Building uncertainty, flexibility into infrastructure megaprojects

The hope is that with the research underway, novel, easy-to-use techniques will become the new standards to make better decisions. By Michel-Alexandre Cardin and Joseph Cherian

BUILD it and they will come ... Or will they?

Across Asia and around the world, billions of dollars are being pumped into infrastructure. Megaprojects such as giant new ports, bridges, tunnels, highways, rail lines, airports or even entire cities are being debated, designed or are already in the process of being built.

Large scale infrastructure often attracts prominent headlines and hype, but to be viable it demands careful planning and evaluation. Bad decisions can have costly implications.

A striking example of what happens when things go awry is the phenomenon of so-called “Ghost Cities” in China, sprawling metropolises with roads, gleaming apartment blocks, mails and government buildings, but no inhabitants. The most infamous of these is Ordos in the province of Inner Mongolia, where building began in 2004 with plans to create a new city for over a million people. Today acres of residential, commercial and government buildings remain largely unoccupied; its six-lane highways deserted.

Ordos is an extreme example of how difficult it is to account for uncertainty, and how a tendency to rely on overly optimistic forecasts can have a significant impact on the economics of a project.

Forecasting the future is difficult, but when a multi-billion dollar engineering project is at stake the ramifications can be stunning. Add to the current climate of economic uncertainty and the challenges become even greater - will the finished project be too big? Or not big enough?

Relying on unduly optimistic views of future demand, prices, cost or capacity may produce an oversized white elephant with too much unused capacity. On the other hand, taking an excessively conservative view could result in damaging under capacity and opportunity costs.

In any situation an obvious answer to uncertainty is flexibility: If you’re unsure what might happen, keep your options open.

What is needed in infrastructure ventures is a set of tools that allow us to take uncertainty and flexibility into consideration. One promising solution is offered by Real Options Analysis (ROA), a theory that specifically recognises the impact of uncertainty in irreversible investment projects while quantifying the additional value that stems from project flexibility.

Applied in a broad range of projects, ROA has been shown to routinely deliver up to 30 per cent economic value improvement against other more traditional methods. For infrastructure projects worth hundreds of millions or even billions of dollars, the improvements brought about by using ROA can be substantial.

The modelling of uncertainty (eg, commodity prices, costs) is a common component of project evaluation teaching in university finance and engineering courses. However, ROA goes one step further by involving the explicit consideration of uncertainty and flexibility.

The ROA approach is significant because it considers the additional value that stems from being able to adapt to changing conditions - be they economic, environmental, social or political. It means that many strategies can be exploited subsequently, reducing exposure to downside risk as well as providing contingencies to capitalise on upside opportunities.

DEVELOPING NEW TOOLS

Building in flexibility - also known as “real optionality” - into infrastructure projects is certainly not new. One often-cited example is the Health Care Service Corporation building in Chicago which was built initially as a 30-storey building in 1997, but with the structure designed to accommodate more floors should additional office space be required. In 2010, the second phase was completed, adding an additional 24 stories. Today the tower is a landmark of the Chicago skyline.

This is an example of a capacity expansion strategy using ROA. Other approaches exist such as building capacity in stages, delaying investment decisions until market conditions improve, or designing product line flexibility to accommodate different customer bases.

Nevertheless, in practice the additional value that either already exists in projects, or that might be generated through creative design is commonly overlooked. Equally important, many of the cur-
rent and popular tools for infrastructure finance and project evaluation are fundamentally deterministic, not accounting for uncertainty and flexibility.

However, ROA remains an underused tool in infrastructure finance, project evaluation, and engineering. This is perhaps due to the sophisticated level of mathematics required to quantify the value of project flexibility, or because decision-makers' rationality is limited by the information or time they have available at the time of making investment decisions.

Given these factors, researchers such as ourselves are pushing the development of new tools, inspired by ROA theory, that are better suited to the realities of infrastructure finance, evaluation and engineering. One such tool uses techniques that simulate a range of scenarios around the idea of a decision rule – a process similar to a logical statement in computer programming: IF you observe this, THEN do that, ELSE do nothing. For example, a decision-maker may choose to expand capacity in a building by a given amount (eg, two floors, 20 condo units) if the demand reaches a certain value.

