BHEF, a membership organization comprised of a Fortune 500 CEOs from various sectors, as well as leaders of research universities and foundations, is in a unique position to assess the conclusions of "Steady as She Goes." BHEF began a STEM initiative four-years ago designed to understand the STEM pipeline problems and propose solutions where needed.

While some of the study is sound, a core assertion made by the authors—that companies are failing to make jobs attractive and are responsible for the significant decline in the proportion of high-scoring students choosing STEM majors or careers—cannot be explained by the data in the study.

It's not a core assertion –the exact quote from our paper is:
"What might explain this loss of high-performing students from the STEM pipeline? This question cannot be answered by these data, but this analysis does strongly suggest that students are not leaving STEM pathways because of lack of preparation or ability. Instead, it does suggest that we turn our attention to factors other than educational preparation or student ability in this compositional shift to lower-performing students in the STEM pipeline.
The decline in the retention of the top achievers in the late 1990s is of concern. This may indicate that the top high school graduates are no longer interested in STEM, but it might also indicate that a future in a STEM job is not attractive for some reason. The decline in retention from college to first job might also be due to loss of interest in STEM careers, but alternatively top STEM majors may be responding to market forces and incentives."

We tried to be very clear that there are number of possible explanations, and that the key point is that enrollments are sensitive to market conditions. This, then, would be entirely consistent with explanations listed below. In fact, in terms of IT, we make that very case in a couple of earlier papers. (see graduates by major tables, attached, where we discuss this for a number of the disciplines).

Rather, the decline may better be explained by other factors such as a fundamental change in the STEM job market resulting from the bursting of the dot-com bubble in 2000, which happens to coincide with the latest data points used by the authors. At that particular time, students rationally voted with their feet as jobs vanished from an imploding sector of the economy. It also is interesting to note that much has changed over the past several years. For instance, the most recent data from UCLA on college freshman (HERI 2008) indicate an upswing in interest in engineering majors and careers. Likewise, the Computer Research Association showed increases in computer science enrollments of more than six percent last year, the first increase in enrollment in six years. In addition, employees of STEM-oriented companies report high levels of satisfaction with their career choices and jobs. For instance, the most recent Fortune "100 Best Companies to Work For" list includes numerous STEM companies, with at least 12 companies in the top 20.

As to "job quality" that would affect enrollments, we suggest in this paper (and discuss in a bit more detail in other papers and is subject of ongoing field work), that it is largely market aspects of the jobs (pay, stability, future career prospects) and, in fact, we frequently note that mid-level and senior engineering folks say they had a great career but are concerned that it will not be as "good" (e.g., stable employment, advancement, pay) for the next generation. Would also note that a survey such as that cited above has potential for selection bias – it's a survey of those who stayed and one assumes they are more satisfied than those who leave. But in any event, we don't speak to the

"satisfaction" issues, and don't doubt the finding, but rather we raise questions about the market aspects that would affect career choice.

The authors only examine STEM labor outcomes in isolation. It would have been more informative to examine STEM labor outcomes in contrast to outcomes in other fields. Interestingly, the data source the authors use - the B&B 1993/2003 dataset - does just that, and paints a different picture. For example, NCES' report "Where are They Now" (NCES, 2006) exams this data in detail and indicates that 57.5 percent of 1993 engineering undergraduate degree holders were employed in "Engineering/architecture/computer science" in 2003. This compares to 59.4 percent of business majors who were employed in their given field. Other major career areas show similar rates. This data would support the conclusion that labor outcomes are remarkably similar among graduates among a range of fields, and that a great deal of career switching exists among all types of majors at 10 year employment point in their careers.

Good points and we would agree. In fact, this is the point that is useful to make for those who are concerned about the rate of "leak" in the pipeline – namely, fluidity is both a characteristic in education and career pathways in the US (as, e.g., compared to Germany) and it is probably a source of strength in the US economy (allowing for entrepreneurs to try new ventures, cross-disciplinary perspectives, breadth in education and career, etc. etc.).

The study's authors used overall college GPA as a proxy for college STEM capability. The authors themselves acknowledge, and significant research concludes, that overall college GPA is a weak proxy for likely success in STEM careers. This limitation, combined with small sample sizes, makes it hard to draw much more than conjecture about elite, average, or low-performing STEM students. Yet the study and the article make definitive claims about the career choices of students within these groups.

We also used SAT scores. There are limits to what you can infer from these or any measures, but we wouldn't be quite so dismissive of them as indicating some level of performance and desirability by employers. (I don't have the research at hand, but I believe the finding is that SAT /GRE scores are not predictive of career success but GPA is a good predictor, or at least the best of the available measures –but don't quote me on that since that is my recollection but would need to verify.)

Finally, the authors did not report on other employment outcomes or examine satisfaction with their undergraduate education among STEM professionals, which also point to different conclusions. For example, the same report found that engineering graduates reported the highest employment levels, the highest earnings, and also reported that their undergraduate major (e.g. engineering) was very important to their lives, second only to health majors, and ranked first in terms of importance to work and career.

Yes, and this is consistent with our findings and interpretations. I think we do note that engineering has higher transition rates than science, and, as would be expected, that is true of most professional programs/degrees. But don't see how this would address our findings; these are important things to look at and a number of studies have done so.

The study does shed needed light on the STEM workforce pipeline and raises some provocative issues that merit further exploration, such as a more systematic examination of college STEM proficiency and career choice. Nonetheless, we should exercise caution in interpreting its results and in using it as the basis for decision making.

Any one study is not definitive and we would be the first to argue that policy should be evidence based and rely on as broad a research base as possible/is available. This paper and our previous (and our forthcoming) are put forth as contributions to the research base, not proposed as definitive, though they are the most in-depth and comprehensive to date. As such, we note that a number of long-held positions and policy directions are not based on much evidence and our studies suggest reconsidering them in light of our findings and a growing body of empirical work which generally has similar findings. We are in substantial agreement with BHEF that we need to improve the evidence base for policy and we welcome these comments in the spirit of using and discussing the available evidence to inform policy and our knowledge about STEM pathways. It also seems that we're in fundamental agreement with BHEF and comments above, namely the most important point of our findings is that enrollments/supply appear to be responsive to the market and there is little evidence to suggest there is a problem in "supply" of well-qualified STEM graduates.