

*Hamessing the Power of Financial Markets for the Public Good*

# FINANCIAL POLICY FORUM

Derivatives Study Center



## **Managing Energy Risks: Why, How and When**

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# MANAGING ENERGY RISK

- Deregulated energy markets have exhibited volatile prices
- Why volatility is an important cost to firms
- Comparison of sources of volatility
- What can be done about it
- The characteristics of well functioning derivatives markets
- How to improve these markets



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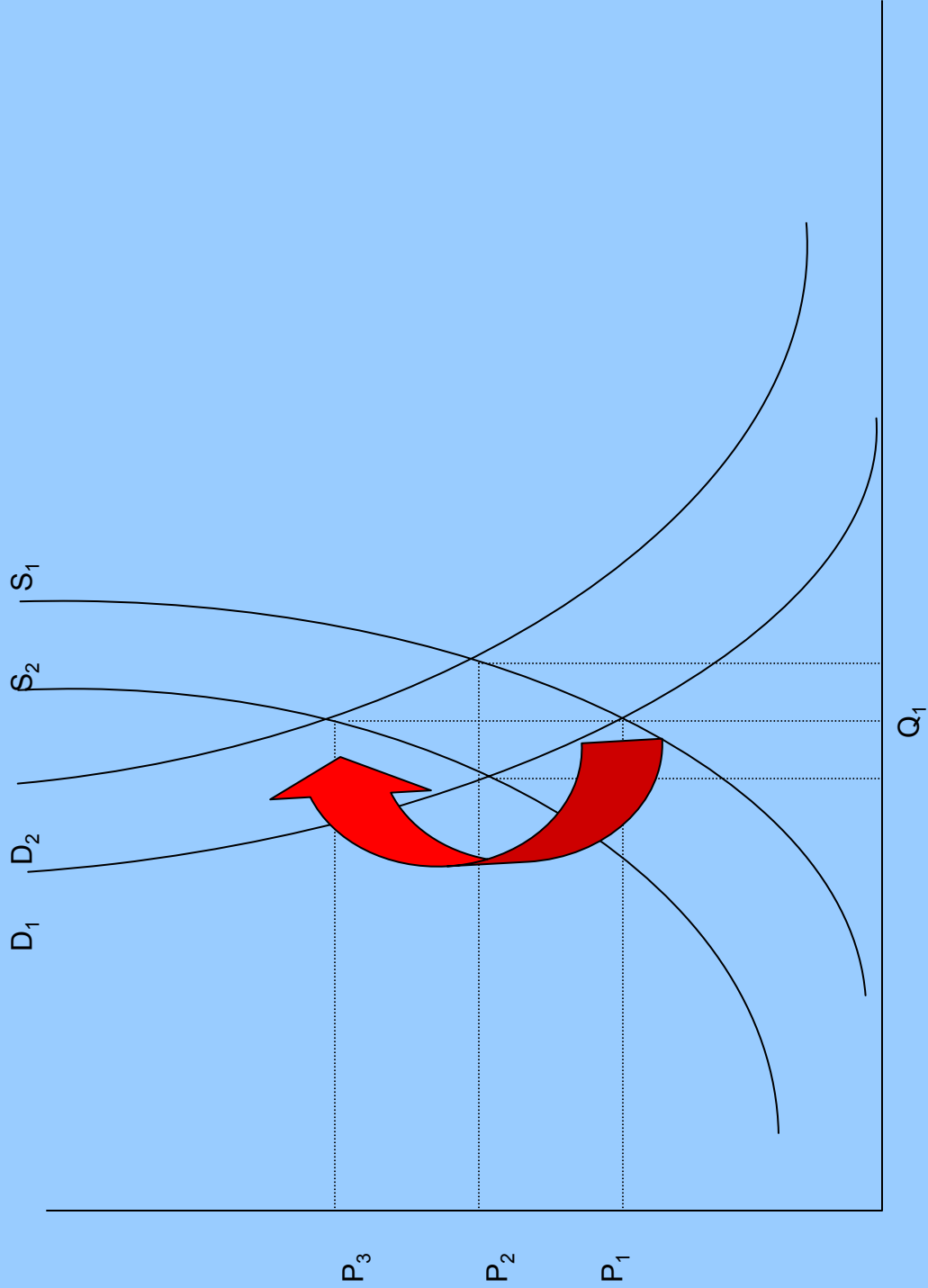
# INELASTICITY GIVES RISE TO VOLATILITY

Inflexibility in use, and inflexibility in supply – economists use the term inelasticity of supply and demand with respect to changes in prices – means that small changes in supply or demand conditions can result in large changes in prices.

