E3grid2012 – dynamic results

INTERPRETATION OF DYNAMIC PRODUCTIVITY RESULTS IN E3GRID2012

The investigation of productivity development for TSOs in e3grid2012 is made using the very same model as for the static efficiency, evaluated using a Malmquist formulation to calculate estimates for overall productivity gains, efficiency changes (catch-up) and technological change (frontier shift). The general results are given in Table 22 in the final e3grid2012 report.

The frontier shift estimates for TSOs in related studies have ranged from 1.3% (ECOM+ 2000-2003) to 2.4% in e3GRID 2008. The current result (-1%) for 2007-2011 requires an interpretation, since it suggests a frontier regress, rather than technological progress. Also, interestingly the catch-up speed is reported as stronger in the last period than during 2000-2007.

Frontier shifts and regress

The concept behind the frontier shift using annual frontiers relies on the assumption of a balanced panel of peers facing new conditions each period and responding by implementing best practice. Normally, similar operating conditions imply technological progress (in real terms), since previous method and technology continue to remain applicable while some new innovations enter the scene to improve the frontier through some operators. The revenue cap formula using a generalized X-factor then may use this information to prospectively share productivity gains between the firms and the consumers.

However, one may also face technological regress, e.g. in the regulation of airport security, when all operators including the peers face radically changed tasks and operating conditions. Insofar that the regress correspond to a valid and generalized technological change, i.e. the infeasibility to apply previous best practice on current operations, the regress could also lead to consequences in terms of the revenue cap parameters.

Such frontier regress tends to be characterized by a commonly observed system change (e.g. new outputs) and a generalized change of technology for the operators.

Analysis of the frontier shift 2011

First, for the period 2007-2011, no system change is observable for the period through techno-economic data, annual reports or regulatory requirements.

While the need to integrate increasing volumes of renewable energies has been discussed as a possible cause for rising cost – such deemed extensions of the

supply task were not found to be a statistically significant explaining factor of cost – at least for the available data up to 2011.

Indeed, given the sequential and gradual expansion of the existing network and the asset-driven performance model, there is so far no reliable indication of such change. Therefore, the regress does not appear to be an externally driven feature.

Second, in the current data, part of the operators in 2011 demonstrate atypical increases in operating costs related to specific organizational changes, end-of-period allocations and restructuring. For others, such as the subgroup of highly efficient outliers from 2003-2007, no regress is observed. Thus, the regress is not generalizable and cannot be linked to the feasibility of applying earlier best-practice.

Third, given the analysis above, we note that the picture changes radically if the last year performance is excluded from the dynamic assessment. For the period 2007-2010, the average annual productivity growth is (-0.5%), the average annual catch-up is (-1.6%) and the average annual frontier shift is +3.7%. Although this time series is shorter (4 years), it is of the same length as series in the 2008 study. Nevertheless, we chose to interpret this merely as an additional argument to invalidate the conjecture that the electricity transmission sector will face a technological regress in the coming years.

Recommended interpretation and implementation

All regulatory benchmarking is based on the empirical assessment of performance opportunities, either statically or dynamically. As such, it is fundamentally a hypothesis testing where the analyst presents econometric evidence to reject the null hypothesis that the observed firm is fully cost efficient. In the overall modelling, this is implemented by using cautious assumptions about the production possibility set, the comparability of data, the development of prices, inflation and the influence of external factors. In the dynamic assessment, this is made through the use of panels and average results, by disentangling the potential opportunities for inefficient and efficient firms and by using annual frontiers.

Following this logic and the argumentation above, the correct interpretation is to say that the dynamic results for 2007-2011 do not provide robust proofs of the existence of generalized technological progress possibilities for the electricity TSOs. It is not to be interpreted as evidence of technological regress, given the counterfactual evidence (e.g. the analysis for the years 2007-10).

Consequently, the results on the frontier shift in this study should be interpreted as no evidence having been found for frontier shift for the period 2007-11, implying zero percent to be used as basis for corresponding parameter(s) in the revenue-cap (e.g. the general X-factor).