The Too Short Introduction to LaTeX 2ε

Or LaTeX 2ε in 56 2/3 Minutes

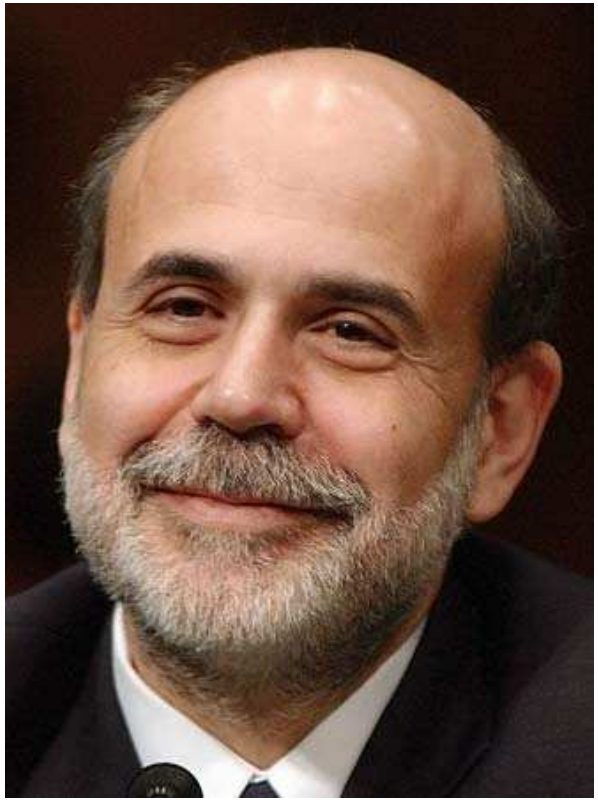
Rich Ryan
richard.w.ryan@gmail.com

Federal Reserve
Bank of Boston

Summer 2012

Disclaimer: I do not speak for:

Eric Rosengren,
President of Boston Fed



Ben Bernanke,
Chairman of Federal Reserve

For some years I hoped that Sims would share a Nobel with Zellner for their contributions to Bayesian econometrics. Alas, Zellner died before that could happen. As a second best outcome, I'm happy to see Sims and Sargent honored for the contributions to macro. Most people of a certain age say they remember where they were when Neil Armstrong first stepped on the moon. That's fine; but I remember just as vividly picking up the latest Econometrica in the Birkbeck College library in January 1980 and reading with amazement Sims's "Macroeconomics and Reality." It seemed to me he had raised fundamental questions about the traditional approach to identifying macroeconometric models. Not quite sure that VARs would prove to be a superior alternative, I was eager see what Sims could do with them. As it turns out, he could do a lot.

The Inefficient Go-through-a-million-symbols-not-to-find-the-one-you-want Process of Word

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For every $\epsilon > 0$, I simply type `$\epsilon$` to get an ϵ.

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For every $\epsilon > 0$, I simply type `$\epsilon$` to get an ϵ.

Writing serious mathematics in Word is the academic equivalent of the double-dribble.

1 Motivation

Paramount Phonetics

Paramount Phonetics

- TEX pronounced "Tech"

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- LATEX pronounced

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- LATEX pronounced
  - “lay–tech”

Paramount Phonetics

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  - "lah–tech"

Paramount Phonetics

- TEX pronounced "Tech"
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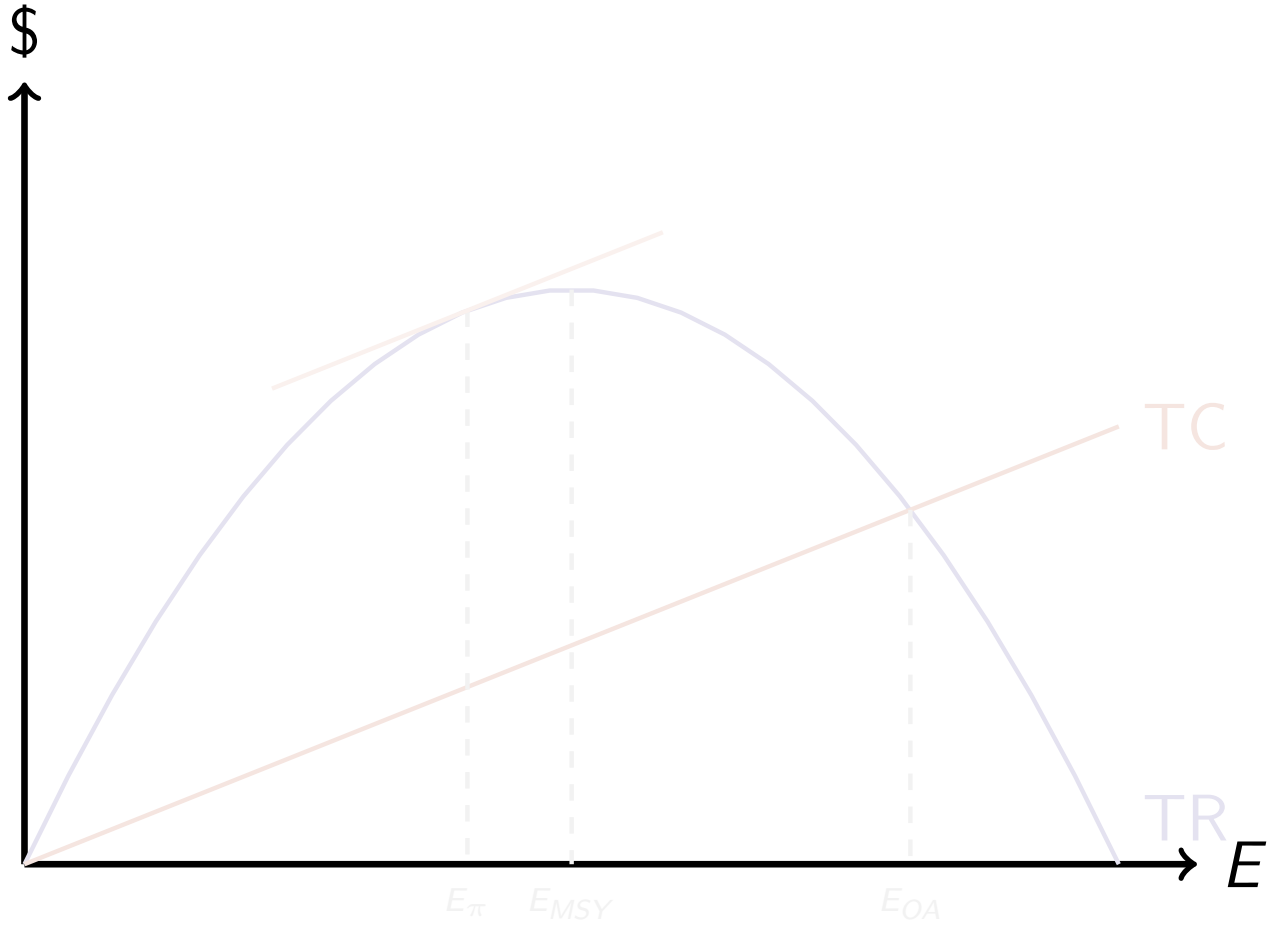
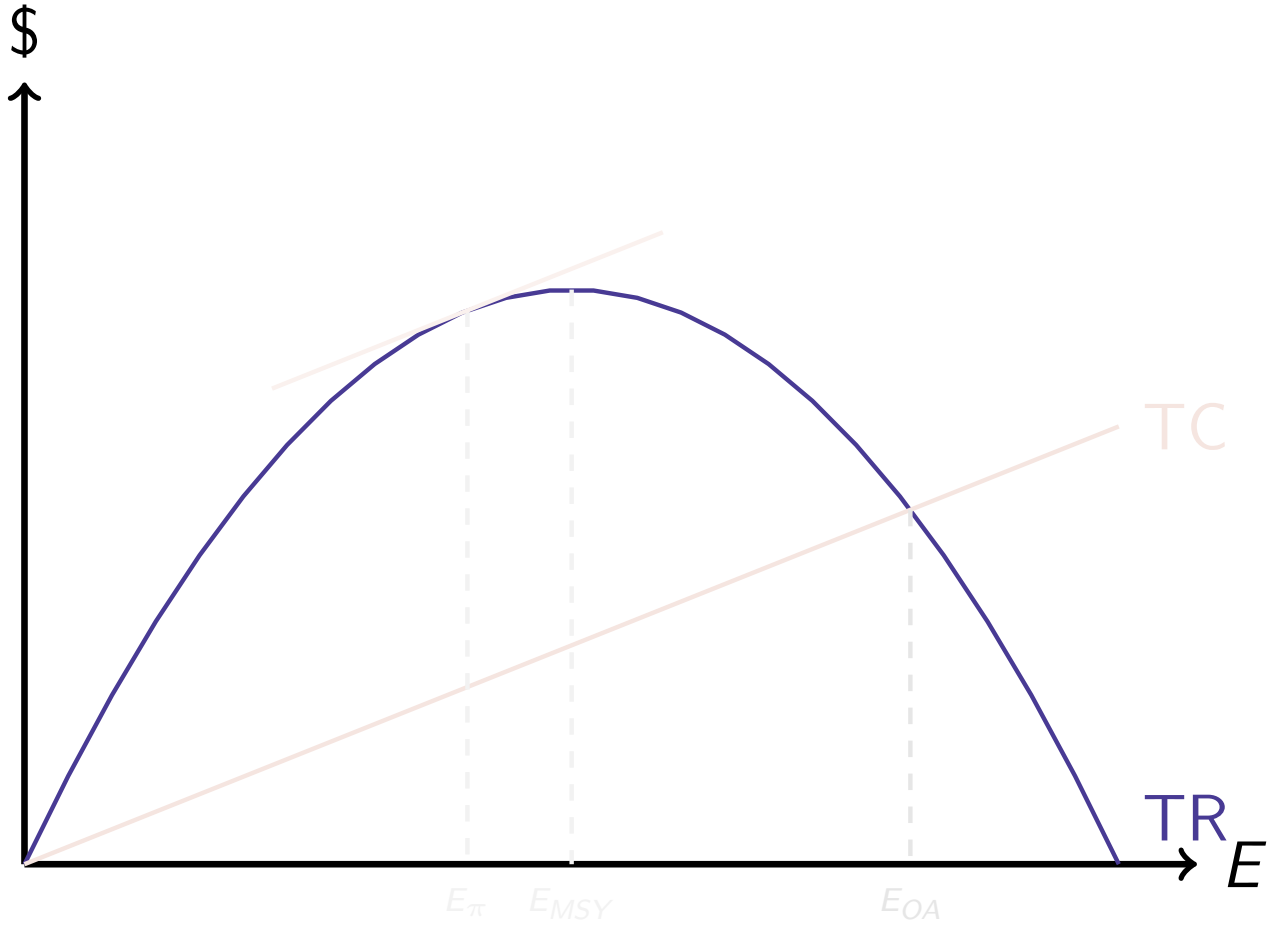
- LATEX 2$_\varepsilon$ pronounced "LATEX two e"

