Issues with static approaches

Key points

- Standard industry approaches to private asset valuations rely on static cash flow forecasts that do not take a probabilistic (or scenario-driven) approach.
- Investor's cash flow forecasts for infrastructure project are **notoriously inaccurate and over-optimistic**. This is well-documented in academic research.
- Future payouts used in investor valuations are, in effect, not forecasts but a simple 'base case'.

Cash flow forecasts made by infrastructure investors and developers are **notoriously inaccurate**. The base case of infrastructure projects is often found to be overoptimistic and demand or traffic risk is the primary reason why infrastructure projects experience significant problems[1] , including default and therefore equity losses.

A well documented 'optimism biases' leads to the overestimation of future demand or traffic[2]. Numerous papers and book report that demand forecasts and construction cost schedules are usually over-optimistic in both publicly and privately financed projects with this optimism bias averaging 25% and deviations from the base case sometimes reaching 200 or 300% [3][4][5][6].

The standard approach taken by valuers and investors to predict future dividends consists of mimicking the cash flow waterfall in a static manner: from future revenues to future operating and maintenance costs, given any reserve accounts or senior debt covenant in force (e.g., dividend lockup, cash sweep, etc.), the remaining free cash flow can be used to repay future outstanding senior debt and, when possible, pay back shareholder loans or make distributions to shareholders.

This approach underpins the initial business case upon which investment decisions in unlisted infrastructure are taken.

In the best case, such models represent the best information available at the time and provide investors and valuers with an approximation of what cash flows can be expected, conditional on the assumptions made for each model input. This *base case* however is typically not a statistical model and thus may not represent the expected value of future cash flows.

Moreover, beyond the initial investment date, updating such models presents numerous challenges:

1. They are fraught with **estimation errors**:
    - Predicting revenues requires taking a forward-looking view of numerous external inputs over long horizons, for example, forecasting the revenues of certain power-generation companies requires estimating the future of energy prices or subsidies, in some cases the future of commodities, etc. Port and airport businesses rely on revenues that are impacted by global trade and macroeconomic forces, etc.
    - Each one of these forecasts implies an estimation error.
    - Forecasts about exogenous variables such as global GDP or energy prices are notoriously hard to make over long horizons, and estimation errors thus tend to be large.
    - Individual forecasting errors magnify each other and may lead to very uninformative forecasts.
2. They require numerous inputs yet **ignore correlations**: Static cashflow waterfall models require forecasting dozens of inputs but typically do not take into account the correlation between them. Future revenues impact future asset utilisation and in turn future operating costs, the evolution of labor costs may justify adapting the firm's operations to optimise productive efficiency, etc. But these interactions are typically ignored in static cash flow waterfall models.
3. **They are not forecasts** in the statistical sense: While this approach typically includes "sensitivity" analyses to attempt to determine a range of potential outcomes, the absence of correlation measures between the different risk factors found in each investment greatly limits the value of the exercise. The use of (Monte Carlo) simulation and other tools is possible but does not solve the issue of the number of inputs and their correlation, while making the exercise more costly.

In short, the standard static waterfall approach requires a lot of inputs and is fundamentally *ad hoc*: it is not a model of the expected value of cash flows in the statistical sense.

References

1. 1
2. 1
3. 1
4. 1
5. 1
6. 1