This alternative approach to ROA provides a similar assessment of the value of flexible investment projects, while providing solutions for system owners and operators that are more readily usable than solutions from traditional ROA methods.

With economic uncertainty set to be the new norm, further research and applications are well under way in this promising area. The hope is that novel, easy to use techniques, that recognise explicitly both uncertainty and flexibility, will become the new standards to make better infrastructure finance and economic project evaluation decisions.

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Dragon babies, muted achievements
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Sumit Agarwal and Qian Wenlan
For The Straits Times

The upcoming Chinese New Year is a time for people to read up on what the Chinese zodiac sign can bring to them in terms of fortune, love and health for the year.

One well-known belief is that the zodiac sign at year of birth plays a role in determining a person’s personality, health and prosperity.

For instance, people born in the Year of the Rat are said to be quick-witted, while those born in the Year of the Rabbit are considered sociable. Those born in the Year of the Rooster, this year’s sign, are said to be trustworthy with a strong sense of responsibility.

Among the 12 zodiac animals, those born in the Year of the Dragon are believed to be noble, fearless and ambitious, and bound for success. Thus it comes as no surprise that there is usually a baby boom during this auspicious year among the Chinese.

But with so many babies born in the Year of the Dragon, do the astrological endowments on Dragon babies, as they are called, translate to success in life?

Studies in the United States have demonstrated negative effects of cohort size on wages and employment. Large baby boom cohorts who enter the market have lower lifetime earnings than smaller cohorts. Beyond economic consequences, individuals from larger cohorts tend to have higher material aspirations but because of increased competition and reduced opportunities, these aspirations are, more often than not, unattainable, resulting in feelings of personal failure and even higher suicide rates.

To see whether such cohort-size effects are relevant to Singapore, a study at the National University of Singapore was conducted using data from different sources, including Singstat, to capture various life outcomes – university applications, savings and credit card usage, property ownership, as well as bankruptcy status. Apart from the two of us, the research was also conducted with Associate Professor Sing Tien Foo, Dean’s Chair Associate Professor of Real Estate at the National University of Singapore, and Assistant Professor Tan Poh Lin at the Lee Kuan Yew School of Public Policy.

EDUCATION AND EMPLOYMENT
As male Singaporeans enter university and work life two years later than females from their same birth year because of national service, we are mindful of the different year of entry. After controlling for gender, ethnicity, year and month of birth, we found that those born in the Year of the Dragon have lower admission scores, especially the men.

This is likely to reflect a true decline in academic ability since the A-level examinations are administered externally and unlikely to be affected by cohort-size changes in Singapore. Likewise, Dragons’ monthly incomes are also lower, especially for the more recent cohorts.

The differences in academic results and incomes between Dragon and non-Dragon children are more marked for Chinese than other ethnic groups. Although the Government opened new primary schools to accommodate the larger Dragon Year cohort, the opportunities of marginal Dragon students are still reduced, which takes an economic toll when they
SAYINGS, CONSUMPTION, BANKRUPTCIES AND LAWSUITS

We did not find differences in savings balances between Dragon and non-Dragon individuals. Neither are Dragons bigger risk-takers nor more likely to become embroiled in bankruptcies or lawsuits.

But what is disconcerting is that despite their lower incomes, both Dragon men and women are more materialistic—they spend more on “visible” items such as apparel, watches, jewellery, home furnishings, and appliances. They are also more likely to buy a private condominium, a status symbol. These effects are even more pronounced for Dragons born after 1972 when Singapore began to make economic progress with its industrial development.

Several likely explanations account for their conspicuous consumption. First, Dragons may have been brought into the cultural perceptions and beliefs about their celestial endowments. Therefore, they become overly optimistic about their financial circumstances. However, that they are not high bankruptcy risk suggests that their consumption is quite under control.

