Kaleidic Economics

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Can we measure uncertainty?

It seems intuitively obvious that "uncertainty" can influence the economy and impede economic recovery. But the widespread use of the term lags behind common agreement about what it really means. The Austrian school is well placed to contribute to this debate. The concept of "Knightian" uncertainty is a cornerstone of Austrian theory and "regime" uncertainty has been utilised to provide a convincing explanation for the duration of the Great Depression. Recent attempts to measure certain forms of policy uncertainty show that conventional economists are beginning to take it seriously, but are we all talking about the same thing? This short article will argue that attempts to *measure* uncertainty have insurmountable methodological flaws, but that doesn't mean the Austrian school cannot contribute to a contemporary and progressive research agenda.

Defining uncertainty

Frank Knight's "Risk, Uncertainty and Profit" is perhaps the seminal treatment of uncertainty, and foreshadows the uneasy way it's been treated by economists ever since. His distinction rests on measurability. Risk is measurable. Uncertainty isn't. The answer to the question of "can we measure uncertainty" is, in the Knightian sense, a resounding "no!" With this approach we can view "Knightian" uncertainty to be the natural state of affairs, and the role of insurance and other financial markers to quantify as much of it as possible. This view is not unique to Austrian school economists (although Mises' distinction between "case" and "class" probability is an excellent explanation of Knightian uncertainty), because Keynes also fretted about events that could not be reducible to mere risk,

> "By 'uncertain' knowledge, let me explain, I do not mean merely to distinguish what is known for certain from what is only probable. The game of roulette is not subject, in this sense, to uncertainty...The sense in which I am using the term is that in which the prospect of a European war is uncertain, or the price of copper and the rate of interest twenty years hence...About these matters there is no scientific basis on which to form any calculable probability whatever. We simply do not know." Keynes, 1937[1]

[1] Having said this, it is still legitimate to claim something uniquely Austrian about this view of uncertainty due to its central position within the Austrian theory of entrepreneurship. In the

In Donald Rumsfeld's language, uncertainty is the unknown unknowns. Known unknowns, have the potential to be quantified. Once quantified, uncertainty gets turned into risk, and forward planning becomes much easier. The danger, as Nasem Taleb so famously points out, is the "black swans" of uncertainty. Just because they're not quantifiable, doesn't make them disappear. It's also misleading to think that the rise of insurance markets necessarily decreases the amount of uncertainty. It's not the case that there is a fixed amount of "total" uncertainty, and gradually over time we can simply convert some of it into risk. The notion that uncertainty is "increasing" or "decreasing" doesn't make much sense. "Aggregate" uncertainty has no meaning. The focus should be on disaggregating uncertainty, and trying to operationalise it. To help with this, a more sophisticated definition is as follows:

- Risk: where events belong to a known distribution
- Ellsberg ambiguity: where the distribution is unknown
- Knightian uncertainty: where we don't even know the range of possible events

As an example, picking a ball out of an urn that contains 20 white balls and 40 black balls is defined as a situation of risk. Picking out balls without knowing how many balls are white and how many are black, is a situation of ambiguity. Pulling out a purple ball (or a bomb?) is uncertainty.

There is a direct relevant of the efficient market hypothesis (EMH) here, because by definition uncertain events cannot be anticipated. Can we identify instances where we've pulled out a purple ball? Perhaps the following come close:

- 9/11 (this example if often attributed to Vernon Smith)
- Hurricane Katrina
- Japanese earthquake

To a lesser extent we can consider surprising economic data, but it's very hard to identify unique events that come completely out of the blue.[2] This may be a sign that financial markets have become increasingly successful at reducing exposure to Knightian uncertainty. It is also because it may be the size of the losses generated that is the source of uncertainty, and not the probability of the event occurring or not.

Operationalising regime uncertainty

Uncertainty is amorphous and pervasive, but perhaps the most brilliant attempt to demonstrate its relevance for macroeconomic performance is Robert Higgs' account of the Great Depression. He

Knight/Mises view entrepreneurship is effectively defined as an exposure to Knightian uncertainty. The entrepreneur is the residual claimant after all contractual claims are met (see Foss and Klein 2012)

[2] We also need to consider occasions where what people treat as "potential" purple balls (e.g. the Y2K bug) fail to materialise.

