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Industrial Organization of Lockheed Martin: An Analysis

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Industrial organization concepts are important for firms to understand as they contribute to the success or failure of the business. The concepts of interest, for Lockheed Martin (LM) in particular, are mergers and acquisitions, research and development efforts, and intellectual property rights. Mergers occur when two or more firms join together and LM is known for its many mergers that have allowed it to gain dominance. The most recent merger attempt is one of concern, however, as it is a direct action to reduce the capabilities of the competing firms. Research and development is what brings about the innovations that drive business success and advance society as a whole. At its core, LM is a research and development company, due to the nature of the defense industry and the need to secure highly competitive contracts. LM's research and development budget is a large part of its contract expenses, while it also has a decent budget for improving internal systems and processes. Intellectual property is a result of these research and development efforts as new ideas are created and need to be protected in some way. Deciding to patent or keep the idea as a trade secret is a hot topic that requires some analysis to determine the best approach given the specific scenario. LM's approach to intellectual property appears to be ideal as it balances patents and trade secrets well. All of the decisions in these different industrial organization areas contribute to the success of LM, although there are certain aspects that seem to need adjustment based on the limited, public information provided in the 10-K. Because of LM's vast market share in the defense industry and solid grasp on intellectual property, it should focus more on internal technological improvements to increase productivity and reduce costs as opposed to attempting mergers and acquisitions that will likely be denied and draw expensive and unnecessary legal scrutiny of its motivations. Mergers and acquisitions can still be considered, but only if they can be defended on the grounds of increasing social welfare rather than the recent merger attempt, which is a direct action to reduce competition.

Mergers are an important aspect of economic growth as they are intended to accelerate technological advancements, reduce duplicate efforts, and lower costs. Since “robust competition is critical to preserving America's role as the world's leading economy”, regulating mergers is crucial (Executive Order No. 14,036, 2022). Two basic types of mergers are horizontal mergers, when firms that produce similar products join together, and vertical mergers, when a firm acquires one of its suppliers. Although most of the focus is on horizontal mergers to prevent firm dominance in a specific industry, vertical mergers can also have severe implications if not monitored closely. This is exactly what happened with the merger described in LM’s Form 10-K.

LM was in the process of a vertical merger with Aerojet Rocketdyne (AR), a supplier of propulsion systems (Lockheed Martin, 2022, p. 3). LM sounded hopeful that the merger would be accepted, likely due to the weakening of antitrust laws which has made it “harder [for antitrust authorities] to prevail in court, causing them to be more cautious in the mergers they challenge” (Shapiro, 2019, p. 75). Even so, the merger was unanimously denied by the FTC in a 4-0 vote, on the grounds that it would inefficiently prevent competitors from acquiring key inputs, since LM would control the “country’s last independent supplier of key missile propulsion inputs” (Lordan, 2022). AR being the last domestic, independent propulsion supplier and LM’s hypocrisy in noting that competitor mergers would negatively affect business is what makes this attempted merger seem careless (Lockheed Martin, 2022, p. 8). LM likely thought it could perform the merger because it had succeeded in many previous mergers and became a dominant firm in the defense industry. This is a poor way to view mergers, however, as they need to be based on clearly increasing social welfare. The merger should not have been considered, as it makes LM appear unaware of the merger guidelines and the more general social contract that permits high market power and profit in exchange for generating innovations that serve the general public.

R&D is often crucial for firms to stay competitive and capitalize on breakthroughs while increasing social welfare. Research can be used to innovate new technologies to be sold as products, enhance existing products, or even used to enhance internal processes that result in increased productivity and reduced costs. The power of internal improvements is emphasized by Bessen (2020) in his statement that “increasingly, it seems, top-performing firms utilize new technologies productively, while their rivals do not.” (p. 31). These top firms, such as LM, have the R&D capabilities to innovate new technologies and integrate them into their process to increase efficiency, more so than smaller firms.

