

Long-Term Contracts and Institutional Structure

Lessons from the Natural Gas Industry

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Why Contract Long-Term?

- Markets characterized by high degree of uncertainty and relationship specific conditions
- Contingencies and provisions left out of ex ante agreements (incomplete contracts)

Benefits of Long-term Contracts

- Minimize transaction cost when significant specific assets are required
- Overcome the hold-up problem without vertical integration (Klein, Crawford, and Alchian, 1978, Williamson, 1979)
- Provide sufficient investment incentives and inexpensive ex- post renegotiation
- Reduce inefficiencies in ex- ante investments or ex-post exchange (Grossmann / Hart, 1986, Hart / Moore, 1988)

Take-or-Pay Contracts



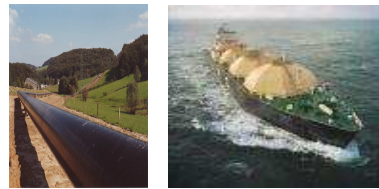
Seller

Secure return on investment

commits to deliver up to a quantity x_{\max}

→ *PRICE RISK*

Contract



Buyer

Flexibility w.r.t. volumes

commits to pay for $x_{\min} \leq x_{\max}$ whether taken or not

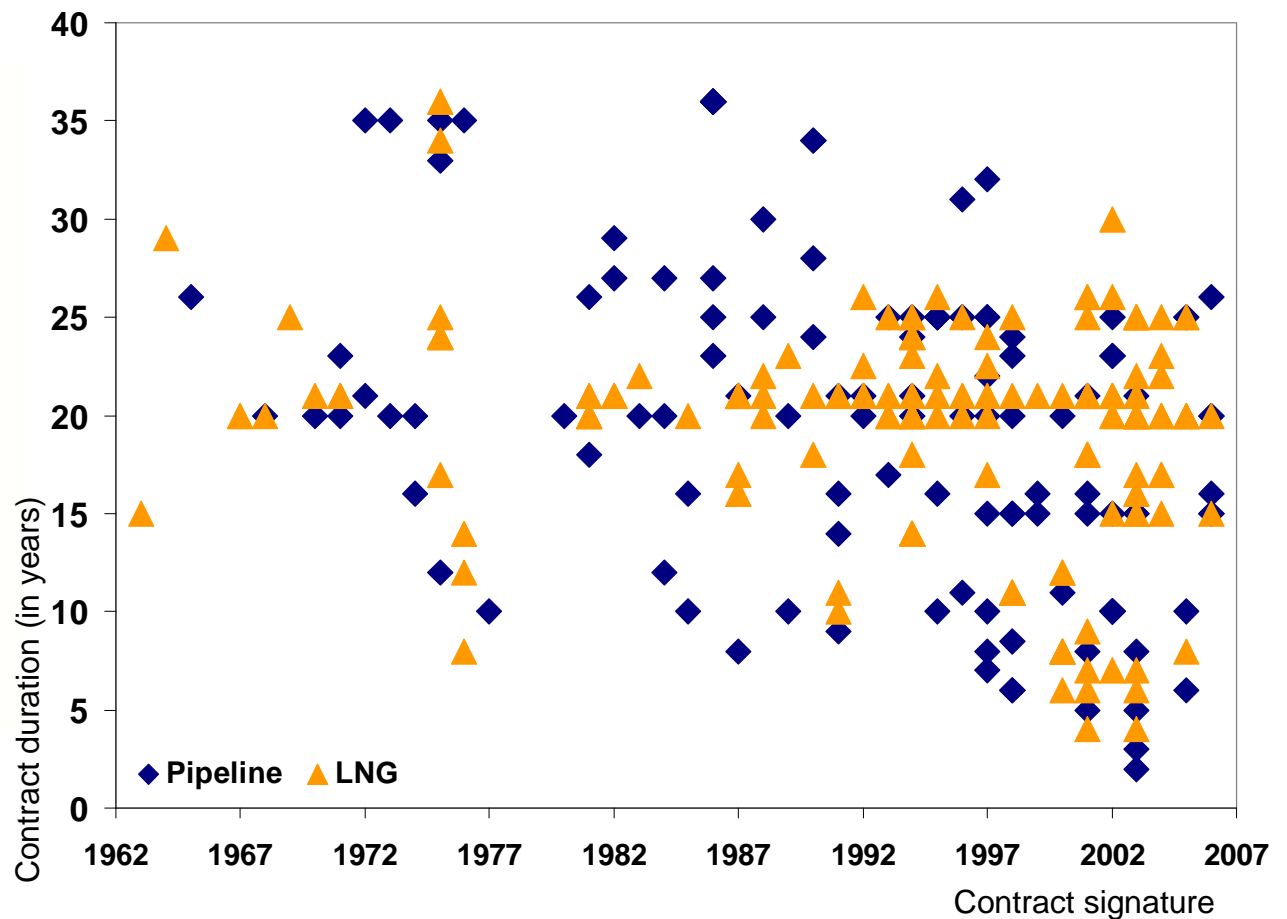
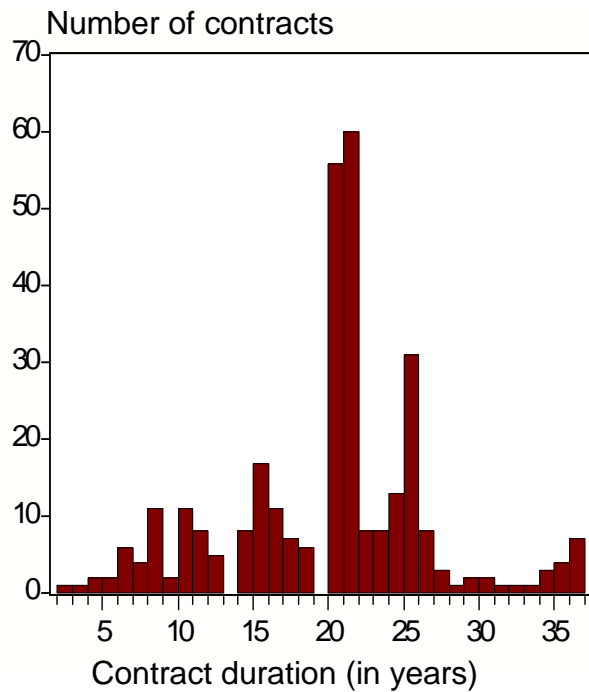
→ *QUANTITY RISK*

- Take-or-pay quantity
- Price with fixed and variable part
- Price indexation
- Price adjustment clause
- Swing-Option

Gas Pricing Formula (Europe)

- Constant basis price
 - value of gas at time of entering contract
- Escalation supplement linking gas price to energy substitutes
 - light fuel oil, coal, electricity (weighted averages)
 - price change is multiplied by energy conversion factor
 - individual escalation terms multiplied by impact factor
 - Natural gas prices are highly responsive to price changes in substitutes (high volatility)
 - Price adjustment of substitutes is the difference between current and historic prices
 - Current prices are average for reference period (3-9 months)

Decreasing Contract Duration?



Changes in the Industry

- Asset-specificity decreases
 - Significant cost reductions along value chain
 - Increasing number of market participants
 - Growing importance of spot trade
- Long-term contracts loose importance in liberalized markets
- Contract structures evolving towards more flexible arrangements; corporate structures depend upon specific strategy options