Adequacy of the FERC's ISO/RTO Performance Metrics

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This paper looks at the ISO/RTO performance metrics issued by the Federal Energy Regulatory Commission (FERC) from the perspective of best corporate performance management practice. As a ten-year practitioner, entrepreneur, author, and business researcher who built finance executive networks to share best performance management practices for the Corporate Executive Board, I believe it's especially important to be clear about the purpose of performance metrics. (See attached Curriculum Vitae.) That purpose is not to assign blame for disappointing results but to understand what causes them. The primary agenda for any set of performance indicators is learning. Accountability is a means to that end. I have laid out elsewhere in more detail the argument that performance metrics promote learning by testing critical assumptions.[1]

In the case of restructured electricity markets, performance metrics have the potential to test key assumptions we must make in our expectation that those markets can give rise to benefits for consumers. The paper looks at two of these assumptions in particular. The first is that the cost of the price-setting unit is not significantly higher than energy that has failed to clear the market due to high energy bids or capacity withheld for economic reasons (i.e. not for maintenance). The second is that producers will enter the market when prices are high enough to support attractive rates of return on new capacity.

The FERC should publish individual generator data on costs, profit, and the quantity of cleared capacity and energy to meet its goal of ensuring that rates, terms and conditions are just, reasonable and not unduly discriminatory or preferential in restructured wholesale energy markets. The purpose of

[1] D. Apgar, *Relevance: Hitting Your Goals by Knowing What Matters* (Jossey-Bass 2008).

this is not to hold generators accountable for the competitiveness of the restructured markets in which they sell energy and capacity but rather as the only practical way to test specific assumptions or hypotheses about the competitive effects of the current structure of ISO/RTO-operated wholesale energy markets.

Section I of these comments clarifies the FERC's goal in collecting metrics on the performance of ISO/RTO-operated wholesale energy markets. Since metrics that test assumptions about the effect of the structure of energy markets are necessary for FERC to comply with its responsibility to monitor and oversee these markets, it is wrong to assume that any such testing creates a new layer of enforcement or compliance activity. Section II reviews the key market competitiveness and pricing metrics proposed by the FERC with respect to their power to test key assumptions about the competitive effect of current ISO/RTO-operated market structures. Section III argues that only generator cost, profit, and cleared capacity and power data can adequately test some of the actual assumptions underlying recent wholesale energy market restructuring in the US.

I. Assumption testing and the justification of ISO performance metrics

One of the FERC's two primary goals -- according to its mission as described in the current Strategic Plan[2] -- is to "ensure that rates, terms and conditions are just, reasonable and not unduly discriminatory or preferential." It underlies the Commission's responsibility to "monitor and investigate energy markets".[3] And, in the end, it provides a clear justification and a simple criterion for collecting ISO/RTO performance metrics.

The lack of a clearly defined standard for just and reasonable rates and terms in restructured markets seems at first to create huge complications for the selection of ISO/RTO performance metrics.

[2] *The Strategic Plan, FY 2009-2014*, Federal Energy Regulatory Commission, p. 3, http://www.ferc.gov/about/strat-docs/FY-09-14-strat-plan-print.pdf
[3] Ibid., p. 43.

Since no one knows the ideal future price of energy or capacity in any market, the most we can hope to do is to make sure energy markets are structured in ways that will produce optimal amounts of energy and capacity at rates that distribute benefits fairly and efficiently among consumers and producers.

Ideal-market models like those stipulated by Arnold Harberger[4] in his classic analysis of market efficiency and deadweight loss lay out conditions under which markets that set price equal to the marginal cost of production will be efficient and fair (defined as a state where any improvements in one party's results will have to come at the expense of someone else). Based on these classical economic theories, it's tempting to collect data on price and the cost of marginal production to test whether the market's rates are just and reasonable.

This approach takes marginal cost as the correct standard for evaluating energy market prices. It's an approach that gets the justification of performance metrics backward – it yields a metric that is simple but relies on a principle for selecting metrics – one that involves when theories of market efficiency apply – that is complicated. "Real-world" markets may not always meet all of the conditions for a comparison of price and marginal cost to be sufficient for evaluation. A simple criterion will lead to less controversial and more compelling performance metrics.

