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ELECTION EVE UPDATE

ELECTION 2013

PUNDITS V PREDICTIVE STATISTICS

Pottinger **ANALYTICS**



After the longest countdown in Australian election history, people are itching to get to the polls, cast their votes, and see Australia open a new chapter in its history. Whatever the outcome tomorrow, it is critical that the country returns to the positive energy, good humour and decisiveness for which the country is renowned. Indeed, an incoming Government inherits an economy whose growth is the envy of the developed world, whose fiscal position remains strong in relative terms, and many of whose businesses benefit from excellent domestic profitability and strong international reputations. This economic hand of cards transcends politics, and reflects the inherent strength of Australia's democracy and diversity.

At the start of the year, we thought we would put our analytical capabilities to the test in forecasting the outcome of the Australian Federal Election, Nate Silver style. We've used these techniques to great effect in agriculture, financial services, utilities, patronage analysis, property, resources, and even astrophysics, so why not Canberra? In practice, the Australian electoral system has particular challenges to navigate and we commenced our analysis against the background of relatively limited electorate-level polling.

Additionally, we have tried throughout our analyses to answer the question, "what will the outcome be?" rather than the question which is asked in opinion polling, which is:

"who would you vote for if an election was held today?" To address this challenge, we created an integrated analysis which combines both polling data and betting market data simultaneously – we believe that this is the first time this approach has been adopted anywhere in the world.

It is still too early to judge whether or not our analysis has been successful, and we plan to publish a final update and post mortem next week to reflect on how we have done. Wherever the end result lands, we have analysed 327 polls and witnessed amazing gyrations in the pundits' predictions. On a more serious note, we've explored the more complex issues with some of the world's leading academics as we've refined

the analysis, and we've also enjoyed some fascinating correspondence with a number of the other statisticians and electoral commentators around the world, including Simon Jackman, Drew Linzer, William Bowe, Kevin Bonham, and Mark the Ballot. We would like to record our sincere appreciation for the open engagement as we have developed the thinking co-operatively. We have also greatly appreciated the feedback from the many people who have responded to our commentary.

What may have surprised some is that our forecasts of the likely outcome of the election *haven't really changed that much*. Back in early June, commentators were forecasting a dramatic loss for Labor, with a result as

