

# Metcalfe's Law Is Wrong

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The devil is in the details. Of all the popular ideas of the Internet boom, one of the most dangerously influential was Metcalfe's Law. Simply put, it says that the value of a communications network is proportional to the square of the number of its users.

Source: IEEE Spectrum Magazine

The law is said to be true for any type of communications network, whether it involves telephones, computers, or users of the World Wide Web. While the notion of "value" is inevitably somewhat vague, the idea is that a network is more valuable the more people you can call or write to, or the more Web pages you can link to.

Metcalfe's Law attempts to quantify this increase in value. It is named for no less a luminary than Robert M. Metcalfe, the inventor of Ethernet. During the Internet boom, the law was an article of faith with entrepreneurs, venture capitalists, and engineers, because it seemed to offer a quantitative explanation for the boom's various now-quiet mantras, like "network effects," "first-mover advantage," "Internet time," and, most poignant of all, "build it and they will come."

By seeming to assure that the value of a network would increase quadratically, that is, by the square of the number of its participants, while costs would, presumably, grow linearly, Metcalfe's Law was the theory that justified the mad rush for growth and the neglect of profitability. It may seem a mundane observation today, but it was hot stuff during the Internet bubble.

Remarkably enough, though the nostrums of the dot-com era are gone, Metcalfe's Law remains, an implicit justification lately for a new wave of investment that is being contemplated--a Bubble 2.0 that appears to be inspired by the success of Google. That's a shame because, as authors Bob Briscoe, Andrew Odlyzko, and Benjamin Tilly demonstrate, the law is wrong. If we are to see a new, broadband-inspired period of telecommunications growth, it is essential that we not reprise the mistakes of the 1990s.

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