

## Lecture 8: Arms Production

### Context

- Cold War was a very strange period with rising and generous military spending and procurement
- World milex and arms exports peaked in the mid-1980s, fell gradually at first, then rapidly with the disintegration of the Soviet Union.
- Arms trade halved mid 1980s-90s
- Milex has now bottomed out and is rising –particularly War on Terror effect in US
- These trends have reinforced US dominance >40% world milex.

### Military Industrial Complex (MIC)

- Cold War saw growth of MIC –partic in US: Eisenhower
- MIC reflects the vested interests around military spending
  - Military
  - State
  - Capital
  - Labour
- Dynamics of Cold War –provide justification for increased allocation of use of resources without any obvious change in threat
- Wasteful and inefficient but debate over economic effects
- Understanding of its role in capitalism
  - Permanent arms economy: positive
  - Institutionalist: negative

- **Cold War DIB**
- Particular characteristics of major weapons system production led to rather particular corporate structures
- Role of government important:
  - When mainly private (US)
  - When mainly public (Fr)
- Industry size, structure, trade are all determined by government: main customer and regulates exports.

### **Differences from civil**

- An emphasis on performance of high-technology weaponry rather than on cost
- risk borne by government, which often finances R&D and in some cases provides investment in capital and infrastructure
- the prevalence, outside the US, of companies that are national monopolies or close to it.
- elaborate rules and regulations on contracts, to compensate for the absence of any form of competitive market and to assure public accountability
- Incumbents favoured
  - Firms who specialise in defence work become better at getting money of govt rather than being successful in commercial markets. –know way round red tape
  - close relations between contractors, procurement executive and military, notably the ‘revolving door’
- As a result of the structure of the market there are both barriers to entry and barriers to exit, which led to the Cold War DIB showing remarkably stability in terms of its composition of main contractors.
  - Market barriers
  - Technological barriers
  - Procedural barriers
- But of course production for military not homogeneous
  - Large and small etc

- Particular features:
  - Concentration of production
  - high fixed R&D costs
  - steep learning curves
  - economies large relative to size of market
- so expect problems when demand declines
  
- **End of Cold War**
- The end of the Cold War produced not just a quantitative change in the amount of weapons required, but a qualitative change in the type of weapons required.
  - Revolution in Military Affairs: network centric warfare and asymmetric conflict
  - Some hangover from previous designs
- technology: spin off to spin in
- changes in government policy to DIB
  
- Government dilemma
  - Pressure to reduce costs
  - Introduce Competition
    - reduce prices
    - problem maintain competition
    - problem maintain innovation
    - Tension between benefits of scale and competition
- The fixed costs of R&D for major systems continue to grow and all but the US, thus face structural disarmament: particular problem for major European countries
- Problem of security of supply?

## **Corporate Responses**

- convert
- diversify
- cooperate
- concentrate
- internationalise

## **Company Changes**

- Systems integrators
- Subcontracting
- International supply chains
- Cross ownership, joint ventures
- Hollowing out: role of finance capital
- Spin in rather than spin off: COTS
- Intra network trade
- Marketing and lobbying

## **Developments -summary**

- Strategic developments: Asymmetric Warfare: Peacekeeping Roles: War on Terror NATO enlargement:
- Economic Developments: Changes in demand: Inertia: Economic growth Linkage to other sectors: Internationalisation: Employment
- Political Developments: Privatisation of production and PFI; Privatisation of defence services and support: EU enlargement: European Defence Agency. Code of Conduct: Arms Trade Treaty:
- Technological developments; From Spin-off to Spin-in: Dual-use technologies: Cooperation and collaboration: Communications technologies and internet:
- Social developments: changing gender and class nature of the workforce: as companies change and sourcing; reduced share of production workers; change in union structures.
- Peacekeeping roles are changing the nature of the armed forces.
- Changing geographical and international imperatives:

## **Restructuring**

- US Defence Mergers: last supper: govt sponsored 1993-7 merger wave
- European restructuring different but consolidation still happening to some degree
  - Ownership differences
  - Requires cross country mergers: BAE systems/ EADS/ Thales: Racal

- Only US can afford comprehensive national DIB
- Increasing importance is the 'hidden' defence spending.
- Unlike most manufacturing industries, which went multinational, the arms industry remained national.