Alternatively, Dragons may understand that these perceptions of nobility and success are unfounded but still value the boost these give to their self-image. Hence, they enjoy high self-esteem and feel good through conspicuous consumption.

It is also possible that the likely preferential treatment given to Dragon babies by their parents and grandparents may have extended to financial safety nets. Despite their lower income, they are willing to spend because they know they have the financial backing of the family for their lifestyle expenses.

TIGER WOMEN

We also studied babies born in the Year of the Tiger, in particular Tiger women as they are the least desired among Singaporean Chinese who consider them to be fierce and unsuitable for marriage. Hence, there is a smaller cohort of Tiger babies than Dragon babies, and we wondered whether a smaller cohort size would confer benefits.

We did not find a cohort effect—Tiger babies do not have higher admission scores nor are they more likely to be admitted to a local university. Apparently, the advantages of being born in a small cohort are not as evident as the disadvantages of being born in a large cohort. But interestingly, Tiger women have higher monthly wages.

For many, the lure of taking advantage of the zodiac sign in family planning is too tempting. However, there are practical implications to consider.

Our findings suggest that taking advantage of the allure of Dragon years for childbearing reduces the economic well-being of cohorts in these years.

While Singapore’s education system actively attempts to reduce the effects of zodiac birth timing to ensure that all children have a chance at education, it is possible that classroom-size effects—which include dispersed attention and high student-teacher ratio—come into play that result in lower academic excellence and its consequences in employment.

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When regulation hurts the little guy
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By Nikhil Pengra

When much praise has been heaped upon former US president Barack Obama’s legacy, one unfortunate aspect of his presidency was the belief that everything could be solved by passing incredibly complex regulation.

The Dodd-Frank financial regulation bill, signed into law in 2010, has been particularly contentious. Characterising it as a confused and bloated law, The Economist opined that it was "too big not to fail".

Indeed one of the campaign pledges of Donald Trump was to scrap Dodd-Frank, saying that rather than rein in banking excesses, it made Wall Street even more of a threat to America’s economy and working families.

In his first meeting with business leaders on Jun 23, the new US president said he would cut regulations by 75 percent, adding that the laws he had inherited "make it impossible to get anything built".

Whether he ultimately fulfills that pledge remains to be seen, but his vocal stance on rolling back unnecessary or counterproductive regulation raises some interesting issues from which we in Singapore are not immune.

Take the example of small-scale investors buying or selling a small amount in unit trusts at their local bank. It should be a relatively simple task. You fill out a form, submit it and the trade will be done in due course.

Unfortunately, a raft of regulations imposed since the 2008 financial crisis means even small trades involve wading through a mountain of paperwork designed to assess, among other things, your investment knowledge and your risk profile – a notoriously difficult thing to assess.

The regulations follow a number of cases when investors were sold products that were inappropriate for their age, finances or their risk appetite. This is intended to protect the ordinary investor – the "little guy" – from the sophisticated and powerful "big guy". In this case, financial institutions such as banks.

Certainly protecting the "little guy" is important, but there are side effects to attempting to do so, sometimes leading to a situation of having too much of a good thing.

I once asked a banker why I had to complete so much paperwork to buy a few thousand dollars worth of unit trusts but not for buying property, which involves several hundred thousand dollars. The answer was that property purchases do not fall under Monetary Authority of Singapore (MAS) regulations but unit trust purchases do. Thus the degree of regulation seems to not only vary by country but across industries, depending on what agency is in charge.

OBSTACLES TO OPPORTUNITY

Another sector burdened by over-regulation is healthcare. While nobody can argue with the need for healthcare to be of the best quality, regulation has its price in the form of higher prices (increased paperwork adds to administration costs) and, more importantly, diverting the attention of doctors from their job of treating patients to completing reams of forms.

While some regulations are no doubt sensible, others are likely to be draconian and serve only as obstacles to opportunity. Aspiring entrepreneurs, for example, can easily see their dreams crushed when presented with a maze of regulations for which they have neither the time nor the resources to navigate.

