

ANNEX B

Markets, Output, and Bounties As Determinants Of R&D

1. The Market Structure and R&D

The patent protection confers on an inventor firm monopoly power, which is positively linked to R&D activity. The causality runs from innovation activity to monopoly market structure. To sustain R&D activity, monopoly power is to be accorded to the inventor. Schumpeter-inspired hypotheses, in contrast, suggest that the possession of monopoly power is itself conducive to innovation. That is, an existing monopoly market structure will determine the pace of innovation. As the market structure moves from monopoly to duopoly to looser oligopoly, the ability of firms to hold prices at monopoly levels breaks down. When that happens, the quasi rents per firm will be too small to cover R&D costs not only because the new product market is divided into so many slices, but also because price competition has eroded the market's profitability.

There is a clash between market structure and incentives for innovation. Up to a point, the **stimulus factor** works: increased fragmentation stimulates more rapid and intense support of R&D. But when the number of firms becomes so large that no individual firm can appropriate quasi rents to cover its R&D costs, innovation can be slowed or even brought to a halt.

Historical studies reveal that high concentration in such North American and European industries as synthetic fibers, synthetic rubber, synthetic dyestuffs and derivative organic chemicals, electric lamps, telephone equipment, aircraft engines, and photographic supplies was caused in part by vigorous innovation combined with patent and/or barriers to imitation. Empirically, it is less clear that these tendencies have survived in recent times. The existing evidence favors a conclusion that innovation under late twentieth-century conditions has tended to be more concentration-reducing than the opposite.

In general, larger and diversified firms have a favourable effect on the vigor of R&D efforts. There is statistical evidence that the fraction of total industrial R&D outlays devoted to basic research rises with overall firm size and greater diversification. Vigorous support of basic research, in turn, appears to be positively associated with higher innovative output across individual firms and higher productivity growth across broadly defined industry sectors.