

DISCUSSION OF ‘ENDOGENOUS TECHNOLOGY
ADOPTION AND R&D AS SOURCES OF
BUSINESS-CYCLE PERSISTENCE” BY
ANZOATEGUI, COMIN, GERTLER, AND
MARTINEZ

Robert E. Hall
Hoover Institution and Department of Economics
Stanford University
NBER

Conference on Macroeconomics and Monetary Policy
San Francisco Federal Reserve Bank
4 March 2016

THE PAPER...

makes the case that a slowdown in R&D spending and adoption of new technologies, resulting from the crisis, accounts for a lot of the persistent shortfall in TFP and thus in output over the past 8 years

THE PAPER...

makes the case that a slowdown in R&D spending and adoption of new technologies, resulting from the crisis, accounts for a lot of the persistent shortfall in TFP and thus in output over the past 8 years

According to this view, productivity, like the capital stock, is a slow-moving state variable that accounts for the persistent effects of a crisis

THE PAPER...

makes the case that a slowdown in R&D spending and adoption of new technologies, resulting from the crisis, accounts for a lot of the persistent shortfall in TFP and thus in output over the past 8 years

According to this view, productivity, like the capital stock, is a slow-moving state variable that accounts for the persistent effects of a crisis

The current version of the paper is sketchy on the empirical foundations; it lavishes most of its effort on a general-equilibrium model with all the usual DSGE complications plus endogenous technical progress

.

FIRST EMPIRICAL QUESTION

How big was the shortfall in R&D spending following the crisis in 2008?

FIRST EMPIRICAL QUESTION

How big was the shortfall in R&D spending following the crisis in 2008?

Answer: surprisingly small

FIRST EMPIRICAL QUESTION

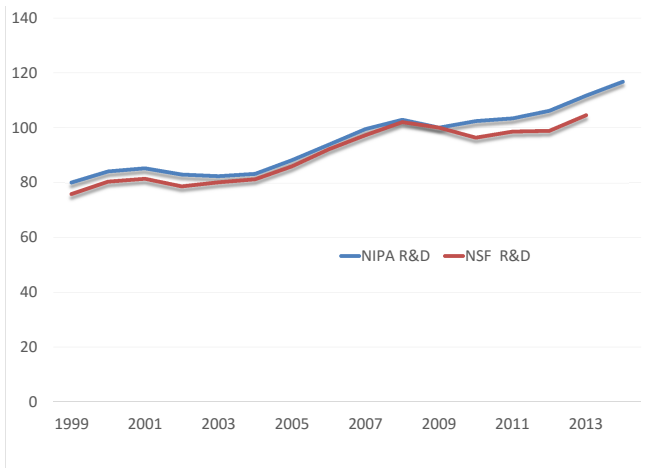
How big was the shortfall in R&D spending following the crisis in 2008?

Answer: surprisingly small

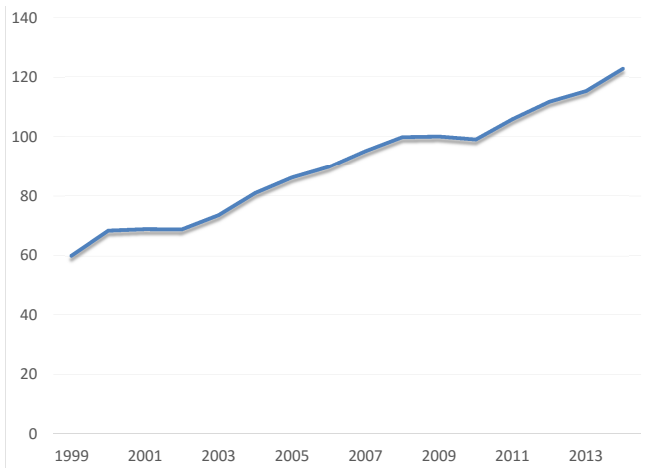
Also true of software, but large cutbacks in equipment and structures investment

.

