SELECTED READINGS

Focus on: Christopher A. Sims

January 2011

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INTRODUCTION

Christopher Albert Sims, along with Thomas J. Sargent[1], has won the 2011 Nobel Prize for Economics. Dr. Sims is an econometrician and macroeconomist, who is currently the Harold B. Helms Professor of Economics and Banking at Princeton University.

Dr. Sims earned his A.B. in mathematics from Harvard University magna cum laude in 1963 and his PhD in Economics from Harvard in 1968. He has held teaching positions at Harvard, University of Minnesota, Yale University and, since 1999, Princeton.

He is a Fellow of the Econometric Society (since 1974), a member of the American Academy of Arts and Sciences (since 1988) and a member of the National Academy of Sciences (since 1989). In 1995 he was the president of the Econometric Society. He will be the President-Elect of the American Economic Association in 2011 and then the President of the American Economic Association in 2012.

Christopher A. Sims published numerous important papers in his areas of research: econometrics and macroeconomic theory and policy. He has been one of the main promoters of the use of vector autoregression in empirical macroeconomics, and contributed to the development of Bayes estimators for vector autoregression. In particular, Dr. Sims developed a method to analyze how the economy is affected by temporary changes in economic policy and other factors. Sims and other researchers have applied this method to examine, for instance, the effects of an increase in the interest rate set by a central bank. It usually takes one or two years for the inflation rate to decrease, whereas economic growth declines gradually already in the short run and does not revert to its normal development until after a couple of years.

Among other topics, Dr. Sims also helped develop the fiscal theory of the price level and the theory of rational inattention.

Together with Thomas Sargent, Dr. Sims won the Nobel Memorial Prize in Economic Sciences in 2011 for their "empirical research on cause and effect in the

[1] A Selected Readings on Thomas Sargent (June 2008) is available in the Euro-Indicators web pages.

macroeconomy". Although Sargent and Sims carried out their research independently, their contributions are complementary in several ways. The laureates' seminal work during the 1970s and 1980s has been adopted by both researchers and policymakers throughout the world. Today, the methods developed by Sargent and Sims are essential tools in macroeconomic analysis.

The following list is a non-exhaustive, subjective selection of Christopher A. Sims's publications. More information can be found at:

- The address of Christopher A. Sims's homepage at:

http://www.princeton.edu/~sims/

Contact point: GianLuigi Mazzi, "Responsible for Euro-indicators and statistical methodology", Estat - D5 "Key Indicators for European Policies" gianluigi.mazzi@ec.europa.eu.

1 DISCUSSION AND WORKING PAPERS

1.1 Christopher A. Sims, June 2010. “Rational Inattention and Monetary Economics”.

No abstract is available for this item.

Full text available at:

http://sims.princeton.edu/yftp/RIMP/handbookChapterRI2.pdf

1.2 Christopher A. Sims, Revised version 2010. “A Rational Expectations Framework for Short Run Policy Analysis”.

Final version published in New Approaches to Monetary Economics, William Barnett and Ken Singleton, editors, Cambridge University Press 1987. The usual formulation of the Lucas critique of econometric policy evaluation is internally contradictory. There is no logical difficulty in supposing that policy makers are offered a menu of time paths for the economy conditioned on choices of policy variables, and that they then choose the path they like best. This is not just an approximation for small variations in policy, but the logical form of any policy evaluation, including changes in "rule". It is the consideration of policy changes cast as deterministic, once-for-all changes in policy rule that can be accurate only as an approximation useful for a limited range of cases.

Full text available at:

http://sims.princeton.edu/yftp/REpolicy/repolicy.pdf

1.3 Christopher A. Sims, 2010. “Commentary: Commentary on Policy at the Zero Lower Bound”, International Journal of Central Banking, International Journal of Central Banking, vol. 6(1), pages 205-213, March.

Several aspects of the difficulties of policy at the zero lower bound are discussed: The difficulty of credible commitment to higher future inflation, as most New Keynesian models imply is necessary; the need for fiscal and monetary policy coordination; and the pitfalls in the taking of quasi-fiscal actions by the central bank.

Full text available at:

http://www.ijcb.org/journal/ijcb10q1a10.pdf

1.4 Christopher A. Sims, 2010. "Understanding Non-Bayesians".

A chapter written for the Oxford University Press Handbook of Bayesian Econometrics, but withheld from publication there because of the Draconian copyright agreement that OUP insisted on --- forbidding posting even a late draft like this one on a personal web site. The paper discusses the essential distinctions between Bayesian and frequentist approaches to inference, then takes up examples of models and estimators that are widely used, or seem useful, but that are thought of as "non-Bayesian". It also takes up the special problems of inference in high-dimensional parameter spaces, arguing that there are indeed special problems, that they emerge clearly in Bayesian approaches, and that they emerge just as strongly, but less clearly, in frequentist approaches.

Full text available at:

http://sims.princeton.edu/yftp/UndrstndgNnBsns/GewekeBookChpter.pdf

1.5 Christopher A. Sims, 2010. "Comment on Angrist and Pischke".

No abstract is available for this item.

Full text available at:

http://sims.princeton.edu/yftp/AngristPischkeJEP/AngristPischkeComment.pdf

1.6 Christopher A. Sims and Filip Matejka, 2010. "Discrete Actions in Information-Constrained Tracking Problems".

Optimal actions of an agent facing a Shannon capacity constraint on the translation of an uncertain signal into an action can easily turn out to be discretely distributed, even when the objective function and the initial distribution of uncertainty contain no discrete elements. We show this result analytically in a broad class of cases. It has implications for the interpretation of observed intervals between changes in prices or other economic choice variables in micro-data as indicators of costs of adjustment or of the degree of "stickiness" in responses to aggregate policy changes or business cycle fluctuations.

Full text available at:

http://sims.princeton.edu/yftp/RIDiscrete/DiscreteTracking2Prop.pdf

1.7 Christopher A. Sims, 2010. "Price Level Determination in General Equilibrium".

Full text available at:

http://sims.princeton.edu/yftp/Istanbul709/SED709text.pdf

1.8 Christopher A. Sims, 2009. "Fiscal/Monetary Coordination When the Anchor Cable Has Snapped".

No abstract is available for this item.

Full text available at:

http://sims.princeton.edu/yftp/FiscalTheoryGreatInflation/Atlanta509

1.9 Christopher A. Sims, 2008. "Making Macro Models Behave Reasonably".

Using the idea of generalized dummy observations, we extend the methods of Del Negro and Schorfheide (DS), who have proposed a way to use a dynamic stochastic general equilibrium (DSGE) model to generate a prior distribution for a structural time series model that relaxes the tight theoretical restrictions of the DSGE. The advantages of this paper's approach over that of DS are that the time series model strictly nests the DSGE specification, that the prior information is more able to resolve weak identification, that uncertainty about identification is treated more like other forms of uncertainty, and that giving greater weight to the prior at particular frequencies is more straightforward.

Full text available at:

http://sims.princeton.edu/yftp/ReasonableModels/MakingReasonable.pdf

1.10 Christopher A. Sims, 2008. "Government and Central Bank Balance Sheets, Inflation and Monetary Policy".

No abstract is available for this item.

Full text available at:

http://sims.princeton.edu/yftp/FiscalTheoryGreatInflation/KnssState.pdf

1.11 Christopher A. Sims, 2008. "Inflation Expectations, Uncertainty, the Phillips Curve, and Monetary Policy".

No abstract is available for this item.