Note that the large changes in price can occur with no significant changes in the output produced or used in the markets. In the chart, as prices move from  $P_1$  to  $P_3$ , the quantity produced and used remains at  $Q_1$ .



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# PRICE VOLATILITY: What does this mean for costs of production?

The following chart looks at the volatility of capital, labor and energy.

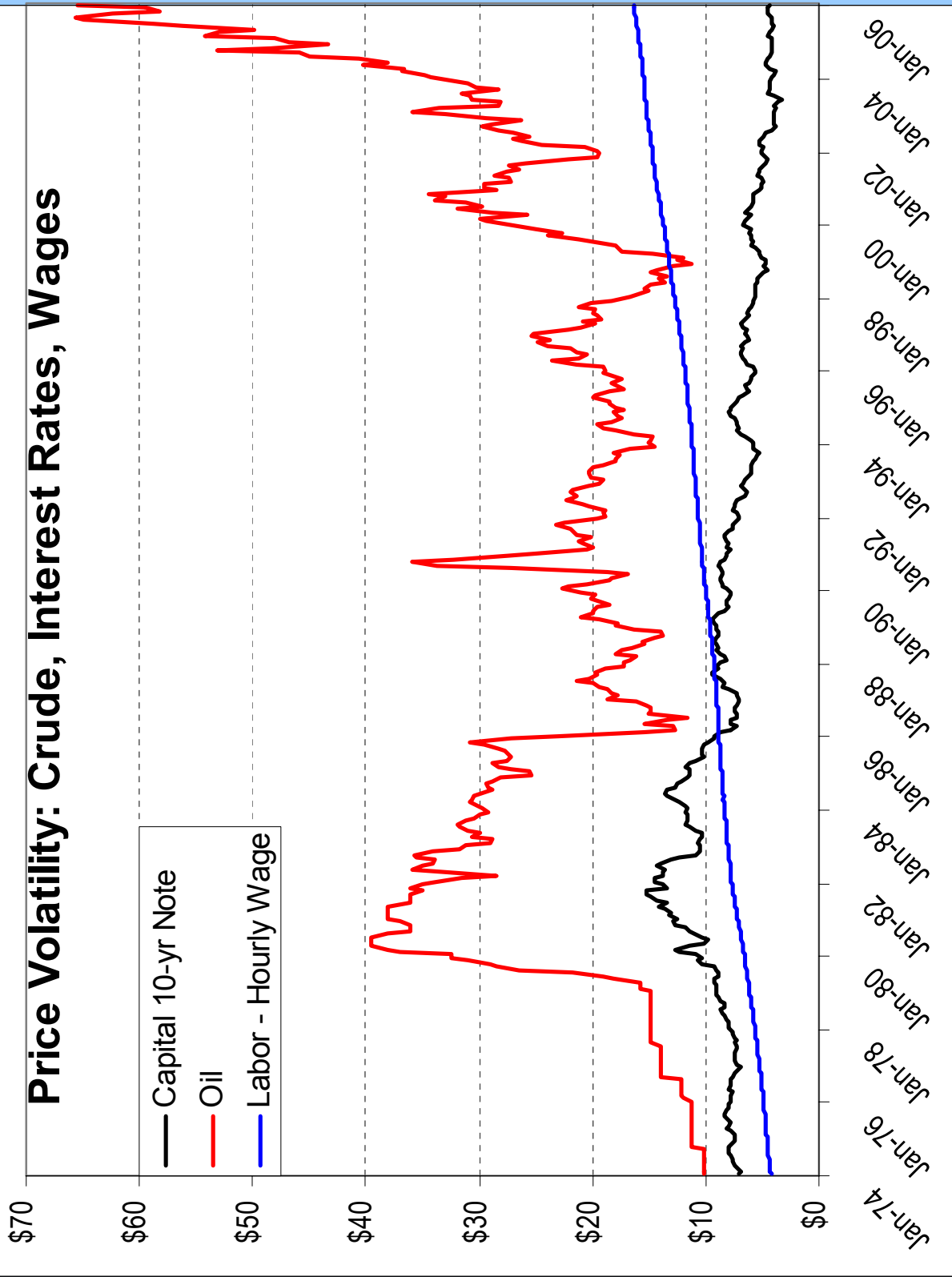
Firms do not generally fund themselves with overnight loans, and do not staff themselves with ‘day labor’, but they do rely on the spot market for energy.

