



The Meaning of Competition: A Graphical Exposition

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HIRSCHEL KASPER, Section Editor

The Meaning of Competition: A Graphical Exposition

Donghyun Park

Competition is one of the most pivotal concepts in the undergraduate teaching of economics. Students usually learn of perfect competition as a particular market structure that is especially useful in gaining an understanding of resource allocation and efficiency. It is a market structure that consists of a large number of perfectly knowledgeable buyers and sellers who are individually too small to affect the market price and who engage in the exchange of a homogeneous good. Students also learn that competitors and resources can freely enter into and exit from competitive markets. Students are taught that perfect competition requires an absence of strategic interaction—firms do not take into account the possible responses of other firms to their own actions. A concept that is related to perfect competition yet distinct is that of price-takers—an industry consisting of firms that act as if they face essentially perfectly elastic demands for their products. Price-takers is a weak concept because it does not require that those firms be either knowledgeable or numerous.

According to another definition of competition, *competition* and *to compete* refer to the same thing. *To compete* means to cut prices, advertise, invest in R&D, and so forth. *Competition* denotes a dynamic process of rivalry among firms in which only the fittest survive and thrive. This is probably what the concept means to most businessmen and entrepreneurs. Within economics, this interpretation of competition is most closely identified with the neo-Austrian school of thought. I use the term *neo-Austrian* somewhat broadly to denote economists who view competition as a process rather than an equilibrium. I include Joseph Schum-

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peter, although he is not, strictly speaking, a neo-Austrian. According to Ekelund and Saurman (1988, 75),

The neo-Austrian view of competitive process dovetails perfectly with J. A. Schumpeter's view of competition as "creative destruction." In Schumpeterian terms, as in those of the neo-Austrians, competition is most fruitfully viewed in dynamic terms. Entrepreneurs are thus the prime movers of the economic process in the Austrian-Schumpeterian conception.

An unfortunate neglect of dynamic competition exists in the undergraduate teaching of economics. Such neglect is understandable in light of time constraints and teaching objective priorities. However, it is only fair that students be at least introduced to the other competition, even at the level of principles. Otherwise, they may develop a one-sided, prejudiced view of a whole range of economic phenomena. The basic goal is to suggest a simple graphical method for developing a brief yet illuminating introduction to competition as a dynamic process and its relationship with the more familiar competition as a market structure.

THE SCHUMPETERIAN VISION OF COMPETITION

Competition as a dynamic process is hardly a new concept (Ekelund and Hébert 1981); its roots go as far back as Richard Cantillon. David Ricardo (1817), John Stuart Mill (1848), and Adam Smith (1776) all contributed to its evolution. These and other classical economists thought of competition as a description of competitive behavior, especially with respect to prices. As McNulty (1968, 649) notes:

Thus, the single activity which best characterized the meaning of competition in classical economics—price cutting by an individual firm to get rid of excess supplies—becomes the one activity impossible under perfect competition.

Machovec (1995) and Kirzner (1997) provide recent surveys of the dynamic interpretation of competition. It would be accurate to say that this view of competition dominated classical economics, and the competition that appears in today's textbooks came much later. In the process of evaluating the effects of competition, Cournot (1838) pioneered the re-invention of competition as a market structure. Contributions by Jevons (1871), Edgeworth (1881), Clark (1900), and Knight (1921) have reinforced, refined, and perfected Cournot's initial efforts. Stigler (1957) and McNulty (1968) provide excellent accounts of the historical evolution of the meaning of competition.

As often happens, the original meaning of competition had largely been lost. Hayek, von Mises, Kirzner, Schumpeter, and other adherents of the neo-Austrian school of economic thought played leading roles in the rediscovery of competition as a dynamic process. Unlike their classical predecessors, the neo-Austrians emphasized elements of competitive behavior other than price cutting. Their influential works helped later generations of economists understand the inherent conflict between the two definitions of competition. In particular, their contribution to the evolution of modern economics was to point out that competitive behavior had no role whatsoever in a world that satisfied all the assumptions of perfect competition. As Hayek (1948, 96) put it,

The peculiar nature of the assumptions from which the theory of competitive equilibrium starts stands out very clearly if we ask which of the activities that are commonly designated by the verb “to compete” would still be possible if those conditions were all satisfied. Perhaps it is worth recalling that, according to Dr. Johnson, competition is “the action of endeavoring to gain what another endeavors to gain at the same time.” Now, how many of the devices adopted in ordinary life to that end would still be open to a seller in a market in which so-called “perfect competition” prevails? I believe that the answer is exactly none. Advertising, undercutting, and improving (“differentiating”) the goods or services produced are all excluded by definition — “perfect” competition means indeed the absence of all competitive activities.