Full text available at:

http://sims.princeton.edu/yftp/CapeCod2008/Sketch.pdf

1.12 Christopher A. Sims, 2008. "Stepping on a Rake: The role of fiscal policy in the inflation of the 1970's".

The inflation of the 1970's in the US is often discussed as if the only type of policy action that could have prevented the inflation were monetary policy actions and the only type of policy errors that might have induced the inflation were monetary policy errors. Yet fiscal policy underwent dramatic shifts in the 70's and economic theory makes clear that in an environment of uncertainty about future fiscal policy, monetary policy instruments may lose potency or have perverse effects. This paper documents the vagaries of fiscal policy in this period and argues that people at the time must have been uncertain about fiscal policy's future course. It also lays out a theoretical framework for understanding the effects of fiscal uncertainties on monetary policy and shows that fiscal variables have predictive value in dynamic models, even if traditional monetary policy indicators are included in the system.

Full text available at:

http://sims.princeton.edu/yftp/FiscalTheoryGreatInflation/BOJpresentation.pdf

1.13 Christopher A. Sims, 2008. "Inflation Expectations, Uncertainty and Monetary Policy".

This paper includes a model in which dispersion of beliefs about monetary policy causes high levels of leverage and can increase or decrease investment, in an environment where uncertainty about investment, common across agents, has no such effects. This paper does not include the econometric analysis of the Phillips curve that

is included in the one below. The directory includes some slides that describe the model of dispersed beliefs by itself.

Full text available at:

http://sims.princeton.edu/yftp/BIS608/SimsBIS.pdf

1.14 Christopher A. Sims, 2007. "Thinking About Instrumental Variables".

We take a decision-theoretic view on the question of how to use instrumental variables and method of moments. Since prior beliefs play an inevitably strong role when instruments are possibly "weak", or when the number of instruments is large relative to the number of observations, it is important in these cases to report characteristics of the likelihood beyond the usual IV or ML estimates and their asymptotic (i.e. second-order local) approximate standard errors. IV and GMM appeal because of their legitimate claim to be convenient to compute in many cases, and a (spurious) claim that they can be justified with few "assumptions". We discuss some approaches to making such a claim more legitimately.

Full text available at:

http://sims.princeton.edu/yftp/IV/IV.pdf

1.15 Christopher A. Sims, 2007. "Thinking about instrumental variables (in Russian)", Quantile, Quantile, issue 2, pages 83-94, March.

We take a decision-theoretic view on the question of how to use instrumental variables and method of moments. Since prior beliefs play an inevitably strong role when instruments are possibly "weak", or when the number of instruments is large relative to the number of observations, it is important in these cases to report characteristics of the likelihood beyond the usual IV or ML estimates and their asymptotic (i.e. second-order local) approximate standard errors. IV and GMM appeal because of their legitimate claim to be convenient to compute in many cases, and a (spurious) claim that they can be justified with few "assumptions". We discuss some approaches to making such a claim more legitimately.

Full text available at:

http://quantile.ru/02/02-CS.pdf

1.16 Christopher A. Sims, 2007. "Bayesian Methods in Applied Econometrics, or, Why Econometrics Should Always and Everywhere Be Bayesian".

No abstract is available for this item.

Full text available at:

http://sims.princeton.edu/yftp/EmetSoc607/AppliedBayes.pdf

1.17 Christopher A. Sims, 2007. "On the Genericity of the Winding Number Criterion for Linear Rational Expectations Models".

In a recent paper Onatski derives a new criterion for existence and uniqueness of solutions of rational expectations models. Specialized to finite order models, the criterion is an improvement on the usual root-counting criterion, but shares its main defect—there are models on which it gives the wrong answer. Onatski argues that the models where the winding number gives the right answer are "generic" — an open, dense subset of the space of all models. This could give a mistaken impression. A sequence of models for which the new criterion works that converges in Onatski's metric to a model on which the criterion does not work shows increasingly bizarre solution behavior as the limit is approached. In a metric that treats models with very different solution behavior as very far apart, the sequence is divergent, not convergent. Models on which the winding number gives the wrong answer will not in fact be extremely uncommon in economics, and they are not in any substantively meaningful sense close to nicely behaved models for which the winding number gives the right answer.

Full text available at:

http://sims.princeton.edu/yftp/OnatskiWinding/OntaskiWndngCmmnt.pdf

1.18 Christopher A. Sims, 2007. "Comment on "International Transmission and Monetary Policy Cooperation"", NBER Chapters, in: International Dimensions of Monetary Policy, pages 192-195 National Bureau of Economic Research.

No abstract is available for this item.

Full text available at:

http://www.nber.org/chapters/c0514.pdf

1.19 Christopher A. Sims, 2007. "Monetary Policy Models," Working Papers 155, Princeton University, Department of Economics, Center for Economic Policy Studies.

No abstract is available for this item.

Full text available at:

http://www.princeton.edu/~ceps/workingpapers/155sims.pdf

1.20 Christopher A. Sims, 2006. "Improving Monetary Policy Models".

If macroeconomic models are to be useful in policy-making, where uncertainty is pervasive, the models must be treated as probability models, whether formally or informally. Use of explicit probability models allows us to learn systematically from past mistakes, to integrate model-based uncertainty with uncertain subjective judgment, and to bind data-based forecasting together with theory-based projection of policy effects. Yet in the last few decades policy models at central banks have steadily shed any claims to being believable probability models of the data to which they are fit. Here we describe the current state of policy modeling, suggest some reasons why we have reached this state, and assess some promising directions for future progress.

Full text available at:

http://sims.princeton.edu/yftp/CBModels/CBModelsPaper.pdf

1.21 Christopher A. Sims, Daniel F. Waggoner and Tao Zha, 2006. "Methods for inference in large multiple-equation Markov-switching models", Working Paper 2006-22, Federal Reserve Bank of Atlanta.

The inference for hidden Markov chain models in which the structure is a multiple-equation macroeconomic model raises a number of difficulties that are not as likely to appear in smaller models. One is likely to want to allow for many states in the Markov chain without allowing the number of free parameters in the transition matrix to grow as the square of the number of states but also without losing a convenient form for the posterior distribution of the transition matrix. Calculation of marginal data densities for assessing model fit is often difficult in high-dimensional models and seems particularly difficult in these models. This paper gives a detailed explanation of methods we have found to work to overcome these difficulties. It also makes suggestions for maximizing posterior density and initiating Markov chain Monte Carlo simulations that provide some robustness against the complex shape of the likelihood in these models. These difficulties and remedies are likely to be useful generally for Bayesian inference in large time-series models. The paper includes some discussion of model specification issues that apply particularly to structural vector autoregressions with a Markov-switching structure.

Full text available at:

http://www.frbatlanta.org/filelegacydocs/wp0622.pdf

1.22 Christopher A. Sims, 2006. "On an Example of Larry Wasserman".

Examples where likelihood-based inference inevitably leads to bad estimators that are clearly worse than estimators that cannot be derived from a likelihood-based approach are rare, possibly because they do not exist. A recent textbook contains what is meant to be exactly such an example. More careful consideration shows that the example is one where Bayesian methods work very well indeed, better than the non-Bayesian method that is proposed in the book. Working through to this conclusion provides useful insights into the pitfalls of inference in high-dimensional parameter spaces.

