



## Are We in a Medical Education Bubble Market?

David A. Asch, M.D., M.B.A., Sean Nicholson, Ph.D., and Marko Vujcic, Ph.D.

In November 1636, the prices of tulip bulbs in the Dutch market rose rapidly from their normal level to the point where a single bulb might sell for 10 times the annual earnings of a typical worker. Just

as quickly, in May 1637, tulip-bulb prices returned to their previous values. The causes of this dramatic rise and fall remain in dispute. The event occurred during the Dutch Golden Age, when stock exchanges, central banking, and many of the fundamental structures that govern contemporary capital markets and the approaches deployed by MBAs today were developed.

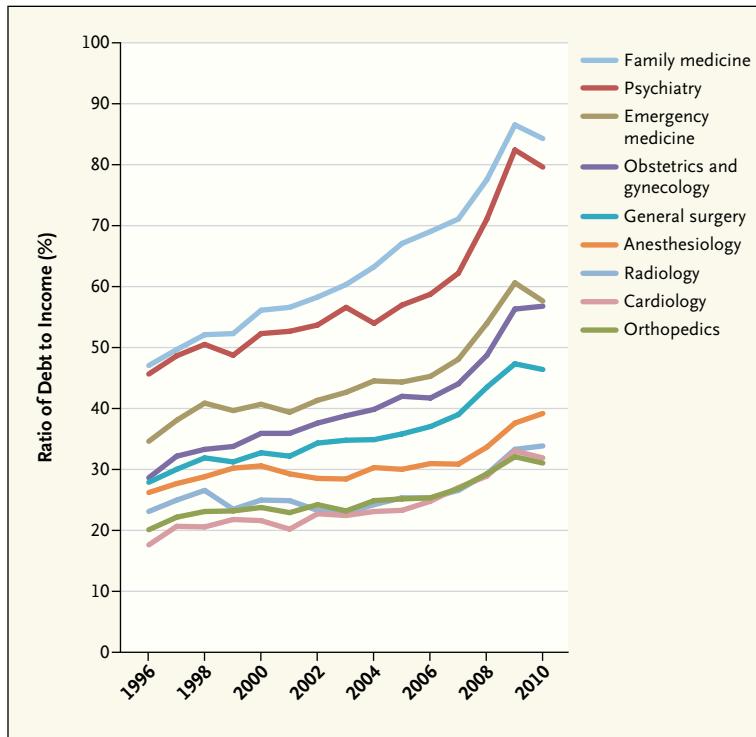
One modern economic analysis suggests that the precipitous decline in tulip-bulb prices resulted from a February 1637 change in the way that futures contracts were enforced, which immediately reduced the value of those contracts by 97%,<sup>1</sup> but this analysis doesn't explain why the

prices had shot up in the first place. Clearly, tulipmania was a bubble market fueled by speculation rather than intrinsic valuation. After all, why would people be willing to pay 10 times the average annual wage for a single tulip bulb unless they were confident that they could sell it to an even greater fool willing to pay even more?

Bubble markets are created when an asset trades for increasingly higher prices as it is bought by people who are hopeful about its future value and then sold to others with even more optimistic views of that value. Recent examples include the U.S. housing bubble, in which home prices rapidly rose until 2007 and then just as rapidly fell, and the dot-com bub-

ble, in which prices of Internet stocks rose until 2000 and then plummeted. Bubbles burst when some new sense of lower intrinsic value appears. The last buyers are stuck with something they paid too much for and can no longer unload. It's like being caught without a chair when the music stops, but whereas even the losers at musical chairs knew that at some point someone would be left standing, bubble markets are usually recognized only in retrospect — the losers never saw it coming.

Are we in a bubble market in medical education? In medicine, students buy their education from medical schools and residency programs (which pay wages that are lower than the value of the work that residents provide in return). This education is transformed into skills and credentials that are then sold to patients in the form of services. So long as it



**Figure 1. Ratio of Debt to Income, According to Medical Specialty.**

Data on median income are from the Medical Group Management Association. Data on average debt are from surveys conducted by the Association of American Medical Colleges.

is believed that patients, or whoever purchases health care on their behalf, will keep paying more and more for physicians' services, students and trainees should be willing to pay more and more for the education that enables them to sell those services.

A simple measure of this market economy is the ratio of the average debt of a graduating student to the average annual income in the profession on entry into the workforce. There are more precise ways to measure the return on investment in medical education — for example, the net present value of the stream of cash flows out (for education) and in (for services). But that value isn't very intuitive for most prospective students. In contrast, debt-to-income ratios reflect what stu-

dents must borrow rather than what they must pay and, given whatever other assets they may have, how much in the hole they have to go. Thus, these ratios may better reflect how students actually feel about buying education.