The Schaefer model: fishery economics



The Schaefer model: fishery economics



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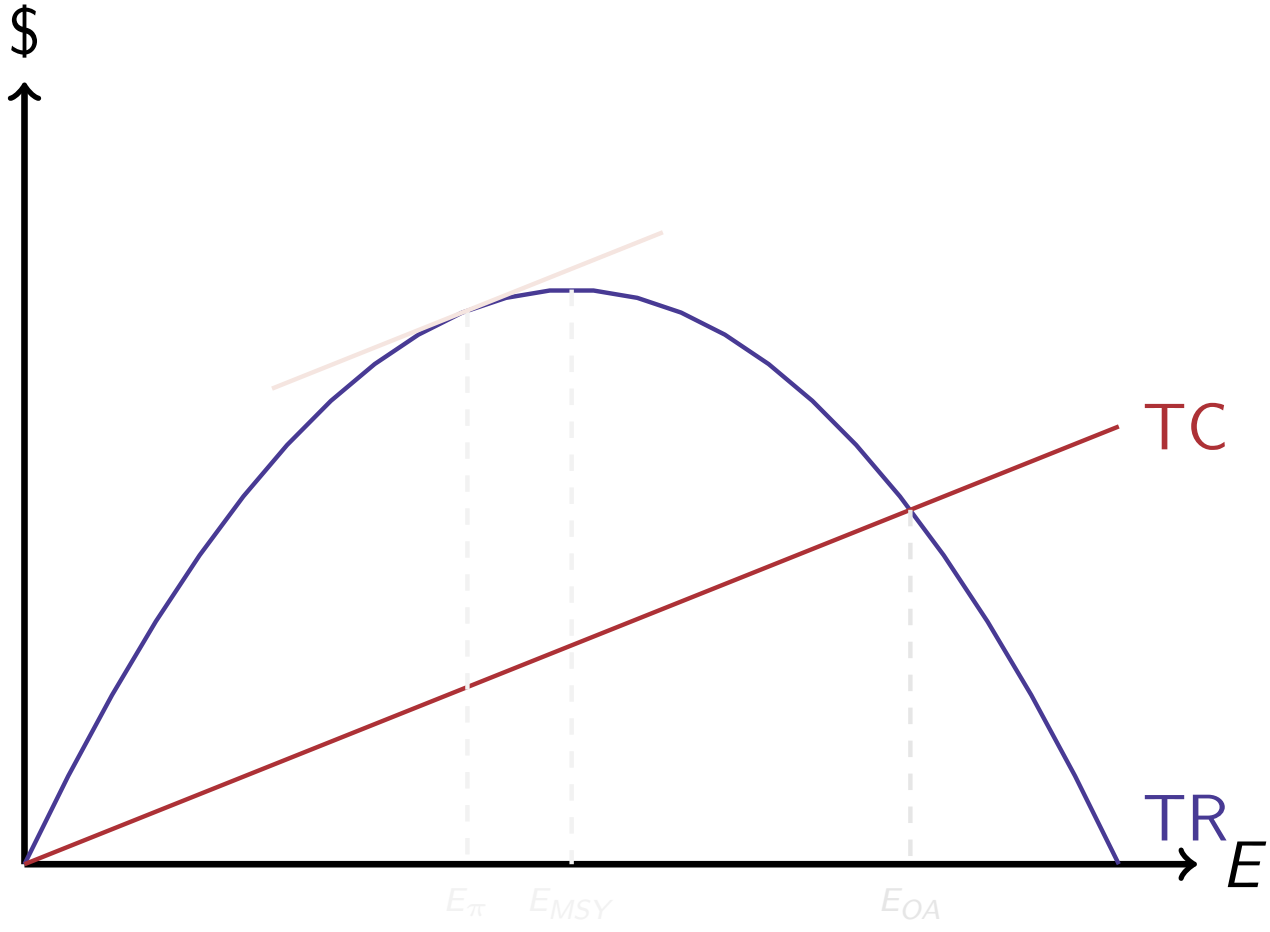
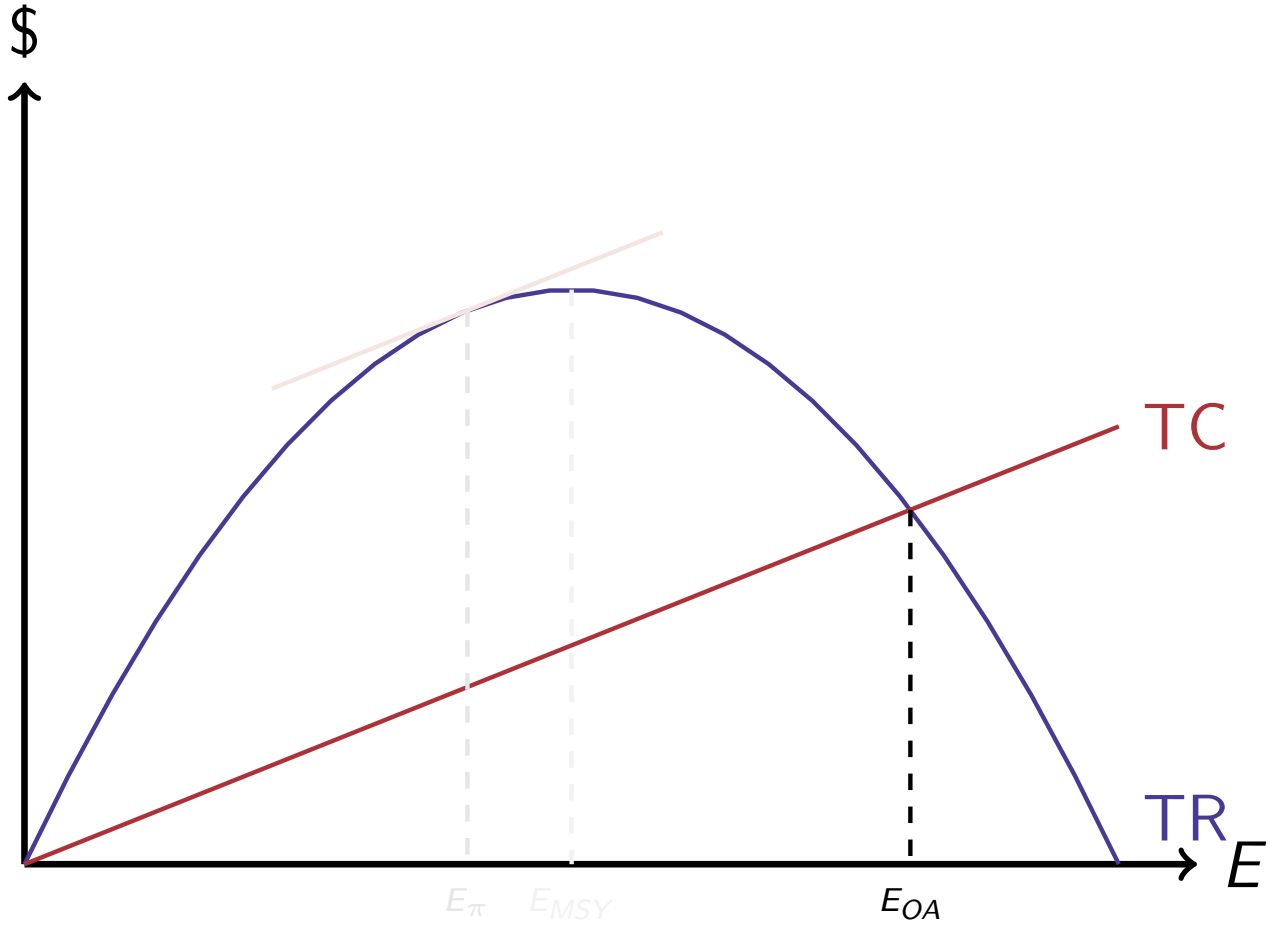


