Education and Economic Prosperity

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Introduction

Good afternoon. It is a pleasure to be here at Montgomery County Community College. As someone who has spent over three decades in the teaching profession, I firmly believe that education is one of the most important investments an individual can make. It is also critical for the long-term health and prosperity of our nation. Today I would like to spend my time with you discussing the links between education and economic well-being both for the individual and society as a whole — a topic that has particular relevance given the current economic and financial environment.

Most of you in this room understand the value of education both to you and to the businesses where you currently work or may work in the future. A skilled workforce is essential to a business's success. Those skills, however, are not just learned through traditional classroom study but are acquired through experience and learning by doing. More broadly, we can think of skills as encompassing not only communication and analytical abilities but also traits such as perseverance and pride in doing a job to the best of one's ability. Thus, education from this point of view is multi-faceted, extending well beyond the classroom, and should be a life-long endeavor for everyone. Such skills, traits, and values can be viewed as components of what economists call human capital.

Economists have long emphasized the importance of human capital for economic growth and prosperity. Economic prosperity is generally measured in terms of living standards, and the improvement in living standards is closely linked to the growth in the productivity of labor, that is, how much is produced per hour of work. In order to improve living standards, the productivity of individuals in a society must increase.

Education affects productivity in two critical ways. First, education supports innovation that creates new technologies, which, in turn, enhance the productivity of workers in the economy. Second, education improves workers' skills, which allow them not only to use new technologies but also to use existing technology more effectively or efficiently. Thus, education, I believe, is at the heart of productivity improvements and thus at the center of how we achieve increases in economic prosperity.

Education and Technological Progress

One way that education improves productivity is through research and development, which contributes to innovations and new technologies that improve our standard of living and the quality of our lives. We have seen this play out in the innovations of the past two decades. Advances in information and communications technology have had dramatic effects on the U.S. economy and how people live and work. Many of you were born during this era of innovation, and technology is an inherent and ingrained part of your daily lives. When I went to college, a student perhaps took a record player and a typewriter; if you were fortunate, the typewriter may have even been electric. But communications between us and home, usually to ask for money, would have been through letters we mailed home or a pay telephone in a hallway that was shared with the rest of the students in the dorm. Of course, today most of you students arrive with your own iPods, laptops, and cell phones, and communication is through e-mail, instant messaging, and text messages using your cell phone — which I am sure you never do during class.

But technological progress and innovation occur in all fields. We have seen great strides in the development of drugs and medical procedures that improve our health. We also have seen innovation and productivity gains in service industries. Innovation in financial services has changed how firms and individuals use and access the financial marketplace. Electronic payments, improved access to credit, and new products that distribute risk and improve the efficiency of financial markets are widespread. These innovations lower costs and expand opportunities for individuals and firms. If the truth be known, I am not

sure any of my children have ever been inside a bank, even though they use banking services.

All this means is that when my children needed money, they sent me a text message or e-mail and expected me to electronically deposit money into their account for access the next day. Of course, although my *ability* to undertake these steps has become more efficient, it is less clear that I am *more willing* to act so promptly.

Education plays a vital role in the development of these advances. First, our nation's colleges and universities train many of the scientists and engineers who develop the technologies that underlie these new products and innovations. Second, and I will return to this point shortly, education helps to teach individuals the skills necessary to use and take advantage of new technologies.

Economists have been studying productivity for a long time, and I don't intend to summarize all of that work for you today. But research has underscored the importance of innovation and education in raising productivity growth.

A 2001 study of 16 OECD (Organization for Economic Cooperation and Development) countries — including the U.S., Canada, Japan, and 13 European countries — examined the effects on productivity growth of research and development — or R&D — spending of various types, including domestic businesses' R&D, foreign R&D, and government and university R&D. Overall, this study of OECD countries underscores the importance of R&D for productivity growth and thus economic growth.[1]

Interestingly, this study found the effects of education on productivity growth to be considerable. The effect of university R&D spending on productivity growth was particularly significant. The authors of the study attribute this to the fact that universities

[1] D. Guellec and B. van Pottelsberghe de la Potterie, "R&D and Productivity Growth: Panel Data Analysis of 16 OECD Countries," OECD Science, Technology and Industry Working Papers 2001/3, OECD Publishing (2001).

provide basic knowledge to industries — knowledge that is then used to make technological innovations.