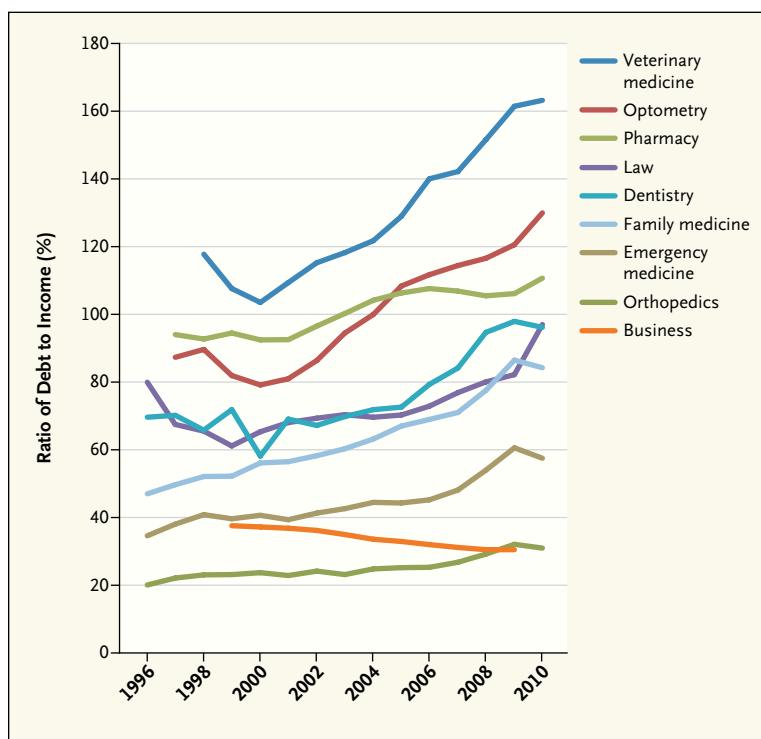
Figure 1 shows these ratios for selected medical specialties over the past 15 years and reveals that the ratio has become less favorable for students overall but particularly unfavorable for students entering family medicine or psychiatry. Although the cost of becoming a doctor is roughly the same whether you go into pediatrics or orthopedics, you earn much more in orthopedics.

The graph is instructive in another way: the debt-to-income ratio reveals the connection between what physicians can charge

patients and what schools can charge students. Just as tulip bulbs can be sold at high prices only to people who think they can resell them at still higher prices, schools can sustain their high tuitions only if students can be convinced of higher returns in the form of payments from future patients. So, the amount that schools are able to charge students is inextricably linked to how much we pay doctors now and how much we plan to pay them in the future. Medical students can take on enormous debt only because the costs of that debt can be easily passed along to others down the road.

So are we in a medical education bubble? We would realize we have been in one if a sudden collapse in what patients are willing to pay doctors made it impossible to sell medical education at current prices, causing applications to fall and some medical schools to cut tuition to continue to attract qualified applicants. Figure 1 might be seen as suggesting that we are approaching such a collapse in primary care fields and psychiatry. But that is not likely to be the case. First, at least at the level of undergraduate medical education, schools charge a single price to students whether they go into family medicine or orthopedics. Although it isn't necessarily clear to students or schools which students will choose what fields, the income of the average doctor can sustain the debt of the average doctor even as the differences among specialties create pressures for primary care and psychiatry.

Second, as high as the debt-to-income ratios may be for primary care and psychiatry, they are even higher for some other fields — notably, veterinary medicine, op-



**Figure 2. Ratio of Debt to Income, According to Occupation.**

Data on median income are from the Medical Group Management Association (physicians), the American Dental Association (dentists), and the Current Population Survey (other professions). Data on average debt are from surveys conducted by the Association of American Medical Colleges, the American Dental Education Association, the American Bar Association, the American Association of Colleges of Pharmacy, and the National Center for Education Statistics.

tometry, pharmacy, and dentistry, as shown in Figure 2. For veterinarians, incomes have risen slowly even as student debt has exploded.<sup>2</sup> Yet although such company may ease the misery of primary care physicians, it does nothing to solve the underlying problem.

The problem is this: if we aim to reduce the costs of health care, we need to reduce the costs of medical education. We don't have to believe that the high cost of medical education is what causes increases in health care costs in order to develop this sense of urgency. We just have to recognize that the high costs of medical education are sustainable only if we keep paying doctors a

lot of money, and there are strong signs that we can't or won't. Only about 20% of health care costs are attributable to physician payments, and many of the current efforts to reduce costs are aimed elsewhere, such as hospital payments, and have only indirect effects on physicians' earnings. But physicians' and dentists' earnings have been sluggish since the early 2000s.<sup>3,4</sup> Even if prospects for physicians' income fall fast, a burst bubble can be averted if schools see it coming before their students do and lower their prices.

The general lesson is that if we want to keep health care costs down and still have access

to well-qualified physicians, we also need to keep the cost of creating those physicians down by changing the way that physicians are trained. From college through licensure and credentialing, our annual physician-production costs are high, and they are made higher by the long time we devote to training.<sup>5</sup>

Although it seems unlikely that we're in a bubble market for medical education, we may already be in one for veterinary medicine. That bubble will burst when potential students recognize that the costs of training aren't matched by later returns. Then the optometry bubble may burst, followed by the pharmacy and dentistry bubbles. At the extreme, we will march down the debt-to-income-ratio ladder, through psychiatrists to cardiologists to orthopedists . . . until no one is left but the MBAs.

Disclosure forms provided by the authors are available with the full text of this article at [NEJM.org](http://NEJM.org).

From the Center for Health Equity Research and Promotion, Philadelphia Veterans Affairs Medical Center; and the Perelman School of Medicine and the Wharton School, University of Pennsylvania — all in Philadelphia (D.A.A.); Cornell University, Ithaca, NY (S.N.); the National Bureau of Economic Research, Cambridge, MA (S.N.); and the American Dental Association, Chicago (M.V.).

This article was published on October 30, 2013, at [NEJM.org](http://NEJM.org).

1. Thompson EA. The tulipmania: fact or artifact? *Public Choice* 2007;130:99-114.
2. Segal D. High debt and falling demand trap new vets. *New York Times*. February 23, 2013:BU1.
3. Seabury SA, Jena AB, Chandra A. Trends in the earnings of health care professionals in the United States, 1987-2010. *JAMA* 2012; 308:2083-5.
4. Vujcic M, Lazar V, Wall TP, Munson B. An analysis of dentists' incomes, 1996-2009. *J Am Dent Assoc* 2012;143:452-60.
5. Emanuel EJ, Fuchs VR. Shortening medical training by 30%. *JAMA* 2012;307:1143-4.

DOI: 10.1056/NEJMp1310778

Copyright © 2013 Massachusetts Medical Society.