The simplest criterion is to select metrics that test our most important assumptions. After all, the point of a metric is to generate facts, and the classic use of facts is to test the theories, hypotheses, and assumptions we make about cause and effect. If you check your speed every few minutes while driving, for example, you're testing the assumption that you're still at a safe speed. Here we need to test our assumptions about the effect of ISO/RTO-operated energy market structure.

One hopeful assumption supporters of the markets make is that generators cannot easily exercise market power or act in concert to charge prices substantially above marginal cost or withhold

[4] A. Harberger, "Three Theorems of Applied Welfare Economics," *Journal of Economic Literature 3* (1971).

strategic amounts of capacity. The simple metric comparing price and marginal cost, discussed above, tests this assumption.

Dastardly collusion by generators is not, however, the only reason consumers may fail to benefit to any reasonable degree from the restructured wholesale electricity markets. Plenty of other assumptions underlie the expectation of the possibility of benefits from the structure and operations of the RTO/ISO-operated markets. And some – like the assumptions that the cost of the price-setting unit is not significantly higher than that of strategically withheld energy and that producers will enter the market when prices are high – are important enough to test.

Indeed, it is hard to see how the FERC, without testing some of these assumptions, can meet its stated goal of ensuring that rates, terms and conditions are just, reasonable and non-discriminatory. The next section reviews the power of selected RTO/ISO performance metrics proposed by the FERC to test some of these assumptions before turning in the final section to the reason why only individual generator costs and profits can fully provide the data needed to test them.

II. Marginal metrics and the assumption of imprudent competitiveness

This section looks at two key metrics that the FERC proposes as a test of market competitiveness and pricing. They both test assumptions underlying the fundamental premise behind the restructuring of the wholesale electricity markets -- that RTO/ISO-operated markets have the potential to benefit consumers. The problem is that the range of assumptions they test is far too narrow.

For example, price-cost markup compares the offered price and variable cost of the marginal (or price-setting) generator in each distinct pricing location of a restructured market. As mentioned above, one of our assumptions is that producers are not succeeding in exercising market power to realize prices in excess of marginal cost. It is well worth testing the assumption and this metric does so.

The metric does not dispose of most of the plausible questions we could pose about the efficacy of restructured markets, however. For example, it's plausible to suppose that every generator in a local market operating near the expected marginal cost has a disincentive to offer too much energy at prices equal to that marginal cost for fear of finding that it has become the marginal producer. Being the marginal producer is bad news since the ISO will set price at that generator's cost and the generator will make little profit. Generators may well see themselves in a game of musical chairs where offering one's full capacity in a given hour at cost is like rushing by a row of open seats as the music stops playing.

Furthermore, if the generators are aware of capacity with higher costs in their local market then they will have an incentive to withhold various shares of their own capacity in capacity auctions until they find levels where the costly producer's capacity still clears the market. This can raise prices substantially above the levels that would prevail if all newer, more efficient capacity in the market were offered. There need not be any collusion whatsoever for this to occur.

The expectation that restructured markets can benefit consumers nevertheless makes the assumption that these scenarios are the exception and not the rule. The reason is that the actual marginal cost in such scenarios can be substantially higher than a marginal cost reflecting competitive pricing of all of the market's available capacity. In other words, the cost of the price-setting unit in these scenarios may be higher than the cost of some capacity that does not clear the market. It is therefore possible that the price-cost markup in such a scenario will be negligible or low even though the apparent marginal unit's cost is higher than other available capacity or energy that has not cleared the market. Such a restructured market would be free to set prices above the marginal cost that would obtain with no capacity withheld for strategic reasons – and those prices are neither efficient nor fair.

This assumption deserves to be tested just as much as the assumption that generators are not actively colluding. A comparison of prices and marginal costs cannot test it, however, for the very good

reason that in each of these scenarios price will continue to be equal or close to the cost of the actual marginal unit – but not the unit that would be marginal under the conditions for efficient markets.

The FERC also proposes to assess market competitiveness by measuring generator net revenue. Consumers can benefit from restructured markets if the expected revenue streams motivate producers to build new capacity as needed at competitive costs.

This metric might seem to test the specific assumption that producers in restructured markets will build new capacity when prices generate a gross margin high enough to cover fixed costs and provide a decent return on investment. If no new capacity were forthcoming even when generator net revenue was sufficient to finance it then the market's incentives for expansion would be questionable.

