The Economics of High-rise (as per 2nd Quarter 2010)
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High vs Low: An Elemental Comparison

(1) GIA = gross internal area (m²).
(2) The most important of the key cost drivers is shape, not least because it has a profound effect upon the structural solution and the cost of the façades.
(3) Tall buildings are less efficient than low-rise schemes because:
   • Structural frames and core walls are larger and thicker
   • More area is taken by plant and risers
   • Smaller floor plates result in relatively high space-taken by lifts, stairs, circulation, etc.
(4) Typical floor area efficiencies (NIA : GIA percentage) for low-rise is between 68%–75%, whilst for high-rise is between 60%–70% only.
(5) Whilst the progression from low/medium-rise offices (up to 20 stories) to high-rise projects (over 35 stories) is generally marked by a significant premium, within each range there are more important cost drivers than height alone. These are shown below:

Key High-rise Cost Drivers
Note: Irrespective of building use/ownership
   • Shape & geometry – height, iconicity, slenderness
   • Size and regularity of floor plate – floor area efficiency
   • Structural Solution (including core location) – construction methodology
   • Façade specification – articulation, repetition, detailing
   • Environmental strategy/sustainability enhancements – life cycle value
   • Site constraints (including seismic considerations) – location
   • Market conditions/procurement route – procurement strategy, risk transfer, market appetite
   • Vertical transportation strategy – number/speed/arrangement of elevators

Relative Elemental Costs for Low and High-rise Office Buildings (Central London)

Substructure  Superstructure  Façades  MEP Services  Lifts & Escalators  Prelims, OH&P, contingency  Internal walls, finishes, etc.

Shell and Core High-rise Construction Cost Range (US$/m² GIA)

The biggest cost items in high-rise office buildings are typically superstructure, facades and MEP services. Given that façades can constitute 20% of the total shell & core cost of a tower, doubling the wall:floor ratio would add 10% to total construction costs. The wall:floor ratio of the tallest Asia Pacific towers ranges between 0.30 – 0.36 with an average of 0.34. While for the tallest Central London towers, this ranges between 0.32 – 0.60 with an average of 0.51.
The construction costs of high-rise office buildings in Central London can be over double that of New York and 3 times that of Shanghai.

Shell and core construction costs for iconic high-rise office buildings are approximately 160% of the construction costs for high-rise residential.