Full text available at:

http://sims.princeton.edu/yftp/WassermanExmpl/WassermanComment.pdf

1.23 Christopher A. Sims, 2006. “Comment on Del Negro, Schorfheide, Smets and Wouters”.

No abstract is available for this item.

Full text available at:

http://sims.princeton.edu/yftp/DSSW806/DSseattleComment.pdf

1.24 Christopher A. Sims, 2006. “Rational Inattention: a Research Agenda”.

The literature applying information-theoretic ideas to economics has so far considered only Gaussian uncertainty. Ex post Gaussian uncertainty can be justified as optimal when the associated optimization problem is linear-quadratic, but the literature has often assumed Gaussian uncertainty even where it cannot be justified as optimal. This paper considers a simple two-period optimal saving problem with a Shannon capacity constraint and non-quadratic utility. It derives an optimal ex post probability density for wealth in two leading cases (log and linear utility) and lays out a general approach for handling other cases numerically. It displays and discusses numerical solutions for other utility functions, and considers the feasibility of extending this paper’s approaches to general non-LQ dynamic programming problems. The introduction of the paper discusses approaches that have been taken in the existing literature to applying Shannon capacity to economic modeling, making criticisms and suggesting promising directions for further progress.

Full text available at:

http://sims.princeton.edu/yftp/RIplus/RatInattPlus.pdf

1.25 Christopher A. Sims, 2005. “Commentary on "trends in hours, balanced growth, and the role of technology in the business cycle”, Review, Federal Reserve Bank of St. Louis, issue Jul, pages 487-492.

No abstract is available for this item.

Full text available at:

http://research.stlouisfed.org/publications/review/05/07/Sims.pdf

1.26 Christopher A. Sims Jinill Kim, sunghyun Kim and Ernst Schaumburg, 2005. "Calculating and using Second Order Accurate Solution of Discrete Time Dynamic Equilibrium Models".

We describe an algorithm for calculating second order approximations to the solutions to nonlinear stochastic rational expectations models. The paper also explains methods for using such an approximate solution to generate forecasts, simulated time paths for the model, and evaluations of expected welfare differences across different versions of a model. The paper gives conditions for local validity of the approximation that allow for disturbance distributions with unbounded support and allow for non-stationarity of the solution process.

Full text available at:

http://sims.princeton.edu/yftp/gensys2/Algorithm2.pdf

1.27 Christopher Sims, 2005. "Model uncertainty and policy evaluation: some theory and empirics – comments", Proceedings, Federal Reserve Bank of San Francisco.

No abstract is available for this item.

Full text available at:

http://www.frbsf.org/economics/conferences/0503/files/sims.pdf

1.28 Christopher A. Sims, 2005. "Dummy Observation Priors Revisited".

In the standard normal linear regression model, Theil's dummy observation idea may seem to be a matter of notation --- just another way to specify a conjugate prior. But in more complicated models, or where we have prior notions about nonlinear functions of parameters, dummy observations are a distinct, and often convenient and intuitively appealing, approach to specifying a prior. Examples are priors on structural coefficients in simultaneous equations, on Markov transition matrices, and on VAR impulse responses.

Full text available at:

http://sims.princeton.edu/yftp/DummyObs/DumObsPrior.pdf

1.29 Christopher A. Sims and Tao Zha, revised version 2005. "Does Monetary Policy Generate Recessions?".

We consider two kinds of answers to the title question: Do random shifts in monetary policy account for historical recessions, and would changes in the systematic component of monetary policy have allowed reductions in inflation or output variance without substantial costs. The answer to both questions is no. We use weak identifying assumptions and include extensive discussion of these assumptions, including a completely specified dynamic stochastic equilibrium model in which our identifying assumptions can be shown to be approximately satisfied.

Full text available at:

http://sims.princeton.edu/yftp/mpolicy/szmd2.pdf

1.30 Christopher A. Sims and Tao Zha, 2004. "Were there regime switches in U.S. monetary policy?", Working Paper 2004-14, Federal Reserve Bank of Atlanta.

A multivariate model, identifying monetary policy and allowing for simultaneity and regime switching in coefficients and variances, is confronted with U.S. data since 1959. The best fit is with a model that allows time variation in structural disturbance variances only. Among models that also allow for changes in equation coefficients, the best fit is for a model that allows coefficients to change only in the monetary policy rule. That model allows switching among three main regimes and one rarely and briefly occurring regime. The three main regimes correspond roughly to periods when most observers believe that monetary policy actually differed, and the differences in policy behavior are substantively interesting, though statistically ill determined. The estimates imply monetary targeting was central in the early '80s but was also important sporadically in the '70s. The changes in regime were essential neither to the rise in inflation in the '70s nor to its decline in the '80s.

Full text available at:

http://www.frbatlanta.org/filelegacydocs/wp0414.pdf

1.31 Christopher A. Sims and Tao Zha, 2004. "MCMC method for Markov mixture simultaneous-equation models: a note", Working Paper 2004-15, Federal Reserve Bank of Atlanta.

This paper extends the methods developed by Hamilton (1989) and Chib (1996) to identified multiple-equation models. It details how to obtain Bayesian estimation and inference for a class of models with different degrees of time variation and discusses both analytical and computational difficulties.

Full text available at:

http://www.frbatlanta.org/filelegacydocs/wp0415.pdf

1.32 Christopher A. Sims, 2003. "Fiscal Aspects of Central Bank Independence".

Most macroeconomic models treat the central bank and the treasury as a unified entity. The balance sheet of the central bank is therefore implicitly treated as an accounting fiction. While this is often realistic, the central bank balance sheet has implications for central bank independence. There are wide differences in the nature of central bank balance sheets today, with the US and ESCB balance sheets nearly at the extremes. The reasons for and implications of these differences are studied here.

Full text available at:

http://sims.princeton.edu/yftp/Munich/CBInd.pdf

1.33 Christopher A. Sims, 2003. "Econometrics for Policy Analysis: Progress and Regress".

No abstract is available for this item.

Full text available at:

http://sims.princeton.edu/yftp/Tinbergen/TinbergenTalkSlides.pdf

1.34 Christopher A. Sims, 2003. "Limits to Inflation Targeting".

Inflation targeting may do more harm than good if there is a substantial chance that the central bank cannot in fact control inflation. A prerequisite for central bank

control of inflation is appropriate coordination with or backup by fiscal policy, and the nature of the required coordination will depend on whether and how central bank independence from the fiscal authority has been implemented. These considerations suggest that in those countries where inflation control has in the past been most difficult, inflation targeting may be least useful. Where inflation control has in the past been successful, the benefits of inflation targeting may have more to do with the associated changes in the policy process and in the central bank's communication with the public than with the inflation target itself.

Full text available at:

http://sims.princeton.edu/yftp/Targeting/TargetingFiscalPaper.pdf

1.35 Christopher Sims and Tao Zha, 2002. "Macroeconomic switching", Proceedings, Federal Reserve Bank of San Francisco, issue Mar.

We discuss the results of fitting a 6-variable structural VAR in which we allow for certain types of parameter variation over time. Allowing structural equation variances to change over time is extremely important in improving fit. Allowing the coefficients that define the model's dynamics to change is less important to improving fit, though models with changing parameters are consistent with the data. We pay special attention to a version of the model that allows the monetary policy rule, but not other parts of the model, to show changing coefficients. Results from this model fit some aspects of conventional wisdom about changes in monetary policy over time, but imply that the changes in policy have been more subtle than dramatic. We construct counterfactual histories for the early 1980's, suppressing the "Volcker regime" in monetary policy. We find a steadier decline in inflation and a smaller recession earlier in the period, but slower growth later, than actually occurred.

