

Globalization: A Mandate for New Models  
*Creating a Competitive Advantage for Arizona: Strategic Investments*

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Thank you very much.

I appreciate the opportunity to be with this group tonight and to begin to discuss with you how to build a competitive advantage for Arizona – so that we compete with the best in the world. A few years ago, I would have simply said that Arizona needed only to compete with the best of the other states in the USA. This country seemed to be on a roll in the 1990s, following the fall of the Berlin wall and for the first time in decades building a surplus in the federal budget. At least that is how I saw the world in mid-2001, before moving to Dublin, Ireland.

My first real day on the job in Ireland was September 11, 2001. My last day on the job in Ireland will be June 30, 2006. In between those dates, I had to fly to London early on July 7, 2005 with SFI Board the Vice Chair, Frank McCabe, to meet with Sir Richard Brook. Frank and I were to be given a preview of the findings of the international review of the progress of SFI over the previous four years. That was a good reason to go to London. It was also the same day as the terrorist strike in London. A number of friends who know about my start-up date and review date with the SFI have asked me to let them know where I will be going next and when – so they can avoid being there. So, if you think I have been hesitant to specify my precise move date to Arizona, you might understand that my reaction is shaped by these events.

More to the point: My current view of the competitive position of the USA has been shaped by important events of the past five years and also from personal experiences and responsibilities that I have had in Ireland. While, like many of you, I have had the good fortune to travel throughout my research career, I tended to go to a country or city and participate in a conference, give a talk, and then be a tourist for a brief period.

Living in Ireland, on the other hand, has been a profoundly important experience as it put me directly in the middle of the most dynamic economy in Europe, if not the world. Ireland has been transformed more than any other European country in the past 20 years. If you look at old covers of Economist magazine, you will see one from 1988 that suggests Ireland is the poor place of rich Europe. The country was almost written off as a basket case. A cover from last year calls Ireland Europe's top economy.

Ireland offers lessons for many states in the USA. Over these past five years, I have developed the strong view that if American states continue to depend on extremist politicians for wisdom leadership, we will fail our children. More significantly, the country risks drifting further and ending up unable to lead or inspire as its treasury will be gone, its high-tech industry outsourced, its medical system bankrupt, and its R&D system G.M.-atized.

My first goal tonight is to cause some anxiety. Or, maybe to scare you, as I think the USA needs a wake-up call – not about a dangerous world and terrorism – but about its economic freedom and prosperity.

My second goal is to begin helping to put some things in perspective and help us together begin to develop a vision for Arizona in 2020 – a vision that will guide SFAZ. I hope we can agree on the general framework needed for SFAZ and to recognize we must be opportunistic and strategic. I have no interest in moving here to accept the status quo – or to be part of place driven by the idea that education is not important or is good enough as it is, or that the research system just needs some gloss, that we do not need to build a seriously competitive high-tech component to AZ's economy.

And my third goal is to ask what I hope will be helpful, tough, and candid questions.

To help focus us all on the end game, let me begin with what I call seven USA myths. Each, I believe, is vital for Arizona to recognize.

Myth 1: The crown jewels of the USA – R&D – will remain in the USA and not be outsourced. FALSE

Myth 2: Universities in the USA are easier to work with than foreign universities and companies prefer to work with them in the USA. FALSE

Myth 3: No place can offer the advantages for software creativity or production as the USA. FALSE

Myth 4: Technically educated people from Europe and Asia will keep coming to the USA as we are THE magnet and everyone wants to be here. FALSE, particularly for the young people who are increasingly developing a negative view of the USA as a place for them. Also, the global economy now bekons the Asians and Europeans to return to their roots and there is a growing pressure in the Asian and European countries to reverse the brain drain that has so benefited the USA.

Myth 5: The USA is the melting pot that welcomes everyone and assimilates them. FALSE

Myth 6: We have the best health system in the world. TRUE OR FALSE? The jury is out. We have on the order of 50 million people without insurance. We have a great system if you are rich. Do we have a system that really works when so many people lose their assets to the medical system in the last months of their lives? The stress on American families versus European families is starkly different.

Myth 7: We have the best research university system in the world. TRUE. No one can easily compete with us. BUT: Can we keep letting the K-12 system fail the country and catch up and win with the university system? Does anyone recall how we as country viewed Toyota and GM in 1973? We are now in the first stage of what I call the G.M.-atization of the university system. We are like the proverbial frog in the boiling water who doesn't realize the change in which it is immersed.

I did not make the long flight to Phoenix to advise this group of people how to do research, medical treatment or innovation. People here know much more about these areas than I do and are truly accomplished world leaders – though I claim there are not enough of you in AZ.

