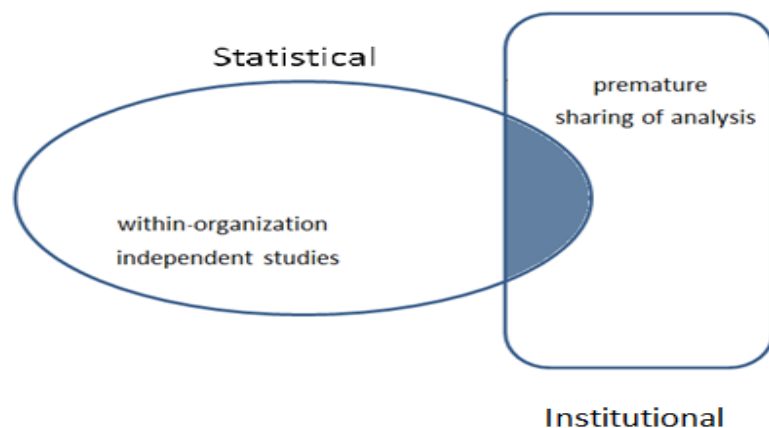


**Internet Appendix A219: Regulation  
Illustrative Pitch Template Example**

Pitcher's Name	Gordon Menzies	FoR category	(JEL) G28 Government policy and regulation	Date Completed	21/05/2015
(A) Working Title	Independent Dimensions of Regulation				
(B) Basic Research Question	Has there been too much focus on <i>institutional</i> independence for regulation when <i>statistical</i> independence is important too?				
(C) Key paper(s)	Freixas, X. and J. Rochet (2008), <i>The Microeconomics of Banking</i> , MIT Press, Cambridge Massachusetts. [pre-GFC regulation] Littrell, C. (2011), 'Responses to the Global Financial Crisis: The Australian Prudential Perspective', <i>APEC Regional Symposium</i> , 8 March 2011. [post GFC regulation] Evans, J. and W. Lindsay (2011), <i>Managing for Quality and Performance Excellence</i> , South-Western. [describes sampling and quality control in a wide range of contexts, including management and administration].				
(D) Motivation/Puzzle	When reporting to the FSI on the costs and benefits of removing 'red tape' it was easy to estimate benefits by increasing the productivity of the financial sector in a multi-industry model. But quantifying the costs proved harder, since uncovering the connection between the risk of recession and the myriad regulations slated for removal was infeasible over the timeframe. I reviewed the foundational principles of regulation, and came to believe that quality control had relevance. Financial regulators have to search for crisis-generating flaws in the financial system, thereby assuring its 'quality'. Some clusters of search procedures operate more or less independently to others. I call these clusters Independent Dimensions of Regulation (IDRs) and they may appear inefficient if the same issue is explored repeatedly. However, statistical independence in this context rapidly reduces the chance of a crisis for each new IDR.				
<b>THREE</b>	<b>Three</b> core aspects of any empirical research project i.e. the "IDioTs" guide				
(E) Idea?	The analytic metaphor used when searching for financial flaws is one of quality control, such as doing statistical inference on an assembly line. This uses the surprising power of statistical independence to generate very small chance of missing a defect in the process, by the multiplication of probabilities. If a quality check of items fails to uncover a flaw with probability $p_1$ then two <i>independent</i> checks will miss it with probability $p_1 p_2$ . Halving the number of checks – from two to one – will not double the chance of failing to discover an important problem, but rather increase it by a factor $1/p_2$ where $p_2$ is the probability of missing the flaw on the second check. If it is smaller than one half the risk of this error will <i>more-than-double</i> . By analogy, removing even one independent dimension of financial regulation can be dangerous. And if the optimal number of IDRs is unknown, insurance in the form of extra dimensions seems attractive.				
(F) Data?	I plan to approach regulators and seek different measures of the same phenomena related to financial flaws and to examine the independence of the different measures over the GFC.				
(G) Tools?	Tests of independence depend on the data structure, but there are number of standards ones, such as the 'runs test'. Any identically and independently distributed sample (i.i.d) should have a pattern of persistence above and below the mean (the 'runs') which follows a well-known distribution. Departures from this indicate non-randomness (i.e. dependence).				
<b>TWO</b>	<b>Two</b> key questions				
(H) What's New?	Public policy formulation may be enhanced by understanding the role that preserving statistical independence can have in avoiding potentially catastrophic financial flaws.				
(I) So What? (Policy)	<ul style="list-style-type: none"> <li>• Regulators could adopt IDRs as one conceptual benchmark in their frameworks for the collection of information.</li> <li>• To this end they could review the independence of their searching for financial flaws, looking across as well as within regulators, since institutional independence is neither sufficient nor necessary for statistical independence (Figure 2).</li> <li>• The IDR framework suggests that regulators have good grounds for resisting efficiency gains in gathering, processing, or modeling information about financial flaws where this risks reducing the number of IDRs. (This doesn't refer only to statistical analysis; it also refers to prematurely closing off policy debates when independent perspectives from different professionals are required to adopt a consensus view).</li> <li>• Regulators could review their frequency of sampling from organizations using evidence-based criteria as well as reporting cycle criteria, where the relevant evidence is the inter-temporal correlation of information.</li> </ul>				

