

Australian Mining Industry Annual Lecture

**“MINING
AND THE IDEAS ECONOMY”**

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On 7 December last year the Government announced its National Innovation and Science Agenda. “I’m here... to usher in the ideas boom”, the Prime Minister said. He went on:-

“The mining boom, the mining construction boom has been great for Australia. It has driven growth in incomes, but, as we have seen, the mining boom inevitably has receded. What is going to drive Australian prosperity in the years ahead? How does our economy transition? Our innovation agenda is going to help create the modern, dynamic, 21st-century economy Australia needs”.

That innovation strategy is to:-

- help businesses embrace risk and incentivise early stage investment in startups;
- increase the level of engagement between businesses, universities and the research sector to commercialise ideas and solve problems;
- attract the world’s most innovative talent to Australia; and
- make Government an exemplar, to lead by example in the use of technology.

There is no reason an innovation strategy should not embrace mining. Mining, over the years has attracted some of the world’s best talent to the country. Mining has embraced start-ups from the days of the gold rushes. Miners have always embraced risk.

But we know, don’t we, when people talk of the “ideas boom” they do not usually have mining in mind? When they talk start-ups they are not talking about Baristas springing up, as they are, in trendy strip-shopping centres. The “ideas boom” and “start-ups”, is the language used to refer to technology companies. When people talk innovation today they usually have a “Silicon Valley” image in mind.

Silicon Valley is not just a geographical place, it is a descriptor of a certain kind of business (just as Wall Street is a descriptor of a certain kind of business). We are talking about people with ideas for developing Apps that might be sold and used on other platforms or used by business or consumers to disrupt current businesses and thereby “innovate” in some way or another. We are looking for

the next generation of Apple, Google or Facebook. The arrival of these companies was hailed as the “new economy”.

As a descriptor the “new economy” was designed to contrast with the ‘old’ economy – agriculture, mining, manufacturing – in fact, practically anything that was established before the late 1990s. Old industries were thought to be at risk in this new world:- dinosaurs facing extinction at the hands of the new arrivals.

In the late 1990s the Australian Treasury decided it would establish a Website. I am glad that it did. It allowed me to upload speeches and transcripts as Treasurer. Anything I did from 1998 belongs to the Internet age and therefore I can access it at the click of a button. That material is part of the new Economy! Material before that belongs to the Gutenberg Age.

Mining was administered the last rites a long time ago

At the turn of the Century, 16 years ago, the new economy was all the buzz. Mining was in the doldrums. And so too, it was thought, was Australia. If anything was thought to encapsulate our decline it was the exchange rate-a symbol of national virility. It had sagged below 56 U.S. cents. On 12 September 2000 – 16 years ago to this very day- I was interviewed on the ABC Radio program ‘AM’ and asked:

“Treasurer, why is the dollar doing so badly? Could it be that as part of this recurring theme which has emerged at the World Economic Summit that Australia is seen as hamstrung by its image as an old economy, that we are missing the information technology boat?”

Note that the old economy was seen as something of a burden – something that was holding back the whole country – that we were “hamstrung” by it. Note too that the answer to our woes was to set sail on the information technology “boat”.

“The World Economic Summit” the ABC was referring to was the World Economic Forum, meeting in Melbourne on September 11, precisely one year before planes flew into the twin towers in New

York. Bill Gates, then the undisputed king of the information technology revolution, was a speaker at the Forum. He suggested Australia had been left behind in the information technology era. The press was very critical of Australia's future prospects.

Reporting the Conference for The Australian, Robert Gottliebsen (a serious commentator), said:

“What the World Economic Forum told the international community was that Australia was not yet ready to make the changes necessary for the society take advantage of the knowledge economy.”

This was the reason for the level of currency Gottliebsen concluded. He was scathing of the political class for its failure to understand it:

“Reserve Bank, Governor Ian MacFarlane, Prime Minister John Howard and Treasurer Peter Costello don't seem to understand why the dollar has collapsed”.

How could we? We were old thinkers trapped in an old economy whose time had passed. The IT boat had sailed while we were out of action with a bad hamstring – a bad hamstring called the “Mining Industry!”

Comparing the triumph of IT to 'old' industries like mining, any intelligent investor attending the World Economic Forum of 2000, would have put their money where the conference mouths were and sold mining stocks to buy the technology sector.

