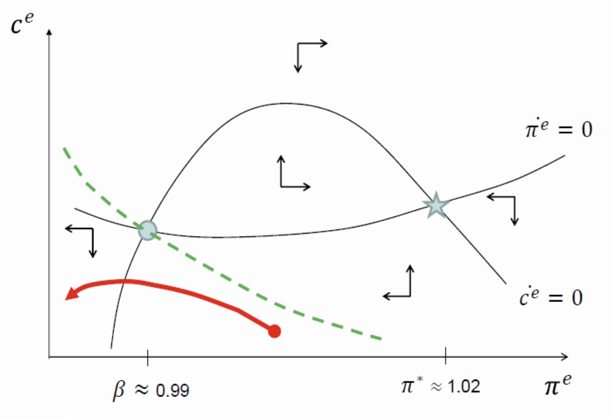
Institution: **University of St Andrews**

Unit of Assessment: 18 – Economics and Econometrics

Title of case study: policy advocacy for economies in deep recessions

1. Summary of the impact



Divergent paths can result from large negative expectation shocks.

The world financial crisis and recession of 2007-2009, and the continued stagnation of global economies, has raised the question of how governments and central banks should respond in deep recessions. Prof. Evans and colleagues have shown using macroeconomic models with adaptive learning that after large pessimistic shocks, a rapid switch to aggressive monetary easing is required and aggressive fiscal policy may be needed. To achieve policy impact this work has been presented in numerous central bank conferences, and it has caught the attention of several members of the US Federal Reserve Open Market Committee (FOMC). The policies of the FOMC since 2008 have been consistently aggressive, despite public criticism and even dissension within the FOMC itself. This research has provided important academic support for the application of these policies.

2. Underpinning research (indicative maximum 500 words)

In "Liquidity Traps, Learning and Stagnation" (EGH2008)[1] Evans, Guse and Honkapohja consider a standard New Keynesian model with the interest-rate rule subject to a zero lower bound. The previous literature focussed on model solutions under the "rational expectations" (RE) hypothesis. In contrast to this literature, and applying recently developed adaptive learning techniques, EGH2008 replaced RE with the assumption that agents (households and firms) forecast future output and inflation using simple statistical adaptive learning rules. Such learning rules are boundedly rational, but they are arguably a more realistic way to model expectations.

EGH2008 shows that the potential for deep recession is much greater in models with learning: while the intended equilibrium is locally stable under learning, unstable deflationary paths can arise after large pessimistic shocks to expectations, including trajectories with falling aggregate output. EGH2008 demonstrates that aggressive monetary and fiscal policy is necessary when the economy has been hit by a large pessimistic shock. A 2008 companion paper[2], written following an earlier visit by Prof. Evans to the Bank of Japan, provides additional discussion. The results of EGH2008 were disseminated widely in a 2009 *Annual Reviews* article.[3]

Three subsequent papers extended this research. "Expectations, Deflation Traps and Macroeconomic Policy"[4] and "Liquidity Traps and Expectation Dynamics: Fiscal Stimulus or Fiscal Austerity?"[6] incorporate long-horizon forecasts by households and firms and non-Ricardian wealth dynamics. "The Stagnation Regime of the New Keynesian Model and Recent US Policy" (2013)[5] shows that convergence to a locally stable stagnation regime can also result from large negative expectation shocks. This paper examines practical policy implications in detail. It is shown that sufficiently large temporary increases in government spending can dislodge the economy from the stagnation regime and restore the natural stabilizing dynamics. Other policy proposals, including quantitative easing, are discussed, as well as how nations and US States can manage debt levels to ensure fiscal flexibility in these settings.

In separate but related work, "Learning about Risk and Return: A simple model of bubbles and crashes" (2011)[7], Branch and Evans study the propensity of asset price bubbles and crashes to emerge when traders use adaptive learning rules to forecast both risk and returns. An asset price crash, like the one in 2007-9 following the collapse of the housing price bubble, can be a trigger for a large pessimistic expectation shock with the potential for deep recession.