In cases where generator net revenue was sufficient to finance new capacity, however, the reliance of the metric on a hypothetical, rather than actual, cost of capacity is a frail reed on which to build a case for keeping prices level if no producer is actually building new capacity. It is too tempting for critics to question the myriad assumptions on which any estimate of the cost of new capacity was based. At the very least, the FERC should publish actual average costs at the 25^{th}, 50^{th}, and 75^{th} percentile of the capacity and energy markets for each reporting period. Then it would at least be possible to visualize where the generator net revenue's assumed costs would fall in the actual offered supply curves.

In short, the metric can signal excessive pricing only by constructing a typical cost structure. It would be far more compelling to compare such pricing with the cost structure of real generators.

III. No substitute for actual generator results

There is only one concrete metric that tests all of the foregoing assumptions underlying the expectation that wholesale energy market restructuring can benefit consumers. It is the cost,

profitability, and market-clearing capacity and energy of the generators in each RTO/ISO-served district. This metric would comprise separate data from the energy and capacity markets.

Cost and profitability data at the generator level test the assumption that producers are offering all of their available energy and capacity at competitive rates. It's not the case, however, that sustained profits at a few of the most efficient producers would indicate any flaw in the functioning of the market. Indeed, there should always be some highly producers whose efficiency earns them an attractive return on investment.

Rather, it's the depth and breadth of generator profitability that indicates the degree to which the producers in a market are acting like fully competitive price-takers. Suppose, for example, that a price-setting generator persistently met, say, 10% of the load in a given restructured market at low profitability while generators meeting the remaining 90% of the load were highly profitable. Then it would be reasonable to ask why opportunistic expansion of high-efficiency capacity never managed to take market share from the price-setting producer.

Cost and profitability data at the generator level also test the assumption that the prices paid in restructured markets motivate new capacity as needed. Rather than relying on the assumptions about the cost of new capacity underlying generator net revenue, this data would include actual levels of profitability to compare with the threshold that the launch of new capacity requires.

It's not the case, once again, that sustained profitability of any one producer adequate to finance new capacity construction indicates that prices implied by the generator net revenue metric are excessive. After all, there are plenty of reasons why a given producer might be able to operate below the cost of new capacity. But sustained profitability adequate to finance new construction at producers representing a significant share of the market might indicate a problem with the new-capacity cost assumptions underlying the generator net revenue metric. (Or it might show that there are many other

factors in the decision to build new capacity.) And sustained profitability adequate to finance new construction at a large number of producers that does not result in new capacity construction indicates a flaw in the market's incentives.

In the RTO markets, the justification of much of the structure and many of the rules – such as locational price differentials and capacity markets – is precisely to motivate the construction of new resources where needed, i.e. in transmission-constrained zones. Only the pattern and distribution of profitability can really test our assumption that there is a connection between price, earnings and decisions concerning new capacity in a restructured market.

Suppose, for example, that many producers meeting two thirds of the load in a given market were sufficiently profitable to have reason to believe they could build new capacity profitably. And yet none did so over a period of years. The reason could well be that each producer hesitated to act for fear that other producers might be planning their own capacity expansion, raising the possibility of a glut in the local market. Generator owners may face the perverse incentive that any actions to increase supply would cut into the earnings of existing generators. Indeed, there are plenty of other innocent reasons why we might be wrong in our assumption that an appropriate level of profitability in a restructured market would motivate capacity expansion. Whatever the reason, this metric successfully tests the assumption by examining actual profitability.

In conclusion, the FERC should publish individual generator cost, profitability, and the amounts of market-clearing capacity and energy for each generator, to meet its goal of ensuring that rates, terms and conditions are just and reasonable in restructured wholesale energy markets. Such a metric does not hold generators accountable for the competitiveness of the restructured markets in which they sell energy and capacity. The metric nevertheless provides the only practical way to test specific

assumptions about the competitive effects of the current structure of ISO/RTO-operated wholesale energy markets