The "little guy" is losing out because the barriers to entry created by a thicket of regulations are too high.

That is not to say that regulation is not welcome in certain areas: it is useful – indeed essential – in cases of true and significant market failure.

A case in point are the so-called "lemon laws" on standards and performance of used cars. These are useful because vehicle purchase transactions are high value and it is a typical buyer doesn’t know much about cars, nor about how well the previous owner took care of the car.

Such situations are clearly a case where the contract law principle of caveat emptor (buyer beware) is insufficient and hence regulatory intervention is needed.

Fundamentally, though, a key concern about too much regulation is that it assumes that most people and companies are cheats. Perhaps instead it is time to argue the case for a more optimistic outlook. Is it always necessary to force a majority to jump through unnecessary hoops because of a small number who may try to break the rules?

Many countries today suffer from a situation where regulation becomes counterproductive – where its costs exceed its benefits – because it tries to prevent every little market failure.

Based upon a zeal to protect the "little guy" from the possibility that he might lose out, regulation may end up actually hurting him instead.

It is important, therefore, for us to constantly question the benefits and costs of regulation, especially in the case of knee-jerk reactions to isolated failures. I certainly hope that Singapore does not ever reach the stage seen in the US and other countries – although it has already taken a few steps in that direction.

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For NUS students Sre Vinod Seenivasan, Ron Teo De Zhao, Rafikah bte Mohamed Halim and Andre Tan, the highlight of their 2016 was spending much of the year immersed in an experience like no other at the NUS Overseas Colleges (NOC) programme in Silicon Valley, California.

The four were part of 95 students who went to the NOC in Silicon Valley in 2016 for a one-year stint, where they interned with technology start-ups as software engineers, marketing executives or other roles, and earned credits studying at the universities there in the evenings.

For them, the NOC was more than an opportunity to make new friends, learn new culture, and experience student life in a foreign country – it was a chance to be in the heart of one of the most entrepreneurial communities in the world, and more importantly it was a journey of self-discovery. In this challenging environment, they also discovered new traits about themselves that they could hone for their future development.

Vinod is a Year 4 NUS Mechanical Engineering student, who found added motivation to acquire more knowledge after seeing how his expertise contributed to his internship role as a software QA engineer in a Californian start-up.

“It triggered my curiosity for learning and knowledge. I returned to Singapore and NUS, more motivated to continue learning. This is my last year, and I’m taking classes in microprocessors and internal combustion engines to get useful knowledge which I hope to
use in my start-up ventures,” said Vinod, who went to Silicon Valley on the NOC programme last year.

Ron, a final year NUS Computing student majoring in information systems, discovered his ability to negotiate business deals with older and more experienced executives as a business development executive with a California-based startup accelerator called Plug and Play.

“I was only an intern but my managers expected me to close business deals with CEOs and senior executives. I learnt how to express myself better and be more confident so that I can do my job,” said Ron.

Vinod and Ron recently returned from their one-year NOC stint in Silicon Valley.

Year 3 NUS Business student Rafikah took up the NOC programme in hopes of exploring entrepreneurship and making the most of her time to participate in many start-up activities like hackathons in Silicon Valley. For Rafikah, juggling school, work and other activities was no walk in the park, and she advised that perseverance is needed.

“Time is always ticking; there’s so much to do here. It’s useful to set goals around entrepreneurship and I found I could persevere and uphold them,” said Rafikah, who is currently in the midst of her internship at Stellar Loyalty, a customer loyalty start-up.

For NUS Computing student Andre, the NOC programme saw him re-affirming his passion for data science. A business analytics major, his internship with social gaming network PlayPhone provided him with a larger data set for him to analyse.

Andre and Rafikah are still in Silicon Valley completing their NOC programme and will return to Singapore in mid-2017.

Over 2,100 alumni have returned from the NOC programme since it started in 2002. Collectively, NOC students and alumni have set up over 270 companies to date. The NOCs
are now located in nine entrepreneurial cities across the world, with Lausanne, Switzerland
and Munich, Germany as the latest additions in 2016.