As Hayek’s words make clear, the two meanings of competition contradict each other. By their very definitions, the paradigm of perfect competition precludes competitive behavior and competitive behavior precludes the paradigm of perfect competition. How can sellers try to offer buyers better deals when all sellers are assumed to be equal? How can sellers be equal when sellers are trying to offer buyers better deals? Why do sellers need to advertise when buyers are assumed to have perfect information, and how can we assume that buyers have perfect information when we observe so much advertising around us?

It seems that product homogeneity is the point of departure for the perfect competition model. The reason is that the perfect competition model describes a particular market structure, and the very notions of markets and market structures become less than clear-cut in the presence of product heterogeneity. On the other hand, once competition is viewed as a dynamic disequilibrium process rather than a specific kind of a static equilibrium, product homogeneity is not only unnecessary but unnatural as well. The whole point of competing, from a purely private point of view, is to be better than one’s rivals. And being better necessarily implies being different from and hence heterogeneity. Such selfish and self-interested competition is also desirable from a social point of view because it promotes efficiency and social welfare.

As any businessperson knows, there is more than one way of competing. One possibility is to compete on the basis of price. Yet it is quite clear that, for the most part, price competition was *not* what the neo-Austrians had in mind when they used the term. Their competition was primarily quality competition, in which firms try to beat their competitors by producing and selling new, improved goods and services. In this connection, the works of Schumpeter are particularly illuminating. Schumpeter (1912, 1942) envisions a dynamic world in which new products and technologies constantly drive out old products and technologies.

The first thing to go is the traditional conception of the *modus operandi* of competition. Economists are at long last emerging from the stage in which price competition was all they saw. As soon as quality competition and sales effort are admitted into the sacred precincts of theory, the price variable is ousted from its dominant position. However, it is still competition within a rigid pattern of invariant conditions, methods of production and forms of industrial organization in particular, that practically monopolizes attention. But in capitalist reality as distinguished from its textbook picture, it is not that kind of competition which counts but the competition from the new commodity, the new technology, the new source of supply, the new type of organization (the largest-scale unit of control for instance)—competition which commands a decisive cost or quality advantage and which strikes not at the

margins of the profits and the outputs of the existing firms but at their foundations and their very lives. This kind of competition is as much more effective than the other as a bombardment is in comparison with forcing a door, and so much more important that it becomes a matter of comparative indifference whether competition in the ordinary sense functions more or less promptly: the powerful lever that in the long run expands output and brings down prices is in any case made of other stuff. (1942, 84–85)

It is possible to view Schumpeter's competition as a broader, deeper definition of quality competition. Regardless of what one calls Schumpeter's vision of competition, the kinds of competitive activities he deems most significant should be clear. In the long run, what separates the successful from the unsuccessful competitors is the ability to create, invent, and innovate. For example, invention of the automobile eventually rendered efficiency in making stage coaches irrelevant.

It is helpful to consider the strategic aspects of the innovative process as well as the determinants of success in innovative activities. Because R&D expenditures represent a choice variable that influences the probability of innovative success, it may be possible to argue in the extreme that firms may collude not to invest in R&D. Why would any firm invest in R&D when all the other firms can also do so and thus also enjoy innovative success?

A possible answer is that although a relationship undoubtedly exists between R&D expenditures and innovation, the relationship is at best random. That is, a lot of uncertainty is involved in the innovative process. One can think of this process as a lottery where many players buy tickets, but only one winner emerges. A second possible answer is that some firms may be more efficient in R&D than others. Such efficiency may reflect the firms' superior relative efficiency across all activities. One can say that the ultimate source of the innovator's success is either luck or efficiency. In any case, in the real world, one observes a lot of innovations and a lot of commercial success resulting from innovations. Furthermore, the possibility that strategic collusion may reduce innovation does not in any way diminish the social benefits of dynamic competition but instead points out the social cost of collusion.

