Summary

The rating and valuation authority in Hong Kong carries out yearly reassessment of the rateable value, i.e. the net annual rental value, of every real estate for ad valorem tax purposes. Assessors employ computer-assisted mass appraisal (CAMA) and specifically, multiple regression analysis (MRA) to complete the appraisals of domestic, office, industrial and some commercial properties within a short period of time.

As land use is compact and mixed in Hong Kong, it is sometimes very difficult to model the location effect. The existing approach of delineating the jurisdiction into neighbourhoods and specifying localised models is not satisfactory, because value inconsistencies exist across neighbourhood boundaries as properties are appraised by different models. Besides, arbitrary location adjustments and manual overrides are often necessary to adjust for variations of location values within the neighbourhoods.

This thesis introduces the Location Value Response Surface (LVRS) modelling, which has been used to appraise single-family residential properties in North America and Britain. The technique endeavours to better analyse location, and increase efficiency and cost effectiveness through integration with geographical information systems. Basically, it derives a location adjustment factor by segregating the intrinsic location element from the sale prices/rents through multivariate analysis. The resultant factors are subsequently mapped and interpolated to form a response surface, as a geographic function of location,
in the LVRS model. This single location measurement then becomes another variable in the CAMA model to predict property values.

In particular, this thesis further devises a "constant quality" approach using the standardization method to ascertain the location factor for multi-storey buildings. The approach adjusts the sale price/rent to bring it in line with the value of a property characterizing the same qualities as of the proxy, normally the typical property. Such approach is proposed because the cost model techniques used in the U.S. are not appropriate to estimate a land parcel's location factor from the evidence of individual assessments within the same multi-storey building block.

A case study using office units from high-rise buildings in Hong Kong is thus carried out to critically examine the applicability and effectiveness of the LVRS model. It also attempts to validate the "constant quality" approach in assessing the rateable values of multi-storey units. The LVRS' "constant quality" analysis of 1,022 office rents in Causeway Bay produces an interpolated response surface that represents a reasonable variation of location values. The subsequent regression model with the derived location factor is also more superior in terms of accuracy and explicability, when compared to the existing approach of localised models. The MRA model is later applied to assess the rateable values of all 2,505 office assessments in the study area, illustrating the importance of appraisal evaluation in achieving fair and equitable assessments.
The case study suggests that the "constant quality" approach enhances the existing LVRS techniques to value individual units in multi-storey buildings. Although valuation accuracy is improved, and regression model specification simplified, the appraiser must also be aware of the LVRS model's limitations from the data, modelling and cost-and-benefit perspectives.