

The Missing “E” In “FE”

David G. Tucek
Value Economics, LLC
david.tucek@valueeconomics.com
314 434 8633

© 2019

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

1

1

**The universe would be a dreary place
if we were all the same.**

Aratak

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

2

2

Do You Agree?

There is no loss of earnings capacity during periods of unemployment because there is no demand for the individual's labor.

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

3

3

Do You Agree?

There is no loss of earnings capacity during periods of unemployment because there is no demand for the individual's labor.

Alternatively

When measuring the loss of earnings capacity, I account for the probability of being unemployed.

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

4

4

Missing E #1

Measuring the Loss of Earnings Capacity

- Horner/Slesnik (1999)
 - Earning capacity is the expected earnings of a worker who chooses to maximize the expectation of actual earnings. . . . to analyze the earning capacity of an attorney who has chosen to stay home with pre-school children rather than enter or remain in the labor market, we need not attempt to estimate the year-by-year probability of returning to the market. (p 15, emphasis added)
 - The existing worklife tables, including mean future working years and median years to final separation, are based on labor force participation status. This underlying data does not distinguish between voluntary and involuntary nonparticipation. Thus, these tables are not an ideal instrument for measuring earning capacity. (footnote 24, emphasis added)

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

5

5

Missing E #1

Measuring the Loss of Earnings Capacity

- Horner/Slesnik (1999)
 - Attorney who chooses to stay at home.
 - Footnote 24.
- Used to support a definition of “active” that includes voluntary absences. Persons who are voluntarily absent from the labor force, including homemakers and retired persons who are not disabled, are assumed to experience a loss (absent unemployment) during what would be periods of voluntary absence from the labor force if they are injured or killed.

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

6

6

Missing E #1

Measuring the Loss of Earnings Capacity

- Horner/Slesnik (1999)
- Used to support a definition of “active” that includes voluntary absences. Persons who are voluntarily absent from the labor force, including homemakers and retired persons who are not disabled, are assumed to experience a loss (absent unemployment) during what would be periods of voluntary absence from the labor force if they are injured or killed.
- Ask yourself this question, if there is no loss of earnings capacity when there is no demand for labor, why is there a loss when there is no supply – that is when the individual is not both willing and able to work? **This is the missing “E”..**

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

7

7

Missing E #1

Measuring the Loss of Earnings Capacity

- Why might there be a loss when there is no supply?
- Required by statute or case law.
 - Could be true, if the statute or case addresses the measurement of lost earnings capacity and not just the existence of earnings capacity.
 - Using WLE for initially inactive persons recognizes the existence of earnings capacity for our stay-at-home attorney and measures it correctly when there is no supply.

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

8

8

Missing E #1

Measuring the Loss of Earnings Capacity

- Why might there be a loss when there is no supply?
- Required by statute or case law.
 - Could be true, if the statute or case addresses the measurement of lost earnings capacity and not just the existence of earnings capacity.
 - Using WLE for initially inactive persons recognizes the existence of earnings capacity for our stay-at-home attorney and measures it correctly when there is no supply.
- Required by definition – earnings aren't maximized if there are voluntary absences.
 - But, people do retire or otherwise voluntarily exit the labor force. They also take lower paying jobs – e.g., a hospitalist versus a specialist.
 - The “true by definition” argument ignores observed behavior. **(Another missing “E”).**

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

9

9

Missing E #1

Measuring the Loss of Earnings Capacity

- Why might there be a loss when there is no supply?
- Required by statute or case law.
- Required by definition – earnings aren't maximized if there are voluntary absences.
- Finally, just because a case uses the phrase “earnings capacity” doesn't mean that Horner/Slesnik is accepted for measuring the loss.
 - In Missouri, *Wolfe v. Kansas City*, 334 Mo. 796 (Mo 1934) is the basis for the earnings capacity standard. It does not address measurement of the loss.
 - To conclude that the Missouri Supreme Court anticipated the Horner/Slesnik definition by 65 years just because it uses the phrase “earnings capacity” strains all credibility.

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

10

10

Show of Hands

**Do you use a bond ladder to discount
future dollars to the present?**

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

11

11

Missing E #2 Use of a Bond Ladder

- Will the plaintiff invest in the one-and done portfolio represented by the bond ladder?