TWO VIEWS OF COMPETITION AND TWO VIEWS OF MONOPOLY

The two definitions of competition have drastically different implications about the welfare consequences of monopoly. It is worth noting that competition as a market structure and competition as a dynamic process are not only descriptive but normative as well. That is, they do not merely describe the nature of competition, they inform us that competition is socially beneficial. Because the two differ in how they perform the first task, it should come as no surprise that they differ in how they address the second task as well.

Any microeconomics textbook explains why competitive markets are socially preferable to other kinds of markets in terms of efficiency; this is one of the primary lessons for undergraduate economics students. They learn about the equality of price and marginal cost in competitive markets and the efficiency such equality implies. Neo-Austrians believe that their kind of competition is also

socially desirable. For them, it is the Schumpeterian process of “creative destruction” in which products and technologies are always in a state of flux that is largely responsible for mankind’s material progress. In the stage coach analogy, the neo-Austrians would focus upon the social benefits associated with the invention of the automobile rather than those associated with a competitive market for stage coaches.

The standard textbook theory of monopoly, like the standard textbook theory of competition, is essentially a theory about a particular market structure. More precisely, it describes a market in which only a single seller charges a higher price and produces a lower quantity than would prevail in a competitive market. The dead-weight losses or social costs associated with monopoly are often illustrated in the classroom with the Harberger Triangle (Harberger 1954). As far as monopoly is concerned, what students basically learn is that monopoly is inefficient, inefficiency is socially undesirable, and hence monopoly is socially undesirable. As any principles textbook shows, the unmistakable teaching focus is on how a monopolist behaves rather than how a monopolist becomes a monopolist in the first place. To the extent that the second issue is dealt with at all, it is usually only tangentially in the context of natural monopoly or collusion among sellers.

Once we equate *competition* with *to compete*, as the neo-Austrians do, the distinction between competition and monopoly becomes blurred at best. What is the ultimate goal of competitive behavior if not to take business away from one’s competitors or, equivalently, to attempt to become ultimately a monopolist? Thus, equating *competition* and *to compete* necessarily amounts to equating *competition* and *to monopolize*.

The Schumpeterian vision of omnipotent technological progress suggests that an important, if not the most important, means of beating one’s rivals is success in innovative activities. A host of legal as well as nonlegal barriers to entry protect successful innovators from competition for some time, and enables them to become monopolists. By their very definition, innovations of all descriptions create temporary monopolies. The essence of the competitive process is the continuous creation and destruction of such temporary monopolies.

Most economists would agree that one needs to know the source of monopoly power before one can make judgments about a monopoly (Armentano 1990). It makes all the difference in the world whether a firm has achieved a position of monopoly because it is run by a dictator’s nephew or because it produces cheaper, better products. Demsetz (1973) has played a prominent role in developing the notion of superior productive efficiency as a source of monopoly power. Imparting to the student a more balanced understanding of monopoly requires a discussion, however brief, of such views. Yet it seems to be true that, as with competition, undergraduate teaching of monopoly concerns itself almost exclusively with market structure.

A SIMPLE STORY AND SOME SIMPLE DIAGRAMS

I propose a simple method for teaching the undergraduate student about the differences between competition as a market structure and competition as a

dynamic process. This method is intended to provide an introduction to the differences between the two indirectly by graphically illustrating the social gains and losses from each definition of competition rather than by providing the definitions themselves. Thus, the student can gain a fuller understanding of the meaning of monopoly.

The point of departure is the standard textbook analysis of competitive markets and monopolistic markets. For the sake of concreteness, consider the market for TV sets. Suppose there are two periods, period 1 and period 2. Initially, in period 1, there are only black and white TV sets. Then, a competitive market is more efficient than a monopolistic market. In Figure 1, triangle tkz indicates the social surplus associated with a competitive market, quadrangle $tkrq$ indicates the social surplus associated with a monopolistic market, and triangle qrz indicates the efficiency losses associated with a monopolistic market.

In period 2, assume an absence of Schumpeterian competition and innovation in period 1. In this case, if the factors affecting demand remain fairly stable as well, Figure 1 would be a reasonable representation of the period 2 market for black and white TV sets.