The Schaefer model: fishery economics



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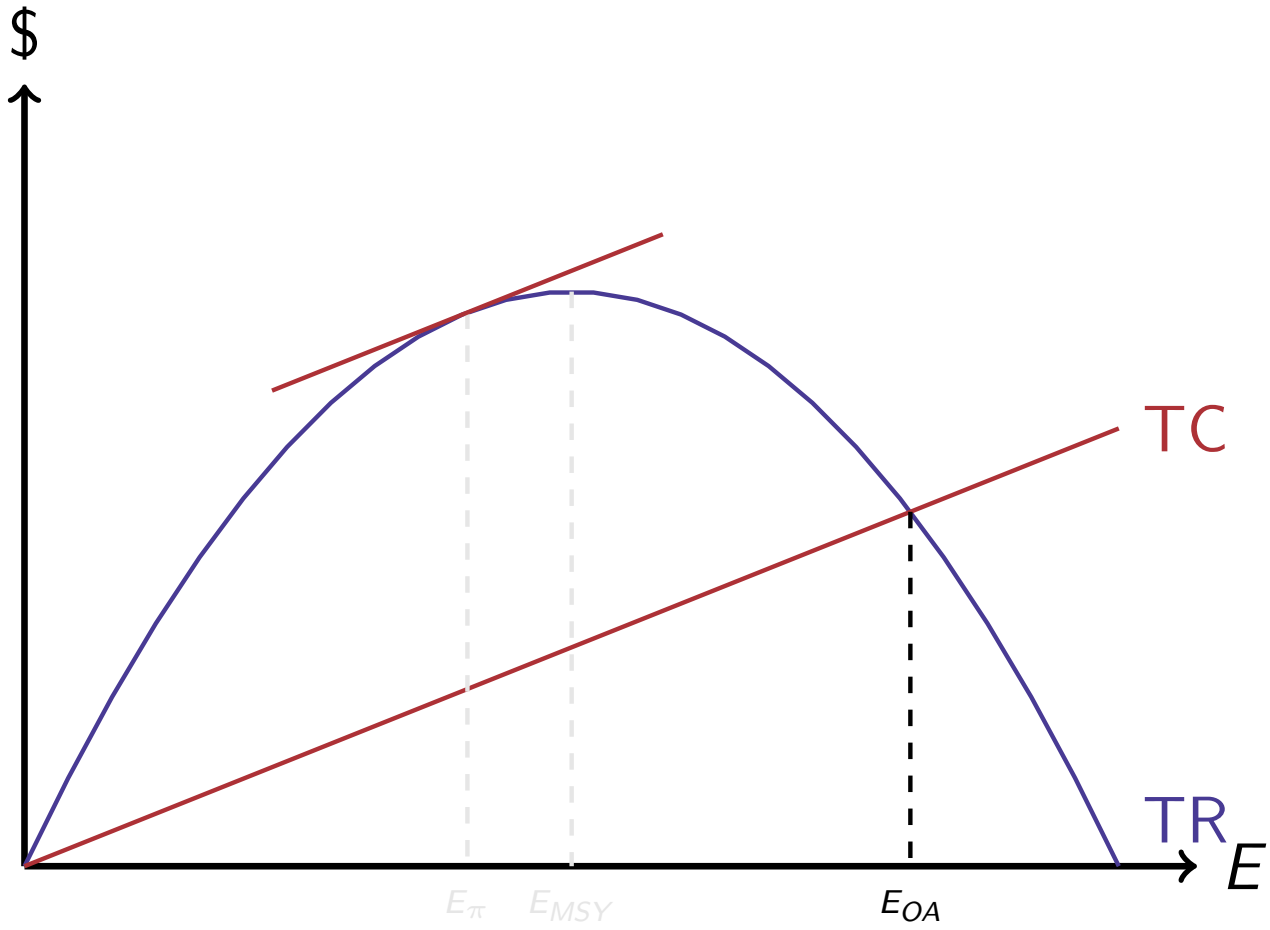

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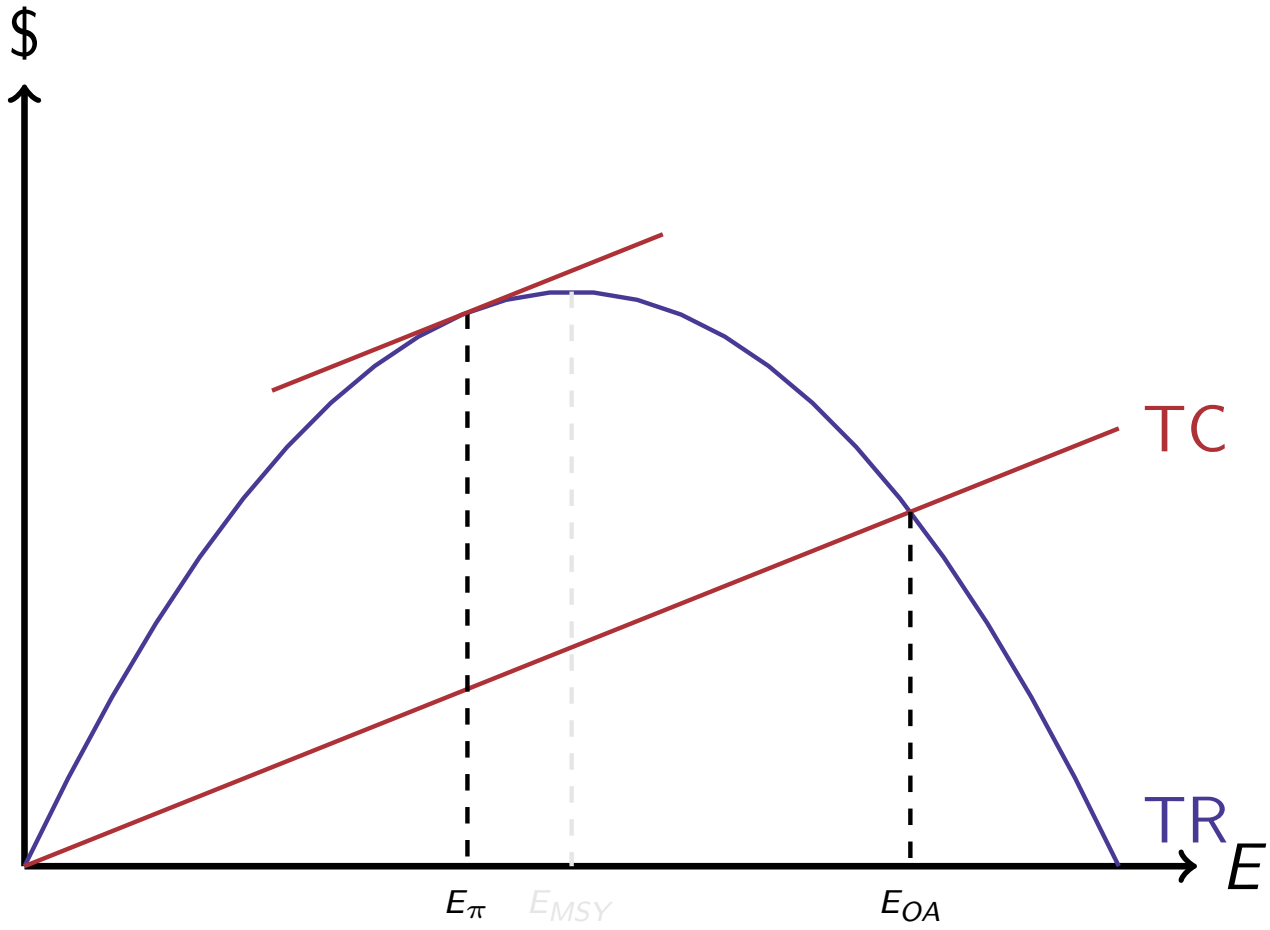

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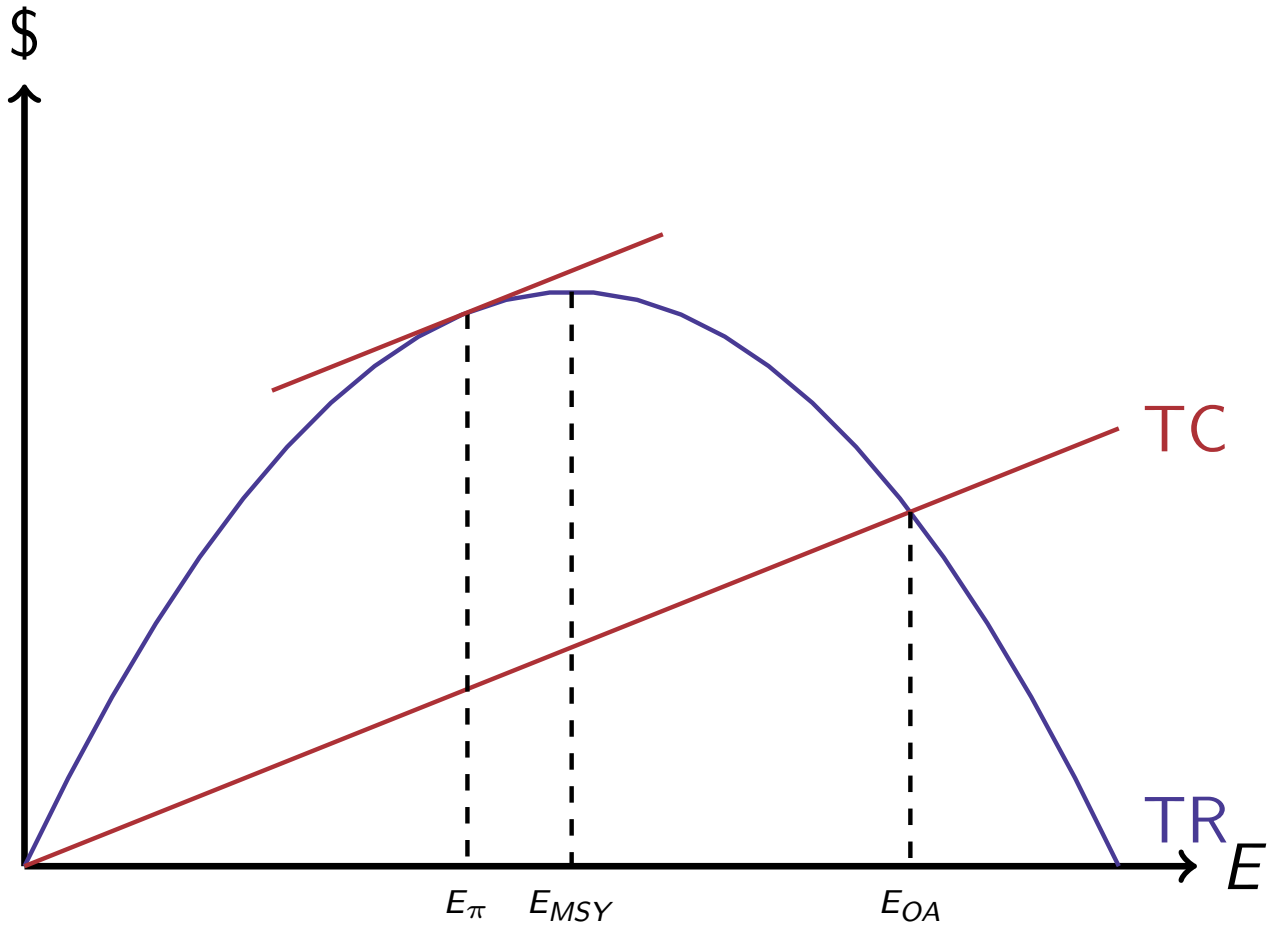