In September 2000 the NASDAQ Composite Price Index was around 3,900. The iron ore price was below USD \$13.00 a tonne. BHP shares were travelling at around \$8.00.

So if you had got the gospel of the WEF in September 2000 and sold your BHP shares to buy the NASDAQ, how would you have fared?

Not too well as it turns out. If you bought the NASDAQ index in September 2000 you would have lost 71% of the value of your investment within two years. By October 2002 the dot.com bubble had well and truly burst. Colloquially it became known as the “Tech Wreck”.

The enthusiasm over the dot.com bubble being spruiked at the World Economic Forum in 2000 was sweeping people into investments that were on the brink of collapsing.

Companies that had never generated revenue, let alone paid a dividend, were trading at exorbitant prices in the enthusiasm of the “new “ economy. In retrospect, it is clear that dot.com stocks were over-valued in 2000. But few saw that at the time.

The frenzy was probably best illustrated by the AOL – Time Warner merger. In early 2000, an internet service provider by the name of AOL (America Online) merged with the global media and entertainment giant – Time Warner to create “AOL Time Warner”. The idea was to take the publishing giant and make it a tech company. It was the largest merger in history. A few months after the deal closed, the dot.com bubble bust, the company was forced to write off \$100 billion, and essentially re-value the AOL part at nothing. The stock collapsed to one tenth of its merger price. Nowadays the episode is taught in Business School as the worst merger of all time. Time Warner has dropped all mention of “AOL” from its name.

What would have happened if you had ignored the prophets of the WEF in September 2000 and held on to your BHP shares?

Well nothing much. Over the next year or so, the price kept bouncing along below \$10. But it was better than losing 70% of your investment on technology stocks.

After being given the last rites, mining went into an all-time-boom

In the decade that followed, those BHP shares went to nearly \$50. Australia was not let down by its ‘old’ industries. It was dragged up. The view that we needed to chase technology to restore the currency could not have been further from the mark. The dollar would double. It had nothing to do with technology. It was that old “hamstring”, the mining industry, that recovered and sprinted off, taking the Aussie dollar with it.

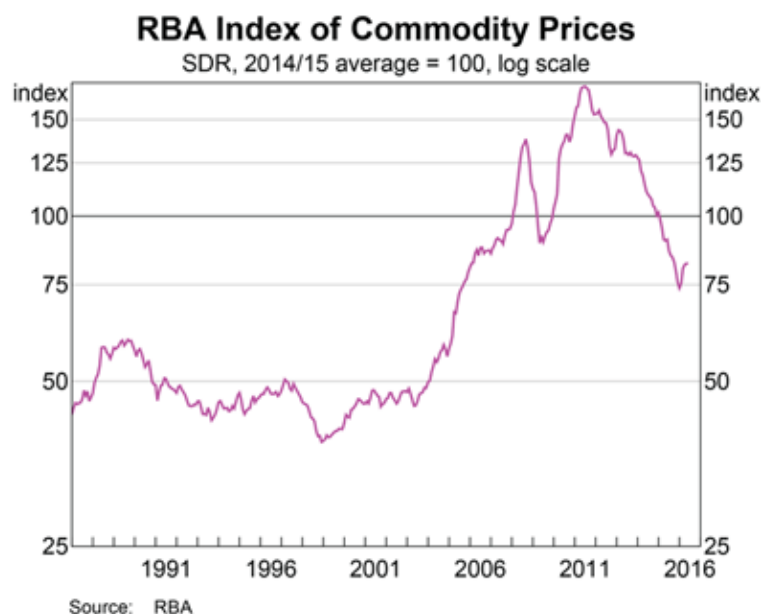
[These days we are more mature about the currency and spend a lot more time trying to think of ways to keep it low rather than ways to pump it up].

The prophets of the tech revolution knew they had a game-changer with the “knowledge” economy. They knew one really big thing – the effect of digitalisation. But they missed another really big thing - the rise of China. It was the rise of China that led the mining boom.

In 2000 iron ore was trading under USD \$13.00 per tonne. In 2011, at the height of the boom spot prices reached as high as USD \$180.00 a tonne. The Australian dollar which was causing so much consternation at 56 cents peaked around USD \$1.09.