Assume instead vigorous Schumpeterian competition in period 1. Suppose that a single firm emerges victorious in this competition by finding a way to significantly cut the costs of producing black and white TV sets and becomes a monopolist in period 2. In Schumpeterian terminology, cost-cutting ability may result from new technology, new source of supply, or new type of organization. Then it is perfectly possible for price, output, and social surplus under the monopolistic market in period 2 to be lower, higher, and higher, respectively,

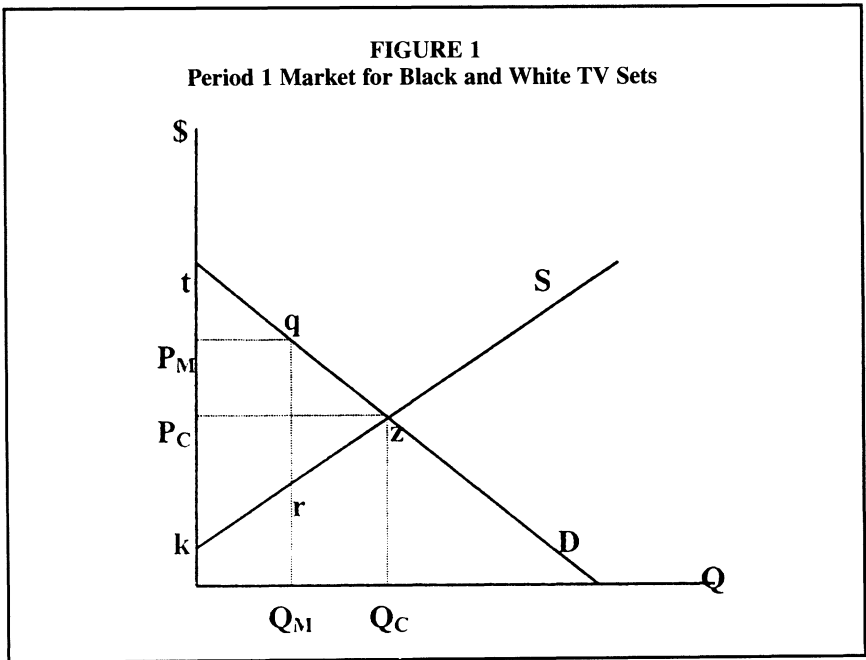
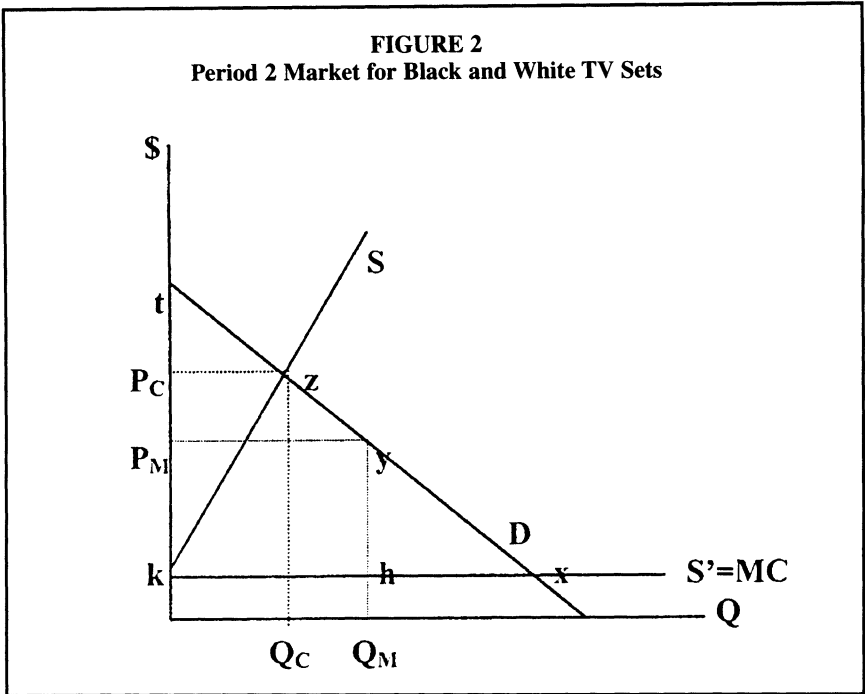