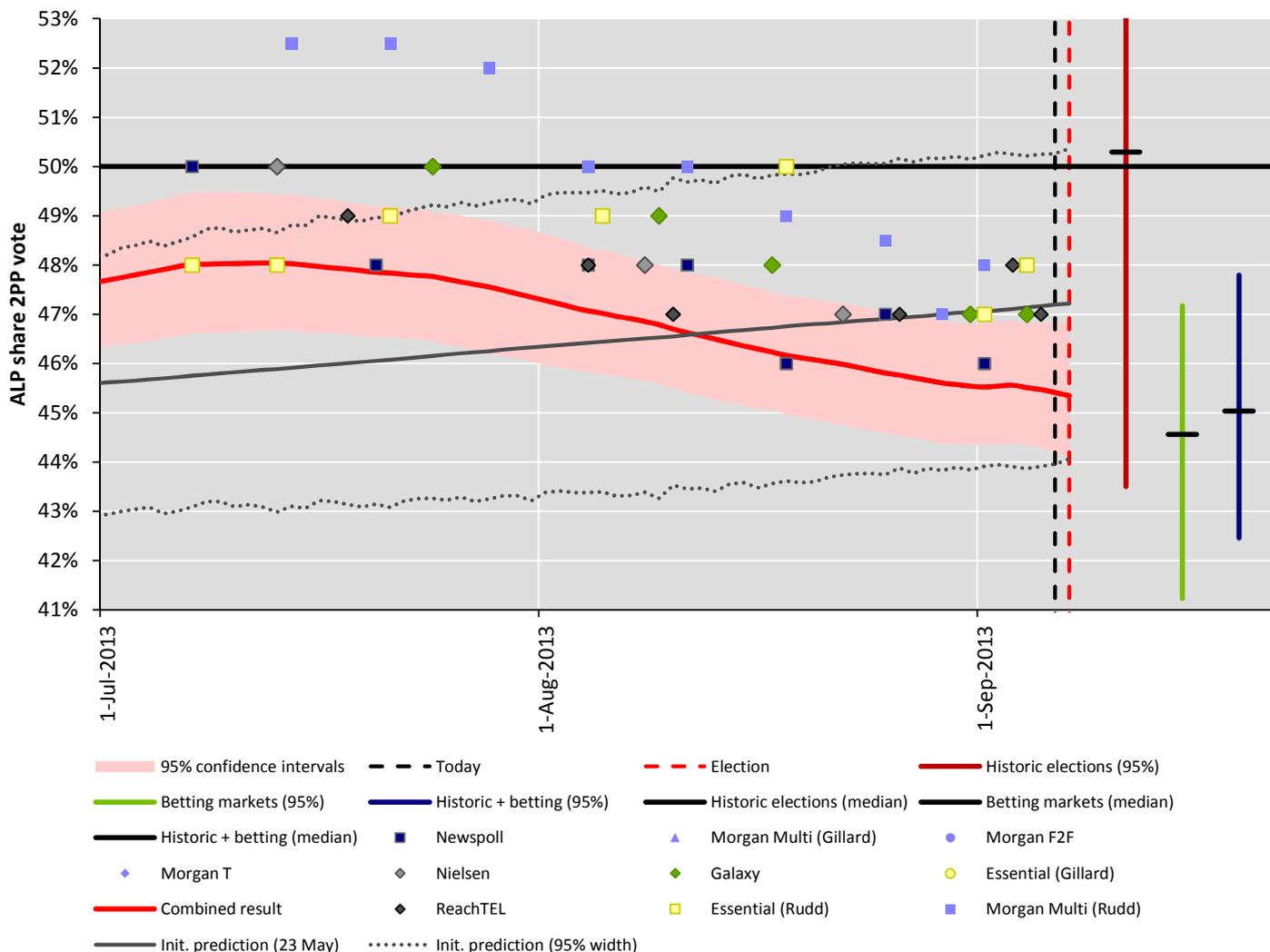


Figure 1: Historic polling data and estimated ALP share of 2PP vote between 1 July 2013 and 7 September 2013, and constraints on election day voting intentions from historic elections and Centrebet

low as 35 to 40 seats, in what would have been the worst result since at least 1937 on a percentage-of-seats basis.

Our analysis incorporated the results of previous elections, which suggested a result this extreme was most unlikely. As a result, our forecast in early June was for a most likely result of 56 seats for Labor, with a median forecast of 62 seats. Either of these could still prove to be right, and indeed for a variety of reasons the range of outcomes that is possible in the light of the polling and betting odds is still relatively wide. Nevertheless our median estimate today is 95 seats for the Coalition and 54 for Labor – amazingly close to our early forecasts.

Our prediction – the final update

Our final model incorporates all 327 polls, as well as the latest Centrebet odds, which offer 1.02 for the Coalition and 14.00 for Labor.

Based on these inputs, our model is currently showing:

- A 2PP result of 54.7% for the Coalition (95% CI: +/- 1.4%) and 45.3% for Labor (95% CI: +/- 1.4%) (Figure 1), compared to 53.2% for the Coalition and 46.8% for Labor in our early June edition
- The probability of a win for the Coalition of >99.9%, up from 95.2% in early June. Incidentally, this is some way ahead of the probability implied by the betting odds of 93.2%
- The most likely outcome of 54 seats for Labor (compared to 56 in early June) and 95 for the Coalition, whilst the median of the distribution gives 54 seats for Labor (down from 62 in early June) and 94 for the Coalition (Figure 2)

How robust is our model?

Like any good scientist, we must question

the assumptions underlying our model. A model is only as good as its inputs. History shows us that election-eve polling is highly predictive of the outcome.

Pollsters sometimes (on average) differ slightly from the actual outcome, which reflects biases in how polling is conducted. Our model accounts for this bias by calibrating off the last election. If the pollsters' methodologies have changed significantly since then, then our model may be in error.

Our model incorporates betting market data. There is good evidence that betting markets are efficient at predicting outcomes. Nonetheless, betting markets for elections have not been around that long, and in Australia our betting market participants do not have a lot of experience with landslide elections (which this one has the potential to be), and so the betting odds may not be

