NRC CTE
National Research Center for Career and Technical Education

Return on Investment Career & Technical Education

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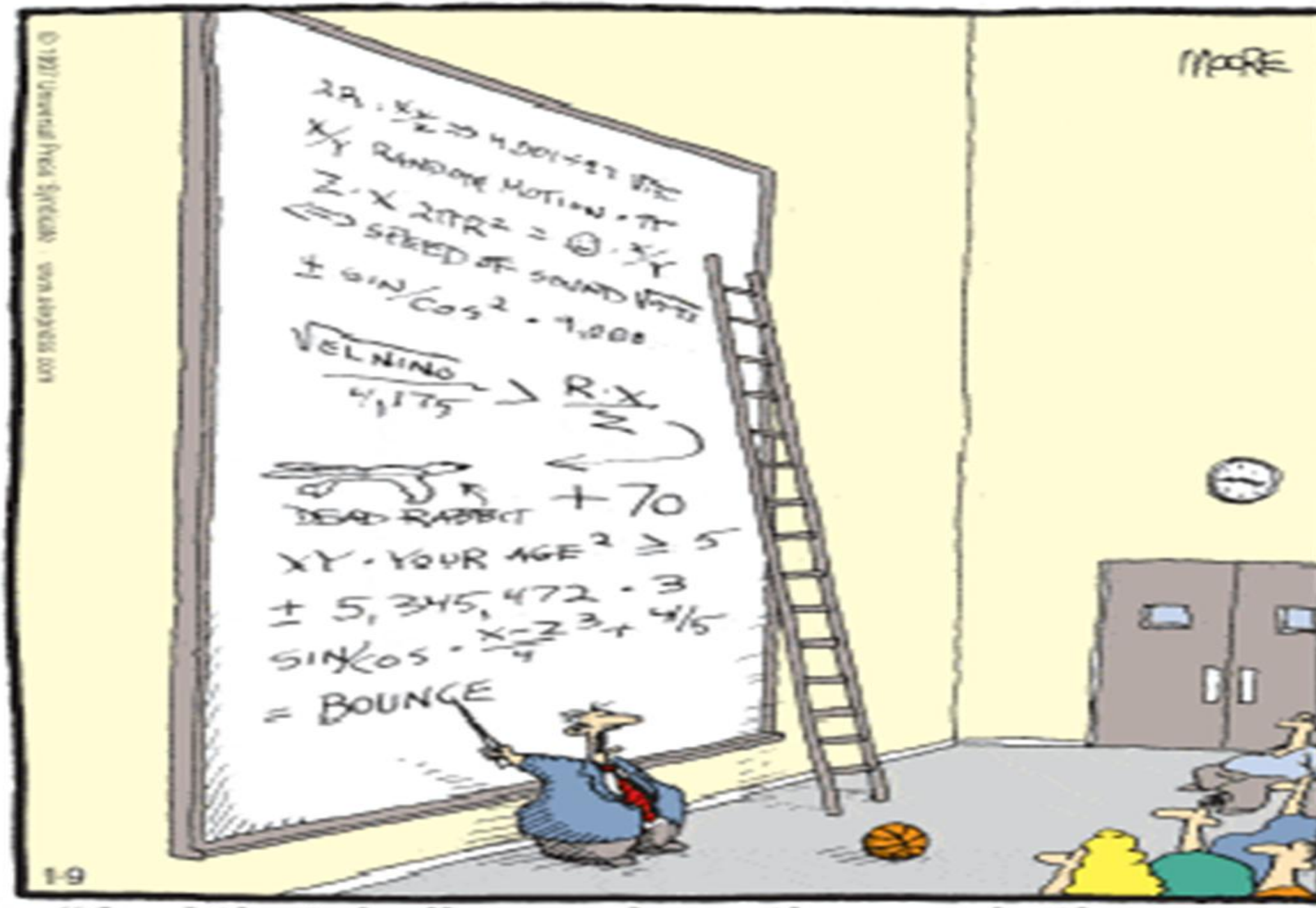
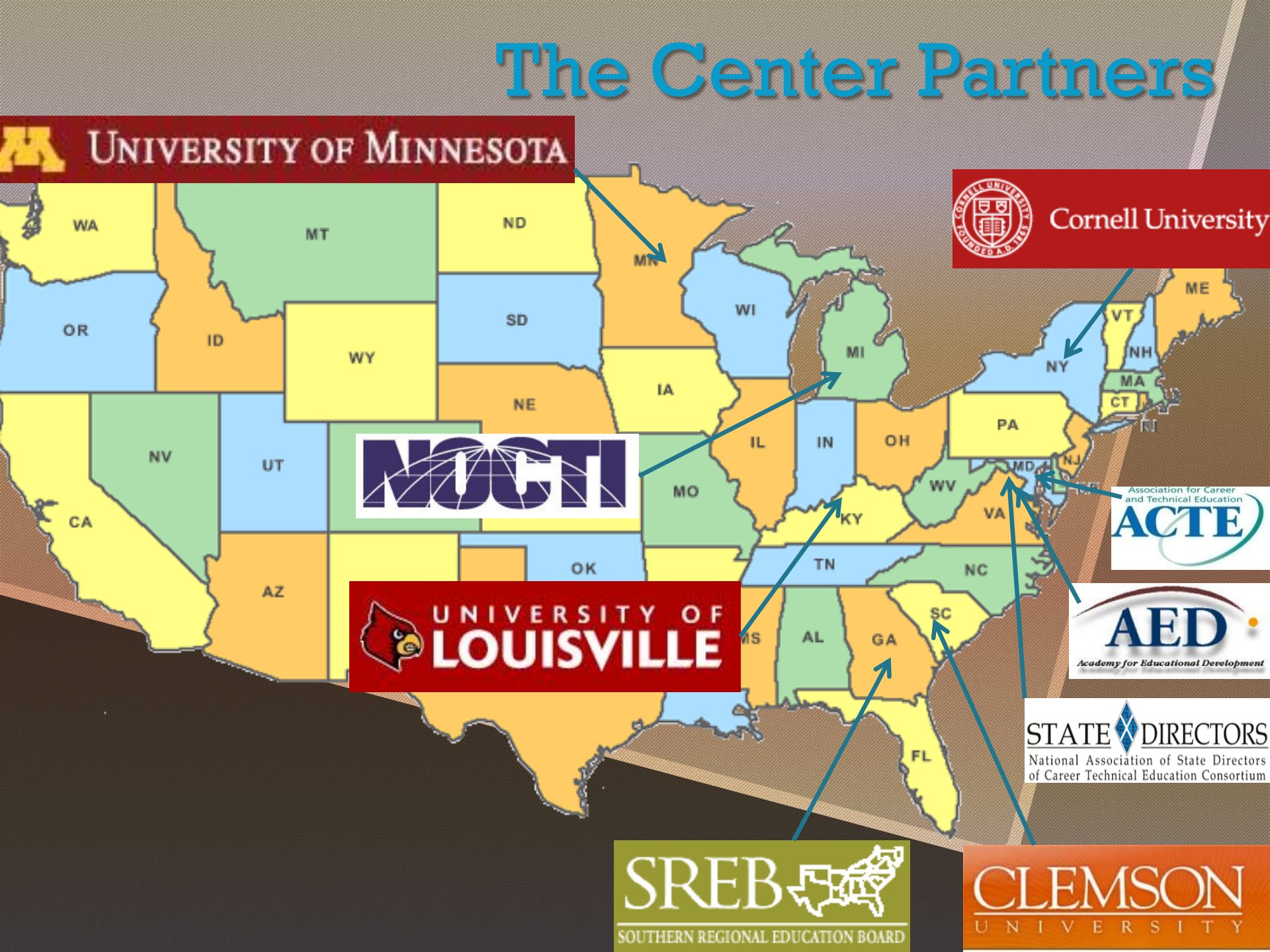
& James Stone