Vinod also shared, “For students who want to be entrepreneurs and don’t know where to
begin, the NOC is a good platform to broaden their skills and gain knowledge in a particular
area. I view it as a life-changing experience and a must-have for wannabe entrepreneurs.”

Ron believes that while not all NOC participants will become entrepreneurs, the experience
will nonetheless help them in their careers.

“It’s important to know what’s your purpose in life, what you should look for,” he stresses.
“When you live in a foreign country, working and studying, juggling your time, you have to
depend on yourself because there’s no family to provide you with back-up plans. This is
reality. Now that I’m back in Singapore, I’m more appreciative of the NOC experience.”
Can Universal Studios Singapore hold its own against growing competition?

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Can Universal Studios Singapore hold its own against growing competition?

- By Monica Kotwani and Dylan Loh, Channel NewsAsia

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SINGAPORE: Seven years after it opened its doors, Universal Studios Singapore (USS) ushered in its 25 millionth visitor on Tuesday (Jan 24) in the face of growing competition from other attractions in the region.

The milestone affirms the viability of the theme park model as a means of drawing visitors to Singapore, said Resorts World Sentosa (RWS), which manages the attraction. It added that the theme park has set its sights on welcoming its 30 millionth visitor next.

But with the attractive exchange rate of the Malaysian ringgit compared to the Singapore dollar, theme parks across the Causeway, such as Hello Kitty Town and Legoland, could pose serious competition with their lower prices.

RWS’ senior vice president of attractions, Jason Horkin said: “What it really means is that we’ll work harder to get the best offerings so people will want to come here. Whether it’s exchange rate issues or other parks, we’re going to want to be the park of choice.”
He added that USS is rolling out promotional packages covering entry tickets and retail vouchers to hook visitors.

Tourism lecturer Michael Chiam noted that USS has done well to draw in an average of over three million visitors per year. Other theme parks in Southeast Asia typically see around two million or more visitors annually, he said.

All the same, USS should look at introducing new rides or features every three to five years to refresh itself, said Dr Chiam, who is deputy director of marketing communications at Ngee Ann Polytechnic’s School of Business and Accountancy. He added that if the theme park did not do so, it would run the risk of appearing stale to its visitors.

"People travel quite often to our neighbouring countries and there are new theme parks coming on board. And when people try new theme parks, they gain new experience, and they always compare with what we have," he said.

Another lecturer, Associate Professor Ang Swee Hoon, noted that USS may not be in direct competition with theme parks in Malaysia, as Hello Kitty Town and Legoland may target younger children, while USS reaches out to a more varied crowd.

However, she pointed to the need for USS to keep a consistent brand image, which is why its rides are virtually the same across its various theme parks internationally.

It also is not viable to introduce new rides each year, as the capital investment is enormous, said Dr Ang, who is with NUS Business School’s Department of Marketing.

While introducing new rides every two to three years is sufficient, what USS needs to do to stay contemporary is to offer a variety, she said. “A ride change is a massive change, but in between massive changes, you want minor changes such as those made to street entertainment, having new parades, variations in food or even through cameo appearances from different characters.”

Ultimately, even if all the attractions remained unchanged, Dr Ang said that repeat visitors, especially locals, would still frequent the park if the experience has been good.

“It’s like when you go to a restaurant for a meal and it’s a good experience. You go back there again and it won’t surprise me if you go back for the same food because it’s the experience that counts. So it’s the same for USS. To stay current or stay interesting, it must make sure what it offers is an experience you can’t find elsewhere,” she said.
Unions are claiming that Surbana Jurong’s controversial termination of 54 employees was done without due process, saying that the company did not inform the union before they let go of unionised employees.

But are companies in Singapore legally obligated to inform them of the terminations of unionised employees?

*HRD* spoke to associate professor Ravi Chandran of the Department of Strategy & Policy of the National University of Singapore (NUS) Business School on the matter.