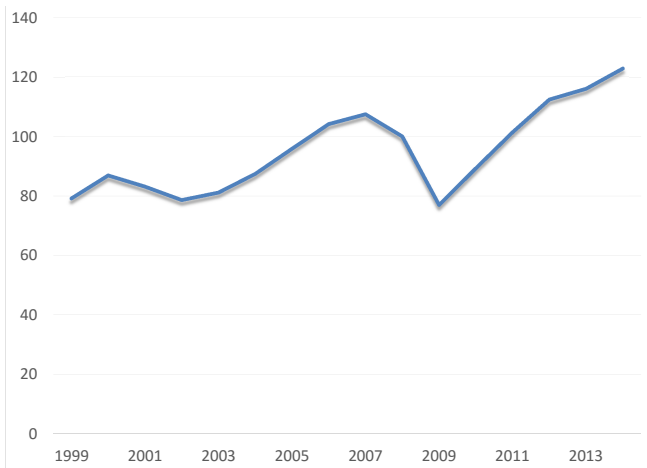
INDEXES OF REAL R&D SPENDING, NIPA AND NSF



INDEX OF REAL SOFTWARE SPENDING, NIPA



INDEX OF REAL EQUIPMENT SPENDING, NIPA



INDEX OF REAL NON-RESIDENTIAL STRUCTURES SPENDING, NIPA

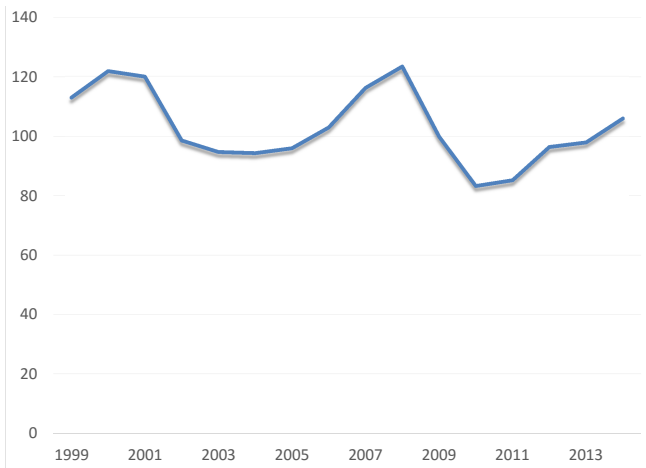
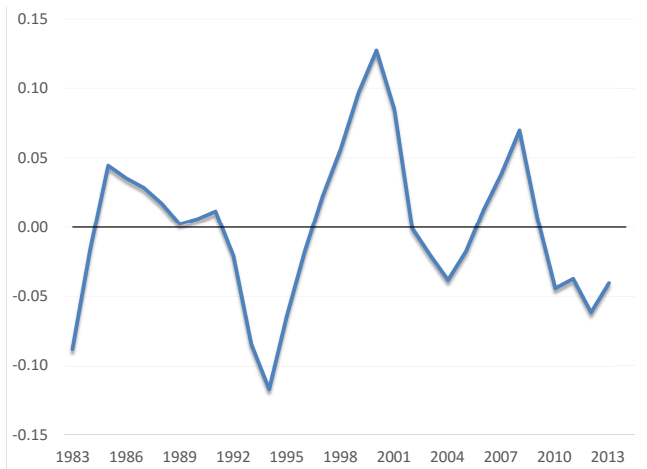
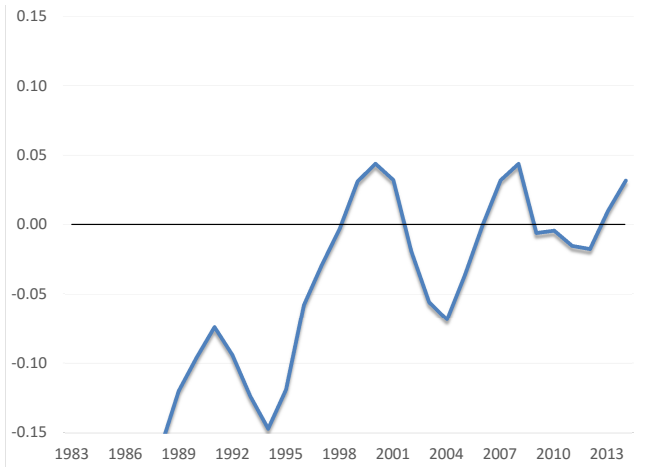


FIG 2 OF THE PAPER: DEPARTURES OF REAL PER-CAPITAL R&D SPENDING FROM TREND



ALTERNATIVE VERSION OF FIG 2: NIPA SPENDING, TREND FROM 1999 ONLY



SECOND EMPIRICAL QUESTION: CYCLICAL EFFECTS ON ADOPTION

Based on regressions,

$$\Delta \log \frac{m_{i,t}}{1 - m_{i,t}} = \alpha_i + G(\text{lag}_{i,t}) + \beta \hat{y}_t + \epsilon_{i,t}$$

SECOND EMPIRICAL QUESTION: CYCLICAL EFFECTS ON ADOPTION

Based on regressions,

$$\Delta \log \frac{m_{i,t}}{1 - m_{i,t}} = \alpha_i + G(\text{lag}_{i,t}) + \beta \hat{y}_t + \epsilon_{i,t}$$

No discussion of identification—doesn't a spontaneous increase, $\epsilon_{i,t}$, raise real GDP, \hat{y}_t ?