Math: LaTeX's Bread and Butter

Let $A = \{x, y, z\}$. Then

$$\mathbb{P}(A) = \{\emptyset, \{x\}, \{y\}, \{z\}, \{x, y\}, \{x, z\}, \{y, z\}, \{x, y, z\}\}.$$

Math: LaTeX's Bread and Butter

```
\begin{theorem}[Cantor's Theorem]
\label{thm:cantor}
For any set $A$,
\begin{equation}
|A| < |\mathbb{P}(A)|.
\end{equation}
\end{theorem}
```

Math: LaTeX's Bread and Butter

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\end{equation}
\end{theorem}
```

Theorem (Cantor's Theorem)

For any set A,

$$|A| < |\mathbb{P}(A)|. \tag{1}$$

Corollary

The set of all sets does not exist.

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Proof.

Suppose that S is the set of all sets.

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Proof.

Suppose that S is the set of all sets. Then by Theorem (1),

$$|S| < |\mathbb{P}(S)|.$$

Corollary

The set of all sets does not exist.

Proof.

Suppose that S is the set of all sets. Then by Theorem (1),

$$|S| < |\mathbb{P}(S)|.$$

But $\mathbb{P}(S) \subset S$.

Corollary

The set of all sets does not exist.

Proof.

Suppose that S is the set of all sets. Then by Theorem (1),

$$|S| < |\mathbb{P}(S)|.$$

But $\mathbb{P}(S) \subset S$. Thus

$$|\mathbb{P}(S)| \leq |S|.$$

Corollary

The set of all sets does not exist.

Proof.

Suppose that S is the set of all sets. Then by Theorem (1),

$$|S| < |\mathbb{P}(S)|.$$

But $\mathbb{P}(S) \subset S$. Thus

$$|\mathbb{P}(S)| \leq |S|.$$

Contradiction. $\square$

LaTeX physiognomy

```
\begin{corollary}
The set of all sets does not exist.
\end{corollary}
```

LaTeX physiognomy

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\begin{proof}
Suppose that $S$ is the set of all sets.
Then by Theorem~\eqref{thm:cantor},
\begin{equation*}
|S| < |\mathbb{P}(S)|.
\end{equation*}
But $\mathbb{P}(S) \subset S$.  Thus
\begin{equation*}
|\mathbb{P}(S)| \leq |S|.
\end{equation*}
Contradiction.
\end{proof}
```

Elegance

Definition

Let $(X, \mathcal{M}, \mu)$ be a given (complete) measure space. Let $1 \leq p < +\infty$. Denote

$$\begin{aligned} \mathcal{L}^p(X, \mathcal{M}, \mu) = \mathcal{L}^p(X) &= \mathcal{L}^p(\mu) \\ &= \left\{ f : X \to \mathbb{R}^+ : f \text{ measurable} \right. \\ &\quad \left. \text{and } \int_X |f|^p d\mu < +\infty \right\}. \end{aligned}$$

Elegance

Theorem (Minkowski's Inequality)

Let $1 \leq p < +\infty$, $f, g \in \mathcal{L}^p(X)$. *Then*

$$\left(\int_X |f+g|^p d\mu \right)^{\frac{1}{p}} \leq \left(\int_X |f|^p d\mu \right)^{\frac{1}{p}} + \left(\int_X |g|^p d\mu \right)^{\frac{1}{p}}.$$

In other words:

$$||f+g||_p \leq ||f||_p + ||g||_p.$$

The Lebesgue Dominated Convergence Theorem

Let $E \in \mathcal{M}$, $g \in \mathcal{L}(E)$. Let $< f_n >_{n=1}^{\infty}$ be a sequence of measurable functions defined on E such that for $n = 1, 2, \ldots$:

$$|f_n| \leq g \text{ a.e. on } E. \tag{2}$$

Assume that

$$f_n \to f \text{ a.e. on } E \tag{3}$$

for some measurable function f on E. Then $f \in \mathcal{L}(E)$ and

$$\int_E f = \lim_{n \to +\infty} \int_E f_n. \tag{4}$$

Proof of LDCT

f is measurable as an a.e. limit of measurable functions is measurable. f_n are all integrable on E for $n = 1, 2, \ldots$ since $|f_n| \leq g$ a.e. on E. Observe that $|f_n| \to |f|$ a.e. on E by (3). Thus from (2):

$$|f_n| \leq |f| \text{ a.e. on } E.$$

By Proposition 23.2, f is integrable on E. To prove (4) observe that by (2):

$$-g \leq f_n \leq g \text{ on } E \text{ for } n = 1, 2, \ldots.$$

Hence:

$$g - f_n \geq 0 \text{ and } f_n + g \geq 0 \text{ on } E. \tag{5}$$

Proof of LDCT

We have also

$$g - f_n \to g - f \text{ a.e. on } E, \quad f_n + g \to f + g \text{ a.e. on } E. \quad (6)$$

By (5) and (6) we can apply Fatou's Lemma to both sequence. We obtain

$$\int_E (g - f) \overset{\text{Th } 22.1}{=} \int_E g - \int_E f \overset{\text{FL}}{\leq} \underline{\lim} \int_E (g - f_n)$$
$$\overset{Th22.1}{=} \underline{\lim} \left(\int_E g - \int_E f_n \right).$$

Proof of LDCT

From Lemma 23.1:

$$\int_E g - \int_E f \leq \int_E g - \overline{\lim} \int_E f_n.$$

Thus:

$$\int_E f \geq \overline{\lim} \int_E f_n. \tag{7}$$

Proof of LDCT

Applying Fatou's Lemma to $< g + f_n >$, we obtain

$$\begin{aligned}\int_E (g+f) &= \int_E g + \int_E f \\ &\leq \underline{\lim} \int_E (g+f_n) = \underline{\lim} \left(\int_E g + \int_E f_n \right).\end{aligned}$$

By Lemma 23.1:

$$\int_E g + \int_E f \leq \int_E g = \underline{\lim} \int_E f_n.$$

Thus

$$\int_E f \leq \underline{\lim} \int_E f_n. \tag{8}$$

Proof of LDCT

(7) and (8) give:

$$\int_E f \leq \underline{\lim} \int_E f_n \leq \overline{\lim} \int_E f_n \leq \int_E f .$$

The latter implies (4).

In the Beginning...

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- Donald Knuth

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- "'TEX is a new typesetting system intended for the creation of *beautiful* books—and especially for books that contain a lot of mathematics. By preparing a manuscript in TEX format, you will be telling a computer exactly how the manuscript is to be transformed into pages whose typographic quality is comparable to that of the world's finest printers."'

In the Beginning...

- "Why did I *start* working on TEX in 1977? The whole thing actually began long before, in connection with my books on *The Art of Computer Programming*. I had prepared a second edition of volume 2, but when I received galley proofs they looked awful—because printing technology had changed drastically since the first edition had been published."

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- Professor Burkett agrees

Installing Packages is Easy—

If You Know What You Are Doing

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- Install ProTEXt (CLS)

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- `C:\ProTeXt`

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- Automatically installs

Writing LaTeX: LaTeX Matters

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- WYSIWYG vs. LaTeX

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Writing LaTeX: LaTeX Matters

- White space is different in LaTeX than in Word
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- LaTeX is easier!
- Let TeX do the work

My favorite economist is John Maynard Keynes. Fun fact: his friends called him Maynard.

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> *For the Classical Theory has been accustomed to rest the supposedly self-adjusting character of the economic system on an assumed fluidity of money–wages; and, when there is rigidity, to lay on this rigidity the blame of maladjustment.*

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> *For the Classical Theory has been accustomed to rest the supposedly self-adjusting character of the economic system on an assumed fluidity of money–wages; and, when there is rigidity, to lay on this rigidity the blame of maladjustment.*

And he rented a room to Virginia Woolf. And he married a Russian prima ballerina, Lydia Lopokova. That was a quote from *The General Theory*.

Maximum Likelihood Estimation of an AR1 Process

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- Log-likelihood function:

$$\max_{\beta,\rho,\sigma_u^2} \ln L = -\frac{\sum_{t=1}^{T} u_t^2}{2\sigma_u^2} + \frac{1}{2}\ln(1-\rho^2) - \frac{T}{2}\ln(2\pi\sigma_u^2)$$

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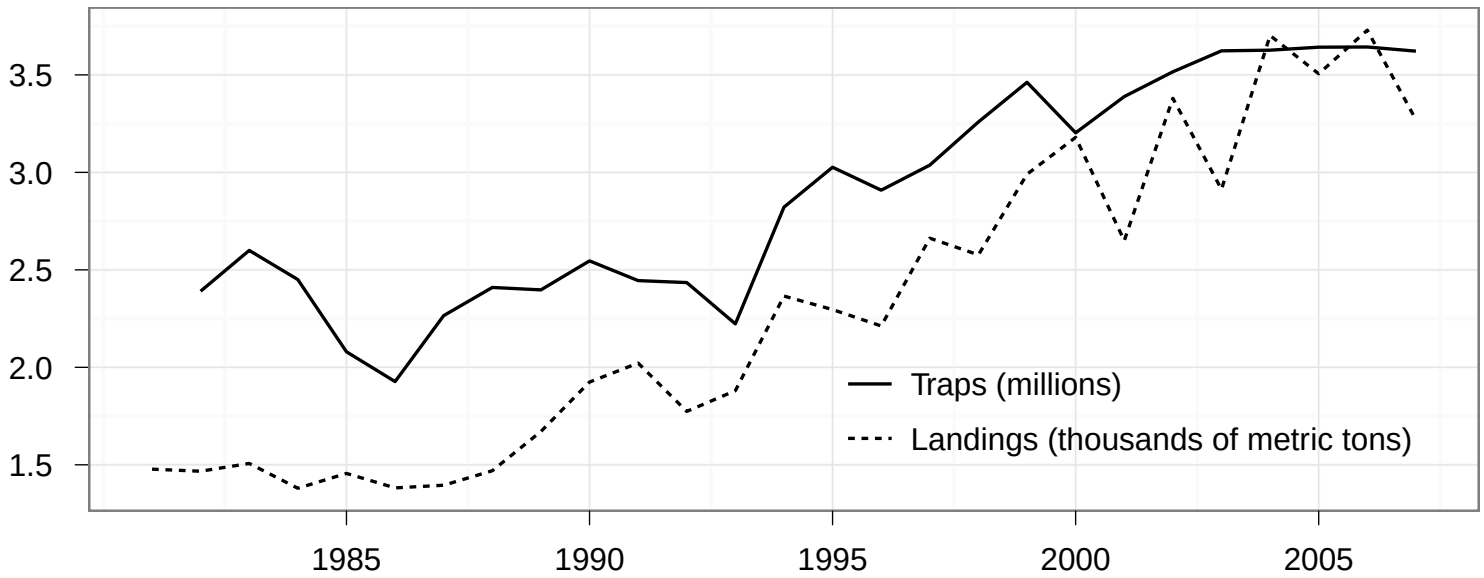
- where $\epsilon_t = \rho\epsilon_{t-1} + u_t$, $E(u_t) = 0$ and $E(u_t^2) = \sigma_u^2$