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

12

12

Missing E #2

Use of a Bond Ladder

- Will the plaintiff invest in the one-and done portfolio represented by the bond ladder?
- The short answer is “No”, because actual cashflow needs may not match the projected cashflow.
 - Projected cashflows may have been probability-adjusted for risks that may not be realized as the future unfolds.
 - Even if projected income matches what would have been earned, it may not equal the plaintiff’s required cashflow due to unanticipated expenses.
 - Projected LCP expenses are often an average – a component needed 4 to 6 times a year may enter plan with an average frequency of 5, or the price may be based on the average of a high and low value. Actual expenses are likely to be different.

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

13

13

Missing E #2

Use of a Bond Ladder

- Will the plaintiff invest in the one-and done portfolio represented by the bond ladder?
- The short answer is “No”, because actual cashflow needs may not match the projected cashflow.
- A longer answer: instead of a one-and-done bond ladder, the plaintiff will likely invest in a changing portfolio of assets.

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

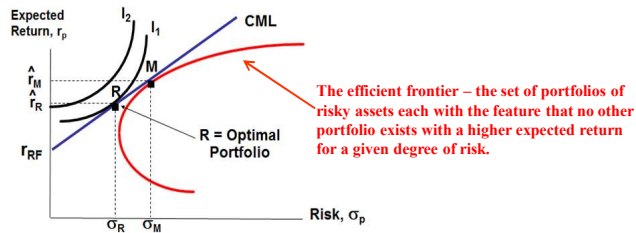
14

14

Missing E #2

Use of a Bond Ladder

- A longer answer: instead of a one-and-done bond ladder, the plaintiff will likely invest in a changing portfolio of assets.



- Investors will invest in a mix of risky and risk-free assets.
This is the missing “E”.

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

15

15

Missing E #2

Use of a Bond Ladder

- Investors will invest in a mix of risky and risk-free assets.
This is the missing “E”.
- But what about *Jones & Laughlin Steel Corp. v. Pfeifer* (103 S. Ct. 2541, or 462 U.S. 523, 1983)?

The discount rate should be based on the rate of interest that would be earned on "the best and safest investments." Once it is assumed that the injured worker would definitely have worked for a specific term of years, he is entitled to a risk-free stream of future income to replace his lost wages; therefore, the discount rate should not reflect the market's premium for investors who are willing to accept some risk of default.

- Constrains portfolio to U.S. Treasuries.

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

16

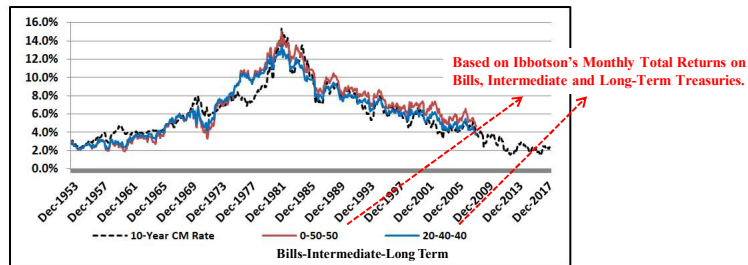
16

Missing E #2

Use of a Bond Ladder

- Investors will invest in a mix of risky and risk-free assets.
This is the missing “E”.
- Jones & Laughlin Steel Corp. v. Pfeifer* constrains portfolio to U.S. Treasuries.
- Possible resolution: use the 10-year Treasury rate.

10-Year Treasury Rate vs Subsequent 10-Year Portfolio Return



Tucek - April 25, 2019

AAEFE – Las Vegas, NV

17

17

Missing E #2

Use of a Bond Ladder

- Investors will invest in a mix of risky and risk-free assets.
This is the missing “E”.
- Jones & Laughlin Steel Corp. v. Pfeifer* constrains portfolio to U.S. Treasuries.
- Possible resolution: use the 10-year Treasury rate.

Correlation Between 10-Year Treasury Rate and the
Subsequent 10-Year Portfolio Return
(For Periods Starting in Apr-1953 through Dec-2007)

	Portfolio Mix				
	Bills	Intermediate	Long-Term	Correlation	
Bills	0.00%	5.00%	10.00%	15.00%	20.00%
Intermediate	50.00%	47.50%	45.00%	42.50%	40.00%
Long-Term	50.00%	47.50%	45.00%	42.50%	40.00%
Correlation	0.9313	0.9350	0.9379	0.9397	0.9403

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

18

18

Would You Answer as **Indicated**?