Full text available at:

http://www.frbsf.org/economics/conferences/0203/simszha.pdf

1.36 Christopher A. Sims, 2002. “The Role of Models and Probabilities in the Monetary Policy Process”.

The primary models in use as part of the policy process in central banks are deeply flawed, both from the point of view of econometric analysis and from the point of view of economic theory. "Subjective" approaches to forecasting play a major role in policy formation in every central bank, and data on the forecasting record of FRB non model forecasts shows that they are excellent forecasts by several measures. Academic research on econometric method and on macroeconomic theory has not provided much guidance for model builders who need to contribute to policy analysis in real time. Policy discussion at central banks uses the language of Bayesian decision theory — putting post sample probabilities on models, generating probability distributions for future values of variables that reflect uncertainty about parameter values and subjective judgment, weighing expected losses of alternative courses of action. But the standard toolkit of econometrics does not connect to this way of thinking about probability. There is some reason to hope for improvement before long.

Full text available at:

http://sims.princeton.edu/yftp/bppolicy/bpPolicy.pdf

1.37 Christopher A. Sims, 2002. “Implications of Rational Inattention”.

A constraint that actions can depend on observations only through a communication channel with finite Shannon capacity is shown to be able to play a role very similar to that of a signal extraction problem or an adjustment cost in standard control problems. The resulting theory looks enough like familiar dynamic rational expectations theories to suggest that it might be useful and practical, while the implications for policy are different enough to be interesting.

Full text available at:

http://sims.princeton.edu/yftp/Gerzensee/info.pdf

1.38 Christopher A. Sims, 2002. "Fiscal Consequences for Mexico of Adopting the Dollar".

Fiat government debt --- debt that promises to pay only government-issued paper --- is much more closely analogous to equity issued by private firms than to debt issued by private firms. Indexed government debt, or government debt denominated in foreign currency, is analogous to privately issued debt. A decision to dollarize, in the sense of converting all debt to dollar-denominated debt and committing to issue only dollar-denominated debt in the future, involves many of the same considerations that arise in corporate finance when a firm decides between equity and debt finance. From this perspective, the paper argues that dollarization has a number of drawbacks. It should not be expected to lower the interest costs of public borrowing, indeed it is likely to raise it. It does not automatically generate pressures for greater fiscal responsibility, and indeed may create incentives in the opposite direction. It has ambiguous implications for the stability of the financial system, in part because it reduces the range of assets available to the private sector in trading risk, but also because it leaves the government less able to intervene supportively in financial crises.

Full text available at:

http://sims.princeton.edu/yftp/Cancun/FiscalConseq.pdf

1.39 Christopher A. Sims, 2001. "Stability and Instability in US Monetary Policy Behavior".

A monetary policy reaction function is estimated, allowing for several possible patterns of time variation in both its coefficients and its disturbance variances. A clear improvement in fit over a fixed-parameter linear model is found. The strongest effect on likelihood is from time variation in variances, but there are also improvements in fit from allowing coefficient variation. The variation is estimated as evolving in a stochastic, repeating pattern, not as evolution from one style of policy at mid-century and a new style in the 90's. The "regime shifts" that are estimated to occur do not last very long, and appear to reflect temporary shifts in the level of policy activism, not systematic improvement.

Full text available at:

http://sims.princeton.edu/yftp/Stockholm/Reactions.pdf

1.40 Christopher A. Sims, 2001. "Pitfalls of a Minimax Approach to Model Uncertainty".

A minimax approach to robustness may be useful, but not if it is taken to offer a substitute for assessing probabilities. And the monetary policy models to which these methods have recently been applied are structured so as to extinguish all but very high order effects of model uncertainty.

Full text available at:

http://sims.princeton.edu/yftp/RobustPits/RobustPitfalls.pdf

1.41 Christopher A. Sims, 2001. "Comment on a Sargent and Cogley's "Evolving us postwar inflation dynamics"

The paper is a technically sharp and innovative descriptive analysis of US monetary and macroeconomic time series. It reaches substantive conclusions using informal identifying assumptions. The comment finds quite a bit to disagree with in the paper.

Full text available at:

http://sims.princeton.edu/yftp/CogleySgt/TJSCogleyCmntFinal.pdf

1.42 Christopher A. Sims, 2000. "Seattle 8/00 ESWC Comment on papers by Gali and by Albanesi, Chari and Christiano".

No abstract is available for this item.

Full text available at:

http://sims.princeton.edu/yftp/SeattleComment/SeattleSlides.pdf

1.43 Christopher A. Sims, Revised version January 2000. "Solving Linear Rational Expectations Models".

A computationally robust solution method for linear rational expectations models is displayed, based on the QZ matrix decomposition. Any rational expectations model, in continuous or discrete time, can be solved by this approach. It requires that the model be cast into first-order form, but it does not require that it be reduced so that the number of states matches the number of equations. It also avoids the artificial

requirement that variables be designated as "jump" variables or not. (Instead, how expectational error terms enter the system must be specified - a more general specification.) Matlab code that implements the approach is in the same directory. The code automatically determines whether the model satisfies conditions for existence and uniqueness.

Full text available at:

http://sims.princeton.edu/yftp/gensys/LINRE3A.pdf

1.44 Christopher A. Sims, 2000. “Whither ISLM”.

ISLM inhibits attention to expectations in macroeconomics, going against the spirit of Keynes's own approach. This can lead to mistaken policy conclusions and to unnecessarily weak responses to classical critiques of Keynesian modeling. A coherent Keynesian approach, accounting for endogenous expectations, implies very strong effects of monetary and fiscal policy and leads to greater attention to the role of the government budget constraint in making the effects of monetary policy conditional on prevailing fiscal responses, and vice versa.

Full text available at:

http://sims.princeton.edu/yftp/Bergamo/Bergamo.pdf

1.45 Christopher A. Sims, 1999. “The Precarious Fiscal Foundations of EMU”.

After a brief overview of the fiscal theory of the price level, we consider insights it provides into monetary policy formation under certain kinds of deflationary and inflationary stress. Then we consider how the institutions of the EMU are equipped---or unequipped---to deal with such stress. The conclusion is that fiscal institutions as yet unspecified will have to arise or be invented in order for EMU to be a long term success.

Full text available at:

http://sims.princeton.edu/yftp/Amsterdam/EMU.pdf

1.46 Christopher A. Sims, 1999. "Drift and Breaks in Monetary Policy".

US monetary policy behavior since 1948 is modeled as nonlinear, changing over time according to a hidden Markov chain specification. Though the estimated Markov chain model implies large shifts in the form of the policy reaction function, its improvement in fit over a simple linear model comes almost entirely from its allowance for persistent heteroscedasticity. A linear model that allows such heteroscedasticity fits almost as well. The shifts in policy regime that are uncovered are not unidirectional---they oscillate, with a given state seldom persisting more than a few years. The paper discusses how these results mesh with attempts to interpret this period through the Lucas critique and natural rate models.

Full text available at:

http://sims.princeton.edu/yftp/Sydney/DriftBreak.pdf

1.47 Christopher A. Sims, 1999. ": Domestic Currency Denominated Government Debt as Equity in the Primary Surplus".

Fiat debt is more closely analogous to privately issued equity than to privately issued debt, as it implies no promise to pay anything except future issues of government paper. This has implications for optimal fiscal policy and implies problems with the issue of large amounts of foreign-currency or indexed debt.