This is all the more unfortunate because the volatility of energy costs is much greater than that for labor or capital, making the reliance on spot markets very dangerous to the viability of the firm and the stability of its earnings.



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# Price Volatility: Crude, Interest Rates, Wages



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**PRICE VOLATILITY:**  
Normalized Standard Deviation (monthly)

Capital	0.334
Labor	0.333
Crude Oil	0.437
Gas	0.621



## PRICE VOLATILITY:

### What does this mean for costs of production?

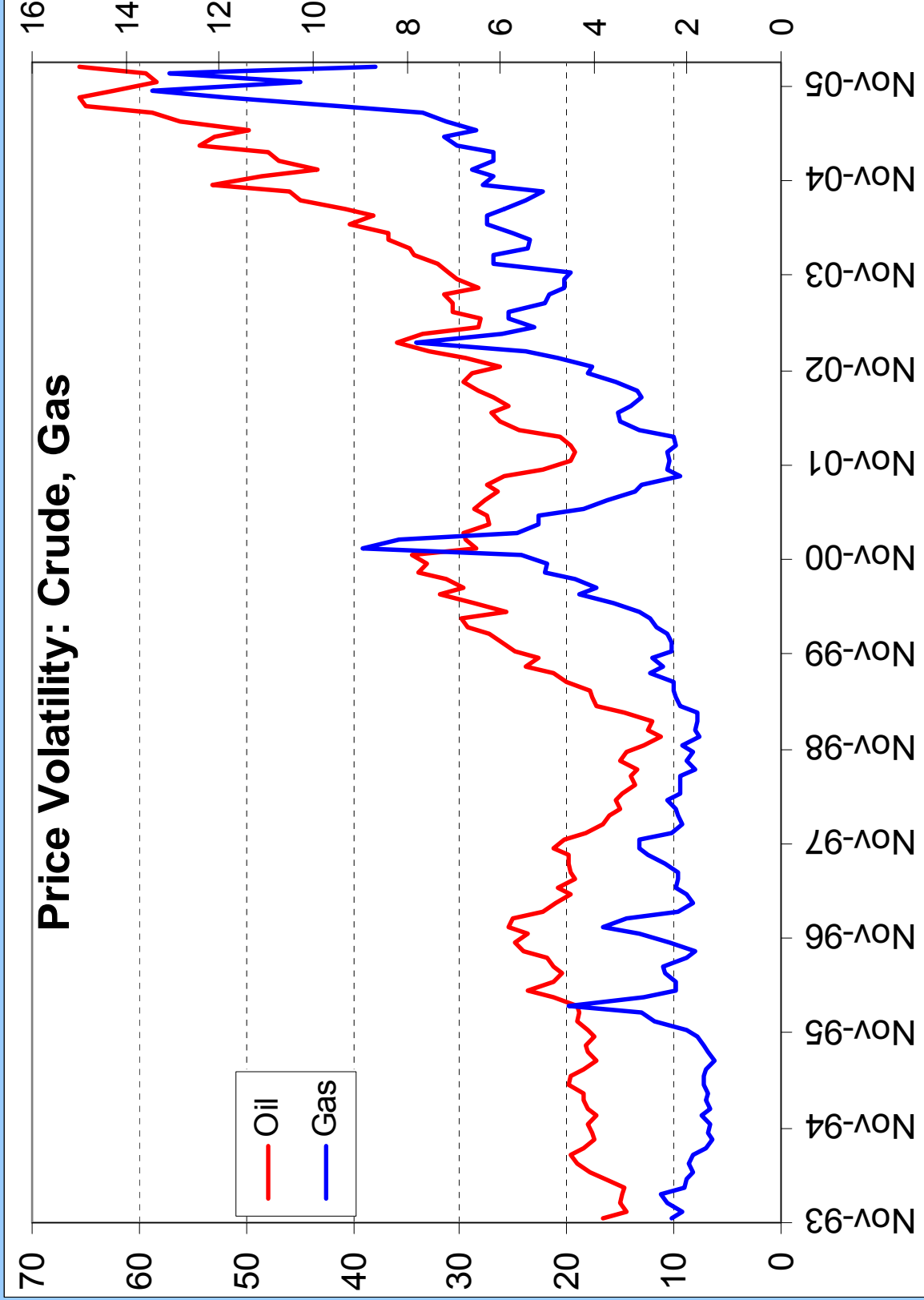
The following chart looks at the volatility of energy prices. Crude oil prices, dollars per barrel, are on the left and natural gas prices are on the right (dollar per million BTU).

