In Depth: PERSONAL FINANCE

PERSONAL JOURNAL.





GETTING GOING

# If You Don't Know Your Math, You'll End Up Taking a Bath

Maybe we're just lousy at math.

The official savings rate remains stubbornly close to zero, mortgage and consumer debt leapt 7.4% in the 12 months through September, and the Pew Research Center recently reported that half of Americans rate their personal finances as fair or poor.

*By Jonathan Clements*

It's tempting to blame all this on financial recklessness. But consider another culprit: Our feeble math skills. Here's a look at where we go wrong—and how we can do better.

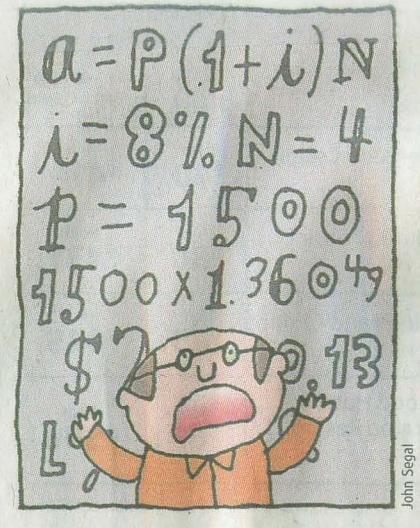
■ **Losing interest.** In a recent study, marketing professors Eric Eisenstein and Stephen Hoch found that most folks underestimated how much savings would grow and how much debt would end up costing.

The problem: People think in terms of simple interest, not compound interest. For instance, if our investments clock 8% a year for 10 years, we don't earn 80%, as many people assume. Rather, we would notch a cumulative 116%. Remember, we earn returns not only on our original investment, but also on the investment gains earned in earlier years. Similarly, with credit-card debt, we pay interest both on our original purchases and on any monthly interest charges we didn't pay off in full.

"People use simple interest because they don't know to use anything else," says Prof. Eisenstein, of Cornell University's Johnson Graduate School of Management. "The higher the interest rate and the longer the time horizon, the worse the error." He argues that this basic math mistake helps explain why people delay saving for retirement and why they postpone paying off credit-card debt.

■ **Guessing wrong.** It isn't just credit cards that trip us up. We also don't appreciate how much interest we're paying on loans that promise "low monthly payments," according to new research by Dartmouth College economics professors Victor Stango and Jonathan Zinman.

The two authors analyzed data from the Federal Reserve's 1983 Survey of Consumer Finances. For that survey, consumers were asked how much they would expect to repay in total, assuming 12 monthly payments, if they took out a $1,000 one-year loan to buy furniture.




John Segal

In response, folks gave answers such as $1,200, which means the effective interest rate was 35%. Yet, when consumers were asked what interest rate was implied, 98% underestimated the rate.

The fewer the number of monthly payments, the more we're likely to underestimate the interest rate charged. Why? When we do our mental calculation, we overlook the fact that, with each monthly payment, we're reducing the loan balance. With a short-term loan, these principal repayments are a big chunk of each monthly payment.

"We know these are hard problems," says Prof. Stango, of Dartmouth's Tuck School of Business. "It isn't surprising that people get the answers wrong. What's really surprising is that people are almost always wrong in the same direction. They underestimate the benefits of saving and they underestimate the costs of borrowing."

■ **Getting better.** What can we do to avoid these mistakes? Try three strategies:

■ If you're considering a loan with "low monthly payments," ask the lender what the finance charge is as an annual percentage rate. That will tell you whether the monthly payments are truly low.

"People are scared to ask the tough questions," Prof. Stango says. "They're worried about not getting approved for the loan. They don't want to seem naive."

■ To get a handle on the costs of borrowing and the benefits of saving, try playing around with some online financial calculators. You can find a great collection of calculators at www.dinkytown.com.

■ As you toy with whether to spend or save, keep in mind the rule of 72. If you divide 72 by the rate of return you expect to earn, that will tell you how long it takes to double your money.

Think you can earn 7% a year? Divide that into 72, and you will learn that doubling your money takes 10.2 years. The implication: If you saved $1,000, rather than spending it, you would have roughly $2,000 after 10 years, $4,000 after 20 years—and an impressive $8,000 after 30 years.

**WSJ.com**

**ONLINE TODAY:** Jonathan Clements answers a question about investing 100% in stocks, at **WSJ.com/Video**