Full text available at:

http://sims.princeton.edu/yftp/Cancun/DebtEquity.pdf

1.48 Christopher A. Sims, 1999. "Stickiness".

We discuss an array of models of dynamically optimizing representative firms and workers, with inertia and price-wage stickiness modeled in various ways. The degree of price and wage stickiness bears no necessary connection to the strength of real effects of monetary policy. Matching the combination of real and nominal inertia in responses to monetary policy found in the data requires a more complex model, with more sources of stickiness and inertia, than has been standard in the literature. The pervasiveness of sluggish cross-variable responses in the macro data, combined with the implausibility of many of the microeconomic stories underlying adjustment cost models, suggests that we look for a different approach to modeling the sources of

inertia in both prices and real variables. One such approach, based on limited information-processing capacity, is sketched.

Full text available at:

http://sims.princeton.edu/yftp/Sticky/StickNew.pdf

1.49 Christopher A. Sims, 1998. "Role of interest rate policy in the generation and propagation of business cycles: what has changed since the '30s?", Conference Series; [Proceedings], Federal Reserve Bank of Boston, issue Jun, pages 121-175.

No abstract is available for this item.

Full text available at:

http://www.bostonfed.org/economic/conf/conf42/con42_07.pdf

1.50 Christopher A. Sims, Revised version August 19, 1998. "The Role of Interest Rate Policy in the Generation and Propagation of Business Cycles: What Has Changed Since the 30's?".

Full text available at:

http://sims.princeton.edu/yftp/IwarPwar/draft.pdf

1.51 Christopher A. Sims, 1998. "Using a Likelihood Perspective to Sharpen Econometric Discourse: Three Examples".

This paper discusses a number of areas of inference where dis-satisfaction by applied workers with the prescriptions of econometric high theory is strong and where a likelihood approach diverges strongly from the mainstream approach in its practical prescriptions. Two of the applied areas are related and have in common that they involve nonstationarity: macroeconomic time series modeling, and analysis of panel data in the presence of potential nonstationarity. The third area is nonparametric kernel regression methods. The conclusion is that in these areas a likelihood perspective leads to more useful, honest and objective reporting of results and characterization of uncertainty. It also leads to insights not as easily available from the usual perspective on inference.

Full text available at:

http://sims.princeton.edu/yftp/Why/Why.pdf

1.52 Christopher A. Sims and Tao Zha, Revised version 1998. "Error Bands for Impulse Responses".

We show how correctly to extend known methods for generating error bands in reduced form VAR's to over identified models. We argue that the conventional point wise bands common in the literature should be supplemented with measures of shape uncertainty, and we show how to generate such measures. We focus on bands that characterize the shape of the likelihood. Such bands are not classical confidence regions. We explain that classical confidence regions mix information about parameter location with information about model fit, and hence can be misleading as summaries of the implications of the data for the location of parameters. Because classical confidence regions also present conceptual and computational problems in multivariate time series models, we suggest that likelihood-based bands, rather than approximate confidence bands based on asymptotic theory, be standard in reporting results for this type of model.

Full text available at:

http://sims.princeton.edu/yftp/imperrs/m4Web.pdf

1.53 Christopher A. Sims, 1998. "Adaptive Metropolis-Hastings, or Monte Carlo Kernel Estimation".

No abstract is available for this item.

Full text available at:

http://sims.princeton.edu/yftp/amh/AMH.pdf

1.54 Christopher A. Sims, 1997. "Fiscal Foundations of Price Stability in Open Economies"

No abstract is available for this item.

Full text available at:

http://sims.princeton.edu/yftp/hongkong/hkbrown.pdf

1.55 Christopher A. Sims, 1996. "Inflation and growth – commentary", Proceedings, Federal Reserve Bank of St. Louis, issue May, pages 173-178.

No abstract is available for this item.

Full text available at:

http://research.stlouisfed.org/publications/review/96/05/9605cs.pdf

1.56 Christopher A. Sims, Revised version 1996. "Inference For Multivariate Time Series Models With Trend".

Full text available at:

http://sims.princeton.edu/yftp/trends/ASAPAPER.pdf

1.57 Christopher A. Sims and Tao Zha, 1996. "Bayesian methods for dynamic multivariate models", Working Paper 96-13, Federal Reserve Bank of Atlanta.

If multivariate dynamic models are to be used to guide decision-making, it is important that it be possible to provide probability assessments of their results. Bayesian VAR models in the existing literature have not commonly (in fact, not at all as far as we know) been presented with error bands around forecasts or policy projections based on the posterior distribution. In this paper we show that it is possible to introduce prior information in both reduced form and structural VAR models without introducing substantial new computational burdens. With our approach, identified VAR analysis of large systems (e.g., 20-variable models) becomes possible.

Full text available at:

http://www.frbatlanta.org/filelegacydocs/wp9613.pdf

1.58 Christopher A. Sims, Eric M. Leeper and Tao Zha, 1996. "What Does Monetary Policy Do?".

No abstract is available for this item.

Full text available at:

http://sims.princeton.edu/yftp/bpea/bpeaf.pdf

1.59 Christopher A. Sims, 1996. "Comment on Glenn Rudebusch's "Do Measures of Monetary Policy in a VAR Make Sense?".

A recent paper by Glenn Rudebusch has criticized identified-VAR studies of the effects of monetary policy. The criticisms are presented not as constructive suggestions, but as if they show the entire approach is invalid. In fact, most of the criticisms are either logically incoherent or generic quibbles about choice of variables, time unit, etc. that are applicable to any empirical work with time series. This comment attempts to explain where the errors lie in the paper's comments and to extract something worthwhile from the rest. It is true, as the paper asserts at one point, that the time series of estimated policy shocks is not robust to variations in the identifying assumptions one finds in the literature. While the paper's implication that this undermines all or even many of the conclusions in this literature is incorrect, the point does deserve more discussion and analysis.

Full text available at:

http://sims.princeton.edu/yftp/GRComm/GRComm.pdf

1.60 Christopher A. Sims, revised version October 1995. "Econometric Implications of the Government Budget Constraint".

No abstract is available for this item.*Full text available at:*

http://sims.princeton.edu/yftp/BalBudg/gbc.pdf

1.61 Christopher A. Sims, 1995. "Macroeconomics and Methodology".

This essay begins with a sketch of some ways I find it useful to think about science and its uses. Following that, the essay applies the framework it has sketched to discussion of several aspects of the recent history of macroeconomics. It considers skeptically the effort by some economists in the real business cycle school to define a quantitative methodology that stands in opposition to, or at least ignores, econometrics "in the modern (narrow) sense of the term." It connects this effort to the concurrent tendency across much of social science for scholars to question the value of statistical rigor and increasingly to see their disciplines as searches for persuasive arguments rather than as searches for objective truth. The essay points to lines of substantive progress in macroeconomics that apparently flout the methodological

prescriptions of the real business cycle school purists, yet are producing advances in understanding at least as important as what purist research has in fact achieved.

Full text available at:

http://sims.princeton.edu/yftp/jep/mthdlogy.pdf

1.62 Christopher A. Sims and Eric M. Leeper, 1994. "Toward a Modern Macroeconomic Model Usable for Policy Analysis", NBER Chapters, in: NBER Macroeconomics Annual 1994, Volume 9, pages 81-140 National Bureau of Economic Research.

No abstract is available for this item.