Let me tell you a little about my experiences of the past five years – not so much about what SFI did but how my work as the lead person for an R&D partnership with China, India and the USA influenced my thinking. And, what I have learned, since early on in my tenure at SFI, from visiting a significant number of VP's for research of major US corporations in the ICT and BioT space to find out firsthand their plans and ambitions.

I have been the leader of the R&D partnership with China for Ireland. It is a significant arrangement, led by the Prime Minister (Taoiseach). He took 300 people to China 2 years ago, including all of the university presidents, four to five top ministers, and business leaders. His message was simple: China is a market with a potential of 1.3 billion people. Ireland is a country of four million. It needs big markets to sell products to create wealth.

You don't create wealth selling to each other in a small country or state.

During our visit to China back in Ireland, each day the Irish newspapers and TV news forecasts discussed the effort to promote Ireland in China and the effort of the universities to establish partnerships. The trip did and continues to pay dividends to Ireland's economy. When we left China, the China Daily newspaper

stated at the end of an article: When you study economics today in school, the last four words in the text should be: Now, go study Ireland.

In Ireland, economic performance is understood to be a precondition to social justice and a fair and civil society. Economic performance is understood to be tied directly to education. So you don't have debates about the importance of education – what you debate is how to make the system better. If a state's education system isn't among the leaders, how will its economy compete in the 21<sup>st</sup> century?

Ireland gets it. All its political parties understood the competition from globalization. They understood they have almost NO natural resources. All they have are people – highly educated people -- and a beautiful place to live. And they understood that if they wanted to seed and nurture wealth and build new businesses and create a high-tech component to their economy, they needed strategic investments. For the 21<sup>st</sup> century, a successful country/economy needs brains and speed to get things done – flexibility and focus.

Now, you might think this was pretty bold for a small country, let alone one not known for its research system. But this is not nearly as bold as deciding in the late 1980s to build an international financial center in the slum-like docklands of Dublin and to challenge other financial centers in Europe for market share. It was bold. And, it worked.

Arizona too is small place, population wise – believe it or not. And it cannot afford to let talent slip away. It must be a “can do” state that values prosperity as the cornerstone to a high-quality of life for its citizens and a place where we have a broad-based economy so that all of our children can elect to remain and work and live here. My contention is very simple: that much of what we must do together is about human capital and talent. Unless we have the right kind of talent available and growing we cannot be successful in the long-term.

So let me quickly tell you about the things that Ireland decided to do over the last few years alone. I think the important thing to understand about Ireland is that in about 1988 Ireland had an unemployment rate of approximately 18%. At the time, the average salary per capita income was 60% that of the EU average or about \$10,000.

Leap forward to the present and you find that Ireland's per-capita income is approximately 140% of the EU average almost \$42,000. Depending when you ask, Ireland or Switzerland now has the highest per-capita income in Europe. Unemployment in Ireland is about 4%. Those here tonight who may be familiar with Irish history probably conclude this economic data proves beyond a shadow

of doubt that there really are lepricons and they are the answer for Ireland's success. The other possible answer is that brains, a global economic focus and a determination to provide a place where one's children can stay and raise their families could be the explanation.

Back in 1988, about 1% of the population was leaving on an annual basis. Now the population of Ireland is growing rapidly, including a huge influx of former Irish emigrants and including people from across Eastern Europe.

I went to Dell computers near Limerick recently and noted that half of the employees are Eastern European or Russian. Ireland has recognized and acted upon the fact that it needs to go from simply a low- cost, high-quality manufacturing situation to a country that generate its own knowledge and intellectual property. In Ireland, the immigrant population is now almost 10% of the total population – a dramatic change.

So back in 1999, towards the end of what was being termed the “Celtic Tiger”, a decade of incredible growth, Ireland's leaders recognized that its short-term economic success was not enough, and not built for the long-term. In the spirit of boldness and leadership we must admire and emulate, they brought together a group of people from the academic community, business community, and government and did a Technology Foresight Study. When it was done, the group sent a recommendation to the Government to invest over \$800M in research. The idea was to jump start the research investment over a five- or six-year period.

And they committed to invest in research in strategic areas – to position Ireland's economy to benefit from its academic institutions in an economy that would have a significant innovation component going forward. For a country that ten years before barely had any research investment, this decision to invest strategically – at a time when they had a large surplus – is instructive for us in Arizona given the reality of change and competition. Indeed, that investment decision was made by the once tattered and struggling figure of Europe.

With this bold investment, amid success, when it would have been easy to sit back and enjoy, the political and business leadership created Science Foundation Ireland. The Government created a mechanism to fund research on an internationally competitive basis to serve better the needs of the nation's economy. Importantly, this investment decision was supported strongly – I think almost unanimously -- by all political parties as they all recognized the need to catalyze innovation and encourage partnership to benefit Ireland, Inc.