SECOND EMPIRICAL QUESTION: CYCLICAL EFFECTS ON ADOPTION

Based on regressions,

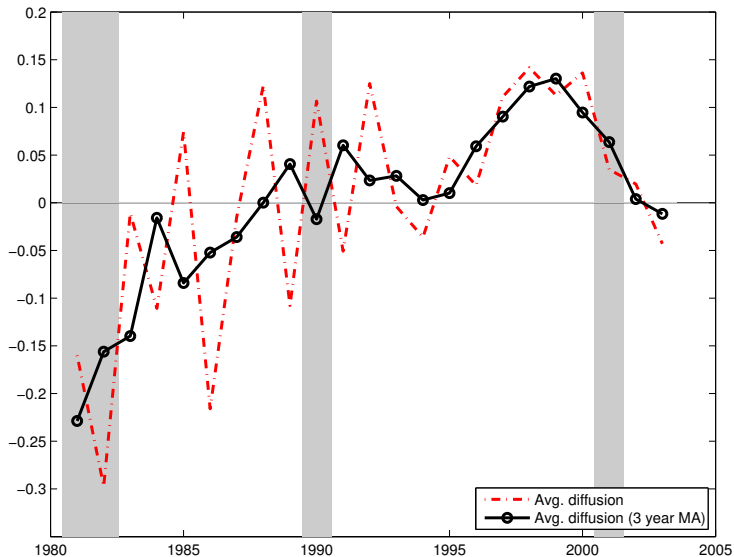
$$\Delta \log \frac{m_{i,t}}{1 - m_{i,t}} = \alpha_i + G(\text{lag}_{i,t}) + \beta \hat{y}_t + \epsilon_{i,t}$$

No discussion of identification—doesn't a spontaneous increase, $\epsilon_{i,t}$, raise real GDP, \hat{y}_t ?

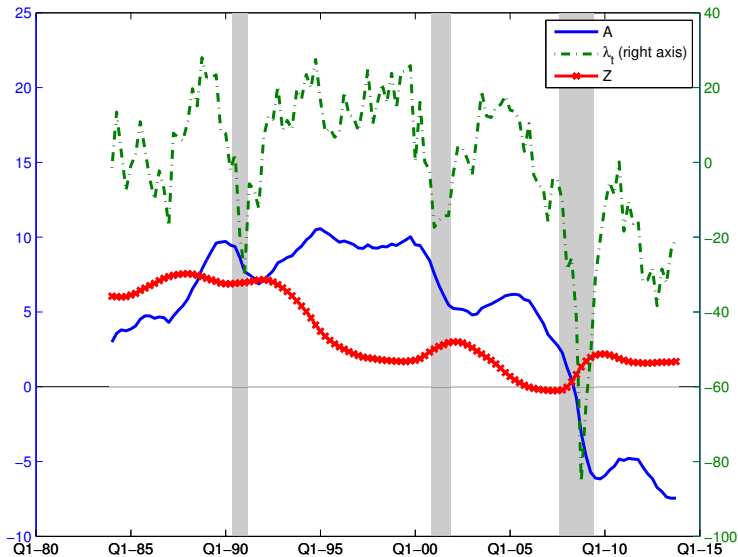
Really hard to find any confirmation in Fig 3

.

ADOPTION IN THE US



DECOMPOSITION OF ENDOGENOUS TECHNOLOGY



CLOSE TO STABLE R&D SPENDING, BUT SLOWER ADOPTION POST-CRISIS

Leading-edge firms continue to innovate, but others fall behind

CLOSE TO STABLE R&D SPENDING, BUT SLOWER ADOPTION POST-CRISIS

Leading-edge firms continue to innovate, but others fall behind

Higher effective cost of capital is a primary reason for the lag

.