

Forecasting Delivery Time of New-Build Projects for Dutch Housing Associations

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Dutch Housing associations (HA's) are responsible for producing, maintaining, and managing about 30% of all Dutch housing stock. HA's draw up their investment forecasts yearly for the next 5 years to construct, improve or maintain homes and other real estate investments. Since 2013, the realization rate of new construction plans by HA's, which is the comparison of forecasts (dPi) against realized plans (dVi) decreased due to HA's not realizing new build homes within the time they propose to realize them in their forecast plans.

Housing associations currently use valuation methods which assist them to mitigate emerging risks that affect new build plans of HA's. However, valuation methods have been found to heavily rely on indexable risks and capture financial loss while excluding time delay effect of real estate development risks. This means that new build investment forecast as currently made are inaccurate since housing associations do not realize plans within the time they forecast to do so leading to low realization rates that point to reduced forecast capacity. Reduced forecast capacity lead to disappointments from tenant organizations and municipalities, reduced financial guarantees from lenders, long waiting times for tenants and affects financial feasibilities which rely on accurate prediction of time to completion of projects.

The aim of the research was to explore how new build plans can be made more realistic by accurately predicting the delivery time of investment forecasts. The study resulted in the identification of risks that lead to delay of new build investment plans and their subsequent indicators. The risks included long permit procedures, long land acquisition processes or lack of land positions to build, long tendering procedures, contractor related building delays, rise in construction costs and lack of capacity at municipal level in dealing with development projects. These risks can be converted to project characteristics that form the indicators of qualitative risks at a quantitative level.

The indicators construction costs, change in input price index of material and labour costs as of date when decision was made to tender, municipal location, and type of construction i.e., on empty ground or existing site that needs demolition were statistically found to predict new build planning and realization time. This was done using stochastic decision tree models (SDTA) that rely on multiple linear regression (MLR) and Monte Carlo simulations (MCS). The research therefore shows that by finding the relevant project indicators to quantitatively represent a qualitative risk, project time of new build projects can be predicted to provide accurate new build forecasts.

The time predicting model provides HA's with a means to determine the percentage of optimism in the budgets to counter check against plans proposed by asset managers and financial controllers. This can therefore help with planning the time it takes to deliver projects based on their different characteristics. It can also help make financial calculations more accurate when time to deliver is correctly incorporated. Supervisory bodies, municipal and national government can also use the results of the model to indicate where more resources need to be provided to deliver set number of homes within a specific period. This allows for plans to be more accurately made.

To accurately forecast new build investment plans, HA's risk appraisal processes must incorporate both time and financial loss effects in forecasts. Failure to recognize project-specific characteristics and their impact on project duration means that the capacity to realize investment projections within the timeframe anticipated will be hampered. This will accelerate the current trend of erroneous investment forecasts. Furthermore, financial return requirements rely on accurate project duration predictions, and as a result, poor project duration predictions have an influence on project financial feasibility and consequently a HA's financial health.