In summary, the underpinning research on expectations and adaptive learning in deep recessions following large negative shocks has strong policy implications: (1) The most serious danger is a disequilibrium deflation trap in which deflation increases real interest rates, leading to lower aggregate output, which worsens deflation. (2) To avoid this trap monetary policy, in response to a large pessimistic shock, should quickly and aggressively reduce interest rates to near zero. (3) Fiscal policy, taking the form of a short-term fiscal stimulus is a complementary policy that may also be necessary. Austerity is usually ineffective. (4) If a sufficiently large fiscal stimulus is politically impossible, then less conventional monetary stimulus should be used.

Key researchers:

George W. Evans. Since October 2007, SIRE Professor of Economics and Finance, University of St. Andrews, UK and John B. Hamacher Professor of Economics, University of Oregon, Oregon, USA.

Seppo Honkapohja. 2004-2008, Professor of International Economics, University of Cambridge, Cambridge, UK. Since 2008, Member of the Governing Board, Bank of Finland.

3. References to the research (indicative maximum of six references)

1. "Liquidity Traps, Learning and Stagnation," (George W. Evans, Eran Guse and Seppo Honkapohja), *European Economic Review*, Vol. 52, 2008, 1438 – 1463. DOI: 10.1016/j.euroecorev.2008.05.003 (EGH2008).

[*EER* is a peer reviewed and highly regarded international general interest journal.]

2. "Monetary and Fiscal Policy under Learning in the Presence of a Liquidity Trap," (George W. Evans) *Monetary and Economic Studies*, December 2008, pp. 59 – 86. http://www.imes.boj.or.jp/english/publication/mes/2008/me26-6.pdf

3. "Learning and Macroeconomics," (George W. Evans and Seppo Honkapohja), *Annual Review of Economics,* Vol. 1, 2009, 421-449. DOI: 10.1146/annurev.economics.050708.142927

[*Annual Reviews* is a widely cited critical review series for a broad spectrum of sciences. This article, which includes a summary of the research in the *EER* paper (reference 1), was chosen to be included in the first volume published in Economics.]

4. "Expectations, Deflation Traps and Macroeconomic Policy" (George W. Evans and Seppo Honkapohja), Ch. 11 in *Twenty Years of Inflation Targeting: Lessons Learned and Future Prospects*, ed. D Cobham, Ø Eitrheim, S Gerlach & J Qvigstad, Cambridge University Press, 2010SBN: 9780511779770, DOI: 10.1017/CBO9780511779770.011

5. "The Stagnation Regime of the New Keynesian Model and Recent US Policy" (George W. Evans), Ch. 3 in *Macroeconomics at the Service of Public Policy*, eds. T.J. Sargent and J. Vilmunen, Oxford University Press, 2013.The first draft was written & disseminated in Oct. 2010. DOI: 10.1093/acprof:oso/9780199666126.003.0004

[Monographs 4 and 5 were published by world-leading academic publishing establishments.]

6. "Liquidity Traps and Expectation Dynamics: Fiscal Stimulus or Fiscal Austerity?" (with Jess Benhabib and Seppo Honkapohja), 2012. NBER Working Paper No, 18114. [This is one of the most widely circulated working paper series in economics.] http://www.nber.org/papers/w18114.pdf

7. "Learning about Risk and Return: A Simple Model of Bubbles and Crashes" (William Branch and George W. Evans), *American Economic Journal: Macroeconomics*, Vol. 3, 2011, 159-191. DOI: 10.1257/mac.3.3.159 [This is one of the top international peer-reviewed macroeconomics journals.]

4. Details of the impact (indicative maximum 750 words)

The impact of this case study was to influence public discourse and to provoke discussion with policymakers, economists and the general public about the need for aggressive monetary easing and fiscal stimulus in the wake of the financial crisis and recession of 2007-9. This is a significant contribution to a major contemporary issue. The impact took the form of policy-oriented papers presented at conferences attended by top monetary policymakers, dissemination of the research in a widely read economics blog, and contact with Federal Reserve Bank presidents and members of the Federal Reserve Open Market Committee (FOMC).