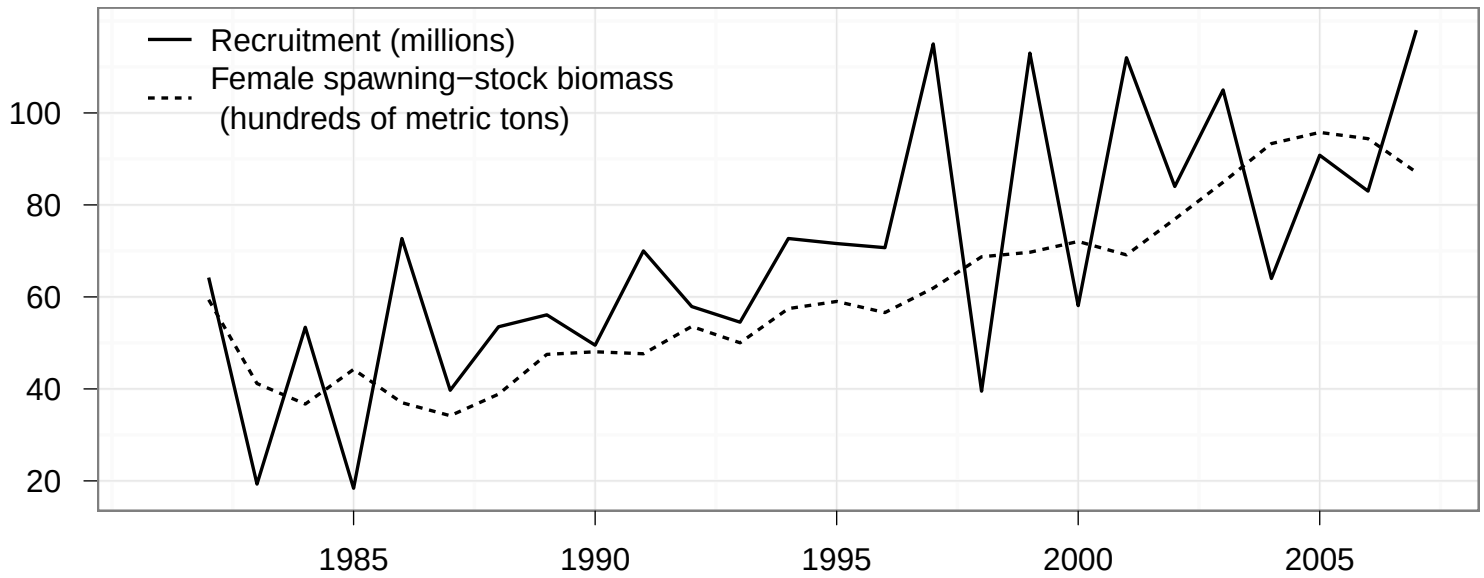
Or for You TEXnicians...

```
\begin{equation*}
\max_{\beta, \rho, \sigma_u^2} \ln L =
-\frac{\sum_{t=1}^{T} u_t^2}{2 \sigma_u^2} +
\frac{1}{2} \ln (1-\rho^2)
- \frac{T}{2} \ln (2 \pi \sigma_u^2)
\end{equation*}
```

Traps and Landings in the Gulf of Maine



Recruitment and Biomass in the Gulf of Maine



Ecosystem Externalities

$$\dot{x} = f(x, Kh) - Kh \tag{9}$$

$$\frac{\rho(Kh)}{Kh} = C_h(h, x, K) \tag{10}$$

$$\dot{K} = \xi \left[\frac{\rho(Kh)}{K} - C(h, x, K) \right]. \tag{11}$$

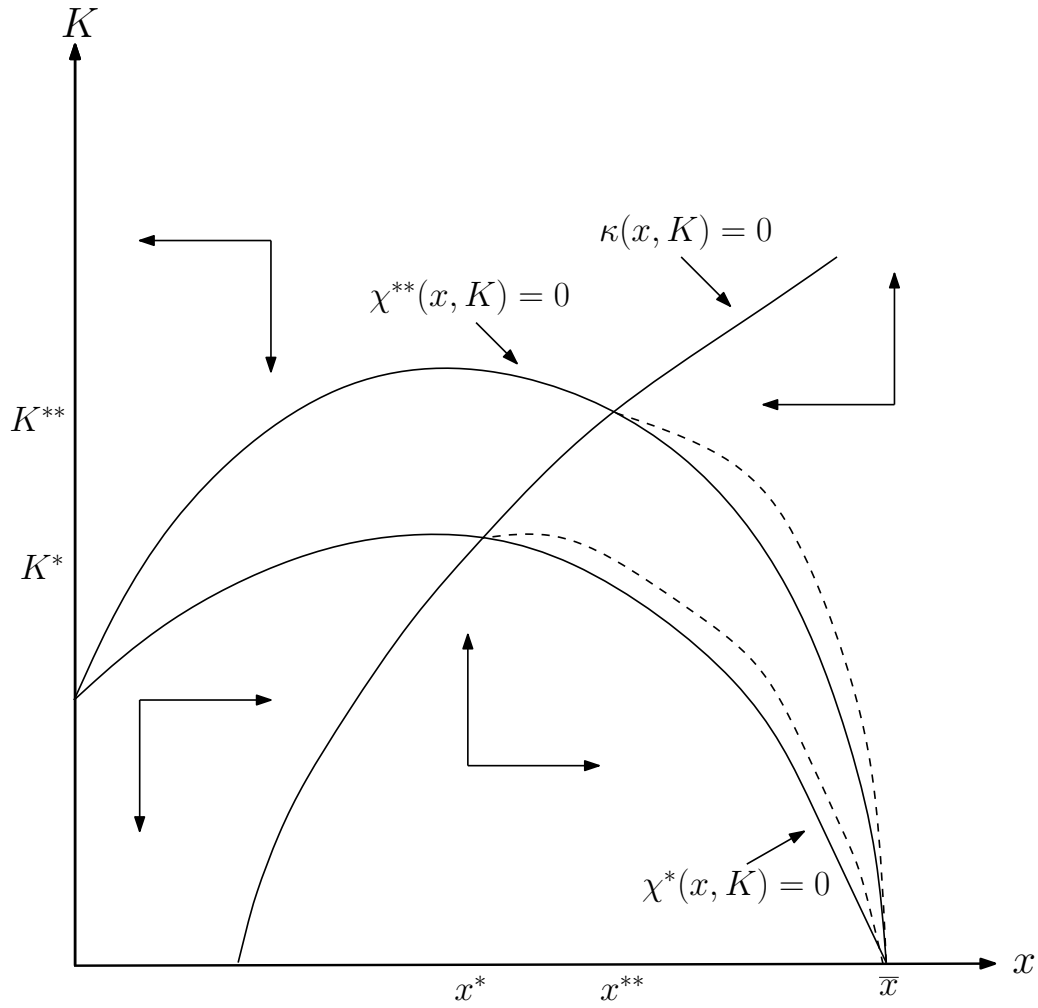
```
\begin{align}
\dot{x} &=
   f(x,Kh) - Kh \label{eq:sys1} \\
\frac{\rho(Kh)}{Kh} &=
   C_h(h,x,K) \label{eq:sol}    \\
\dot{K} &=
   \xi \left[\frac{\rho(Kh)}{K} -
   C(h,x,K) \right] \label{eq:sys2}.
\end{align}
```

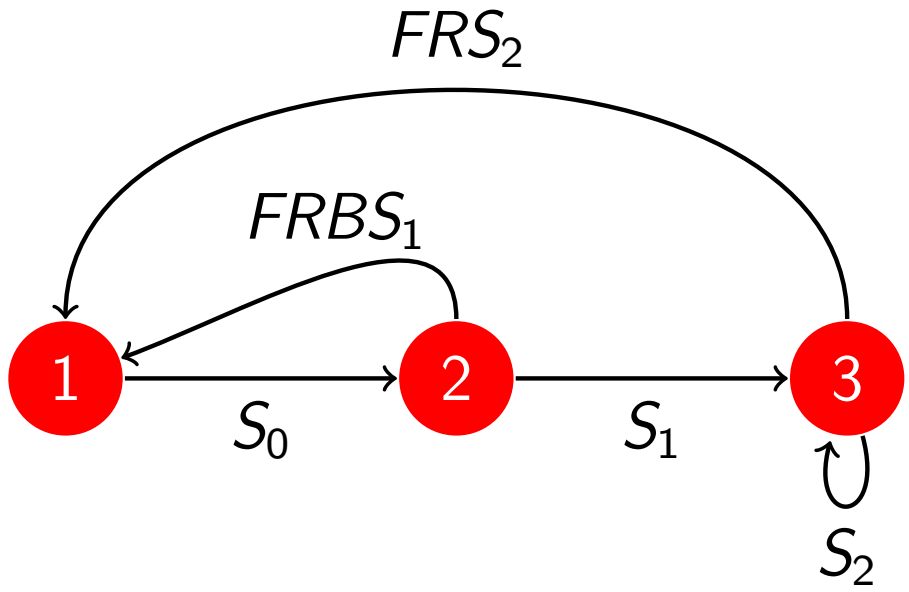
A TEXpert Trick

$$\begin{aligned}\chi(x,K) &= f(x,Kh(x,K)) - Kh\,(x,K)\\ \kappa(x,K) &= \xi\left[\frac{\rho(Kh(x,K))}{K} - C(h(x,K),x,K)\right].\end{aligned} \tag{12}$$

```
\begin{align}
\begin{split}
\chi(x,K)    &= f(x,Kh(x,K)) - Kh \left(x,K \right)\\
\kappa(x,K) &= \xi \left[ \frac{\rho(Kh(x,K))}{K}
    - C(h(x,K),x,K)\right].
\end{split}
\end{align}
```

