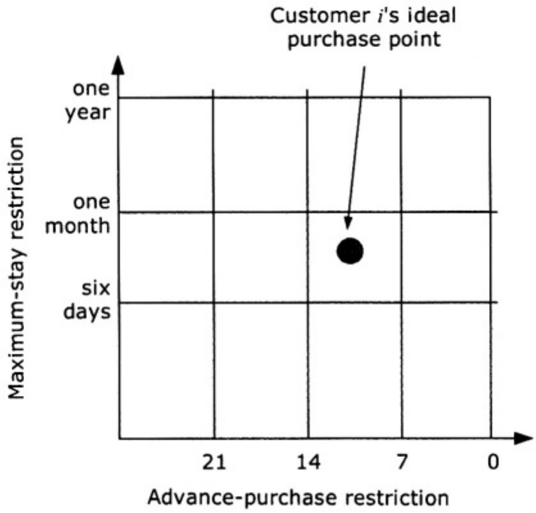

Figure 11.1. Advance-purchase and max-stay restrictions for an airline trip represented by a grid in a two-dimensional space. Customer's ideal point is the most restrictive point in this space where they have the highest valuation.

customer's i's valuation for product j. This however would create estimation difficulties, so below we use a simpler additive model in the spirit of the conjoint utility model of Section 11.1.

Let customer i have an *ideal point* defined as follows: it is the most restrictive product j for which he has his maximum valuation. For example, in Figure 11.1, customer i's uncertainty about his trip is resolved somewhere between 7 and 14 days before his trip date, and his trip takes more than 6 days and less than 1 month. Then his ideal point is represented by the potential product with restrictions of max-stay of 1 month and advance-purchase restriction of 7 days. Let his valuation for the product at this ideal point be v. If however, for reasons of price or availability, he is forced to purchase 14 days in advance, his willingness to pay would be lower. We model this as a reduction in valuation for purchasing less-than-ideal products.

Let w_{jk} represent the disutility for a customer whose ideal point is product j, if he has to purchase product k. (It is conceivable that this reduction is zero, especially when a customer purchases a less restrictive product.) If consumer i's ideal product is j_i, then his net utility for purchasing product k is given by $v - w_{j_ik} - p_k$, where p_k is the price charged by the firm for product k. So far we have assumed all the valuations v and w's are deterministic, but they could also be modeled as random variables to be more realistic. To keep the exposition simple, we assume