There is a severe limit on the extent to which specific impact on Central Bank policy can be documented. Central banks rarely cite factors other than economic conditions when announcing policy changes. Evidence of impact is therefore largely indirect: speeches by top policymakers, seminars and conferences arranged or attended by them, and the actual course of policy. First, there has been considerable interest within central banks in the adaptive learning approach to expectations, used in the underpinning research, and its implications for policy. For example, Prof. Evans co-organized the 2008 "Learning week" workshop at the FRB (Federal Reserve Bank) St. Louis, gave a keynote talk at the July 2012 FRB St. Louis Conference on "Expectations in Dynamic Macroeconomic Models" and was a visiting scholar during 2008-9 at FRBs St Louis and Cleveland. The Bank of Japan commissioned a 2008 article by him on policy in deep recessions for their journal *Monetary and Economic Studies*. Two regional FRB Presidents have done important research using the adaptive learning approach, have supported FRB workshops and conferences on its implications for policy, and have been keynote speakers at these conferences. [S5].

The underpinning research, and its implications for policy, has been disseminated to the public, economists and policymakers in a number of ways. For the economics profession, the results have been summarized in published survey papers. For the general public an opinion piece was written for a newspaper and made available through the *Economist's View*, a widely read economics blog that aims for dissemination of recent papers, opinion and discussion in economics. [S6]. The *Economist's View* also discussed and disseminated key parts of the research of this case study [S7, S8, S9], including the first draft of the Stagnation Regime paper. [Ref. 5].

For research economists and central bank policymakers, a major channel for dissemination and advocacy has been presentation of the research of this case study in Conferences at which senior policymakers were present, including at the Norges Bank (2009), IMF, Wash DC (2009), Swiss National Bank (2009), Erasmus University (2010), Université de la Méditerranée, Marseille (2011) and the Federal Reserve Bank of St. Louis (2012). [S5]. In addition to central bank economists, each conference was attended by one or more senior policymakers: Governor and Deputy Governor, Norges Bank; the IMF Chief Economist; Governor, Central Bank of Cyprus; Deputy Governor, Sveriges Riksbank; and the Presidents of the Federal Reserve Banks of San Francisco, St Louis and Minnesota. These people are influential or directly participate in setting monetary policy. In addition, Prof. Evans's long-term co-author Seppo Honkapohja is a Member of the Governing Board of the Bank of Finland, which participates in ECB policy.

There have been several specific interactions with US monetary policymakers. The FOMC, which sets monetary policy, has followed an aggressive expansionary monetary policy throughout the financial crisis and its aftermath, continuing to this day. This policy has been more consistently aggressive than in other countries. However, members of the FOMC have had a range of views about policy, and FOMC votes have not always been unanimous. The policy debate was intense in early 2009 and again in the summer and autumn 2010. The research of this case study provided support for the policies that were followed. As noted below, several members of the FOMC were aware of this research, which provided strong reasons for following aggressive policies, and which supported the positions of the Chairman and the majority and against the position of dissenters.

More specifically, in late 2008, Prof. Evans sent [text removed for publication] a copy of EGH2008, and received a reply thanking him for the paper and commenting on its relevance in the current circumstances. [S3]. In March 2009, the authors of EGH2008 were told by a Federal Reserve Board economist that he would be presenting their "very nice" paper to [text removed for publication]. They were told afterward that the presentation had gone smoothly and that it was "good advertising" for their paper and research. [S4].