With mining in the doldrums in the 1990s and 2000s, it had been hard to attract capital for new investment. As a result there was little new capacity developed. When demand from China increased strongly, supply was short and prices rocketed. As prices rocketed people realised that new investment had become very commercial. Market signals worked. They led to a huge new investment boom. This occurred not only in Australia but of course globally. As the world re-invested in mining capacity, supply was boosted. As supply was boosted, prices began to normalise.

Figure 1



Prices today are far from their all-time record highs, but they are not bad by historical standards.

Australia is producing more after the investment boom than we ever did before it. That increased production is still boosting GDP.

A Tale of Two Industries

Showing how wrong the WEF and the prophets of the tech boom got it in 2000 is not to engage in gloating.

Nor do I mean to suggest there was nothing to the information revolution. It has transformed daily life and it has transformed business. But in the early days it ran ahead of itself. The tech wreck was really a correction of... dare I say "irrational exuberance". Companies in the sector that survived went on to generate healthy revenue and some, to pay handsome dividends. Sixteen years later the NASDAQ is back where it was at its 2000 peak. We are in a second wave of the IT revolution. In the first wave people saw the potential of IT. In the second wave, business became more adept at monetising it.

I do not suggest that mining is better than IT or the old economy is better than the new, any more than I would suggest the reverse. A portfolio manager can reduce risk by diversifying investments. A country with a wide suite of competitive industries can likewise reduce its risk to economic shocks

The 'ideas' economy is not at odds with the mining industry. It is not a case of tech versus mining, it is not "either" "or", it should be a matter of both. In fact I will argue they depend on each other. But there are some ideas (and they are not particularly new) that are hostile to mining because they are hostile to economic growth. I will come to them later.

What failed was Fiscal Policy

I can't leave this chapter without some observations about the Australian Government's financial position during this period.

Back in 2000 when the iron ore price was below USD \$13.00, the Budget was in surplus. We were not running up debt, we were paying it off. Let me repeat, when the iron ore price was below USD \$13.00 a tonne the Budget was in surplus. I keep hearing journalists and ignorant politicians claim that we only balanced Budgets because of the mining boom. That is an effort to re-write history, usually to justify subsequent fiscal failure.

We first balanced the Budget in 1998 when mining was at a cyclical low. By the time Australia's terms of trade began to lift in 2005, we had already completed seven Budget surpluses and nearly cleared all Government debt.

We were in surplus at the low point of the mining cycle. It was at the height of the boom that we were running deficits.

From 2008 massive spending increases which the Government said were needed to stimulate the economy took place. As a result the Budget went in to deficit. We were still stimulating the economy as the mining boom re-gathered, and peaked in 2011 - the greatest Terms of Trade boom in Australian history.

The tragedy of Australia's fiscal policy was that the fiscal stimulus was over-done and then never withdrawn. Our Budget position significantly declined from 2008 and the great tragedy is that it continued to decline during our most favourable trading conditions in a Century. Successive generations will not forgive that.

Table 1

	Sep-00	Apr-11	Sep-16
Iron Ore (U.S. per tonne)	\$12.45	\$179.00	\$57.00
AUD (in U.S.C.)	55.8	109	77
Budget (% of GDP)	+2%	-3.40%	-2.20%

To recover our fiscal position we need to get Government spending under control again. To balance the Budget, spending will need to fall below 25% of GDP, and preferably well below. Spending will have to be cut.

And to boost growth we need a lift in productivity.

Finding the benefits of Innovation in Productivity

One of the things we find hardest to measure in an economy is productivity. It's a pity, because as Paul Krugman famously observed "Productivity isn't everything, but in the long run it is almost everything. A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker."

Higher output per worker can be obtained by capital investment, for example, when a man swaps his shovel for a back hoe, his output increases enormously. Capital investment boosts output. But outside capital investment and labour inputs, productivity – Total Factor Productivity - means getting more from the same level of input. It is hard to say where it comes from and hard to measure it.

In the late 1990s, Australia, along with certain other developed economies experienced a significant pick up in productivity. The OECD Growth Project of 2000 identified the US, Australia, the Netherlands, Denmark, Norway and Ireland as showing high labour productivity growth, high Total Factor Productivity ("**TFP**") growth and good employment outcomes. One theory to explain this pick up, particularly the pick up in the United States, was the ICT revolution.