In addition, higher levels of education have been shown to help drive innovations that raise productivity. Because innovations can ultimately raise productivity growth, it is helpful to know what factors are important in driving innovative activity. Research conducted by Philadelphia Reserve Bank economists examines this issue by investigating the relationship between inventive output — as measured by patents per capita — and a variety of inputs for a cross-section of about 280 U.S. cities in the 1990s. The inputs included private R&D, academic R&D, and other government-supported R&D, as well as human capital.[2]

I want to highlight the most important finding from that research. In this study, the percent of the population with a college education made the largest contribution to raising the number of patents per capita in a metro area. This is what we call a "knowledge economy." Highly trained and highly skilled workers are critical, not only to their individual success but also to the inventiveness and productivity of the economy as a whole.

The authors suggest that their findings tell us something about how policymakers interested in promoting the growth of innovation should order their priorities. The message is, work first on developing, attracting, and retaining an educated labor force for the community — nothing is more critical for innovation and inventive activity. Second, encourage and support research and development in the private sector and the academic community.

This research shows that higher productivity — and therefore higher living standards — is positively related to a more highly educated population.

[2] See Gerald Carlino, Satyajit Chatterjee, and Robert Hunt, "Urban Density and the Rate of Invention," *Journal of Urban Economics* (2007), pp. 389-419.

The Returns to Education

Education and the skills learned in our colleges and universities not only contribute to productivity through the innovations and technologies they foster, but they equip individuals with the tools and skills to use new technology in ways that make the individual more productive. This is important, since more productive individuals earn more.

The direct benefit to the individual from education is substantial. According to Bureau of Labor Statistics data, the median weekly earnings of college graduates in 2007 were 77 percent higher than the earnings of those with only a high-school diploma.[3] Moreover, this premium for a college education is growing. Just 10 years ago, college graduates earned only 69 percent more than their high-school counterparts. Of course, for those that do not have a high-school diploma, the earnings disparity is even greater. Individuals with at least a college degree have median incomes more than 150 percent higher than those without a high-school diploma. Not only do individuals' earnings rise with their investment in education, but the unemployment rate for the more highly educated is significantly lower as well.

The growing earnings gap between those individuals with more education and training and those without has other important implications.[4] By almost any metric one can find, living standards for the average American have improved significantly over time. Yet it is generally acknowledged that income inequality has also increased. This phenomenon is not recent; it has been going on for some time. One of the most important contributors to this increase in inequality is the growing premium for the more highly skilled. Advances in technology require a more highly skilled workforce, and so the rewards to those with the requisite skills have been growing. This has been an important contributor to the increases in income inequality. Improved education and other investments in human

[3] See Bureau of Labor Statistics, Usual Weekly Earnings of Wage and Salary Workers: Fourth Quarter 2007 and earlier.

[4] See Keith Sill's article, "Widening the Wage Gap: The Skill Premium and Technology," Federal Reserve Bank of Philadelphia, *Business Review*, Fourth Quarter 2002, pp. 25-32.

capital for more of our nation's people are thus critical ingredients in eventually reducing this inequality.

Enhancing the skills and thus the productivity of individuals in our society also makes us better able to meet the demands of a more globalized economy. The U.S. and the world have greatly benefited from the expansion of trade and the improved economic conditions of developing countries. Growth in countries like China and India expand the markets for U.S. products while also offering the U.S. consumer a greater variety of products at lower costs. U.S. workers are, on average, among the most highly paid in the world. That can be sustained only if they remain among the most highly productive and highly skilled workers in the world. If the U.S. is to capitalize on the benefits of globalization, investing in a more educated and a more flexible workforce is essential. Economic development and economic growth around the world will not stand still. Thus, we must adapt and enhance the skills and productivity of our workforce to meet this new and challenging environment.

The demand for more highly skilled workers continues to grow and the rewards are also growing. And it is more evident than ever that investment in human capital pays off, both for the individual and for society more broadly.

Economics and Education

Because education has such a positive and lasting impact on our economy, it is important to ensure that our educational institutions are up to the task. Here in the U.S., our many high-quality universities and colleges have made higher education an export industry. Our universities and colleges are among the best in the world. Unfortunately, the same cannot always be said for our primary and secondary educational systems.

Many of our high-school students languish at too low a level of skill and leave school inadequately prepared. And the technical knowledge our students obtain in our primary and secondary education systems does not stand up very well to international comparisons. For example, in the latest Trends in International Mathematics and Science

Study, conducted in 2003, among the 45 countries participating, the U.S ranked 15th in mathematics and 9th in science.[5]

The result has been an excess supply of labor into the slower-growing or declining areas of our economy. We apparently have quite a distance to go before we catch up to other countries in technical training, including math and science, at the elementary and high-school level.