The results? With the government's support, SFI is helping Ireland's universities and institutes of technology keep the best scientists in Ireland and

recruit them from around the world. SFI now funds more than 1,000 projects with grants totaling \$770 million and this all occurred in the past 4 years.

These projects include 2,500 individuals, research teams, centers, and visiting researchers from Australia, Belgium, Canada, England, Germany, Japan, Russia, Scotland, Slovakia, South Africa, Switzerland, and the United States.

This work is primarily in the information technology and biotechnology areas. And, remember, Ireland only began investing in these programs four years ago.

Ireland is now a base for more than 1,100 multinational companies. Ireland is the world's largest software exporter, ahead of the U.S.A. It accounts for almost one-third of all FDI in Europe in pharmaceuticals and health care. And biotech companies in Ireland get to feed off and cooperate with companies now based there, including Merck, Pfizer, Roche, Glaxo, and Wyeth.

In fact, nine of the world's top ten drug companies call Ireland home. So do 15 of the top 20 medical devices companies. Six of the top twelve blockbuster drugs are made in Ireland.

Dell, Microsoft, Proctor and Gamble, Intel, Lucent, HP, IBM, Bosch, Motorola, Medtronic – they all have operations based in Ireland. This includes research partnerships that each of them has, together and separately, with universities in Ireland, stimulated by grants from SFI.

An SFI program provides that leverage, with grants worth as much as \$30 million over five years. These industry-academic partnerships are the feeding grounds of new ideas, and they will be the genesis of inventions and discoveries that spawn new advances, new leaps in knowledge, and, yes, new companies.

Meanwhile, SFI is connecting its investments to the secondary schools with special incentives to bring the university and secondary teachers together in new ways to benefit the young students and the people of Ireland. So the investment in R&D and the core value of education tie together.

At SFI, we said we said we would be friendly to science and science-friendly. It was a simple but potent theme, and it has become, if you don't mind the expression, a call to arms. We opened everything to international review, tried to attract the best and the brightest or retain the best and the brightest, and began to build a scientific culture that could compete with anyone. We built a process focused on Ireland's strategic advantages. We pursued partnerships with companies where Ireland had a strategic advantage. And we built a system that was flexible, focused and made decisions fast so the scientists with the grants

could get to work. We wanted to minimize bureaucracy and encourage cooperation, innovation and entrepreneurs – all predicated on merit or excellence.

These are the key ingredients: An aggressive attitude, international peer review, a strategic focus, strategic partnerships, and speed. And a little fear doesn't hurt either – fear of how fast the other countries/states are working, fear of slipping back – the kind of fear about competitiveness that America and Arizona need in our systems.

Is not our goal in Arizona to build for the future, to build through smart people, and to support and sustain the multinationals already here, and to begin to grow and start our own companies in a larger way?

So here is my starting point at this time, in this place, and which I offer to you as our collective challenge:

We must create the systems that let quality flourish and encourage innovation from young people. We must avoid at all costs suffocating the system by preventing young people's ideas and curiosity from blossoming.

We must change the way government supports and encourages innovation to insure we can be driven by cooperation and partnerships, with peer review and competitive position as our guides in making choices.

We must use speed in getting to decisions.

We must support innovation in a manner to rival Ireland and Singapore's economic development units to truly prosper. That is, we have to provide a business friendly culture and one stop shopping to help them set up operation in AZ. Competition is global and fierce. A company like INTEL, for example, is aggressively recruited by many, many cities or countries in the world today. We want to be known as a place that encourages innovation and wealth creation so that we can have a society that civil and successful.

We must have an open attitude that allows us to listen and learn from the frustrated CEOs and VPs for research of major companies who elect not to do R&D in Arizona or to expand manufacturing here.

We must ferment a realistic approach and strategic focus to what we can do in the biosciences, and a serious industrial sector with things like medical devices and start-ups. We want a strategic competitive advantage for Arizona.

Arizona is behind. You and I know that. There is an old saying that applies in Europe and here: If you do things as you have always done them, you will keep getting what you always got.

So as I near the conclusion of my remarks, let me leave with you some questions we must confront:

- Can Arizona really be competitive in the high tech economy if its K-12 system ranks near the bottom of all the states? Arizona needs to be at the very top or surely in the top 10 in the USA. Then, we begin to focus on world league tables to have the economy and social structure we want in the 21<sup>st</sup> century.

- Why should Arizonans accept the fact that the per capita income in Arizona puts it at or below the USA average? Should we not agree that Arizonans are and should be above average and strive for that?