Although oil and gas price to not move in lock step, they do exhibit a great deal of correlation. Thus they do not serve well as substitutes.



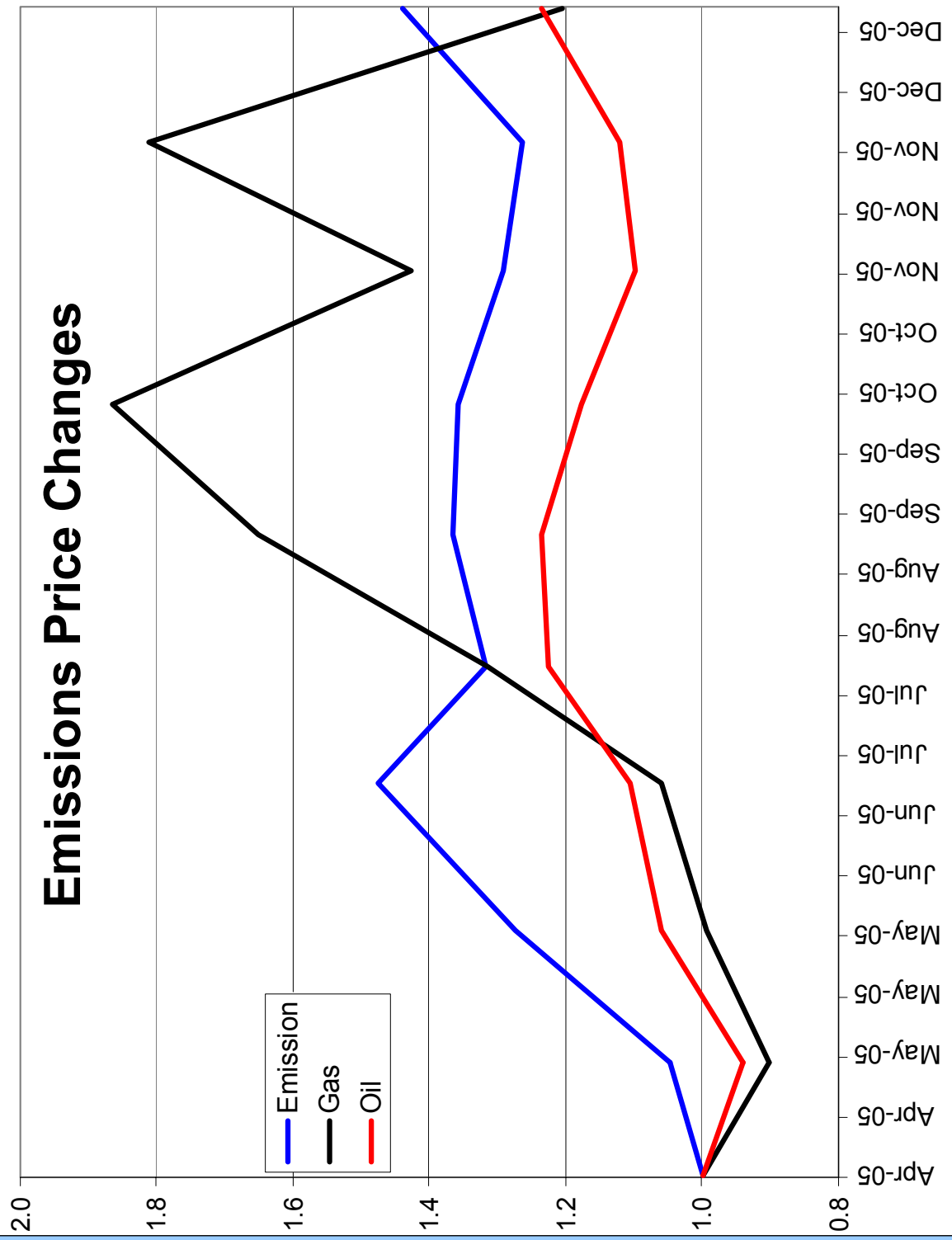
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# Emissions Price Changes