- Are you offering a legal opinion today? **No**
- Are you offering an opinion on liability? **No**
- Are you offering a medical opinion? **No**
- Are you offering your professional opinion as an economist? **Yes**

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

19

19

Missing E #3 Use of an Outside Growth Forecast

- My criticism is based on the position that
 - If you are offering your professional economic opinion,
and
 - If you rely on an outside forecast,

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

20

20

Missing E #3

Use of an Outside Growth Forecast

- My criticism is based on the position that
 - If you are offering your professional economic opinion,
and
 - If you rely on an outside forecast,
- Then you should have an analytical basis for relying on that forecast.

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

21

21

Missing E #3

Use of an Outside Growth Forecast

- My criticism is based on the position that
 - If you are offering your professional economic opinion,
and
 - If you rely on an outside forecast,
- Then you should have an analytical basis for relying on that forecast.

Something more than

“The CBO is unbiased.” or

**“The model is big and complex, and
is used by lots of firms.”**

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

22

22

Missing E #3

Use of an Outside Growth Forecast

- My criticism is based on the position that
 - If you are offering your professional economic opinion,
and
 - If you rely on an outside forecast,
- Then you should have an analytical basis for relying on that forecast.
 - Something more than**
“The CBO is unbiased.” or
“The model is big and complex, and
is used by lots of firms.”
 - The missing “E” is the
failure to apply one’s
training as an economist
to support the use of the
outside forecast.**

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

23

23

Missing E #3

Use of an Outside Growth Forecast

- Then you should have an analytical basis for relying on that forecast.
- An initial step would be to compare history with the forecast.
- For example, compare the forecasted relationship between wage growth and slack in the economy (the “Wage Phillips Curve”) with the historical relationship.

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

24

24

List of Variables

(All Data are Quarterly)

- For example, compare the forecasted relationship between wage growth and slack in the economy (the “Wage Phillips Curve”) with the historical relationship.
- Wage growth measured by growth from 1 year ago in the private industry wage & salary ECI (**ECIYA**)
- Economic slack measured by the unemployment rate (**UNR**) and by the percent of the civilian population \geq age 16 that is not employed (**NEP**).

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

25

25

List of Variables

(All Data are Quarterly)

- Wage growth measured by growth from 1 year ago in the private industry wage & salary ECI (**ECIYA**).
- Economic slack measured by the unemployment rate (**UNR**) and by the percent of the civilian population \geq age 16 that is not employed (**NEP**).
- Compared April 2018 forecasts prepared by the CBO and by Moody’s Analytics (MA).

Historical data stop in 2017Q4 and do not reflect any subsequent revisions – it is the history MA and the CBO had available at the time of their forecast.

