3. ECONOMIC BEHAVIOR UNDER SHORTAGE.

Shortage creates uncertainty of supply (quantity and quality).

All enterprises had coexistence of slack and shortages. However, only the "shortage goods" had value to the enterprise because they were the constraint to increasing output.

3.1.Short term adjustment to shortage.

- forced substitution. => reinforced incentives for "statistical" plan fulfilment.

  - *Tolkachi* (pushers), *blat*.
    Wasteful costs of assuring priority supply.
    Contrast with market economy.

- Barter and grey market.
  Oil in the machine …but seeds of corruption.
  Difference between grey and black market.
  High transaction cost of grey market plus sunk cost =>
  Incentive to engage more and more in black market activity

  Black market withdraws goods from plan. One reason for underestimation of Soviet GNP.

3.2. Medium term adjustment to shortage.

- Ministries and plan changes.

Micawber effect: enterprises discouraged if short of plan =>
Bad for ministerial plan. => Ministries decrease too high plans
but increase plans in other enterprises.
Need sufficient control over supply deliveries
(conflict with *Gossnab)*.

Changes of enterprise plans lowered their time horizon, paradox
given the objectives of central planning!

- Bargaining for lower plans.

Planner

	believes	upgrades
truthful	100 5	90 0
lies	110 10	100 5

manager

Equilibrium

- Demand.

  Most important component is hoarding demand.

  High inventory-output ratio's.
  30% in USA   60% in USSR

  Inventories USSR

	1965	1980
inputs	58.5	59.4
production	20	22.4
output	16.4	13.6

Hoarding demand can create shortage.

Assume needs = 100   Supply = 100   over the year.

Inventory cost c.

Order 10 ten times per year: *10c*

Order 100 1 time per year: *100c*

=> Less costly to order 10 ten times per year.

However, if uncertainty of supply and 10 ordered today and 50% chance of getting orders fulfilled, potential huge irreparable loss on output side => may be preferable to demand 100 today.

But 100 today cannot be satisfied by supply! Shortage ! Reproduces!

Hoarding demand cannot be fulfilled if there was initial shortage.

$\Rightarrow$How to explain high inventories since inventory demand cannot be satisfied under shortage.

Possible explanation: asymmetric information (planners do not know real needs => input misallocations (microeconomic inefficiencies).

3.3. Long term adjustment to shortage.

- Tendency towards vertical integration.
  Enterprise level: despecialization of production. Enterprises produced their own spare parts, tools, sometimes their own electricity at costs 50 to 100% higher.
   Ministry level: despecialization.

Product	Percentage produced in the responsible ministry.
Construction material	37
plastic	32
Automated equipment	57
Suphuric acid	56
trucks	64
Bricks	62
tractors	75

Source: Gorlin 1985.

- Search for a size effect.
  Helps in getting higher in the priority chain.
- Expansion investment rather than modernization.
  - ministerial ratchet effect.
  - innovation increases uncertainty.
  x: output
  r: input
  a: input coefficient

$$x = \frac{1}{a} r \Rightarrow \mathrm{var}(x) = \frac{1}{a^2} \mathrm{var}(r) \uparrow with \downarrow a$$

- overinvestment