It was thought that break-throughs in ICT were significantly lifting productivity. It was concluded, as a result, the US had been able to step up its non-inflationary growth rate. This was the origin of the “new economy” theory. One consequence of the theory was that since there had been a step up in the non-inflationary growth rate, it was possible to leave interest rates lower for longer. This undoubtedly contributed to the U.S. housing bubble and crash in 2008.

We see productivity everywhere except in the statistics

But where has the productivity gone? In the last decade productivity growth has been disappointing in the U.S., in Australia, in fact in the whole developed world. The ICT revolution has not disappeared. Technology and computing power has increased. If the ICT or “knowledge” industries are such a driver of productivity, then why can’t we find this in the statistics?

There are different answers given to this question. Some say that the digital revolution was never as significant as hyped, and certainly not as significant as the period of industrialisation from 1920 to 1970. The principal proponent of this view is Robert J Gordon of Northwestern University who notes that U.S. TFP growth between 1920 to 1970 was around 1.89% per annum. He attributes this to a revolution “when fossil fuels, the internal combustion engine, advanced metals and factory automation came together to produce electric lighting, indoor plumbing, home appliances, motor vehicles, air travel, airconditioning, television and much longer life expectancy.” TFP rose at a much lesser rate - around 0.4% per annum - from 2004 to 2014. This was an era when “web browsers, web surfing and email became universal.” Gordon concludes that the second industrial revolution, which drove living standards in the 20th Century, was unique and much more significant for the growth in living standards than digitalization has proven to be.

The champions of the digital economy do not dispute these figures but note there was a long lag time between the discovery of electricity and the re-organisation of the work place to take full advantage of it. They say we are experiencing a lag period where the new general purpose

technology - computing and the internet - is available but business is still trying to coming to grips with how best to organise around it. Those of this view have great faith that the productivity (and consequent rise in living standards) will come. They say we must wait a while longer for it to turn up in the figures

There are others, such as Andrew McAfee of MIT, who suggest that there are substantial productivity gains and associated benefits already occurring, it's just that we are unable to measure it. In particular he says, we are unable to measure "free" goods that the digital economy provides - things like increased leisure time.

It is possible that digitization has given us significantly more leisure time. But then it has invented more activities – like Facebook and Twitter - to soak that time up again. Are we more productive? It is hard to say let alone to measure.

Innovation delivers when it transforms established business

But let us assume there are enormous benefits to be harvested in the digital economy and it is just a question of businesses and innovators figuring out how to do it. What will they be looking to do? In most part they will be looking to bring general purpose technology (digitization) to the established economy (let's call it the old economy) to lift productivity. It is not to replace the old economy. It is to capture higher value from it.

Let's take Uber. As you all know Uber is a classic Silicon Valley start-up. (By the way, the Future Fund managed to get early exposure to an interest in it). Uber developed and distributes an App which allows people to hail a nearby car, take a journey and use a payment system that reverts directly to their recorded account. It provides a reliable service, alleviates the need for cash or credit cards, and provides real time information on how long a car will be. It is a service that can be used worldwide. I have used it on three continents.

From the supplier's point of view, there are low barriers to entry. Practically anyone can provide their car, pay a commission to Uber, and generate revenue without the need to buy expensive taxi plates.

Uber has developed a transformative technology that has taken an old business (physical transport) and made it more productive. The App does not replace the transport. It enhances it.

This kind of innovation has already transformed mining. Mining today does not involve a man climbing down a deep shaft to dig out rock with a pick-axe. State of the art mining, comprises an open cut mine where automated trucks run from Global Positioning Satellites and carry production to driverless trains which carry it hundreds of kilometres under operation from a control-room using sophisticated software and GPS. The prices are set on an automated online exchange. Sophisticated miners hedge out their risk with complex financial derivatives on prices and currencies, demand, and supply.

The "new" technology has re-organised many aspects of mining and enhanced productivity. It has not replaced it.

Innovation relies on established infrastructure

Even the new economy does not operate in a vacuum. It did not appear ex nihilo. It developed in the context of a whole system of intellectual and physical infrastructure that is essential to nurture and grow it. Intellectual infrastructure protects patents and intellectual property and certainty of contract and financial reward. Physical infrastructure provides optic fibre and hardware in tablets and iPhones. Energy is mined or drilled from the ground to keep all these activities going. Needless to say all those digital companies are running on silicon chips and optic fibres that utilize metals and hydrocarbons that are extracted ultimately by miners. To function at all, the new needs the old.