R&D is a crucial aspect for defense companies in securing contracts in one of the most advanced industries. According to the Form 10-K, LM had net sales of \$67 billion in 2021 and spent \$1.5 billion on internal R&D which is a \$200 million increase from the previous 2 years (Lockheed Martin, 2022, p. 3, 75). This increase is partly due to the internal improvements made to the workforce management technology (Lockheed Martin, 2022, p. 7). In 2021, LM focused human capital and R&D finances on improving this internal system to allow for more streamlined operations. This involves upfront spending, which increases cost in the short run, but will hopefully reduce average and marginal costs to lower levels than before the R&D once the new system goes online. Contracts also require their own R&D which increases the overall cost of contracts and the R&D budget (Lockheed Martin, 2022, p. 75). By allotting the \$1.5 billion for internal R&D efforts in addition to the normal R&D needed for satisfying contracts, LM is able to stay ahead of the competition and capitalize on increased productivity. Seeing there were outdated systems and allocating precious R&D budget to improve them is an exemplary application of industrial organization concepts and will allow LM to gain more market share if the magnitude of cost savings and/or product enhancements that result is large enough.

We live in the age in which intellectual property (IP) rights are increasingly important for encouraging innovation. Patents, a form of IP, offer protection to the innovator for 20 years, but require at least partial disclosure on the specifics of the innovation. This is a deterrent in some cases, as even partial disclosure of an innovation might yield imitations from competitors, ultimately decreasing the value of the original idea for the firm. If a firm does not want to disclose any information about the innovation, they can hold onto it as a trade secret. In a study by Anton & Yao (2004), they found that “for small and medium-sized innovations, the innovator has a strong incentive to patent” but larger innovations lend themselves to protection through secrecy “as a response to the problem of imitation” (p. 3, 11). This cautions policy makers that important innovations are often kept as trade secrets rather than disclosed in patents, which is the case with LM.

Due to how little was disclosed in the Form 10-K, LM is likely to have a multitude of trade secrets. LM notes its large portfolio of patents and trademarks while also emphasizing that it develops its own IP, often in the form of trade secrets. LM also emphasizes that, although its IP is important for business operations, losing any existing IP would not have a “material adverse effect” on the business (Lockheed Martin, 2022, p. 6). This is most likely due to the nature of the defense market. The industry is highly concentrated and unique, as instead of innovating for IP rights, the firms innovate to win contracts that in turn protect the generated IP rights and the main work source. Trade secrets seem to be more secure than patents and disclosure in this market, since the other firms in the market would need to take time away from contract procurement to research and discover the competitors’ trade secrets. Because of this unique market structure, LM appears to be taking the correct stance on IP with keeping trade secrets when possible and staying ahead of the competition with limited disclosure.

LM has generally done well in industrial organization terms and making decisions that have led to their great success and dominant position in the defense industry. LM's position on intellectual property, especially with respect to maintaining trade secrets, is an ideal application of economic concepts; however, the approach to mergers should be improved. As a firm evolves, its actions often have to evolve as well. LM is familiar with mergers being used to gain market share and increase productivity; but with the defense market being as highly concentrated as it is now, it is likely that few mergers will be approved in the future. Since mergers are mainly out of the picture, LM should instead focus on improvements to its internal technologies. With a large firm, the development and/or improvement of internal technologies will be utilized to great effect and drastically increase productivity and reduce costs. This effect can imitate that of merging with a competitor to gain technological knowledge and increase productivity, or performing a vertical merger to reduce input costs, all while increasing social welfare and not directly reducing competition (Fig 1). Because of this, it is the optimal strategy from the eyes of the government, which would decrease the chances of higher regulations on the defense industry that would negatively affect LM's profits. The government might even provide subsidies for the internal improvements, as it would ultimately reduce the cost of the contracts of which they are the primary consumer. If LM makes a breakthrough discovery during these internal improvements that drastically increase productivity and reduce costs below all of the competitors, a natural monopoly will form and greatly increase LM's profits while also increasing social welfare with lower contract costs (Fig 2). By making the moves towards more internal improvements instead of reaching out for more market share directly through mergers, LM will be able to increase productivity, reduce costs, and likely gain more market share without having directly compromised the ability of their competitors.