Full text available at:

http://www.nber.org/chapters/c11008.pdf

1.63 Christopher A. Sims, Fourth Revision August 1993. "A Simple Model for Study of the Determination of the Price Level and the Interaction of Monetary and Fiscal Policy".

A representative-agent model with money holdings motivated by transactions costs, a fiscal authority that taxes and issues debt, no production, and a convenient functional form for agents' utility is presented. The model can be solved analytically, an illustrates the dependence of price determination on fiscal policy, the possibility of indeterminacy, even stochastic explosion, of the price level in the face of a monetary policy that holds M fixed, and the possibility of a unique, stable price level in the face of a monetary policy that simply pegs the nominal interest rate at an arbitrary level.

Full text available at:

http://sims.princeton.edu/yftp/MnF/Mandfpape4.pdf

1.64 Christopher A. Sims, 1993. "A Nine-Variable Probabilistic Macroeconomic Forecasting Model", NBER Chapters, in: Business Cycles, Indicators and Forecasting, pages 179-212 National Bureau of Economic Research.

No abstract is available for this item.

Full text available at:

http://www.nber.org/chapters/c7192.pdf

1.65 Christopher A. Sims, 1992. "A Nine Variable Probabilistic Macroeconomic Forecasting Model", Cowles Foundation Discussion Papers 1034, Cowles Foundation for Research in Economics, Yale University.

A model for U.S. macroeconomic time series that has been used for forecasting for several years is described in some detail. The model is a multivariate Bayesian autoregression, with allowance for conditional heteroskedasticity, stochastic time-variation in parameters, and non-normality of disturbances. It specifies the prior distribution in ways that improve on previous Bayesian vector autoregression specifications in realism and forecasting performance. The model's record of forecasting in recent years is displayed and discussed.

Full text available at:

http://cowles.econ.yale.edu/P/cd/d10a/d1034.pdf

1.66 Christopher A. Sims, 1992. "Empirical Implications of Arbitrage-Free Asset Markets".

The martingale-equivalence condition delivered by a no arbitrage assumption in complete asset markets has implications for fine-time-unit asset price behavior that can be rejected with finite spans of data. A class of stochastic processes that could model such deviations from martingale-equivalence is proposed.

Full text available at:

http://sims.princeton.edu/yftp/martpric/bergst24.pdf

1.67 Christopher A. Sims, 1991. "Interpreting the Macroeconomic Time Series Facts: The Effects of Monetary Policy".

Existing theory and evidence on the effects of monetary policy are reviewed. Substantial room for disagreement among economists remains. New evidence, based on multivariate time series studies of several countries, is presented. While certain patterns in the data consistent with effective monetary policy are strikingly similar across countries, others, particularly the tendency of interest rate increases to predict high inflation, are harder to reconcile with effective monetary policy.

Full text available at:

http://sims.princeton.edu/yftp/Madrid/EER4.pdf

1.68 Christopher A. Sims, 1991. "Comment on 'To Criticize the Critics,' by Peter C. B. Phillips", Cowles Foundation Discussion Papers 824, Cowles Foundation for Research in Economics, Yale University.

In his paper "To Criticize the Critics" (1991), Peter Phillips discusses Bayesian methodology for time series models. The main point that Uhlig and I set out to make, however, was that careful consideration of the implications of the likelihood principle suggests that much of the recent work under the "unit root" label in the econometrics literature is being incorrectly interpreted in practice. We pointed out that time series models with possible unit roots are one of the few domains within which the implications of a likelihood principle approach to inference are difference, even in the large samples, from those of a classical hypothesis testing approach. Phillips addresses this part of our paper only indirectly.

Full text available at:

http://cowles.econ.yale.edu/P/cp/p08a/p0824.pdf

1.69 Christopher A. Sims, 1990. "Rational expectations modeling with seasonally adjusted data," Discussion Paper / Institute for Empirical Macroeconomics 35, Federal Reserve Bank of Minneapolis.

In a world where time series show clear seasonal fluctuations, rational agents will take account of those fluctuations in planning their own behavior. Using seasonally adjusted data to model behavior of such agents throws away information and introduces possibly severe bias. Nonetheless it may be true fairly often that rational expectations modeling with seasonally adjusted data, treating the adjusted data as if it were actual data, gives approximately correct results; and naive extensions of standard modeling techniques to seasonally unadjusted data may give worse results than naive use of adjusted data. This paper justifies these claims with examples and detailed arguments.

Full text available at:

http://www.minneapolisfed.org/research/DP/DP35.pdf

1.70 Christopher A. Sims, Revised version 1990. “Martingale-Like Behavior of Asset Prices”.

This is a 1990 paper that was never published in a journal. In good part it is superseded by "Empirical Implications of Arbitrage-Free Asset Markets," (with S. Maheswaran) above. However, its different approach is of some independent interest. This paper shows how regularity conditions on the behavior of the price process, together with absence of arbitrage, imply that econometric tests of the martingale hypothesis on asset prices will tend to accept it when the data are at small time intervals. The paper includes a somewhat nonstandard derivation of the existence of a "market probability measure".

Full text available at:

http://sims.princeton.edu/yftp/martpric/Newmart4.pdf

1.71 Christopher A. Sims, 1989. "Solving nonlinear stochastic optimization and equilibrium problems backwards," Discussion Paper / Institute for Empirical Macroeconomics 15, Federal Reserve Bank of Minneapolis.

In a stochastic equilibrium model some stochastic processes are usually exogenously given, while others are either chosen optimally by agents or emerge from market equilibrium conditions. When we simulate such a model, often we aim at studying the relations among variables in the model as we vary parameters of policy and of behavior of economic agents. We are no more certain (indeed often less certain) of what is reasonable or interesting behavior for the exogenous variables (some of which may be unobservable) than of the variables chosen by agents or fixed in markets. It turns out that if we are flexible about which variables’ behavior we take as given in the model solution computation, freeing ourselves from the convention that the variables exogenous to the model economy must be taken as given in the simulation computations, great computational savings may result.

Full text available at:

http://minneapolisfed.org/research/DP/DP15.pdf

1.72 Christopher A. Sims, 1989. "Modeling trends", Discussion Paper / Institute for Empirical Macroeconomics 22, Federal Reserve Bank of Minneapolis.

Models of low-frequency behavior of time series may have strongly conflicting substantive implications while fitting the data nearly equally well. We should develop methods which display the resulting uncertainty rather than adopt modeling conventions which hide it. One step toward this goal may be to consider "over parameterized" stationary ARMA models.

Full text available at:

http://minneapolisfed.org/research/DP/DP22.pdf

1.73 Christopher A. Sims, 1988. "Models and Their Uses".

A 1988 paper that appeared in the American Journal of Agricultural Economics. It solves a simple flex-price RBC model by backsolving and uses the resulting simulated data to generate impulse responses to compare to VAR's fit to actual data. Though monetary policy has negligible real effects in the model, the observed Granger causal priority of M to output is reproduced in the simulated data. On the other hand the simulated data imply unrealistic behavior of prices.

Full text available at:

http://sims.princeton.edu/yftp/ModelsAndUses/ORDE4.pdf

1.74 Christopher A. Sims, 1988. "Bayesian skepticism on unit root econometrics", Discussion Paper / Institute for Empirical Macroeconomics 3, Federal Reserve Bank of Minneapolis.