IPE: CHECK IT OUT




FRS_2
$FRBS_1$
1
2
3
S_0
S_1
S_2

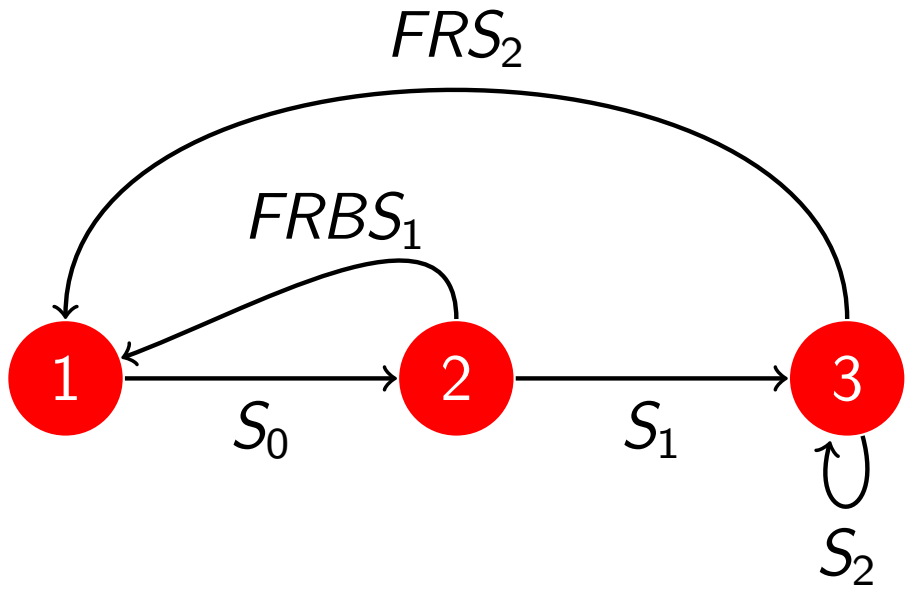
```
\begin{tikzpicture}[->,thick,node distance=2.5cm,
main node/.style={circle,fill=red,
                  text=white,
                  draw=none}]
  \node[main node] (1) {1};
  \node[main node] (2) [right of=1] {2};
  \node[main node] (3) [right of=2] {3};

  \draw[->] (1) to node [below] {$S_0$} (2);
  \draw[->] (2) to node [below] {$S_1$} (3);
  \draw[->] (3) to[loop below]
                node [below] {$S_2$} (3);
  \draw[->] (2) to[out=90,in=20]
                node [above] {$FRBS_1$} (1);
  \draw[->] (3) to[out=90,in=90]
                node [above] {$FRS_2$} (1);
\end{tikzpicture}
```

birds that are female. In terms of these parameters, the nominal population projection matrix is

$$\mathbf{A} = \begin{pmatrix} 0 & FRBS_1 & FRS_2 \\ S_0 & 0 & 0 \\ 0 & S_1 & S_2 \end{pmatrix}. \qquad (4)$$

We use parameter values estimated from the Peregrine Falcons in Colorado, USA (Table 1; Craig et. al. 2004). We need to incorporate harvesting into the population


FRS_2
$FRBS_1$
1
2
3
S_0
S_1
S_2

$$A_h = \begin{bmatrix} 0 & (1-h)FRBS_1 & (1-h)FRS_2 \\ S_0 & 0 & 0 \\ 0 & S_1 & S_2 \end{bmatrix}. \qquad (5)$$

Harvesting can affect the nesting habits of the parents and the survivorship of the remaining nestlings

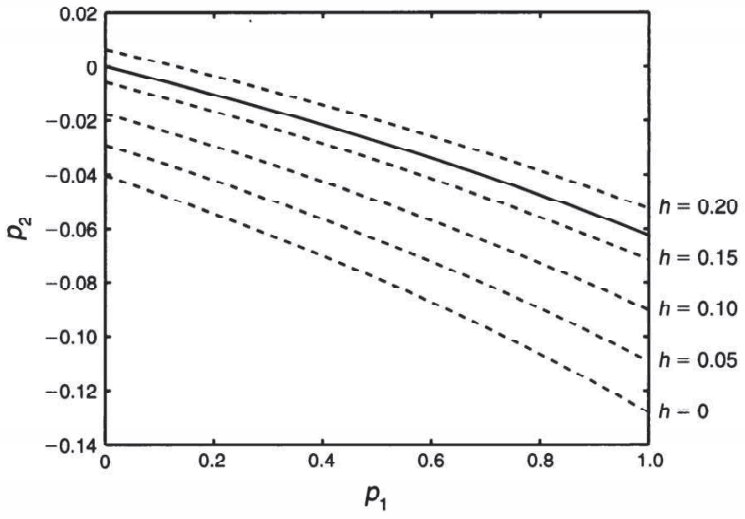


FIG. 3. The effect of the harvesting fraction h on the $\lambda(p_1, p_2) = 1$ curves. The bold line is $h = 0.1714$, the amount of harvesting that yields $\lambda(p_1, p_2) = 1$ with no uncertainty for the nominal values.

Greatest LaTeX Package Ever: Tikz

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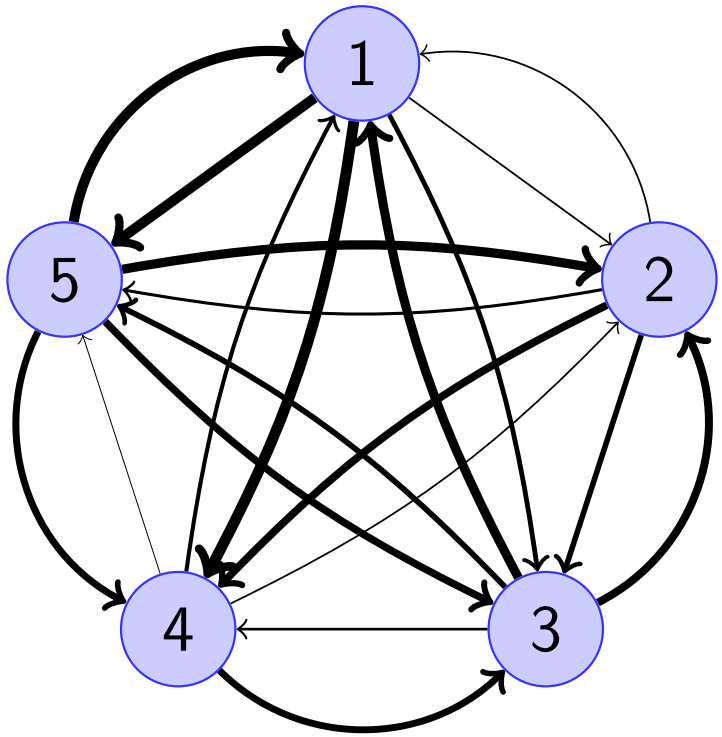


Illustrative network with $n = 5$. Line width represents link strength where link strength was draw from the unit interval.

Greatest LaTeX Package Ever: Tikz I

```
\begin{figure} \label{fig:definition}
\begin{center}
\begin{tikzpicture}[scale=1.0]
% five nodes separately equally around circle of
    radius 2
\node (node1) at (0.,2.) [circle,draw=blue!80,
   fill=blue!20] {$1$};
\node (node2) at (1.902113022,0.618033989) [
   circle,draw=blue!80,fill=blue!20]
{$2$};
\node (node3) at (1.175570505,-1.618033989) [
   circle,draw=blue!80,fill=blue!20]
{$3$};
\node (node4) at (-1.175570505,-1.618033989) [
   circle,draw=blue!80,fill=blue!20]
{$4$};
\node (node5) at (-1.902113022,0.618033989) [
   circle,draw=blue!80,fill=blue!20]
```

Greatest LaTeX Package Ever: Tikz II

```
{$5$};
% draw edges
\draw [->,line width=0.1656859*2pt] (node1) to (
    node2);
\draw [->,line width=0.4397615*2pt] (node1) to [
    bend left=10] (node3);
\draw [->,line width=0.9918130*2pt] (node1) to [
    bend left=10] (node4);
\draw [->,line width=0.9314671*2pt] (node1) to (
    node5);
\draw [->,line width=0.1625215*2pt] (node2) to [
    bend right=45] (node1);
\draw [->,line width=0.5076240*2pt] (node2) to (
    node3);
\draw [->,line width=0.7045427*2pt] (node2) to [
    bend right=10] (node4);
\draw [->,line width=0.2802187*2pt] (node2) to [
    bend left=10] (node5);
```

Greatest LaTeX Package Ever: Tikz III

```
\draw [->,line width=0.8311642*2pt] (node3) to [
    bend left=10] (node1);
\draw [->,line width=0.7233529*2pt] (node3) to [
    bend right=45] (node2);
\draw [->,line width=0.2423346*2pt] (node3) to (
    node4);
\draw [->,line width=0.5235810*2pt] (node3) to [
    bend right=10] (node5);
\draw [->,line width=0.37237589*2pt] (node4) to
    [bend left=10] (node1);
\draw [->,line width=0.16194550*2pt] (node4) to
    [bend right=10] (node2);
\draw [->,line width=0.62577038*2pt] (node4) to
    [bend right=45] (node3);
\draw [->,line width=0.07505986*2pt] (node4) to
    (node5);
\draw [->,line width=0.92767949*2pt] (node5) to
    [bend left=45] (node1);
```