FIGURE 2
Period 2 Market for Black and White TV Sets



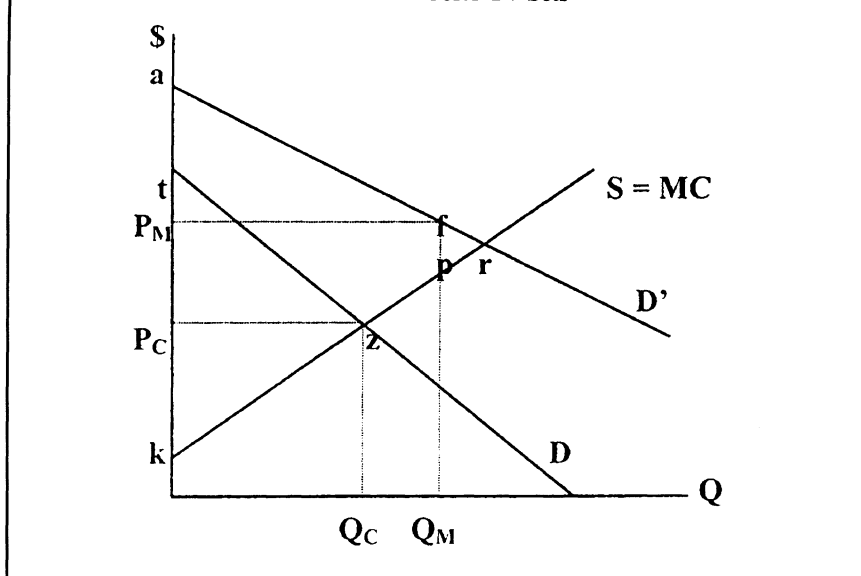
than the price, output, and social surplus under the competitive market in period 1 (see Figure 2).

In Figure 2, S represents the supply of the competitive industry while S' represents the constant marginal costs of the period 2 monopolist, who charges a lower price and produces a higher output than would have prevailed in a competitive market without any Schumpeterian progress. The social surplus associated with the Schumpeterian monopolist in period 2 is quadrangle $tkhy$; the social surplus associated with the competitive industry in period 1 is tkz . Therefore, quadrangle $kzyh$ represents the dynamic efficiency gain or the increase in efficiency between the two periods.

More precisely, quadrangle $kzyh$ is an overestimate of this gain because Schumpeterian competition diverts resources from elsewhere in the economy. Because the monopolist is likely to advertise and advertising raises demand, quadrangle $kzyh$ may also underestimate the dynamic efficiency gain although we have to take into consideration the fact that advertising also involves the use of scarce resources. The static efficiency loss caused by the market structure being monopolistic rather than competitive in period 2 is triangle yhx .

Let us again assume Schumpeterian competition. Once again, a single winner emerges. This time, the winner wins not by finding a way to produce black and white TV sets but by inventing a new product—color TV sets—in period 1. The inventor produces and sells the invention in period 2. Suppose that, in period 2, color TV sets completely displace black and white TV sets so the winner of the Schumpeterian technological race again becomes a monopolist.

FIGURE 3
Market for Color TV Sets



In Figure 3, for the sake of graphical simplicity and clarity, I have assumed the marginal costs of the monopolist in period 2 to be identical to the supply of the competitive industry in period 1. D' represents the demand for color TV sets in period 2 whereas D represents the demand for black and white TV sets in period 1. Then the social surplus associated with the Schumpeterian monopolist in period 2 is quadrangle $akpf$ whereas the social surplus associated with the competitive industry in period 1 is again triangle tkz . Therefore, pentangle $atzpf$ represents the dynamic efficiency gain or the increase in efficiency from period 1 to period 2.

More accurately, pentangle $atzpf$ will overestimate this gain because the inventive process itself would have used up resources. On the other hand, pentangle $atzpf$ may underestimate the gain because the monopolist is likely to advertise. The static efficiency loss in period 2 caused by the market structure being monopolistic rather than competitive is triangle fpr . Although Figure 3 should not have two different products on the same quantity axis, I have deliberately drawn it this way to illustrate the main point—successful innovations produce a greater social surplus even if they result in the displacement of competitive markets by monopolistic markets. It is perhaps best to think of Figure 3 as one diagram superimposed on top of another.