He said that while the Industrial Relations Act allows for a unionised employee to file a claim against an employer for unjustified terminations, it does not legally require employers to inform unions of any planned dismissals.

“Pursuant to section 35(3) of the Industrial Relations Act, where an employee considers that he has been dismissed without just cause or excuse by his employer, he may, within one month of such dismissal, make, through his trade union, representations in writing to the Minister to be reinstated in his former employment,” he said.

“While the Industrial Relations Act, gives the employee this right – it does not impose any obligation on the employer to consult the union before dismissal.”

“Nonetheless, as a matter of good practice, if the union is informed and the matter is aired out – it is less likely that a section 35(3) appeal will arise. It may also lead to better industrial relations,” he advised.

Companies looking to dismiss employees – regardless of whether they are unionised or not – should be cognizant of the three most common legally accepted forms of dismissal, he said:
(a) by notice;
(b) by salary in lieu of notice;
(c) without notice or salary in lieu of notice (ie summary dismissal) provided there is a serious breach (eg: employees steals from the employer) or it is justified by contractual provisions (eg: contract states, employer can summarily dismiss if employee is made a bankrupt)

“In relation to all three situations above, if the employee falls under the Employment Act, he has a similar right to appeal to the Minister if he feels that the dismissal is without just cause or excuse,” he reminded employers.
Those who pre-pay are taking risk: Case
21 January 2017 - The New Paper

Consumer watchdog concerned over two-fold jump in cases of pre-payments for goods and services last year

Those who pre-pay are taking risk: Case

LINETTE HENG

Pre-payments for goods and services are a growing concern, especially in an uncertain economy, says Singapore’s consumer watchdog.

The Consumers Association of Singapore (Case) saw close to a two-fold jump in the number of consumers affected by company closures last year — with 877 cases — compared to 440 cases in 2015.

In 2014, there were 334 cases.

The bulk of last year’s complaints were about California Fitness, which suddenly shut its outlets last July after nearly 20 years of operating in Singapore.

While the beauty and health industry is known for getting customers to sign packages at discounted prices, other businesses are also joining in this practice.

Case’s new executive director, Mr Loy Yoke Jian, told The New Paper on Monday that it had recently seen cases of furniture companies and parallel importers who failed to deliver after collecting payments from customers.

Mr Loy, who started his new role at Case on Jan 1, added: “I would have liked some legislative protection for consumers, but right now we could do more in terms of consumer education.

As consumers, the bargaining power is in your hands until you hand over the money. I don’t think signing packages will go away, but consumers should be careful about signing expensive packages with attractive discounts as they are taking a risk.”

In a separate interview, former Case head Seah Seng Cheon, who is now the non-government organisation’s adviser, also expressed concern over pre-payments and called it a “questionable” business practice that needs to be addressed.

He said: “As the number of companies collecting pre-payments increases, more consumers will be affected...

“More companies are jumping on the bandwagon because pre-payments from consumers are free cash or ‘loans’ to run their businesses.”

In such situations, the consumers shoulder the risk and could lose their money if the companies go under.

Retail experts agreed that collecting upfront payments should not be used as a business model.

National University of Singapore Associate Professor of marketing Ang Swee Hoon thinks more should be done to increase awareness of accreditation schemes like CaseTrust, which recognises businesses that are committed to fair trading and transparency to customers.

For instance, CaseTrust accredited companies in the spa and wellness industry allow customers a cooling-off period of at least five working days to seek a full refund.

Prof Ang added: “Consumers should be more cognisant as well and do their own screening. The future is unpredictable.

“After you pay the company, you have limited options if it does not deliver. It’s a matter of penny wise, pound foolish.”

Nanyang Business School Adjunct Associate Professor Tan Wee said: “It should be done minimally as the core business of the company is not capital management.

“If they collect more than they can service, it is not ethical. There should be a limit to how much they can raise in this way.”

But Prof Wee explained that pre-payments are also a form of customer retention.

“The companies cultivate loyalty through better deals. (It is also) a form of customer service as it offers convenience in payment.”