

Productivity and Efficiency of US Gas Transmission Companies: A European Regulatory Perspective

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Tooraj Jamasb, Michael Pollitt, Thomas Triebs

Gas transmission networks are regulated rather differently in Europe and in the US. Both, the traditional US cost-of-service regulation and European incentive regulation are based on the notion of natural monopoly. Whereas US regulation is shifting its focus from cost to value by complementing cost-of-service regulation with institutions fostering competition and market integration, European regulators treat gas transmission as incentive-regulated franchise monopolies.

However, unlike electricity or gas distribution, gas transmission networks are not necessarily natural monopolies. Although there exist economies of scale in relation to pipe diameter, markets for gas can easily be served by several pipelines. Natural gas pipelines are oligopolies rather than monopolies. US regulatory change exploits that insight and this paper investigates how successful this has been done.

This paper studies the development of industry average productivity as well as the convergence of productivity at the firm level for a sample of US interstate gas transmission pipelines covering the period 1996-2004. The model used in the analysis essentially investigates the change of input-output ratios as measures of efficiency change. Moreover, the model distinguishes between technical efficiency change and technical change. This distinction is important because given the investment cycle of the industry, a typical regulatory period is only long enough to incentivize technical efficiency. Whereas our output variables are total cost and alternatively total revenue our input variables are total delivery volume, pipeline length, and the total horsepower rating of compressor stations. Our use of a revenue model has two desirable features from a regulatory perspective: (1) revenue is the total cost to consumers; and (2) aggregate revenue measures are readily available.

The results indicate that taking productivity and convergence as performance indicators, US regulation has been rather successful, in particular during a period where overall demand was flat. We find that

total factor productivity change and technical efficiency change seem rather high for a rate-of-return regulated, natural monopoly industry. For the total cost models we observe yearly average growth rates of 2.9 and 5.9 percent. For our revenue models we find growth rates of 4.5 and 6.9 percent respectively.

Broadly, our analysis points towards a short-run and a long-run lesson for European regulators. In the short-run US data provides an opportunity for individual European regulators to benchmark national gas transmission companies without a standardized European data set. In the long-run European regulators should consider giving more emphasis to market integration and competition since these arguably lead to productivity increase and convergence, as in the US.

For benchmarking with US data we suggest the following. First, if European regulators begin to collaborate on gathering data in a systematic and comparable way they can produce robust results from European data alone. However, in the meantime, comparing European companies to US companies provides some guidance for regulators that often face difficult-to-verify claims from industry. An added advantage of using US data is that a panel is available that allows for more robust conclusions on performance changes since single cross-sections are likely to be affected by measurement error.

In the long-run, even if European data were available, international benchmarks still have an important role to play. It is possible that US companies embody best international practice. Also, there is no reason to believe that firms under incentive regulation should fare worse than under rate-of-return regulation (complemented by competition or not). Excluding the US firms from any European benchmark could amount to forfeiting consumer surplus.

More importantly, in the long-run competition through the creation of the necessary institutions might be more important than the prevailing form of tariff regulation. Given our results, it seems likely that even for a mature industry with a long history of rate-of-return regulation, competition and market integration can increase efficiency, which is the prerequisite for lower customer tariffs.

Contact tpt21@cam.ac.uk
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