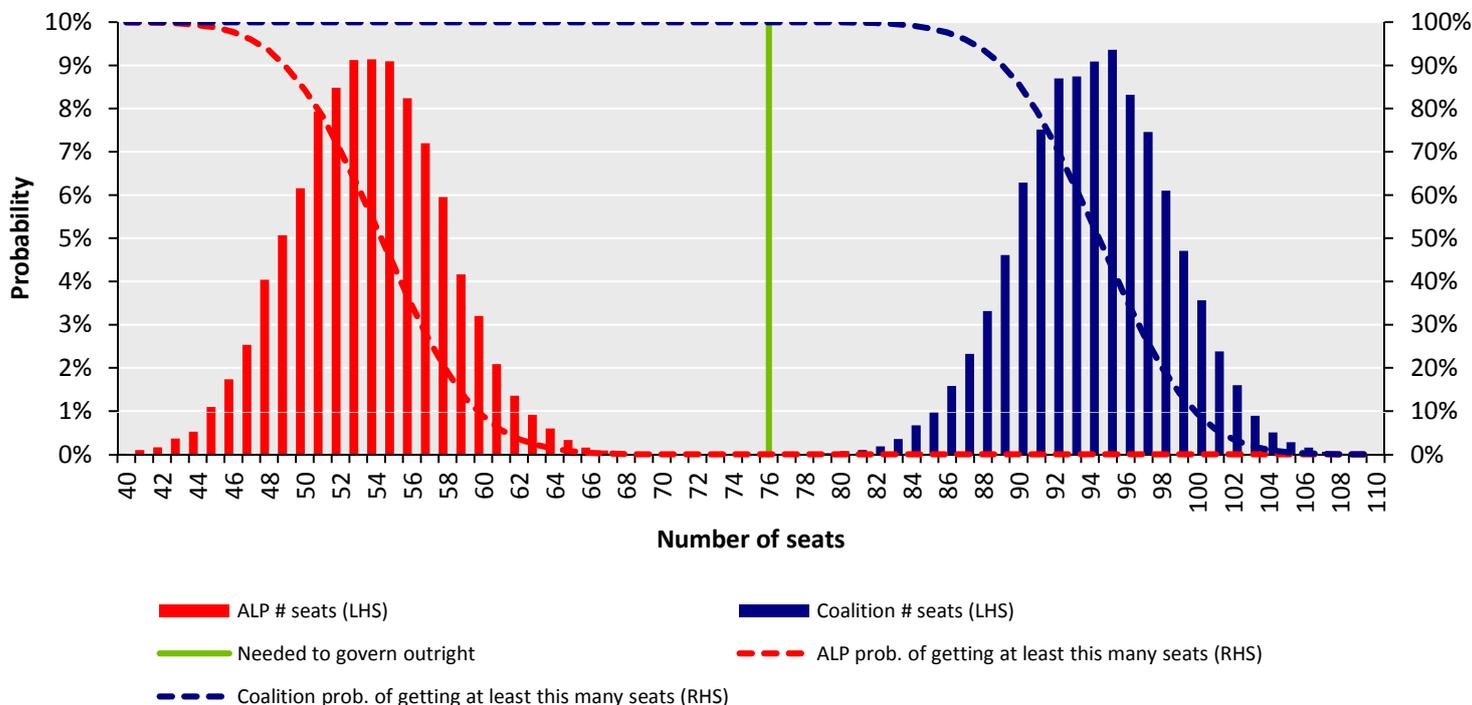


Figure 2: Implied distribution of outcomes for the number of seats for the ALP and the Coalition

quite as predictive as they have been in the past (and commensurately, our model which converts the betting market odds into a 2PP prediction has been calibrated off data from closer elections than this is likely to be).

The US experience has shown us that statistics are clearly better than pundits at predicting the outcome of elections. Taking this as a given, then all that is left is to try to build the most accurate model. If our model is accurate, then there's something to be learned from this. If our predictions are substantially off, then there are things to be learned from this as well – this is the scientific method, and can only lead to better forecasts in the future.

What does this mean for my business?

One of the most common questions that our analysis provokes is: "How can we use this in our business?" The short answer is that sophisticated quantitative and statistical analysis of this nature is useful in a wide variety of circumstances. Most people will already be familiar with the concept of big data – and more importantly the "big analytics" that is needed to make sense of the data. In practice, more or less anywhere that data exists is a fertile ground for deploying these capabilities.

To date, nearly all of this analysis has

been focussed on consumer behaviour and other areas of operational decision-making and optimisation. The application of these techniques to more complex strategic questions is still very rare. Yet our experiences in a range of industries have shown that much better decisions can be made, adding significant value and/or reducing risk substantially, if you are prepared to use a more sophisticated approach.

If you are not aggregating polls you are not in the game

As an example, we advised on the formation of Queensland Urban Utilities via a \$4.3bn merger, in what was one of the largest ever utilities transactions in Australian history, and probably the only ever five-way merger. By harnessing advanced statistical evaluation techniques, we were able to explore the impact of unlikely but realistically possible shocks on the business that might occur in the early years following formation and to recommend a capital structure that took these into account. Six months later, when the Brisbane floods hit, QUU was able

to complete a significant remedial capex programme without recourse to its council shareholders for additional funds – an exceptional result.

In another example, we advised two consortiums on the potential acquisition of the iconic Queensland cotton property, Cubbie Station. This property spends most of its time in flood or drought, making average cases meaningless. We utilised detailed hydrological modelling of the catchment area to create a simulation-based model to predict the future outcomes of the property, thereby allowing us to value the asset reliably as well as gaining a much better understanding of the property's risk, letting us determine how much debt the property might be able to support.