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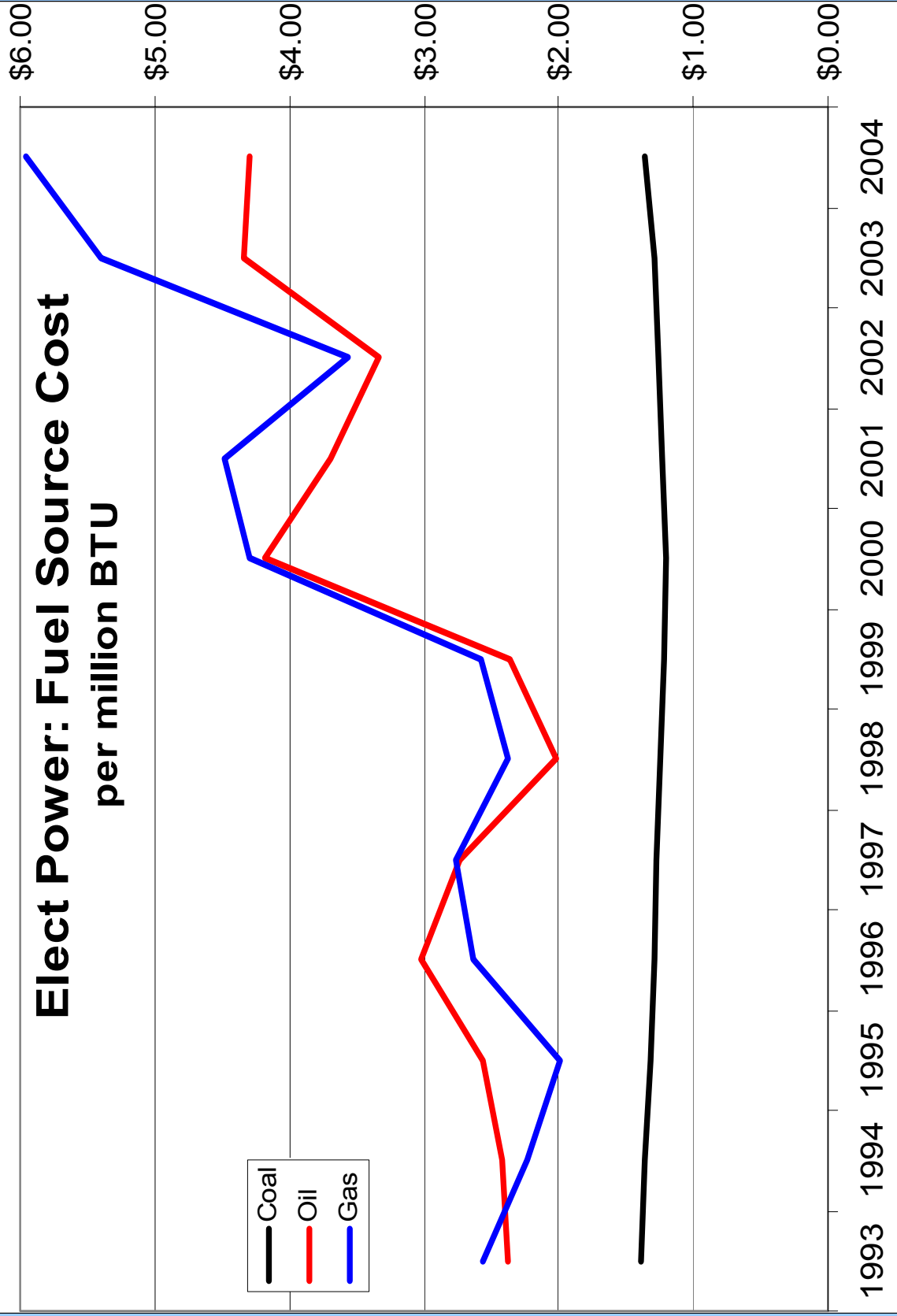
# PRICE VOLATILITY: Electric Power

Electric power prices are linked to the price of natural gas. As gas prices rise, so too does the cost of electrical power.