It is important to remember that Innovation delivers benefits when it boosts the productivity of existing activities. As far as we can tell, human beings will always live in time and space, not cyber space. It means they will always need physical goods and services. What cyber space may be able to do is provide ways to reduce the cost of producing those goods, or improve time in transporting them, or improve the quality of goods or services, that is, deliver productivity. But cyber space cannot substitute the array of physical goods and services that human beings need or want.

Digital disruption might put some existing companies out of business. It is particularly effective in reducing the number of players in the supply-chain between the producer and consumer. This is the process called “disintermediation”. But at the end of the day goods and services still have to be produced and consumed in a physical world.

There is nothing new about economic disruption. This is an important insight. The Austrian Economist Joseph Schumpeter, identified ‘creative destruction’ as one of the fundamental drivers of capitalism back in the 1940s. He used the example of railroads. Electricity had the same effect. Digitalisation is the disrupter of recent times. There will be others. Artificial Intelligence may be the next.

Digital innovation has the capacity to make existing industries – like mining – more productive. It cannot replace them.

Australian mining as an export activity

The best way to think of the contribution mining makes to Australia’s economy is to think of it as an export industry. Mining is not a huge contributor to GDP. It is a huge contributor to exports.

Fig. 2

Sectoral contribution to GDP, 2015-16

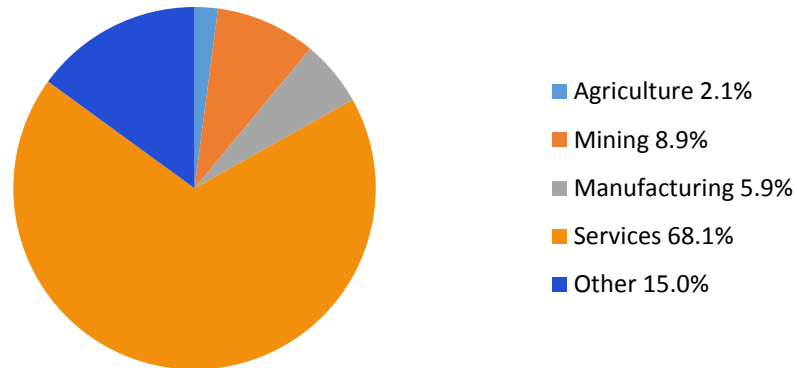
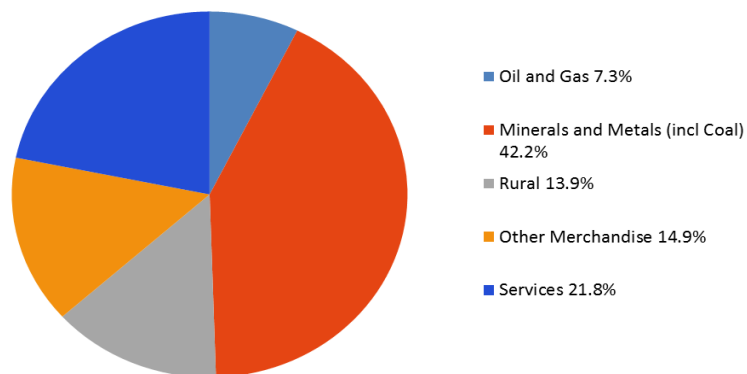


Fig. 3

Contribution to total Australian exports 2015/16



Around 42% of Australia's total exports comes from minerals and metals (including coal). Just over 7% comes from Oil and Gas. Together these two categories comprise around 50% of the country's exports. (Agriculture adds another 14%). The share of exports that is comprised by mining has jumped in the aftermath of the mining boom. Investment may have come off but production has substantially increased. Mining is carrying Australia's exports more than ever.

Table 2

Change in Contribution to total Australian Exports					
	Oil & Gas	Minerals & Metals (inc. Coal)	Rural	Other Merchandise	Services
2000/01	8.6%	27.1%	18.7%	22.5%	23.1%
2015/16	7.3%	42.2%	13.9%	14.9%	21.8%
Change	-1.3%	15%	-4.8%	-7.6%	-1.3%

Some mining is used for domestic production, for example in steel, some thermal coal goes to domestic electricity production, but overwhelmingly Australia's mineral production is produced for other countries. The industry has only survived because it is internationally competitive (the same is true of agriculture). Mining is and always has been Australia's truly great competitive international industry. In this industry we lead the world.