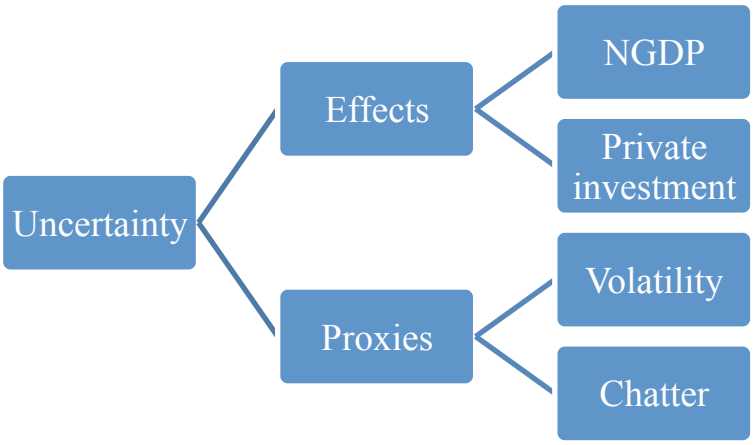
makes a convincing argument that the rhetorical and material threats to the private property right regime caused a significant impact on the planning decisions of economic agents. In stark terms the fact that investors were no longer confident that they'd continue to operate within a capitalist system, stymied economic recovery. We can treat this as the prime example of regime uncertainty in action. But there's a danger of ascribing too much to regime uncertainty. After all, the "property rights regime" is sufficiently vague that any policy decisions could be interpreted through this lens. In particular, several directions would be interesting to pursue, in an attempt to reinforce Higgs' argument:

- To what extent is regime uncertainty an extreme form of policy uncertainty? At what point do policy changes threaten the "regime"?
- In terms of tax reform people tend to like changes provided they are anticipated. Very few people want the tax code to stay the way it is. Therefore *stability* is less important than *predictability*. Therefore can policy changes reduce uncertainty, provided they're communicated clearly and help form expectations?[3]
- Regime uncertainty is typically applied to the US economy during the Great Depression, and the "Great Recession". It's also been applied to the UK economy (Evans, forthcoming). On the surface, one would expect it to be especially pronounced during coups and other radical constitutional changes. It would be interesting to see cross country comparisons and detailed case studies
- The basic idea is that a stable investment climate is important in generating confidence. But what if the present investment climate is inhospitable? To what extent can regime uncertainty lead to good economic outcomes?
- Is it the uncertainty that's the problem, or the prospect of worse economic policies? In crude terms can we compare regime uncertainty with regime shittiness?
- Uncertainty doesn't disappear when times are good, so what can we learn about the issue by comparing recessions with times of economic growth?
- Does regime uncertainty mean that investors hold off on investment (this is argued by Bernanke 1983), or alter the *types* of investment they make?

Higgs uses the following potential indicators: gold prices, hoarding cash, and the yield curve. But we would argue one of the strengths of Higgs' analysis is that he puts the focus on the consequences of regime uncertainty, rather than attempting to measure it directly.

The crude diagram below attempts to distinguish between effects of uncertainty, and the proxies we can use.

[3] This seems to be the point Warren Buffet is making when he argues that policy responses may increase uncertainty but that isn't necessarily a bad thing. See Paulson (2010, p.284)



The reason economists tend to focus on investment is because it is a more volatile component of national expenditure – if you explain investment, you explain the business cycle. In the UK National Account investment (i.e. Gross Fixed Capital Formation) is split into 4 categories – business investment, general government, public corporations, and private sector dwellings. In December 2011 Kaleidic Economics began publishing a measure of "private investment" which is simply the sum of business and private sector dwellings.[4] In short, *this* is what we need to explain:

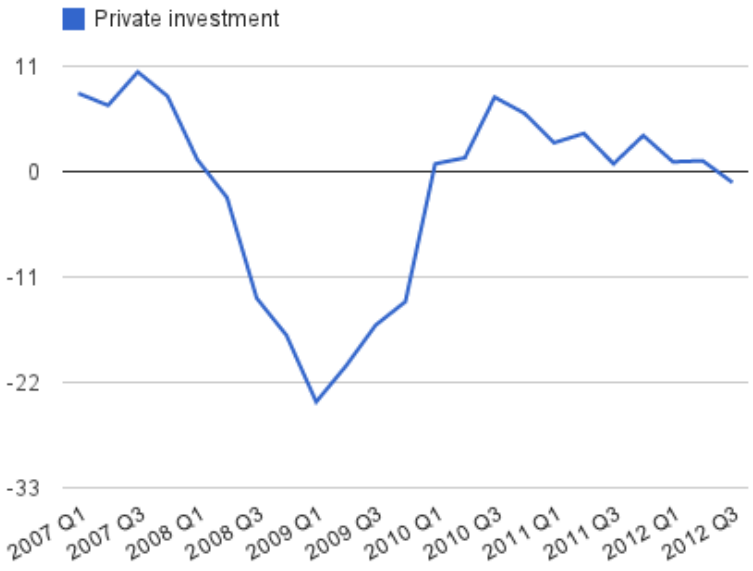


Figure 1: Private investment (percentage change, quarter on previous years corresponding quarter)

[4] See http://www.kaleidic.org/data/#investment. At the moment this is a gross measure as opposed to a net measure. We intend to publish a net measure in the future.