This paper examines several grounds for doubting the value of much of the special attention recently devoted to unit root econometrics. Unit root hypotheses are less well connected to economic theory than is often suggested or assumed; distribution theory for tests of other hypotheses in models containing unit roots are less often affected by the presence of unit roots than has been widely recognized; and the Bayesian inferential theory for dynamic models is largely unaffected by the presence

of unit roots. The paper displays an example to show that when Bayesian probability statements and classical marginal significance levels diverge as they do for unit root models, the marginal significance levels are misleading. The paper shows how to carry out Bayesian inference when discrete weight is given to the unit root null hypothesis in a univariate model.

Full text available at:

http://minneapolisfed.org/research/DP/DP3.pdf

1.75 Christopher A. Sims, 1988. "Projecting Policy Effects With Statistical Models".

Paper presented at the August 1988 Latin American Meetings of the Econometric Society in San Jose, Costa Rica. Later published in Revista de Analisis Economico (Santiago, Chile). The promise of then newly developing statistical methods for policy analysis is discussed. A model of policy makers who continually re-estimate a time-varying-parameters Phillips Curve without correctly modeling expectations shows that such policy makers may stay nearly all the time near the optimal policy attainable by policy-makers who know the true economic structure. The version here omits some graphs, but includes new, clearer versions of the graphs related to the Phillips curve model.

Full text available at:

http://sims.princeton.edu/yftp/SanJose/pape4.pdf

1.76 Christopher A. Sims and Harald Uhlig, 1988. "Understanding unit rooters: a helicopter tour", Discussion Paper / Institute for Empirical Macroeconomics 4, Federal Reserve Bank of Minneapolis.

No abstract is available for this item.

Full text available at:

http://minneapolisfed.org/research/DP/DP4.pdf

1.77 Christopher A. Sims, Thomas Doan and Robert B. Litterman, 1986. "Forecasting and conditional projection using realistic prior distribution", Staff Report 93, Federal Reserve Bank of Minneapolis.

This paper develops a forecasting procedure based on a Bayesian method for estimating vector autoregressions. We apply the procedure to 10 macroeconomic variables and show that it produces more accurate out-of-sample forecasts than univariate equations do. Although cross-variable responses are damped by the prior, our estimates capture considerable interaction among the variables. ; We provide unconditional forecasts as of 1982:12 and 1983:3. We also describe how a model such as this can be used to make conditional projections and analyze policy alternatives. As an example, we analyze a Congressional Budget Office forecast made in 1982:12. ; While no automatic casual interpretations arise from models like ours, such models provide a detailed characterization of the dynamic statistical interdependence of a set of economic variables. That information may help evaluate casual hypotheses without containing any such hypotheses.

Full text available at:

http://minneapolisfed.org/research/sr/sr93.pdf

1.78 Christopher A. Sims, 1986. "Are forecasting models usable for policy analysis?", Quarterly Review, Federal Reserve Bank of Minneapolis, issue Win, pages 2-16.

In this article, Christopher A. Sims argues the answer to his title is yes. Sims explains that any decision making model must incorporate some identifying assumptions to enable it to forecast the effects of alternative decisions. He argues that although all identifying assumptions in econometric policymaking models are of uncertain validity, those incorporated in vector autoregression (VAR) forecasting models have the advantage of allowing their uncertainty to be measured. Sims concludes by demonstrating a method for identifying a small macroeconomic VAR model so that it can be used to analyze monetary policy.

Full text available at:

http://www.minneapolisfed.org/research/QR/QR1011.pdf

1.79 Christopher A. Sims, 1982. "Policy Analysis with Econometric Models", Brookings Papers on Economic Activity, Economic Studies Program, The Brookings Institution, vol. 13(1), pages 107-164.

No abstract is available for this item.

Full text available at:

http://www.brookings.edu/~/media/Files/Programs/ES/BPEA/1982_1_bpea_papers/1982a_bpea_sims_goldfeld_sachs.pdf

1.80 Christopher Sims and Fumio Hayashi, 1980. "Efficient Estimation of Time Series Models with Predetermined", Discussion Papers 450, Northwestern University, Center for Mathematical Studies in Economics and Management Science.

No abstract is available for this item.

Full text available at:

http://www.kellogg.northwestern.edu/research/math/papers/450.pdf

1.81 Christopher A. Sims, John P. Burman, Dennis Farley, Stephen Zeller, Martin M. G. Fase, Agustin Maravall and Kenneth F. Wallis, 1978. "Contributed Comments to "Seasonal Analysis of Economic Time Series"", NBER Chapters, in: Seasonal Analysis of Economic Time Series, pages 461-479 National Bureau of Economic Research.

No abstract is available for this item.

Full text available at:

http://www.nber.org/chapters/c4335.pdf

1.82 Christopher A. Sims and Thomas J. Sargent, 1977. "Business cycle modeling without pretending to have too much a priori economic theory", Working Papers 55, Federal Reserve Bank of Minneapolis.

No abstract is available for this item.

Full text available at:

http://www.minneapolisfed.org/research/WP/WP55.pdf

1.83 Christopher A. Sims, 1977. "Remarks on Real Value Added", NBER Chapters, in: Annals of Economic and Social Measurement, Volume 6, number 1, pages 135-139 National Bureau of Economic Research.

No abstract is available for this item.

Full text available at:

http://www.nber.org/chapters/c10506.pdf

1.84 Christopher A. Sims, 1974. "Output and Labor Input in Manufacturing", Brookings Papers on Economic Activity, Economic Studies Program, The Brookings Institution, vol. 5(3), pages 695-736.

No abstract is available for this item.

Full text available at:

http://www.brookings.edu/~/media/Files/Programs/ES/BPEA/1974_3_bpea_papers/1974c_bpea_sims_lovell_solow.pdf

1.85 Christopher A. Sims, 1974. "Optimal Stable Policies for Unstable Instruments", NBER Chapters, in: Annals of Economic and Social Measurement, Volume 3, number 1, pages 257-266 National Bureau of Economic Research.

No abstract is available for this item.

Full text available at:

http://www.nber.org/chapters/c10010.pdf

1.86 Christopher A. Sims, 1972. "Are There Exogenous Variables in Short-Run Production Relations", NBER Chapters, in: Annals of Economic and Social Measurement, Volume 1, number 1, pages 16-35 National Bureau of Economic Research.

No abstract is available for this item.

Full text available at:

http://www.nber.org/chapters/c9181.pdf

2 COURSE MATERIALS

2.1 Money and Banking (ECO342)

An undergraduate course, assuming calculus and previous coursework in macroeconomics. Models of price determination. Monetary and financial institutions. Financial stability. Monetary policy for economic stability. Financial regulation.

Course materials are available:

http://sims.princeton.edu/yftp/Money2011/

2.2 Speculative Bubbles and Financial Panics (Eco315, part 2)

An undergraduate course, assuming previous work in macroeconomics. Combines historical reading and discussion about financial bubbles and panics with examination of mathematical models of them. The models may provide insight into what kinds of asset market behavior are to be expected in well-functioning markets, how they can be distinguished from pathological behavior, and what, if anything, ought to be done to control or curtail the pathological behavior.

Course materials are available:

http://sims.princeton.edu/yftp/Bubbles2007/

2.3 Econometric Theory I (517)

The first-year, first-semester graduate econometrics course.