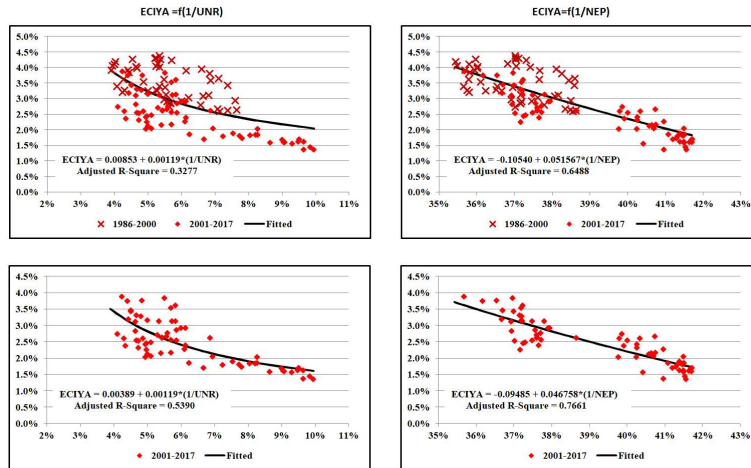
Tucek - April 25, 2019

AAEFE – Las Vegas, NV

26

26

Let's Look at the Data



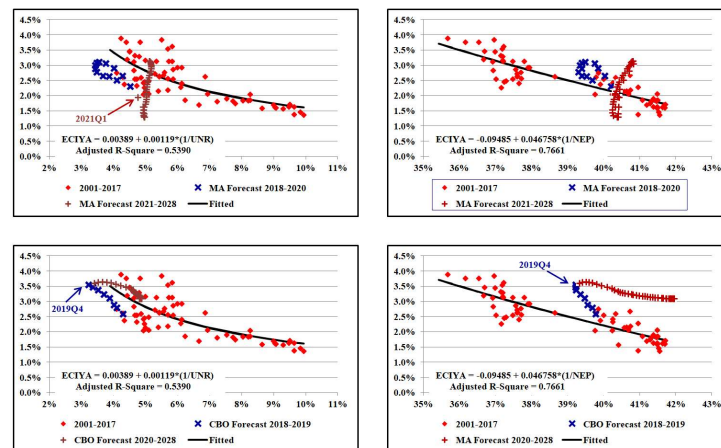
Tucek - April 25, 2019

AAEFE - Las Vegas, NV

27

27

Let's Look at the MA and CBO Forecasts Compared to Our Two Slack Measures



Tucek - April 25, 2019

AAEFE - Las Vegas, NV

28

28

Initial Takeaways from this Comparison

- For 2018-2020, the MA forecast seems low (below fitted line) for UNR slack measure, and high for NEP slack measure.
- From 2021 on, there is variation in wage growth, but no corresponding variation in either slack measure.
- For 2018-2019, the CBO forecast seems to be migrating to a new, higher wage Phillips curve.
- From 2020 on, the shift in the wage Phillips curve is more pronounced for the NEP measure.

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

29

29

Missing E #3

Use of an Outside Growth Forecast

- This simple analysis is both time consuming and inconclusive.
- I conclude that it is not possible to render a professional opinion as an economist on the suitability of an outside forecast without a lot more work.
 - What are the forecast's underlying assumptions?
 - What is the overall specification of the underlying model, assuming there is one?
 - For the variables of interest, what is the specification of the underlying equations, assuming they exist?

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

30

30

Missing E #3

Use of an Outside Growth Forecast

- I conclude that it is not possible . . .without a lot more work.
 - What are the forecast's underlying assumptions?
 - What is the overall specification of the underlying model?
 - For the variables of interest, what is the specification of the underlying equations, assuming they exist?
 - There are a lot of moving parts: Monetary and fiscal policy; developments in the global economy; changes in regulation; the level of uncertainty of households and firms; unknown shocks.
 - Time passes and events occur that are not reflected in the forecast but are reflected in current interest rates.
 - Plus, you are faced with the "Pretty Woman" problem. ("What's your name, honey?" "What do you want it to be?"
- What's an FE to do?

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

31

31

Do you agree?

- Once we have a starting point (a base level of earnings or a LCP) and
- Once we have decided how to account for risk,
- The present value of the loss is determined by the growth rate, g , used to project future dollars into the future and by the interest rate, i , used to discount future dollars to the present.

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

32

32

Do you agree?

- Once we have a starting point (a base level of earnings or a LCP) and
- Once we have decided how to account for risk,
- The present value of the loss is determined by the growth rate, g , used to project future dollars into the future and by the interest rate, i , used to discount future dollars to the present.

Cannot deny the math: the values of i and g do not matter – it is their geometric difference that determines the present value.

What's an FE to do?

- If you are offering a professional opinion, then it is my opinion you cannot rely on a forecast.
- It takes work to reach and maintain an informed opinion on any forecast.
- **You must use an NDR approach.**

What is an FE to do?

- You must use an NDR approach, **but . . .**
. . . the FE is not off the hook:
- Consistency between i and g equates to stationarity.
- Addressing the stationarity question involves more than running a single statistical test and calling it quits.

What is an FE to do?

- You must use an NDR approach, **but . . .**
. . . the FE is not off the hook:
- Consistency between i and g equates to stationarity.
- Addressing the stationarity question involves more than running a single statistical test and calling it quits.
- What Dave does:

What is an FE to do?

- You must use an NDR approach, **but . . .**
- **. . . the FE is not off the hook:**
- Consistency between i and g equates to stationarity.
- Addressing the stationarity question involves more than running a single statistical test and calling it quits.
- What Dave does:

March 2020, +/- 3months?

What is an FE to do?

- You must use an NDR approach, **but . . .**
- **. . . the FE is not off the hook:**
- Consistency between i and g equates to stationarity.
- Addressing the stationarity question involves more than running a single statistical test and calling it quits.
- What Dave does:

March 2020, +/- 3months?