### **Global Arms Market**

- With cuts in Cold War exports became increasingly important
  - Allows maintain output levels despite cuts
  - Allows lower average costs through economies of scale
- Theoretically might expect industry to be competitive at international level as many buyers and sellers potentially, but it is not
- Few arms companies private entities in reality. Govt has direct influence esp on government to government transactions
- Govt has controls on firm to foreign government transactions
  - Export controls; Quotas and sanctions; Global arms market
- Prices may not reflect a market prices in any real sense
  - Aid to allies; Offset deals; Subsidising exports
- Quotas may lead to deadweight loss to exporting economy, but may give security benefits keeping arms away from enemies

## **Concentration and Restructuring**

- Data on Concentration
  - SIPRI company database
  - Sample top 100 1990 onwards
  - Valuable resource
- Expect increase in concentration but what we get is very large
  - Herfindahl index doubled 1990-1998 for arms sales, bit less for total
  - US 15 majors 1993 and only 4 in 1996: Govt stopped
  - top5 went from 22% to 42% arms production 1990-2000
  - Sutton lower bound 20%
  - Others close to lower bound
  - Total sales more concentrated and increase less 33%-40%

## **Observations**

- Expect increase in concentration following fall in demand but this rather large
- Proportionate decline in miles less than decline in number of equivalent firms. So decline in demand not full explanation for reduced no. firms
- Fall in R&D less than decline in miles so fixed costs have risen.
- Suggests nature of market concentrated: like pharmaceuticals civil aerospace
- National government's policies have prevented inevitable concentration

## **Evolution of Concentration**

- Econometric analysis (Gibrat) did not suggest concentration is the result of company characteristics
- fall in arms sales not reflected in total sales: suggests firms responding well
- Transition matrices: most exit medium to small size groups
- Continuing concentration but now not so much to reduce capacity as to gain new capabilities:
  - Ended for majors but still going on for smaller companies
  - New companies joining club: IT, electronics
- Govt attitude changes: US concerns home production; EU concern for industry restructuring

## Conclusions

- Change but also continuity particularly in the nature of the markets and the relations between the main producers and government. There are important changes that have taken place, but it is still political rather than economic logic that controls the market at heart
- End of Cold war industry restructured and it continues –but differences
  - Arms industry relatively unconcentrated -close to lower bound
  - Reason: government national procurement
  - Decline market and rise R&D intensity led to increase in concentration
  - So still a way to go if governments allow
- Certainly econometric analysis did not suggest concentration is the result of company characteristics
- Important difference between US and Europe need further investigation
  - US restructuring continues
  - EU restructuring some way to go -some areas/regions producing major weapon systems, with rest niche production/supply chain?
- US dominance; US and European links; but new global players -internationalisation
- Primes still maintain dominance but:
  - Lot of new companies coming in – but could have takeovers
  - Different industrial sectors involved more
  - Outsourcing of military services
  - Parts of the MIC now have an interest in conflict –rather than just the production of arms
- Have had a reinvention of the MIC?
  - Less visible
  - More invasive of civil
  - More international
  - Less controllable
  - Linked to conflict
  - Need international scrutiny –important governance issues

## South Africa –has seen

- Growth of Milex
- Development of lobbying: MIC
- Changing role of armed forces
- Demand side adjustment:
  - Procurement and offsets: considerable debate
  - Armscours
  - Exports:
- Industrial Restructuring:
  - Denel
  - Private Sector
  - Role foreign companies
- Use of offsets to maintain industry: niche markets
  - Opportunity cost
  - Corrupting influences
  - Inefficiencies
  - Sustainability
  - Reinforcing existing structures
- Loss of clarity: economic arguments for military spending
  - Clear can't afford a DIB and debate should be
    - niche player –without subsidy
    - intelligent customer

## **Market Structure -theory**

### **Monopsony**

- Government are the monopoly buyer
- But firms have some monopoly power and regulated
  - Government is asking for weapons that don't exist
  - Limited number of companies can provide them
  - At one time foreign supply would not have been considered in major producing countries
- So price not necessarily lower

### **Bilateral Monopoly**

- Firms can have monopoly power as only compete in initial phase of contract
- Charge higher price for lower output than competitive as reflects willingness to pay
- But government has monopsony power, so actual price depends on bargaining strength of the two
  - If arms producer has alternative civil it will be stronger
  - If national champions stronger –threat of exit
  - Firms in industry become experts at getting money from government – lobbying
  - This is why new entrants struggle
- Explains cost overruns and high prices

### **Principal agent problem**

- Can also explain high prices
- Uncertainty and risk endemic in market
- Asymmetric information: firm knows true cost government doesn't –moral hazard
- Principal pays more than would if perfect info which even more expensive to get
- Get underinvestment in cost reduction and quality improvements
- To avoid moral hazard
  - Fixed price contracts –can lead to high prices as include risk premiums but can be good deal
  - Cost plus contracts: actual costs plus agreed profit rate –caused many problems in past
  - Incentive based contracts: pay a fee and fraction of contract costs; depends on firm leverage
- Governments may get firms to reduce costs by helping them to make money in export markets\

### **Strategic Games**

- Clearly can model behaviour as strategic games
- Government versus company with threat –eg foreign sourcing- credible?

**Externalities**

- Could argue that the high prices represent deadweight loss
- But also could argue there are other benefits to society –spillovers, externalities
- Less convincing now but imp argument in past
- Can think of as societies demand higher than governments and so is its willingness to pay
- So could demand more and justify higher price than govt could bargain