- Why is there all this talk of Tucson vs. Phoenix vs. Flagstaff. ...or ASU vs. U of A vs. NAU? We need to get beyond that and talk about Arizona, Inc. We must get past the petty egos. We must get beyond acting like crabs in a bucket – one institution or city has success and the rest of us pull them back down instead of admiring the progress and working to learn from it for Arizona.

- Why can't all of the academic institutions have a responsibility for working together to build a better Arizona instead of wasting time on trivia or territorial issues? Every academic at a public institution in Arizona is paid by the citizens from hard-earned tax dollars. Let's expect a new way of working and valuing this investment by the people of Arizona.

- And, finally, why not expect the universities and community colleges to work together to keep costs down and share new ways of increasing student matriculations? We need more four-year graduates. Bring down the institutional Berlin Walls at last.

Ireland used SFI as a tool to catalyze innovation, cooperation and partnership. By any objective measure, SFI has made a good start. It is now globally competitive.

And so is economic competition. And that competition challenges any state in America which hopes to build a lasting culture of success, growth and opportunity for its citizens.

We in Arizona need new approaches to excel. You rise or you sink – but you do not stay the same. That is what history teaches us.

Two years ago, I was invited to speak to a significant group of California leaders. I said that I would not want to be the Governor of California knowing

how its K-12 education system had eroded, how its state university system was spending an enormous amount of money on remedial education, and when California had major business executives, such as Intel and HP, stating that they would not add more high tech jobs there because of the regulation and inertia.

I found similar problems in Connecticut when I spoke there this spring.

My studies and thinking about the current state of the US economy have convinced me that if we continue to cede high-tech manufacturing to other countries, our economic and national security will be at risk in the not-too-distant future.

If we cede industrial leadership, we will erode the argument for innovation, engineering, quality, and high-tech jobs – that is a genuinely possible outcome, and we should all contemplate the vicious cycle it would begin for us.

When these challenges enter conversation, I am not satisfied with the answer I often hear – that the USA has always done the next thing and will keep doing so and moving up the value chain – so to speak. Doing the “next great thing” may have worked in the past, but I am not confident it will work in the future.

The economic future, of course, now includes China and India. These two countries represent about 40% of the world’s total population. We in the West simply do not appreciate the impact of their rising economic success. We are, frankly, largely uninformed of how competitive and ambitious they are. Each of these countries is now operating “market economies” and has a culture that favors the study of mathematics, science, engineering, and medicine. And, the people in these countries work hard.

Trusting in the next thing for America simply is not enough anyway. A little more than a decade ago, the global economy changed. The water got hotter, and we are the frogs sitting in it. Yet I find few in the United States soundly aware of the challenges and opportunities that have resulted. We are too insular and we are too comfortable. Looking at the USA from Ireland, I was hard-pressed to believe that consumerism, federal and private debt, and a service or real-estate economy is the foundation for economic and social prosperity over the long term. One trip to India or China will make you ask that. Many will make you worry.

Given all of these challenges, some colleagues have asked me why I decided to move to Arizona this summer. That is a fair question and I have a simple answer. I have been inspired by some of the leaders of Arizona – business, philanthropic, academic and government. Governor Napolitano, some of the business leaders in GPL, SALC, and Flagstaff 40, the enormous talent in the universities and the

other R&D elements in the state simply have a vision for Arizona that I admire and share.

I believe Arizona can be the place of the rebirth of American ambition and excellence. We can use SFAZ to catalyze cooperation and to support research activities that are strategic and opportunistic. We can use SFAZ to create a “buzz” nationally and internationally that something very important and exciting is happening in this beautiful place called Arizona. We can use SFAZ to rattle the system, wake us up, and get a new kind of competition going. One that doesn’t say the primary goal is to compete within Arizona to win for ourselves. But one that says the primary goal is to win for Arizona within the world.

I believe we in the USA need contemporary R&D models and investment strategies – not only models like the NSF that had great beginnings but have been re-shaped by almost 40 years of the cold war and the politics of those times.

So let me challenge and invite this group to engage the debate about the future and explore new ways to leverage and influence the federal investment strategy.

We can begin by using SFAZ as model for strategic investments to create a competitive advantage for Arizona.

We have the energy, I believe we have the can-do attitude, and we have institutional leaders who are ambitious for the state and not simply for themselves.

I am excited by the challenges here and the potential of this state and its people. I am excited by the opportunity to help you build the future.

I came from that emerald isle in the Atlantic to join you in this glorious desert because I sense here the will to win. My pledge to you is to listen carefully to smart people on how we can win together, to try to synthesize good ideas and, then, to work aggressively to help SFAZ employ all its resources for greatest advantage for Arizona in the world. This can and should be a state where America begins a renewal of its historic commitment to hard work, innovation and opportunity for all.

Which leads me to two final questions?

Why not here? Why not now?

Thank you.