To exacerbate matters, the speed of change in our knowledge-based economy also means faster depreciation of workers' skill sets. To succeed, our educational systems must not only train future workers for today's environment but also arm them with the tools and resources to continually upgrade their skills. Education is not a one-time event. Life-long learning is a necessity in today's rapidly changing world. That means providing students with both the desire and the tools to continue their education. To do so, our educational systems must focus more attention on developing students' decision-making and problem-solving skills along with analytical abilities and communication skills.
It seems clear that our school systems need to better respond to the changing economy.

We succeeded in responding to this type of challenge in the past. In the early 20th century — a time when the nation was fostering a rapidly developing manufacturing sector — the educational system took on the responsibility of broadening the skills of students to meet the needs of a growing economy. High-school enrollment rose rapidly, and graduates entered the workforce better skilled and prepared with the training necessary for success in many occupations of the day.[6]

Today, as in the past, we need to be forward looking to adapt our educational system to the evolving needs of the economy and our changing society. We must work to provide graduates with the education needed to meet the realities of today's and tomorrow's

[5] See the National Center for Education Statistics, http://nces.ed.gov/timss/index.asp.

[6] "The Critical Role of Education in the Nation's Economy," remarks by Alan Greenspan at the Greater Omaha Chamber of Commerce 2004 Annual Meeting, Omaha, Nebraska, February 20, 2004.

marketplace. Those efforts will require the collaboration of policymakers and educators. But if such efforts are successful, we can ensure a more productive, highly skilled, technically trained workforce that will support a vibrant and robust economy in our region and the nation.

Economic Education and Financial Literacy in the Current Economic Environment

The current economic environment underlines not just the importance of education but the need for improved economic and financial literacy. I am not the first, nor will I be the last, to make this plea. As an economist, I have a particular interest in economic and financial education. The events of the last decade, as well as our current economic and financial situation, have reinforced my sense of urgency in this regard.

Technological progress is not confined to computers and manufacturing or to science and medicine. The financial world has witnessed tremendous innovation during the last 25 years. We have seen new products and new opportunities for businesses and individuals to manage their financial affairs and give them access to opportunities they never had before.

Yet with these innovations have come challenges. The development of the subprime mortgage market and the securitization of mortgages have made homeownership a reality for many individuals and families who might otherwise never have been able to afford a home. More low- and moderate-income families were able to obtain credit for both home purchases and home improvements. Yet as with any new product, some consumers bought products that were not suitable to their circumstances. They borrowed more than they could afford; took risks they were unable to bear; or entered into agreements they did not understand. In making these choices they were sometimes misled by abusive lending practices that rendered the terms and conditions of the loan agreements they signed far from transparent.

The consequences of these choices are now all too apparent. Mortgage delinquencies and foreclosures have risen rapidly. Many individuals and families have already suffered the

loss of their homes, and many other families are suffering from anxieties about whether they will be able to continue to afford to remain in their homes. The housing industry and the economy as a whole are also suffering.

With the benefit of hindsight, I expect studies by analysts, financial institutions, academics, and policymakers (including the Federal Reserve) will eventually come up with a number of "lessons learned" that will help us understand what we might have done differently that could have kept us from getting to where we are today. What I hope is not lost in such analyses of "lessons learned" is that this episode should be a lesson in the importance of economic education — that both consumers and businesses would be better served if financial literacy were a greater priority.

To address the economic and financial situation that has developed, the Federal Reserve has been working on multiple fronts. Let me briefly summarize what the Fed has been doing on a number of these fronts, including monetary policy, financial stability, financial regulation, foreclosures, and economic and financial education.

On the monetary policy front, the problems that developed in the housing sector and the subprime mortgage market in 2007, along with further increases in the price of oil, led to successive downward revisions in the outlook for the economy. As the outlook for the economy deteriorated, the Federal Reserve reduced the target for its policy interest rate instrument, the federal funds rate, in a series of steps — from 5.25 percent in early September to its current level of 2.25 percent.

On the financial stability front, problems in the subprime mortgage market eventually spilled over to other markets and resulted in more widespread impairment of the effective functioning of financial markets. As a result, the Federal Reserve also took a number of innovative actions to provide additional liquidity to financial markets, in particular by establishing three new types of lending facilities as alternative sources of funding for banks and other financial firms. The Fed also took special steps to avoid allowing the collapse of the Bear Stearns investment bank from causing serious disruptions to other

financial institutions and their customers. All of these actions fall under the central bank's responsibility for ensuring financial stability.