We have also developed a statistical pricing model for resources projects that accounts for a wide range of factors beyond the quantity of mineral present. Our model explains most of the difference in valuation between different resources projects and allows us to price resources projects with most minerals, in most countries, and at every stage of development more accurately than using conventional techniques. Using this model, we are able to provide deep insights to clients as to where value currently lies in the sector, as well as the implications

for longer term strategic decision-making.

In simple terms, this is big data for the Boardroom, an emerging branch of analysis often referred to as "Strategic Analytics". It combines traditional strategic advisory skills with leading edge quantitative and statistical analysis in order to provide robust, data-based support for strategic decision-making. Our Pottinger Analytics practice acts as a focal point for our range of specialist strategic analysis services in this field, and we have had strong demand for the insights that we can provide where others are unable to do so.

What next?

So, where to from here? The Victorian elections are just over the horizon, and will provide an interesting testing ground for a number of improvements we plan to make to our electoral analysis. And a few people have already begun to ask about the likely outcome of the 2016 election. For now, let us content ourselves with seeing how our predictions fare tomorrow. **P**

By Julian King and Nigel Lake

Julian is a Vice President at Pottinger. He has a PhD in astrophysics and was a winner of the 2012 Eureka Prize for Scientific Research. He has a keen interest in understanding the true drivers of risk and value in businesses, in part by trying to apply Bayesian statistics to everything.

Nigel Lake is Joint CEO of Pottinger.

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Pottinger is a multiple award-winning strategic and financial advisory firm.

We help our clients to adapt, innovate and transform their organisations to ensure their sustained success in today's increasingly complex and fast-moving business and economic environment. We do this by providing insight and advice that encompasses the design of strategy and the negotiation and execution of M&A transactions.

Our clients say that we offer a completely different proposition to traditional consulting and investment banking advisors, seamlessly integrating true strategic thinking, commercial insight, financial expertise and execution excellence. Our assignments typically relate to one or more of:

- Strategy and public policy
- Mergers and acquisitions
- Partnerships and joint ventures
- Restructuring and capital advice
- Risk, sustainability and related decision-making

Together our team has advised on over 200 M&A and financing transactions, as well as many significant strategic advisory assignments. Our experience covers most of the world's larger economies, and we enjoy the complexity of assignments that extend across borders and cultures.

We are regarded as an industry leader in productivity and as a role model for investment in our people. We have been recognised by the Australian Workforce and Productivity Agency as a benchmark for effective skills development in financial services and for the last seven years we have been awarded "Recommended Employer" by the Australian Business Awards.



Cassandra Kelly
Joint CEO



Nigel Lake
Joint CEO

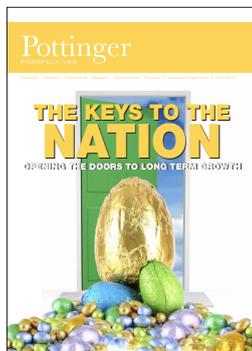
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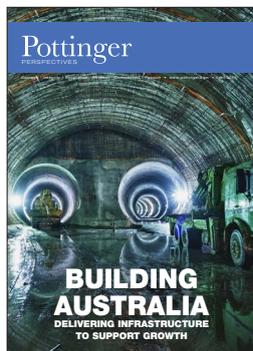
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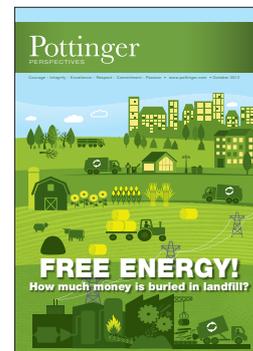
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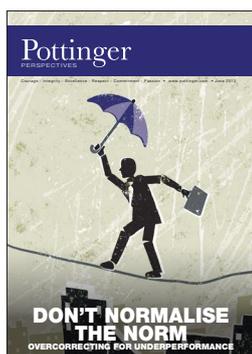
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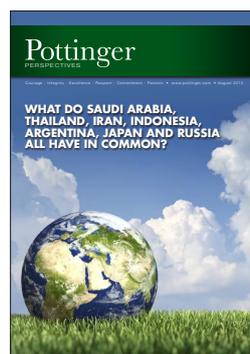
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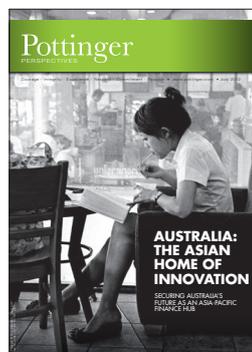
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