**I was born at night, but
it wasn't last night.**

What is an FE to do?

- You must use an NDR approach, **but . . .**
- . . . the FE is not off the hook:**
- Consistency between i and g equates to stationarity.
- Addressing the stationarity question involves more than running a single statistical test and calling it quits.
- What Dave does:
 - Look at the correlogram for the NDR.
 - Look at $(1 - |\hat{\rho}|) \div SE_{\hat{\rho}}$ where $\hat{\rho}$ is the estimate of ρ in $Y_t = a + \rho \cdot Y_{t-1}$
 - Perform four stationarity tests.
 - Estimate an AR(1) model and use it to project the NDR into the future.

Both adjusted to correct bias in OLS estimate.

Tucek - April 25, 2019

AAEFE – Las Vegas, NV

39

39

Sample Results

CPI	Sample Period	Correlogram Dies Out After	H ₀ : NDR has a unit root			KPSS H ₀ : NDR is stationary	(1 - $\hat{\rho}$) + SE $\hat{\rho}$ Based on OLS Autoregressive		
			P-Value Based on ADF Test	P-Value Based on PP Test (Bartlett Kernel)	P-Value Based on PP Test (AR OLS)		Coefficient Corrected For Bias	(1 - $\hat{\rho}$) + SE $\hat{\rho}$ Based on AR(1) Model	Long-Run NDR
Physicians' Services	2001M01-2019M03	7 lags	0.02000	0.02038	0.01675	p>0.10	1.94	2.79	1.22%
Other Medical Professionals	2001M01-2019M03	6 lags	0.00285	0.00313	0.00129	p>0.10	2.78	3.12	1.50%
Outpatient Hospital Services	2001M01-2019M03	8 lags	0.05272	0.03480	0.05272	p>0.10	2.22	2.75	-1.90%
Medical Equipment & Supplies	2010M12-2019M03	4 lags (plus 12 & 16)	0.01636	0.00715	0.00000	0.05<p<0.10	3.12	3.93	2.24%
Prescription Drugs	2001M01-2019M03	9 lags	0.03780	0.06940	0.02665	0.05<p<0.10	1.64	2.50	0.53%
Nonprescription Drugs	2010M12-2019M03	5 lags	0.08855	0.09545	0.08855	p>0.10	1.92	2.43	3.00%
Domestic Services	2001M01-2019M03	6 lags	0.00891	0.01468	0.00377	0.01<p<0.05	2.48	3.02	1.10%

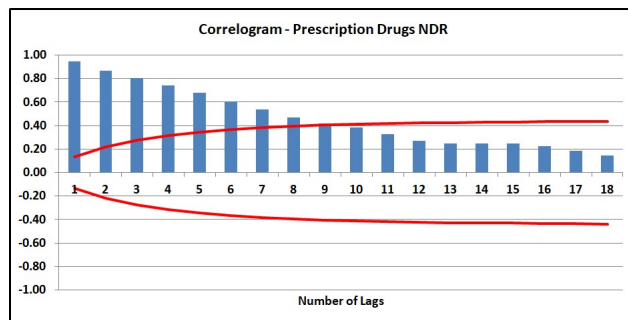
Tucek - April 25, 2019

AAEFE – Las Vegas, NV

40

40

Sample Results



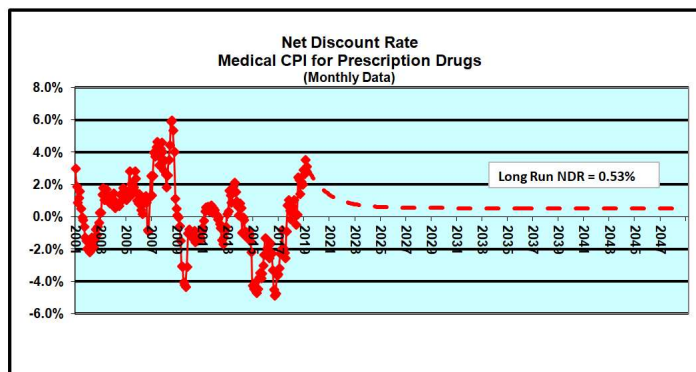
Tucek - April 25, 2019

AAEFE – Las Vegas, NV

41

41

Sample Results



Tucek - April 25, 2019

AAEFE – Las Vegas, NV

42

42