Greatest LaTeX Package Ever: Tikz IV

```
\draw [->,line width=0.8416968*2pt] (node5) to [
    bend left=10] (node2);
\draw [->,line width=0.6766177*2pt] (node5) to [
    bend right=10] (node3);
\draw [->,line width=0.6366259*2pt] (node5) to [
    bend right=45] (node4);
\end{tikzpicture}
\caption{Illustrative network with $n=5$.  Line
    width represents link
  strength where link strength was draw from the
      unit interval.}
\end{center}
\end{figure}
```

Your .bib File

bibliography.bib

```
@ARTICLE{,
   AUTHOR =        {},
   TITLE =         {},
   JOURNAL =       {},
   YEAR =          {},
   volume =        {},
   number =        {},
   pages =         {},
   month =         {},
   note =          {},
   abstract =      {},
   keywords =      {},
   source =        {},
}
```

Using BibTeX

- \usepackage{natbib}
- \bibliography{H://bibliography//bibliography}
- \bibliographystyle{bostonfed}
  1. latex
  2. bibtex
  3. latex
  4. latex
- delete files
- \cite{ }

Example BibTEX Entries

```
@UNPUBLISHED{krugman/2005,
  AUTHOR = {Paul Krugman},
  TITLE  = {That Hissing Sound},
  NOTE   = {\textit{New York Times}, August 8.
            Available at~\url{http://www.nytimes.
               com
            /2005/08/08/opinion/08krugman.html}},
  year   = {2005},
}
```

Some cites (and some legerdemain)

Here we're going to cite people like [Krugman(2005)] and the GIAT [Fuhrer(2000)].

here

Some cites (and some legerdemain)

Here we're going to cite people like [Krugman(2005)] and the GIAT [Fuhrer(2000)].
(You can't use the `natbib` package in `beamer`.)

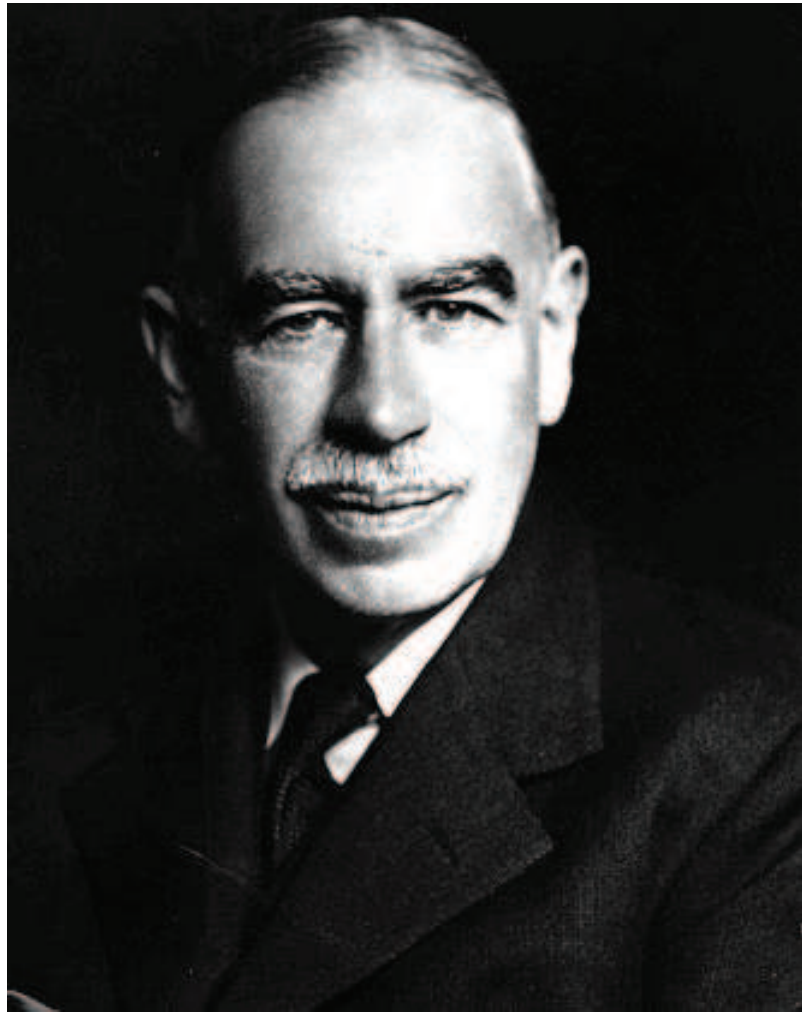
here

Citing Examples within the Text

Fuhrer (2000) vs. (Fuhrer, 2000)

```
\citet{fuhrer} vs.~\citep{fuhrer}
```

Figures in LaTeX



Maynard Keynes

(Easy)

```
\begin{figure}
% Requires \usepackage{graphicx}
\includegraphics[width=2in]{
    ../fall2011/john-maynard-keynes}
\caption{Maynard Keynes}
\end{figure}
```

The Rules Rule

The Rules Rule

- `.eps`

The Rules Rule

- `.eps`
  - `latex`

The Rules Rule

- `.eps`
  - `latex`
  - dvi $\rightarrow$ ps

The Rules Rule

- `.eps`
  - `latex`
  - dvi $\rightarrow$ ps
  - ps $\rightarrow$ pdf

The Rules Rule

- `.eps`
- `.pdf`, `.png`, `.jpeg`, `.gif`

The Rules Rule

- `.eps`

- `.pdf`, `.png`, `.jpeg`, `.gif`
  $\Rightarrow$ PDFLaTeX

Not Difficult, Though Time Consuming

A Simple Table

Simple

	OLS	MLE	AR(1)
Intercept	5.819^{***}	5.819^{***}	6.176^{***}
	(0.365)	(0.325)	(0.442)
ln(Landings)	-0.146^{***}	-0.146^{***}	-0.151^{***}
	(0.008)	(0.007)	(0.009)
ρ			0.649
# of observations	216	216	216
AIC	-4.058	-4.051	-4.058

Note: Dependent variable: log(Price). Standard errors are in parenthesis. Level of significane: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. OLS applies least squares to the linear model; MLE applies maximum likelihood estimation to the linear model; AR(1) applies maximum likelihood estimation to the first-order autoreggressive model. ρ is significant, $p < 0.01$, based on a χ^2 test with one degree of freedom ($\lambda_{LR} = -2(135.81 - 191.12) = 110.62$). AIC= $\ln(e'e/n) + 2k/n$.

Not Difficult, Though Time Consuming I

A Simple Table

```
{\tiny
\begin{table}
  \centering
  \caption{Simple}
  \begin{tabular}[htbp]{@{}lccc@{}}
\toprule[0.1em] \addlinespace
& OLS & MLE & AR(1) \\ \cmidrule{2-4}
Intercept     & $5.819^{***}$  & $5.819^{***}$ &
   $6.176^{***}$ \\
              & (0.365)        & (0.325)       &
                 (0.442) \\ \addlinespace
$\ln(\text{Landings})$ & $-0.146^{***}$ & $
   -0.146^{***}$ & $-0.151^{***}$ \\
              & (0.008)        & (0.007)       &
                 (0.009) \\ \addlinespace
$\rho$        &                & & $0.649$ \\ \
   addlinespace
```

Not Difficult, Though Time Consuming II

A Simple Table

```
\midrule
\# of observations & 216 & 216 & 216 \\
AIC & -4.058 & -4.051 & -4.058 \\ \bottomrule
    [0.1em]
\multicolumn{4}{p{4.3in}}{\emph{Note}: Dependent
    variable: log(Price). Standard
  errors are in parenthesis.  Level of
    significane: $^{*}p<0.1$, $^{**}p<0.05$,
  $^{***}p<0.01$.  OLS applies least squares to
    the linear model; MLE applies
  maximum likelihood estimation to the linear
    model; AR(1) applies maximum
  likelihood estimation to the first-order
    autoreggressive model.  $\rho$ is
  significant, $p<0.01$, based on a $\chi^2$
    test with one degree of freedom
  ($\lambda_{LR} = -2(135.81-191.12)=110.62$).
    AIC$= \ln(e'e/n)
```

Not Difficult, Though Time Consuming III

A Simple Table

```
   + 2k/n$. }
\end{tabular}
\end{table}}
```

Not Difficult, Though Time Consuming

A Simple Table

- Use `estout` or `esttab` in Stata
- You can even define your own style
- Then use the LaTeX command `\input{yourfile}` to include `yourfile`, which was created with the `estout` command

estout: "lorenz" style

- Use "lorenz" style
- Add `estout_lorenz.def` to ado path
- `tabler.pl`:

```
$ perl tabler.pl <cptkirk.tex >spock.tex
```

- `cptkirk.tex` from Stata `using` command

beamer

```
\begin{frame}
\frametitle{Paramount Phonetics}
\begin{itemize}
\item<2-> \TeX{} pronounced ``Tech''
\item<3-> \LaTeX{} pronounced
\begin{itemize}
\item<4-5> ``lay--tech''
\item<5> ``lah--tech''
\end{itemize}
\item<6> \LaTeXe{} pronounced ``\LaTeX{} two e''
\end{itemize}
\end{frame}
```

Small thing I found out yesterday...