Course materials are available:

http://sims.princeton.edu/yftp/emet04/

2.4 Time Series (513)

We discuss the general definition of a stochastic process and a variety of specific cases: ARMA, trigonometric, continuous or discrete time, stationary or non-stationary, large model, small model, structural and non-structural. We also consider inference for each model type we discuss. The emphasis will be on Bayesian

inference, with some discussion of similarities and differences between Bayesian and sampling-theory approaches.

Course materials are available:

http://sims.princeton.edu/yftp/Times09/

2.5 Econometrics III (552b)

This course covers linear regression, generalized least squares, generalized method of moments, simultaneous equations, and Kalman filtering, among other topics. It is meant as a high-level introduction to econometrics, for graduate students with strong math and statistics backgrounds but little econometrics training, or students with good, but not necessarily rigorous, previous econometrics training. The course is taught from a Bayesian perspective.

Course materials are available:

http://sims.princeton.edu/yftp/Emet3/

2.6 Macroeconomic Theory II (504)

The second semester first-year Princeton graduate macro theory course.

Course materials are available:

http://sims.princeton.edu/yftp/Macro2009/

2.7 Advanced Macroeconomics (521 or 2)

Second year, second semester macro course. Rational inattention, models with price levels and inertias.

Course materials are available:

http://sims.princeton.edu/yftp/AdvMacro10/

2.8 Intermediate Macro Theory, Honors Section (153a)

An undergraduate course, taught using more math and a less conventional approach than is usual at this level.

Course materials are available:

http://www.princeton.edu/~sims/IntMacro/rl153a.htm

3 SOFTWARE COMPONENTS

3.1 Christopher A. Sims, 2002. "Solving Linear Rational Expectations Models", Computational Economics, Springer, vol. 20(1-2), pages 1-20, October.

We describe methods for solving general linear rational expectations models in continuous or discrete timing with or without exogenous variables. The methods are based on matrix Eigen value decompositions.

Available at:

http://www.springerlink.com/content/100248/

3.2 Christopher A. Sims, 2001. "Matlab Code for Solving Linear Rational Expectations Models", QMandRBC Codes 11, Quantitative Macroeconomics and Real Business Cycles.

A computationally robust solution method for linear rational expectations models is displayed, based on the QZ matrix decomposition. Any rational expectations model, in continuous or discrete time, can be solved by this approach. It requires that the model be cast into first-order form, but it does not require that it be reduced so that the number of states matches the number of equations. It also avoids the artificial requirement that variables be designated as "jump" variables or not. (Instead, how expectational error terms enter the system must be specified - a more general specification.) The code automatically determines whether the model satisfies conditions for existence and uniqueness. Two matlab files, gensys.m and gensysct.m, analyze linear rational expectations systems and return solutions for their dependence on exogenous disturbances. The systems need not have non-singular lead matrices (coefficients on current variables in discrete time, on derivatives in continuous time) and they need not be well-specified. The program analyzes them to determine whether solutions exist and whether they are unique. It returns a solution even when it is not unique, and it returns a solution that constrains exogenous variable behavior when no solution that does not do so exists. The continuous time program, unlike the discrete

time program, handles only the case of serially uncorrelated exogenous processes. The files qzdiv.m, qzdivct.m, and qzswitch.m are required by the gensys.m programs. If you try to implement the algorithm in non-Matlab languages, you will need to find or write a routine that does the complex QZ (or generalized Schur) decomposition. Fortran routines that do this are available in the ACM algorithm files.

Available at:

http://dge.repec.org/codes/sims/linre3a/

3.3 Christopher A. Sims, 2000. "Matlab Code for Second Order Accurate Solution of Discrete Time Dynamic Equilibrium Models", QMandRBC Codes 12, Quantitative Macroeconomics and Real Business Cycles, revised 26 Jun 2003.

From the first and second derivatives of a set of equations that may include expectational Euler equations, this algorithm produces a second-order accurate expansion of the mapping from "states" to "controls" and of the dynamics of the states. The states do not need to be specified explicitly, but the software allows the user to specify any state vector that seems natural, reverting to its default method if the user's choice does not work. The gstate.m program in the gensys2 folder analyzes the G1 and impact matrices that come from gensys (or the corresponding F1, F2 matrices from gensys2) to facilitate translation into a possibly more familiar "state-control" form. The order2setup.m program uses the Matlab symbolic package to calculate first and second derivatives analytically from model equations specified as matlab-notation equations.

Available at:

http://dge.repec.org/codes/sims/gensys2/

3.4 Christopher A. Sims, 1999. "Matlab Optimization Software", QMandRBC Codes 13, Quantitative Macroeconomics and Real Business Cycles.

Matlab programs that solve nonlinear equations and minimize using quasi-Newton with BFGS update. The programs are somewhat more robust, apparently, than the stock Matlab programs that do about the same thing. The minimizer can negotiate discontinuous "cliffs" without getting stuck. This directory contains a set of matlab m files that do unconstrained optimization and nonlinear equations-solving. It also contains some auxiliary m files. csminwel: minimization. Uses a quasi-Newton

method with BFGS update of the estimated inverse hessian. It is robust against certain pathologies common on likelihood functions. It attempts to be robust against "cliffs", i.e. hyperplane discontinuities, though it is not really clear whether what it does in such cases succeeds reliably. csminit: called by csminwel. numgrad: crude numerical derivative. Called by csminwel if no analytic gradient supplied. Beware of this or any other numerical derivative on large or ill-conditioned problems. bfgsi: The BFGS update for the inverse hessian. csolve: nonlinear equation solver. More robust than many. Tries random search directions if things look bad and will not get stuck at a flat spot in the sum of deviations objective function that is not a solution.

Available at:

http://dge.repec.org/codes/sims/optimize/

4 BOOKS

4.1 Christopher A. Sims, (ed.), 1996. "Advances in Econometrics," Cambridge Books, Cambridge University Press, number 9780521566100.

This is the first of a two-volume set of articles reflecting the current state of research in theoretical and applied econometrics. The topics covered include time series methods, semi parametric methods, seasonality, financial economics, model solution techniques, economic development, and labour economics. All the contributions were commissioned to be presented at the plenary sessions of the Sixth World Congress of the Econometric Society in Barcelona.

4.2 Christopher A. Sims, (ed.), 1996. "Advances in Econometrics," Cambridge Books, Cambridge University Press, number 9780521566094.

This is the second of a two-volume set of articles reflecting the current state of research in theoretical and applied econometrics. The topics covered include time series methods, semi parametric methods, seasonality, financial economics, model solution techniques, economic development, and labour economics. All the contributions were commissioned to be presented at the plenary sessions of the Sixth World Congress of the Econometric Society in Barcelona.

4.3 Christopher A. Sims, (ed.), 1994. "Advances in Econometrics," Cambridge Books, Cambridge University Press, number 9780521444590.

This is the first of a two-volume set of articles reflecting the current state of research in theoretical and applied econometrics. The topics covered include time series methods, semi parametric methods, seasonality, financial economics, model solution techniques, economic development, and labour economics. All the contributions were commissioned to be presented at the plenary sessions of the Sixth World Congress of the Econometric Society in Barcelona.

4.4 Christopher A. Sims, (ed.), 1994. "Advances in Econometrics," Cambridge Books, Cambridge University Press, number 9780521444606.

This is the second of a two-volume set of articles reflecting the current state of research in theoretical and applied econometrics. The topics covered include time series methods, semi parametric methods, seasonality, financial economics, model solution techniques, economic development, and labour economics. All the contributions were commissioned to be presented at the plenary sessions of the Sixth World Congress of the Econometric Society in Barcelona.