In the summer of 2010, the President of the FRB, St Louis, who was viewed at the time as a centrist, published a paper "Seven Faces of 'The Peril'" which discussed the possibility that the US might become enmeshed in Japanese-style deflation. (The paper included references to the research of this case study). [S8]. In this paper and in the months thereafter, this President recommended that low interest rate policies be supplemented by "quantitative easing" (QE2). In September 2010, Prof. Evans wrote and first presented the "stagnation regime" paper, extending the earlier model and providing additional support for aggressive monetary and fiscal policies. This policy-oriented paper was disseminated and discussed on the blog Economist's Views. [S9].

In his [text removed for publication] 2010 speech, [text removed for publication] suggested that interest rates might need to be *increased* to avoid deflation. On August 31, the President of FRB St Louis, in commenting on a post on the Fedwatch blog, mentioned that Prof. Evans is *"one of the world's experts on the question of the dynamics*" lying behind the Figure that he used in his Seven Faces paper. [S8]. Noting this, Prof. Mark Thoma [S2] asked Prof. Evans to make a video explaining why adaptive learning theory implies that increasing interest rates is the wrong policy when deflation threatens. This video was posted on Economists' View on Sept. 1, 2010. [S7]. According to Prof. Thoma, the video has had over 9,600 views. [text removed for publication] [S10]. [text removed for publication]

The policies of the FOMC have been in line with those recommended in the research of this case study. Aggressive monetary policy has been followed, and the Chairman has been explicit concerning the danger posed by deflation [S11(i)], a central focus of this research. The Chairman has also consistently stated that, in the context of longer-run plans for fiscal stability, short-term fiscal stimulus and deficit spending is desirable to support the economy. [S11(ii)]. The policy of Quantitative Easing can be viewed as a response to inadequate fiscal stimulus. These policies have been highly controversial. While the Chairman and the majority of the FOMC had many reasons for pursuing the policy they followed, the research of this case study will have been helpful in providing support for their stance.

5. Sources to corroborate the impact (indicative maximum of 10 references)

S1. Corroborating contact: Dr. Seppo Honkapohja, Bank of Finland. [text removed for publication]
S2. Corroborating contact: Professor Mark Thoma, Economics Department, University of Oregon. [text removed for publication]
S3. [text removed for publication]
S4. [text removed for publication]
S5. Conference presentations (with hyperlinks): (i) Norges Bank Conference 2009 Inflation Targeting Twenty Years On (ii) IMF Conference: Macroeconomic and Policy Challenges Following Financial Meltdowns, 2009. (iii) Swiss National Bank, 2009 Financial Markets, Liquidity and Monetary Policy (iv) Erasmus University Conference 2010, Expectations, Asset Bubbles and Financial Crises. (v) Université de la Méditerranée & GREQAM-IDEP, Marseille, 2011. Asset Prices, Credit and Macroeconomic Policies, (vi) FRB St Louis Conference, 2012, Expectations in Dynamic Macroeconomic Models. Corroborate both the conference presentations of the research of the case study and the presence at those conferences of senior policymakers.
S6. Newspaper commentary, 2009: fiscal policy in deep recessions & *Economist's View* synopsis. Corroborates that the underpinning research, and its implications for policy, has been disseminated to the public, economists and policymakers.
S7. Sept. 2010 *Economist's View* blog with Prof. Evans's video discussion of interest rate policy, "The Dynamic Properties of New Keynesian Models with Learning".
S8. FRB St. Louis President's 2010 paper "Seven Faces of the Peril", which cites Prof. Evans's research papers, and his 31/8/2010 comments on Prof. Evans reported in *Economist's View*.
S9. Oct. 2010 *Economist's View* synopsis of Stagnation Regime draft. Later Oct. 2012 discussion on *Fed Watch* blog. *Economist's View* synopsis of Reference 6 paper and *Forbes.com* synopsis. Corroborates that the underpinning research, and its implications for policy, has been disseminated to the public, economists and policymakers.
S10. [text removed for publication]
S11. Speeches by Federal Reserve Board Chairman (i) emphasizing dangers of deflation 27/8/10 and 17/7/12, (ii) short-term fiscal support 21/7/10, 12/5/11, 20/11/12.