Graphs

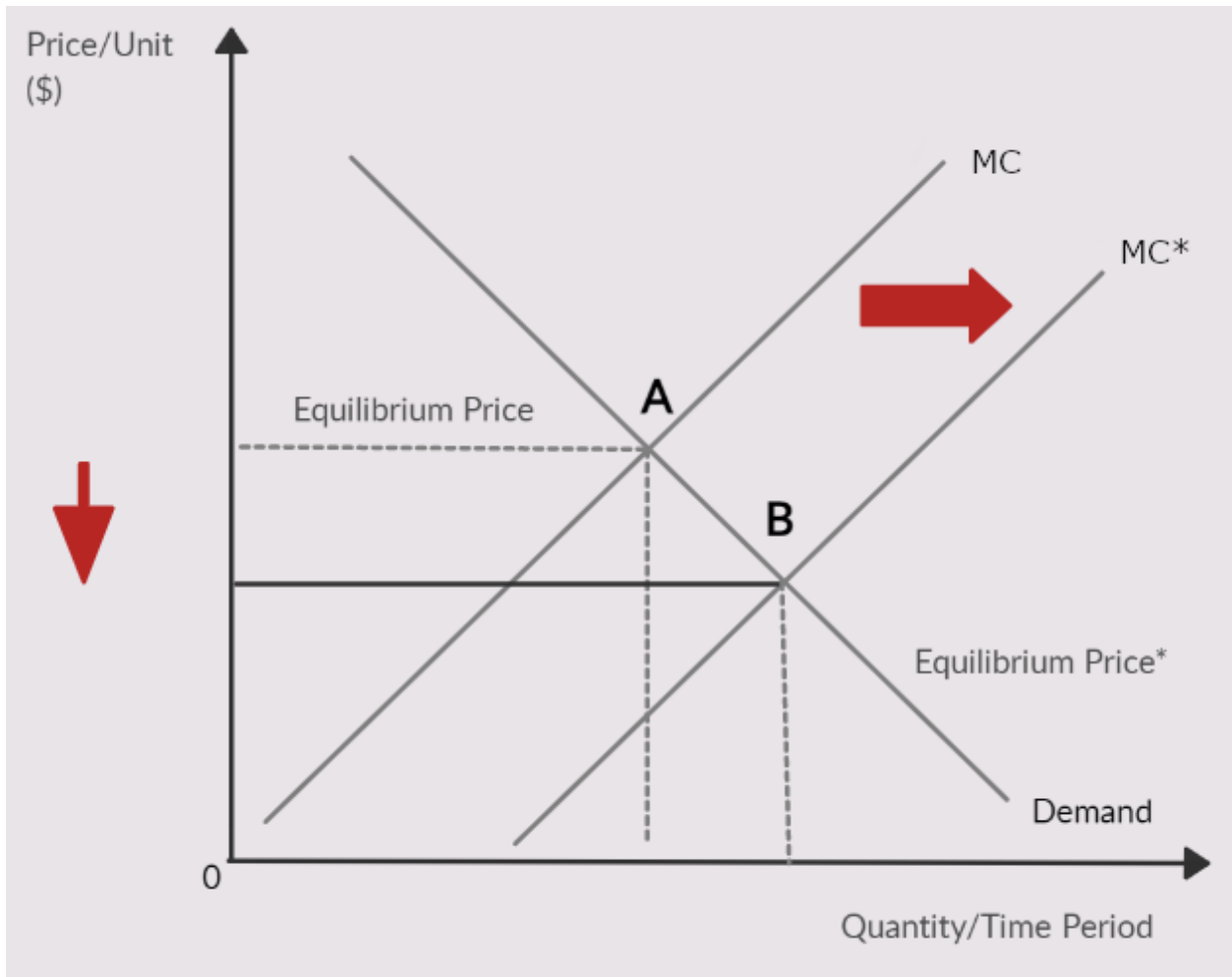


Fig 1 - Technology improvement that increases productivity will effectively shift the marginal cost curve to the right and result in lower prices and more quantity supplied

