

HAIL ROBERT C. MERTON!

Paul A. Samuelson, 5 March 2009

Science, like art, has its dull ages and its vintage ages. Newton and Leibniz wrote during such a Golden Age, so that Puccini might later have romanticized it in an opera, although he didn't.

I nominate for another such unwritten Puccini opera a true fable of a stellar period in modern finance theory.

MIT was made for Robert C. Merton and young Merton was made for MIT. Only the MIT economics professor Harold Freeman, who drew young Paul Samuelson to MIT and then in 1950 drew Bob Solow from Harvard to MIT, could have engineered getting Bob Merton into a graduate economics school.

When Bob decided to abandon graduate work in Applied Math at Cal Tech, he dutifully applied to all the usual suspects: Harvard, Chicago, Princeton, Yale, Wharton and MIT. Only one gave him a nibble. It was Freeman on our Admissions Committee who offered Bob a fellowship which he gratefully accepted.

That autumn there was a long line of registering students in front of Solow's open office door. Cynical Harold said to Merton, "Avoid the regular courses, they'll bore you to death." So, as Bob tells it, he went through the open door of my adjacent office instead and didn't come out for three years! No one—and I mean *no one*—benefitted from talks with Merton more than no-longer-

young Paul Samuelson.

Most days each noon Bob and my Harvard undergraduate son Bill played poker or bridge. (No wonder Bill got sucked into the family business!)

What uniquely made Merton the top guru in finance? Thomas Kuhn would have said it was his new and better departure from previous *normal* economic science. Yes. Yes. But as Freeman Dyson corrected Kuhn, sometimes it is a new technology rather than a new paradigm that revolutionizes a science. Galileo without a telescope could not have been Galileo. Biologists without a microscope would have remained naturalists.

Merton's secret weapon was the Itô stochastic calculus. He couldn't have learned that studying electricity at Columbia as an undergraduate. How then? Merton first met Itô outside of finance theory. The time was ripe to make a stochastic version of plain-vanilla Solow-Douglas production theory. So a future Nobel laureate—who can be left nameless in this telling of the story—wrote up such a model. But it was Merton, between poker games, who created the version of Itô appropriate for stochastic finance where you can't know the future before it happens.

The rest is history. It was said that Hegel didn't understand his own philosophy until he read its French translation. So it was with the brilliant Black-Scholes pair whose "perfect hedge" couldn't be understood and perfected without the Itô stochastic calculus. Three persons richly deserved the 1997 Nobel

prize in finance, but death robbed Fischer Black of it. Thus, Merton and Scholes shared the award.

Bob enriched MIT life. In doing that, Robert C. Merton, worthy son of old sociologist Robert K. Merton, also enriched the paradigm of modern finance theory.

Most fitting it is that we should honor Bob Merton. If only I were a Puccini, I could spell that out in beautiful arias.