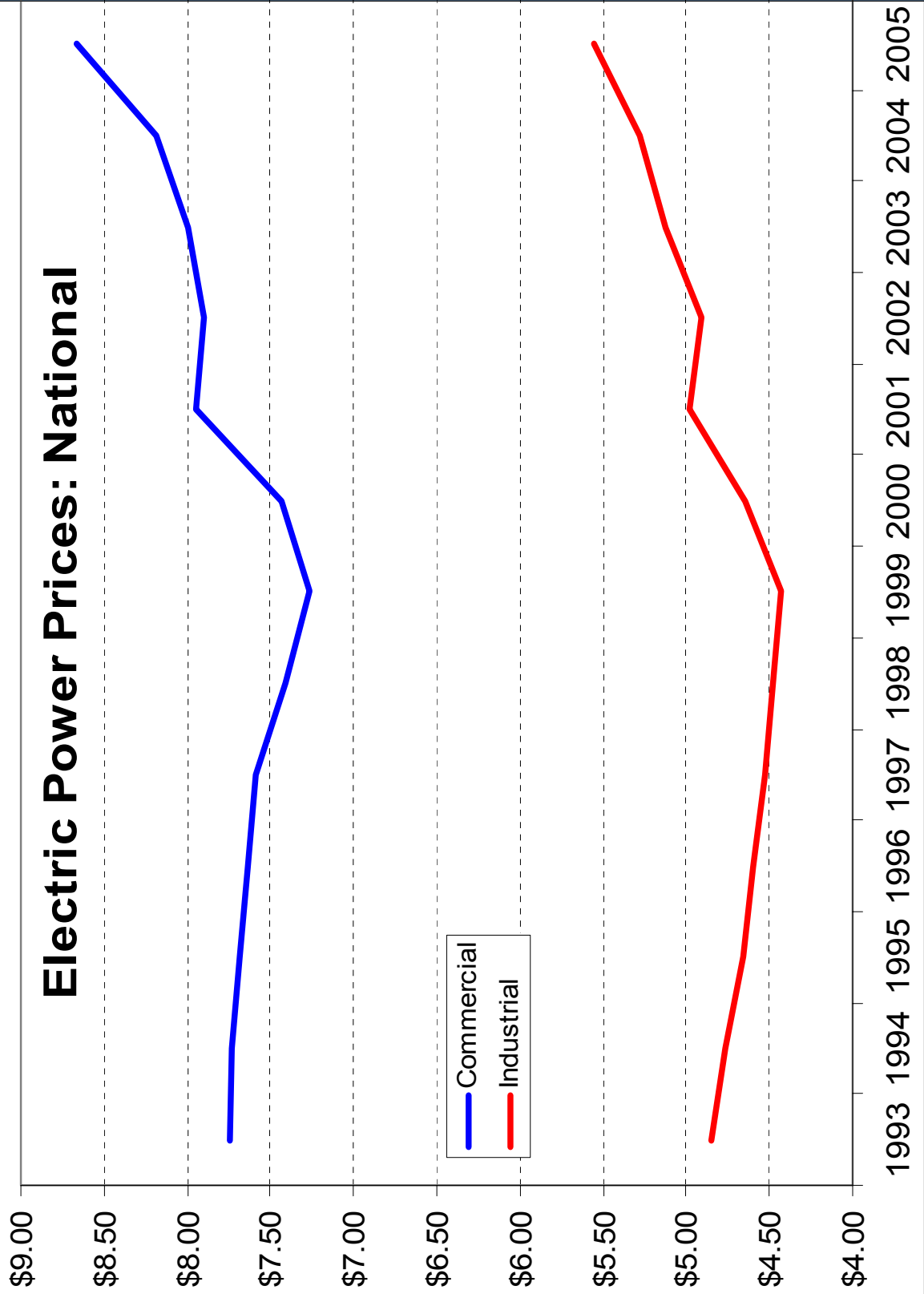
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# Elect Power: Fuel Source Cost per million BTU



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# Electric Power Prices: National



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# Good news is.....

You can hedge a great deal of this volatility through the careful use of energy derivatives markets.

## Advantages

- Shift risk to those more willing or able to bear it
- Establish future market prices that provide signals for investment and consumption
- Reduced exposure to market risk is something creditors and investors should price into the costs of credit and the price of securities. In other words, a hedge is something that you ought to be able to take to the bank.



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# Bad news is.....

Derivatives markets do not always work as well as promised, or even as well as needed.

## Problems

- Illiquidity
- Shallow, especially at longer maturities (tenors)
- Mispricing – subject to manipulation and fraud



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# Policy Response

How to address short-comings in derivatives markets

1. Better management of credit risk
  - Netting
  - Collateral
2. Capital adequacy for dealers/ market-makers
  - Better provision of liquidity
  - Obligations on dealers to maintain bid-ask quotes
  - Real time price disclosure/ reporting
3. Multilateral trading facility
  - Better policing of pricing function of market
  - Larger trader position reporting requirements
  - Clear, enforceable prohibitions on fraud and manipulation



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