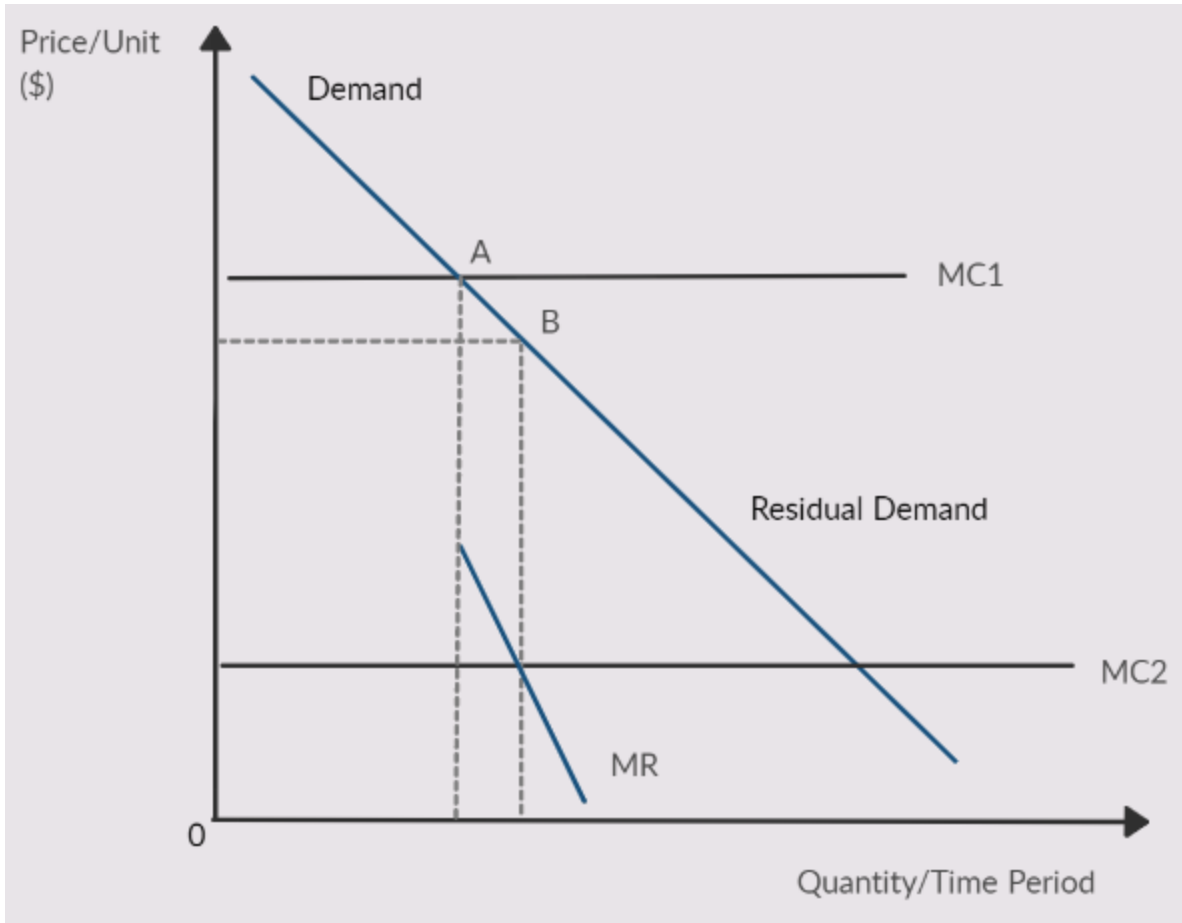


Fig 2 - If the firm makes a large enough breakthrough on internal advancements, their marginal cost will be lower than all competitors and they will become a monopoly with lower price and higher quantity supplied

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