Proxies for uncertainty

We split the proxies for uncertainty into two main types. Some of them are simply measures of financial market volatility. Perhaps the most famous one is VIX, and a 5-year series is shown below[5]:

Figure 2: VIX

In terms of the UK economy, the closest equivalent is probably the FTSE 100 Volatility Index.[6] However these suffer from severe methodological implications. One is that for any measure of volatility timescale is very important. Nothing is "volatile" independent of the specific period of time in which the economist is choosing to look at. Many commodities may appear "volatile" in the short term, but deliver long term sustained growth. Another example is a comparison of fixed versus floating exchange rates. Fixed appear less volatile over the period in which it holds. But if the fix breaks down then we tend to see dramatic and discrete changes in the value of the currency. When a football crowd falls silent, this isn't an indicator that volatility (in terms of crowd noise is low). It may be a penalty has been awarded, and all hell is about to break loose. Another problem is that VIX is "at the money". You can buy futures contracts. There is a forward curve. Most importantly of all, *it's being watched*. It's a measure of risk, not uncertainty. Some investors will focus attention on "out of the money", and this moves us closer to the territory of Knightian uncertainty. But we're probably left in the sphere of Ellsberg ambiguity. By definition the market cannot look at uncertainty. This may seem a semantic, academic point. But the 2008 credit crunch is a reminder that the type of event that would make us realise that the distribution is wrong is a severe one. Black swans are abstract until they bite you on the arse. The successful traders in September 2008 were those who quickly adjusted to the revelation that

[5] See http://uk.finance.yahoo.com/q?s=%5EVIX.
[6] See http://www.ftse.com/Indices/FTSE_Implied_Volatility_Index_Series/Downloads/FTSE_100_Implied_Volatility_Factsheet.pdf.

the risk calculations were based on the wrong distribution. It was those who *attempted* to consider the extreme scenarios that prospered, even if they couldn't see a complete picture.

The second proxy for uncertainty we've labelled as "chatter", and this is a reliance on newspaper reports and other signs that people are concerned by uncertainty (e.g. business surveys). A prominent example of this is the "Policy Uncertainty Index" devised by Scott Baker, Nicholas Bloom and Steven Davis.[7] They combine the frequency of news media references to policy uncertainty, impending tax code expirations, and forecaster disagreement over inflation and government spending. The chart below shows US policy uncertainty since 2007:[8]