On the financial regulation front, the Fed has proposed new rules (under the Home Owners Equity Protection Act, or HOEPA) to strengthen oversight and prevent abusive lending practices in order to help consumers in the future. Significantly, these rules will apply to the entire mortgage industry, not just those institutions directly regulated by the Federal Reserve. The Federal Reserve Board also continues to work toward more effective consumer disclosure rules and will be doing extensive consumer testing to ensure that proposed new disclosures are comprehensible to borrowers. Changes to the Truth in Lending Act are being proposed that will require earlier disclosures by lenders and address concerns about misleading mortgage loan advertisements.

On the foreclosure front, the Federal Reserve, along with the other federal financial regulators, has worked to guide federally supervised institutions as they deal with mortgage defaults and delinquencies. The federal regulatory agencies, along with the Conference of State Bank Supervisors, have encouraged lenders to work proactively with borrowers who may be facing delinquency or foreclosure. We have also encouraged servicers of securitized residential mortgages to determine what they can do to restructure failing loans and to pursue appropriate strategies for mitigating losses on such loans. The Federal Reserve continues to encourage servicers and investors to make every effort to keep troubled borrowers in their homes.

The Federal Reserve Board and all 12 Reserve Banks have also been working with financial institutions and community groups around the country to address challenges posed by loan performance and foreclosure problems. Using mapping software, we have tried to help identify those communities around the country that are most at risk of having a high number of foreclosures to help local groups better focus their outreach efforts to borrowers.[7] The Fed has also been working with Hope Now, an alliance of loan servicers and housing counselors, to prevent foreclosures.

[7] http://www.newyorkfed.org/mortgagemaps/.

In February the Philadelphia Fed's Community Affairs Department hosted a meeting for 180 housing counselors from the Third District and seven of the top 10 national subprime loan servicers. The purpose was to open the lines of communication between housing counselors and mortgage loan servicers so they could find ways to modify or refinance delinquent loans to avoid having people's homes go into foreclosure.

Returning to my theme of economic and financial education, we believe it is important to enhance financial literacy so that consumers have more information and are able to make better decisions regarding their own financial well-being. One way we are doing our part is by actively promoting economic education and financial literacy in our schools. As Fed Chairman Ben Bernanke recently noted, today only eight states in the U.S. require students to take a personal finance course before middle-school or high-school graduation. Although some schools offer elective courses in personal finance, statistics indicate that only 21 percent of students between the ages of 16 and 22 say they have exposure to personal finance courses in school. Most high-school graduates enter the workforce ill-prepared to understand how our economy and financial system work or how to deal with the credit card offers they receive the first week of college.

The Federal Reserve's economic and financial education programs can help increase financial literacy. Each of the 12 Reserve Banks as well as their branches has at least one economic education specialist. Many of these specialists offer training seminars to help educators teach economic and personal finance topics in their classrooms. The Fed also has an education web portal offering easy access to a host of beneficial resources geared to students, parents, and teachers. [8]

Our own Philadelphia Reserve Bank offers teacher-training programs that provide knowledge and resources to teachers so they can get the right message to students. The Philadelphia Fed worked with the University of Delaware's Center for Economic Education and Entrepreneurship to develop an elective financial education curriculum that has been successful in many regional high schools. From one pilot program at one

[8] FederalReserveEducation.org

Delaware high school in the 2001-2002 school year, today nearly all of the 31 public high schools in Delaware are offering this program, along with a number of private and parochial schools. We have recently introduced the program into the other two states of our Fed District, and it is now offered in 45 schools in Pennsylvania and eight in New Jersey.

We know that broad-based economic and financial education initiatives for students will translate into a society of more financially literate adults. Economic education gives people the building blocks for a successful financial future. It imparts the knowledge and tools to improve people's economic well-being. In this way, it can have a powerful influence on the future health of our nation's economy and should help families avoid getting into the types of subprime lending problems we are experiencing today.

Conclusion

In conclusion, education is critical to the long-run well-being of our economy and everyone who participates in it. It enhances our productivity and raises living standards. It enables consumers and businesses to make more informed and thus better decisions and choices — improving the broader economy in the process. But the responsibility does not rest solely with government and policymakers, who clearly must do their part. It rests mostly on individuals taking the responsibility to engage in life-long learning, making investments that will reward them handsomely. I commend you — as students, teachers, and citizens — for your efforts and for the investments you are making. Both you and our economy will be better for it.