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Focus

- **Performance management, monitoring and evaluation – as an entrepreneur building best-practices networks for finance executives (managing director for ten years at the Corporate Executive Board), a McKinsey specialist (three years), a World Bank and IFC consultant (two major evaluation methodology projects), and author (*Relevance*, Jossey-Bass, 2008)**
- **Risk management, economic development, and financial institution strategy – as a microfinance risk management director (two years running BlueOrchard's fixed-income credit committee), a financial institutions banker (Lehman Brothers vice president for four years), a bank supervisor (three years as OCC Senior Policy Advisor), and internationally recognized author and innovator (*Risk Intelligence*, Harvard Business School Press, 2006)**

Experience

ApgarPartners LLC: Founder **2009-**

- Project to optimize impact evaluation methods across World Bank, IFC, and MIGA
- TOBB (Turkish Chamber of Commerce) project to increase jobs through selective SME credit expansion
- Consortium for bond fund managers to generate and test credit factors
- Ways to enhance learning benefits of IFC project assessments
- Cygma Finance credit risk process audit

BlueOrchard Finance: Director for investment and risk strategy
2007-09

- Built risk-adjusted performance and asset allocation model
- Designed first microfinance-oriented country risk rating model

Johns Hopkins SAIS, Washington DC and Özyeğin Üniversitesi, Istanbul: Adjunct Professor
2004-10

- Created executive MBA course on Risk and Judgment

- Created graduate finance course on Risk Management and Foreign Direct Investment

The Corporate Executive Board: Managing Director 1998-08

- Launched subscription-based Controllers' Leadership Roundtable in 2003; now 450 members, nearly $15 M in revenue; arguably top research organization for best controllership and accountability practices
- Launched Treasury Leadership Roundtable in 2001, now $10 M in revenue; led and presented *Stress on the Balance Sheet* (2003) to 120 treasurers in NYC, Chicago, San Francisco, London
- Directed Insurance Advisory Board for insurance executives 1998-2000; presented major studies each year to annual conventions of 200 member executives in Washington, 50 members in London

McKinsey & Company: Engagement Manager
1996-98

- Led study to restructure Bank for International Settlements investment portfolios and select new risk and trading system in Basel, Switzerland, 1997-98; presented results to board, May 1998
- Led study to re-price excess lines of major commercial insurer in 1996

Comptroller of the Currency: Senior Policy Advisor 1993-96

- Led task force to draft Interagency Statement on Retail Non-deposit Investment Sales setting guidelines for bank sales of securities in 1994
- Developed proposal for scoring bank underwriting quality to facilitate business loan securitization

Lehman Brothers: Vice President in Financial Institutions Group
1989-93

- Led M&A due diligence and mark-to-market valuation for First Interstate bid for First City of Texas in most complex government-assisted good-bank/bad-bank transaction to date as of 1992
- Led three-year AT&T Capital acquisition campaign—including due diligence, evaluation, negotiations—growing firm's assets from $5 to $18B to become second largest US finance company at time

Senator Bill Bradley: Staff Economist 1985-89

- Directed five-person team of prominent bankers and economists to develop proposal for interest-rate relief Brady bonds as solution for Mexican, Brazilian, Argentine debt crisis of mid 1980s
- Wrote 1985 bill forcing Administration to negotiate Plaza Accord by threatening to strip Federal Reserve of power to sterilize Treasury foreign exchange stabilization interventions

Boston Consulting Group: Consultant **1983-85**

- Audited strategies of bank, petrochemicals, aerospace and sports vehicle clients
- Developed most accurate scooter forecasting model of nine submitted to American Honda in 1984

Rand Corporation: Graduate Fellow **1980-83**

- Designed factory-level Soviet economic decision making model to assess trade embargos
- Developed metrics for efficacy of satellite communication transponders

Education

Rand Graduate School: Ph.D. **1980-84**

- Policy Analysis
- Distinction in Economics and Organizational Behavior

Oxford University, Balliol College: M.A.
1978-80

- Physics and Philosophy
- First Class Honors

Harvard University: A.B. **1975-78**

- History and Literature (completed in three years)
- Magna cum laude

International

- Business fluency in French, German; Turkish (FSI level 2); same level of Russian and Spanish
- Member of Council on Foreign Relations since 1990
- Extensive travel throughout Southeast Asia, China, India, Middle East, Northern Africa