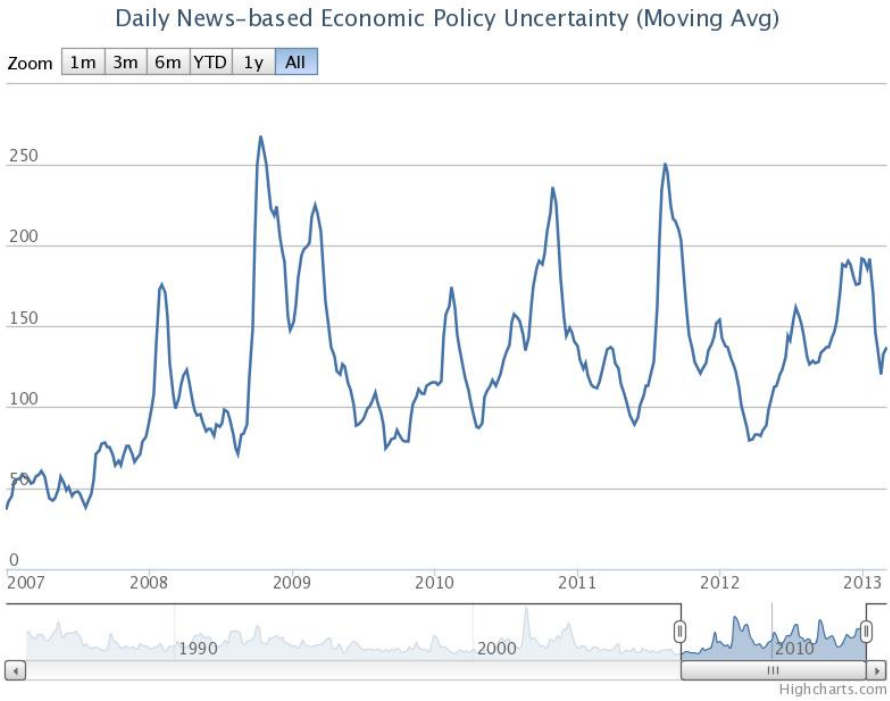


Figure 3: Policy uncertainty

Again, our scepticism is methodological and rests on the inductive way in which components are selected to explain a specific time period. The authors do provide a mechanism by which uncertainty affects economic activity (real options effects, financing costs, and precautionary savings) but little explanation for what they mean by "uncertainty". Whilst such attempts to operationalise uncertainty should be welcomed, there's a danger they end up only paying lip service. Evans and Friedman (2011) discuss ways in which formal modelling fail to deal with ignorance and uncertainty in the sense we are using them. Leduc and Zheng use survey data and claim that it's a leading indicator over economic performance. But they only compare consumer's perceived uncertainty with economic data releases.

[7] See http://policyuncertainty.com/index.html.
[8] Also see http://www.voxeu.org/article/economic-recovery-and-policy-uncertainty-us and http://www.voxeu.org/article/uncertainty-weighing-global-recovery.

But it's not clear whether uncertainty is operating as a self-fulfilling prophecy, or if both factors are driven by other, underlying economic trends.

Monetary policy

The danger of leaving uncertainty reasonably vague is that we make a Post hoc ergo propter hoc fallacy and attribute all bad events to political actions. We also need to look at situations where one might expect regime uncertainty to operate, even if there's no visible impact. One example is the 2010 General Election in the UK that led to a Conservative-Liberal Democrat coalition. On the surface this seems classic example of political uncertainty, but the markets barely budged. You could well argue that this demonstrates the efficiency of markets, and that it was priced in. But is there any evidence of people predicting that the election would result in a Con-Lib coalition that would last 3 years (and counting).

Perhaps an even better example is the appointment of Mark Carney to become Governor of the Bank of England. This came completely out of the blue – the BBC had listed 5 front runners for the job, and he wasn't one of them. He only accepted it following a personal request from the Chancellor and the fact that he could operate on a reduced term to coincide with the schooling of his daughters. Carney had an existing reputation as a reasonably unconventional central banker willing to use forward guidance and a fan of NGDP level targeting. Although the Governor only receives 1 of 9 votes, it is a highly influential position and it's reasonable to believe that were he to publicly suggest a new target the Chancellor would comply.[9] And yet his appointment on November 26th saw little impact on Sterling. It is widely held that his public appearance in front of the Treasury Select Committee, on February 7th, led to a fall in the value of the pound, but this fall began on January 10th. Indeed at that meeting Carney was less enthusiastic about radical monetary policy than many people has expected/hoped. Maybe this is exactly what forward guidance is supposed to achieve, but if Carney's appointment is *not* an example of regime uncertainty, why not? And if it *is*, where is the evidence of the effect?

We focus on monetary policy because the essence of regime uncertainty is investor's ability to calculate the expected profit of a particular business venture. In short, regime uncertainty makes economic calculation more difficult. And monetary policy directly affects one half of every economic exchange. By intervening with the unit of account, we should expect a reduction in economic coordination. Baker, Bloom and Davis imply that monetary policy isn't all that an important cause of uncertainty. Leduc and Zheng argue that once you approach the zero lower bound it becomes so (they *somehow* calculate that uncertainty pushed unemployment up by 1pp over the past three years). We'll

[9] In other words the Governor could make credible commitment to the rest of the MPC that if the vote doesn't go in the direction he would like he will simply force the Chancellor to change the target.

simply add that maybe the best example of regime uncertainty in recent times is the way US politicians have handled "the fiscal cliff" – a term *coined* by Ben Bernanke![10]

Conclusion

If there is a link between uncertainty and investor confidence, an understanding of what it is and how it operates is an attempt to put flesh on the bones of animal spirits. Before we can measure something we need to define it, and identity it. It seems glib to argue that uncertainty is immeasurable by definition, but perhaps this is indeed too ambitious. And this doesn't mean that identifying it and *understanding* it is not a useful enterprise. There's plenty more work to be done on this, but the presence of purple balls must remain a crucial part of it.

[10] Perhaps this is an exaggeration, there's an example of it being used in 1957 but it came into the popular vocabulary following Bernanke's use of the term at a House Committee testimony on February 29th 2012. See http://www.bbc.co.uk/news/magazine-20318326.

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Kaleidic Economics is a business roundtable that meets each quarter in London. For more information: http://kaleidic.org

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