	<ul style="list-style-type: none"> <li>• If search procedures are found which are dependent, policymakers can make them more independent, or remove them. A precautionary principle applies to the latter option since it is risky to remove an IDR and good insurance to add an extra one.</li> <li>• That said – the more IDRs that exist, the harder it is to find independent ones, so tradeoffs start to emerge whereby increasing the number of rounds (<math>n</math>) starts to induce correlation (<math>\rho</math>) which limits the advantages of more rounds (Figure 3).</li> </ul>
<b>ONE</b> <b>(J) Contribution?</b>	<ul style="list-style-type: none"> <li>• Theoretical: <i>independent overlap of scrutiny creates a positive statistical externality.</i></li> </ul> <p>This economic principle has wide application, and runs counter to some deeply-held business intuitions about minimizing costs. For example; should our economic system encourage ‘mixed teams’ to investigate issues or be responsible for outcomes? When faced with an issue it is common for a team of professionals to each comment on their own area of expertise, and to go no farther. In fact, they may risk severe penalties if they comment outside their ‘turf’. But if the goal is to interrogate the same issue from as many independent vantage points as possible, it is actually <i>desirable</i> to have independent overlap. The same principle applies at the level of whole organizations. Is it inefficient for a central bank and an (institutionally) independent prudential regulator to look at the same issue from different perspectives? If they do, is this evidence of inefficiency and the need to cut back the budget of both so that they will focus on core non-overlapping goals? IDRs suggest an answer ‘not necessarily’. Certainly wasteful <i>dependent</i> replication is unlikely to discover any financial flaw, given other regulations in place, but several IDRs with well-designed independent overlap are the opposite of wasteful; they rapidly reduce the chance of a serious flaw being missed.</p> <ul style="list-style-type: none"> <li>• Practical: <b>Regulations that search out financial flaws along a number of independent dimensions are more likely to serve the post-Great-Recession world better than the previous regimes, by making costly banking crises less likely.</b></li> </ul>
<b>(K) Other Considerations</b>	<ul style="list-style-type: none"> <li>• Target journal <i>AEA Economic Policy</i> <a href="https://www.aeaweb.org/aej-policy/">https://www.aeaweb.org/aej-policy/</a></li> <li>• Jean Charles Rochet, author of <i>the Microeconomics of Banking</i>, has encouraged me to write up this, as he says is a new idea. We shared a place on a panel at the Australasian Economics Society Conference in Tasmania about regulation.</li> </ul>

**Figure 2: Venn Diagram –Statistical vs. Institutional Independence**



**Figure 3: Equation – Variance of Sample Mean**

$$\sigma_{\bar{x}}^2 = \frac{\sigma^2}{n} \quad \text{Indept data}$$

$$\sigma_{\bar{x}}^2 = \sigma^2 \left( (1 - \rho) \frac{1}{n} + \rho 1 \right) \quad \text{dependent data;}$$

$$\text{corr}(x_i, x_j) = \rho \quad i \neq j$$