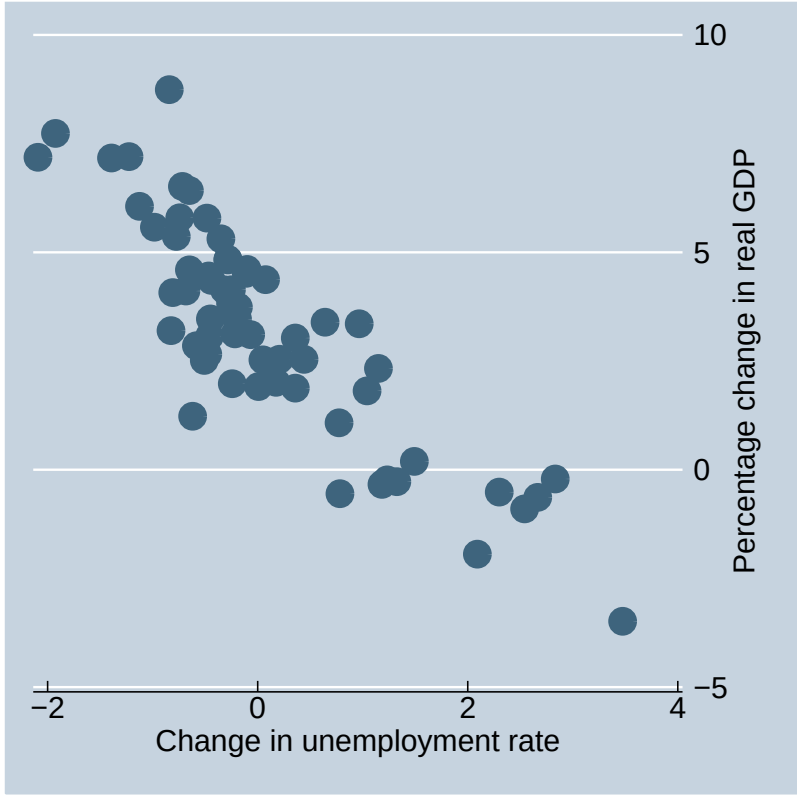
Small thing I found out yesterday...

- The `morefloats` package

Small thing I found out yesterday...

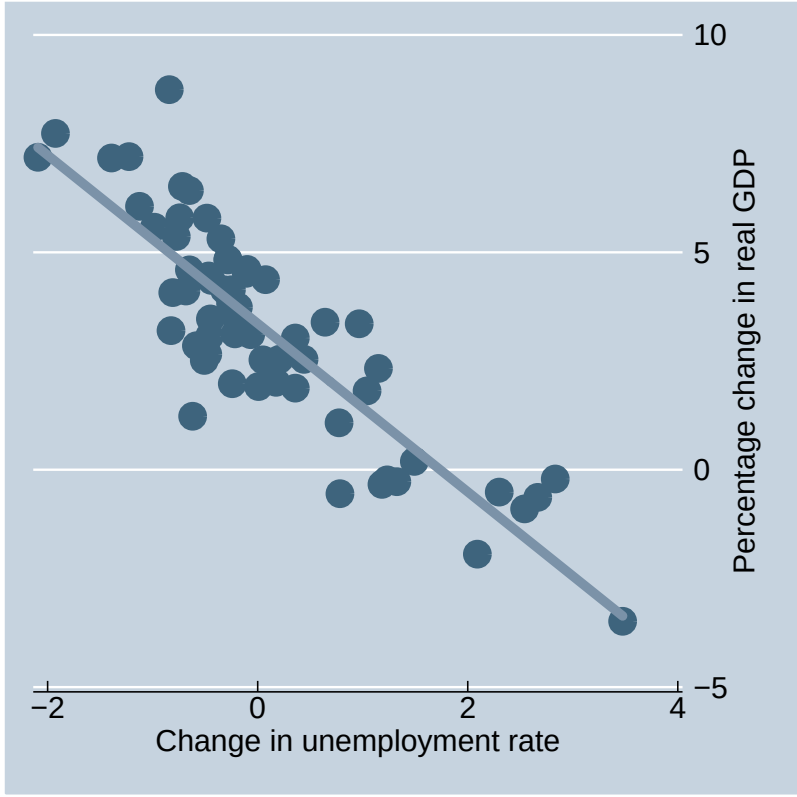
- The `morefloats` package
- The `placeins` package has a command, `\FloatBarrier`, that prevents (most of the time) floats from being placed past the barrier upon compilation.

haver use



Graphics Automation

haver use



Graphics Automation

haver use Code I

```
/*****************************************
Program: latexpresentation.do
Purpose: LaTeX Stata example

Date Started: 10 August     2010
Date Revised: 21 September 2011
*****************************************/

#delimit ;
clear;
set scheme economist;

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
    * * *
* Get the data;
haver use
         LR    /* Civilian Unemployment Rate: 16
             yr+ */
```

haver use Code II

```
          using "C:\Haver\USECON.DAT",
          tvar(temp) clear;
gen date = yofd(dofm(temp));
drop temp;
collapse (mean) LR, by(date);
save temp.dta, replace;

haver use
     GDPH /* Gross Domestic Product, SAAR, Bil.$
         */
          using "C:\Haver\USECON.DAT",
          tvar(temp) clear;
gen date = yofd(dofq(temp));
collapse (mean) GDPH, by(date);

merge 1:1 date using temp.dta;
erase temp.dta;
format date %ty;
tsset date;
```

haver use Code III

```
gen gdp = 100*(GDPH/L.GDPH - 1);
gen ur  = LR - L.LR;

* * * * * * * * * * * * * * * * * * * *  * * * *
    *
* Okun's law;
qui reg gdp ur;
estimates store okun;
esttab okun using
    "S:\LaTeXtraining\fall2011\okun_reg",
replace
r2
cells(b(star fmt(%10.2f)) se(par fmt(%10.2f)))
booktabs
alignment(D{.}{.}{-1})
title(Dependent variable:
    Percentage change in real GDP);
```

haver use Code IV

```
scatter gdp ur,
xtitle("Change in unemployment rate")
ytitle("Percentage change in real GDP");
graph export
"S:\LaTeXtraining\fall2011\okun1.eps",
replace;

tw
(scatter gdp ur)
(lfit gdp ur),
legend(off)
xtitle("Change in unemployment rate")
ytitle("Percentage change in real GDP");
graph export
"S:\LaTeXtraining\fall2011\okun2.eps",
replace;
```

Breakdown?!

(Literally What `esttab` Outputs)

Dependent variable: Percentage change in real GDP

Δ UR	-1.94^{***}
	(0.14)
Constant	3.36^{***}
	(0.16)
N	63
R^2	0.752

Personal Computing—

You Didn't Hear This From Me

Personal Computing—

You Didn't Hear This From Me

- Download MiKTEX

Personal Computing—

You Didn't Hear This From Me

- Download MiKTEX
- Download TEXnicCenter

Personal Computing—

You Didn't Hear This From Me

- Download MiKTEX
- Download TEXnicCenter
- Done!

Personal Computing—

You Didn't Hear This From Me

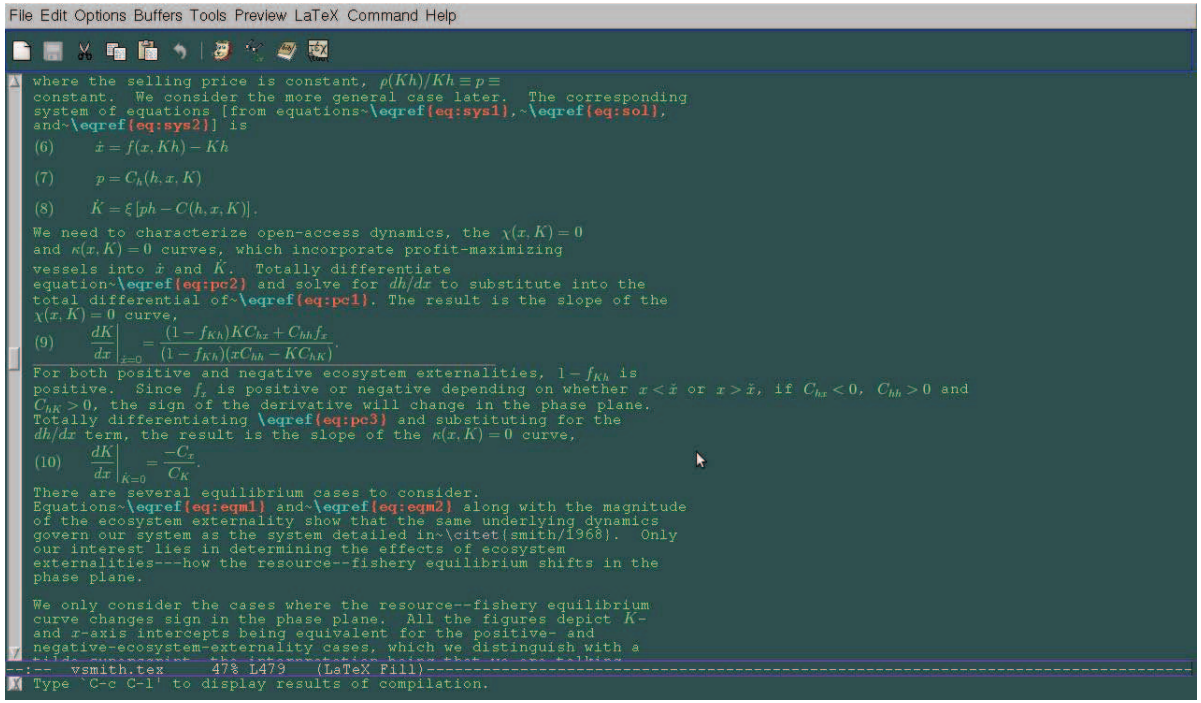
- Download MiKTEX
- Download TEXnicCenter
- Done!
- Impress your classmates

Ubuntu Linux, AUCTEX, Colortheme, Emacs

(aka Sheer Power)

Ubuntu Linux, AUCTEX, Colortheme, Emacs

(aka Sheer Power)



Personal computer.

References

Fuhrer, Jeffrey C. 2000.
"Habit Formation in Consumption and Its Implications for Monetary-Policy Models."
The American Economic Review 90(3): pp. 367–390.
ISSN 00028282.
Available at http://www.jstor.org/stable/117334.

Krugman, Paul. 2005.
"That Hissing Sound."
New York Times, August 8. Available at http://www.nytimes.com/2005/08/08/opinion/08krugman.html.

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