SOME FURTHER STORIES

It is possible to use this graphical method for a number of teaching purposes other than illustrating the difference between competition as a market structure and competition as a dynamic process. Most significant, it can illustrate the

notion that not all monopolies are created equal. If a market that was competitive in period 1 turns monopolistic in period 2 for reasons that have nothing to do with superior productive efficiency (e.g., collusion among sellers or a dictator's gift to his nephew), then what one would normally consider to be the static efficiency loss would be, in effect, the dynamic efficiency loss. To the extent that the monopolist is productively *inefficient* relative to a competitive market, as is plausible in the case of the dictator's nephew, the dynamic losses would be even greater. However, a monopolist who has become a monopolist by winning the Schumpeterian competition will generate efficiency gains.

It is helpful to remind the student that the possibility of socially beneficial monopolies or, more accurately, monopolistic markets carries significant implications for government policy. If one views competition primarily in the textbook sense, the government should be duly concerned about and attempt to influence market structure. If one views competition largely in Schumpeterian terms, the case for government interest in and interference with market structures is much weaker. More generally, a sound antitrust policy will have to take into account both static and dynamic considerations.

Perhaps the classic example of the policymaker's tradeoff between the two kinds of considerations is that associated with patent policy. Patents confer a legal monopoly on the inventor of a new product or a new production technique. As such, they inevitably entail static efficiency losses. At the same time, they create dynamic welfare gains by creating the incentives to compete in the Schumpeterian sense.

A sensible way to motivate a discussion of the tradeoff implied by patents is to talk about how long a patent should last. The longer the life of the patent, the longer will the inventor enjoy a legal monopoly and hence the stronger will be his incentive to invent in the first place. But the longer the legal monopoly, the larger will be the magnitude of the deadweight losses. The shorter the life of the patent, the weaker will be the incentive to innovate, but the magnitude of the deadweight losses will be smaller.

I apply the graphical method not so much to illustrate the socially optimal life of a patent as to illustrate the rationale for patents. If imitation is relatively easy, in the absence of a patent the market for the invented product would quickly become perfectly competitive, seemingly the best of both worlds. But what motivates would-be inventors and would-be innovators is self-interest and profits rather than something abstract called the social surplus. Furthermore, they incur very real costs during the course of their endeavors, costs that they would not incur in the absence of a lucrative reward. In the absence of patents, there would be no competitive market for the invented product for the simple reason that the product would not have been invented. Now one can talk about the social desirability of patents or legal monopolies using the graphical method presented here.

CONCLUSION

Competition is one of the most important concepts taught in undergraduate economics courses. Because of the way in which economic thought has evolved

over the years, competition has become one of the most ambiguous concepts in economics. Whereas classical economists thought of competition primarily as a behavioral term, the subsequent course of events has turned it into a description of a particular market structure. The neo-Austrian school of thought—in particular, Joseph Schumpeter—and those economists influenced by it have been redefining the concept along classical lines, although with a much greater emphasis on invention, innovation, and technological progress.

In the classroom and in the textbooks, competition as a market structure continues to overwhelm competition as a dynamic process. This state of affairs is understandable in light of teaching objective priorities and time constraints. After all, the perfect competition paradigm represents a most indispensable tool for teaching about efficiency in allocation of resources. Yet the relative neglect of the dynamic interpretation is hardly a matter of passing interest. The reason is that students learn not only about competitive markets, they also learn that competitive markets are socially beneficial. Because competitive markets and competitive behavior, particularly of the Schumpeterian kind, often conflict with each other, there is a real danger that the narrow, one-sided understanding of competition imparted to the students will seriously prejudice and handicap their way of looking at a wide range of economic phenomena.

The method presented here represents an attempt to help redress this imbalance and thereby enrich the students' understanding of the concept. It is inevitable that competition as a market structure will always loom larger than competition as a dynamic process within the realm of undergraduate teaching, given the central significance of allocative efficiency in that realm. Nevertheless, I strongly feel the need for at least a brief introduction to the "other" competition, an introduction for which I hope this suggested method will be adequate. It is worth using this method to expose the student to the tradeoff between static and dynamic welfare considerations implicit in the competing definitions of competition. Finally, my method is suitable even for principles students, and perhaps that is the level at which it should be used.

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