Independent Publications

- "Which country is this?" *Cumhuriyet*, Istanbul, October 10, 2010, p. 16
- *Relevance: Hitting Your Goals by Knowing What Matters* (Jossey-Bass, 2008)
- *Risk Intelligence: Learning to Manage What We Don't Know* (Harvard Business School Press, 2006)
- "The Board's Neglected Risk Responsibility," *Directorship*, January/February 2008
- "Questions for: David Apgar," *Rotman Magazine*, Spring 2007
- "Should Iraq Be Split?" *Boston Globe*, December 26, 2006
- "Smarter Risk Portfolios," *Industrial Management*, November/December 2006
- "Security Intelligence," *CIO Magazine*, November 2006
- "Risk Intelligence and the Iraq War," *The Globalist*, September 13, 2006
- "Smarter Security," *Optimize*, November 2006
- "Dateline Afghanistan: Border Security for Iran," *The Globalist*, June 30, 2006
- "Ugly Americans?" *The Globalist*, April 24, 2006
- "Is the United States Mimicking Europe?" *The Globalist*, July 11, 2005
- "Parallel Tax and Accounting Treatment of Option," *Tax Notes*, December 6, 2004
- "Wolfowitz and Sadr: Meeting in the Sand," *The Globalist*, October 22, 2004
- "The Acceleration of History," *The Globalist*, March 5, 2004
- "Terror and Development," *The Globalist*, February 19, 2004
- "Aping Europe," *The Globalist*, June 30, 2003
- "The UN to Tony Blair's Rescue," *The Globalist*, March 18, 2003
- "A Virtual Mid-East Peace," *The International Economy*, Jan/Feb 2001
- "Innovation and Simultaneous Games," *Thinking in Writing* (Boston Consulting Group, 1984)
- *The Adversary System in Low-level Soviet Economic Decision Making* (Rand N-2111 AF, 1984)
- Articles on Germany, Czechoslovakia, and Alsace, *Let's Go Europe: 1979* (E.P. Dutton, 1978)

Representative Speaking Engagements

- "Lean Planning and the Learning Advantage," *Keynote Address* (Conference Board of Canada annual risk management conference: Toronto, January 28-29, 2009)
- "Lean Planning," *Association of Finance Professionals* (Annual Convention: Los Angeles, October 22, 2008)
- "Assumption-Based Metrics for Evaluating Policy and Program Effectiveness," *Treasury Executive Institute* (U.S. Treasury: Washington, DC, July 23, 2008)
- "Risk Intelligence and Board Responsibilities," *Keynote Address* (Institute for International Auditors Annual Meeting: Orlando, Florida, June, 2007)
- "Risk Intelligence and Relevance," *Emerging Issues Panel* (Society for Risk Analysis Annual Convention: Baltimore, December 5, 2006)
- "Discussion with Ian Bremmer on *The J Curve*," *Moderator* (Council on Foreign Relations: Washington, DC, November 20, 2006)
- "Managing Risk Intelligence," *Keynote Address* (Palisade Corporation Annual Client Conference: Miami, November 13, 2006)

- "Liquidity and Risk Capital," *Merrill Lynch Forum for Financial Institutions* (Treasury Leadership Roundtable: New York, 7 November 2006)
- "Risk Intelligence: Learning to Manage What We Don't Know," *Web Seminar* (Harvard Business School Press: October 17, 2006)
- "Risk Intelligence and Economic Management," *Senior Treasury Department Executive Training Guest Lecture* (Treasury Executive Institute: Washington, DC: October 5, 2006)
- "Market Risk, Capital and Growth," *Merrill Lynch Forum for Financial Institutions* (Treasury Leadership Roundtable: New York, 15 November 2005)
- "Unlocking Treasury Contribution," *Annual Executive Retreats* (Treasury Leadership Roundtable: New York, Chicago, San Francisco, and London: 2004)
- "Bridging the Creativity Gap," *Annual Executive Retreats* (Insurance Advisory Board: Washington, 1999)
- McKinsey study conclusions, *Board presentation* (Bank for International Settlements: Basel, May 1998)
- Bank regulatory conferences on OCC's Interagency Statement on Retail Non-deposit Investment Sales (1994)
- "Credit Extension in U.S. Small Business Lending," *International Conference on Business Lending* (Association of Russian Business Bankers: Moscow, October 1993)