Mining is not a large employer because it is highly capital intensive. It does not rely on low wages or cheap transport to make it profitable. In fact, for a good deal of the last Century it was actively hampered by a Government policy of protection and wage regulation that lifted costs in the domestic economy. Mining only survived by being world class- in fact better than world class.

The tens of billions of export dollars it earns the country is not going to be surpassed by tech start-ups any time soon and certainly not in our lifetimes. The senior members in the Government understand this. The talk might be tech but the money's in the mining.

Does mining get the recognition it deserves?

Far from enjoying the hero status that normally would go to an industry overcoming the odds to be a world-beater, mining has been treated rather shabbily in Australia. We do not give much attention to the contribution of mining in the school curriculum. Students in modern Australian schools are more likely to learn about mining as a threat to the environment than an industry that underpins living standards.

Government hostility to mining reached an apotheosis when the Rudd Government announced it would introduce a “Resource Super Profits Tax”. In an attempt to win political support the Government pushed the view that the industry was deriving “super” or undeserved profit on which it was not paying its “fair share” of taxation. But not even the Government could explain how its RSPT would operate. The idea that in return for taking profits the Government would share in losses would have meant taxpayers subsidising miners by now. The RSPT was the weirdest tax ever conceived by a Government in this country. In the end it collected nothing of substance. Its premature decease goes unlamented.

There are others at State level, for example, the new Nationals Leader in Western Australia who are now pushing a similar theme – mining should be treated as a cash cow that can be exploited to solve a whole host of problems it did not cause. Mining will always face challenges from the right and left – some to tax it some to close it.

When I first became Chairman of the Future Fund, the Greens insisted on “grilling” me in a Senate Committee on why the Fund was not divesting the stocks of Australian companies that mined fossil fuels.

As I pointed out to the Greens, when the Future Fund was established they had shown no interest in its mandate or purposes. They had shown no interest in delivering a Budget surplus which could be invested in it. If it had been up to them there would never have been a Future Fund, so it was strange that after all the work had been completed they should appear on the scene as experts on how to invest it. They did not consider it their responsibility to start things, only to stop things.

Miners tend to be practical people. They focus on getting things done and getting output. Their opponents are rhetorical people. They focus on stopping things getting done. The enemies of mining thrive at the theatre of public debate. Miners tend to avoid it.

Which means that although the Mining industry has a good story to tell, it rarely tells it as well as it could.

Ideas can be a force for good or ill

Mining is not at risk from the ideas boom, from technological disruption or innovation. It is not the modern that threatens mining, it is the anti-modern. Mining unlocked energy sources that could drive machinery, and it unlocked the ability to build with steel and concrete. Some environmentalists are deeply hostile to this. They yearn for a pre-industrial age – in their minds if not by their lifestyle. They see closing the Industries that took us out of a State of Nature as positive steps to get us back to a state of nature. It is, of course, a fantasy. But fantasies are ideas and ideas can be powerful.

These ideas are not particularly new, and the industry has dealt with them for a long time. They are liable to be better funded and organised now. One advantage these activists now enjoy is that the law has been widened to allow multiple avenues of court actions that can be used to stop things – a process now described as ‘law fare’ in respect of the proposed Adani development. As I said earlier the opponents of mining specialise not on starting things but on stopping them.

In the clash of ideas to influence public opinion and through that, the actions of lawmakers there will be a constant need to argue the case for mining over and over. It’s a cost that is not going to fall any time soon.

So when enemies suggest that mining is finished the industry might respond by asking whether it is as finished as it was in 2000? When they suggest that the ideas economy will replace it they should ask it when they expect the tech sector to be in a position to earn an annual \$130 billion of export dollars for the country. Would you see it in a decade, or two, or five?

The point to bear in mind is that the mining industry is not at odds with digitisation and the productive benefits it can bring. The mining industry is a chief user and beneficiary of those

benefits. Australian mining has to harness these developments to stay at the forefront of the global industry. Ideas generally are not the problem. It's the bad ones we should worry about because they are a threat to our prosperity.