"And that, ladies and gentlemen, is the way the ball bounces."

The Center Partners



CTE Accountability and Evaluation Portfolio

- *A Tool Kit for Measuring CTE Effectiveness Using Return on Investment and Other Related Techniques*
- *Technical Skills Inventory Project*
- *Crosswalks and Common Data Standards Project*
- *Using the National Center for Education Statistics (NCES) longitudinal and survey data sets, to examine more closely the engagement, achievement, and transition of secondary and postsecondary CTE students.*

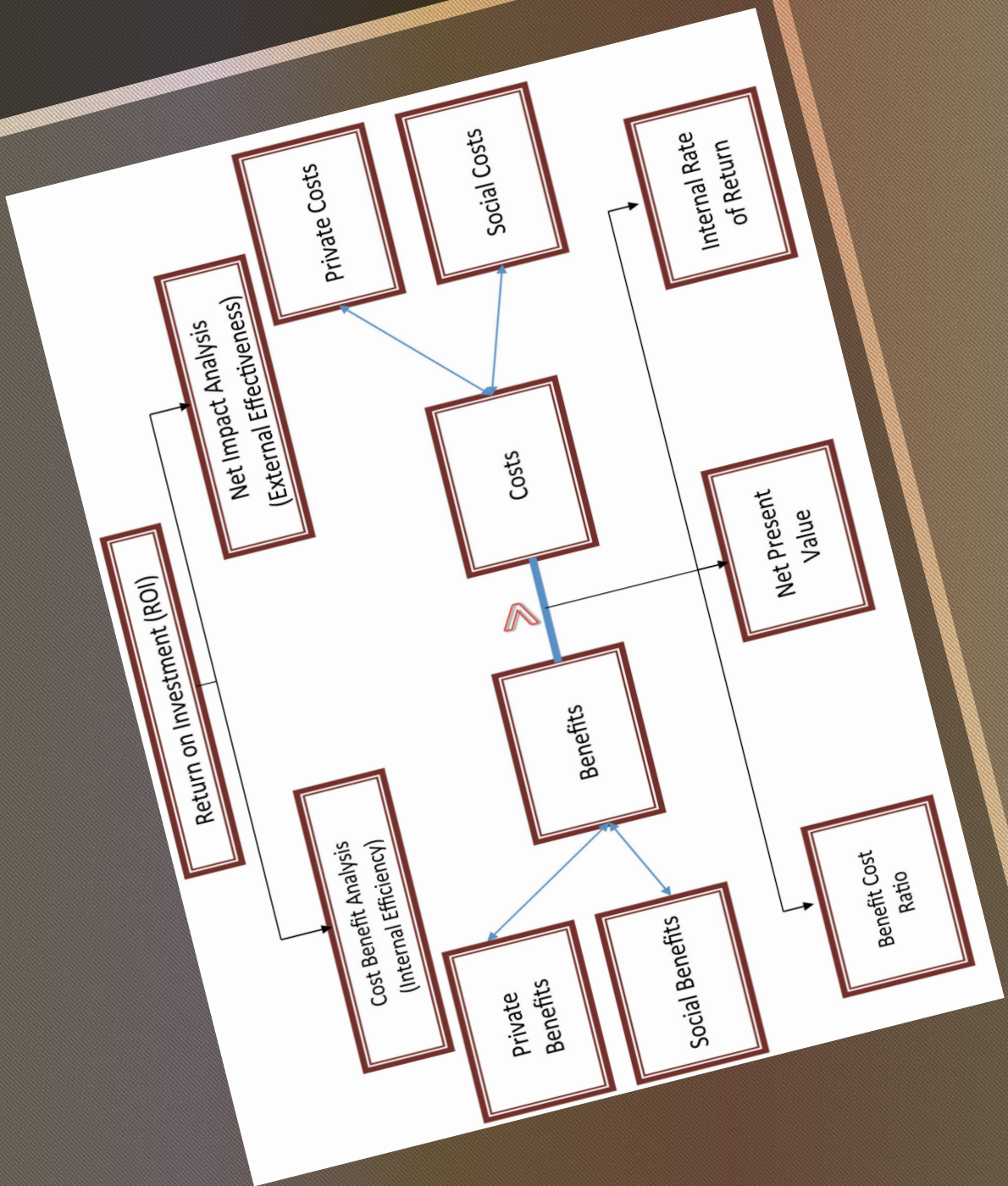
Why ROI for CTE

- An overarching Concern: Is the federal (and state and local) investment in CTE is paying off?

- To answer this, we need to establish:
  - ✓ the *internal efficiency* of CTE by comparing the costs and benefits of implementing CTE using Perkins funds at the local or state levels.

  - ✓ Determine whether CTE has a measurable impact beyond itself. This question focuses on *external effectiveness*.

Connecting Terminology



Boiling It Down to A Number

Reflected as a number:

- **the *benefit cost ratio* (B/C; a number greater than one implies that the program is justified on both internal efficiency and external effectiveness grounds);**
- **the *net present value* (NPV; a number greater than zero implies that building the program today is justified instead of waiting for the future);**
- **and the *internal rate of return* (IRR; when the rate of return obtained from program implementation exceeds the market interest rate; this is the measure used to determine returns from financial investing)**

5 Factors to be Calculated

I. Opportunity Cost
II. Time Horizon before benefits accrue
III. The Discount Rate (future costs/benefits to present $)
IV. Monetizing Non-monetary Benefits and Costs
V. Positive and Negative Externalities of CTE

5 Steps Necessary for CTE ROI

1. Needs Assessment
2. Feasibility Study
3. Process Evaluation
4. Outcome Evaluation
5. Goal Analysis

A. ID Program Gaps?

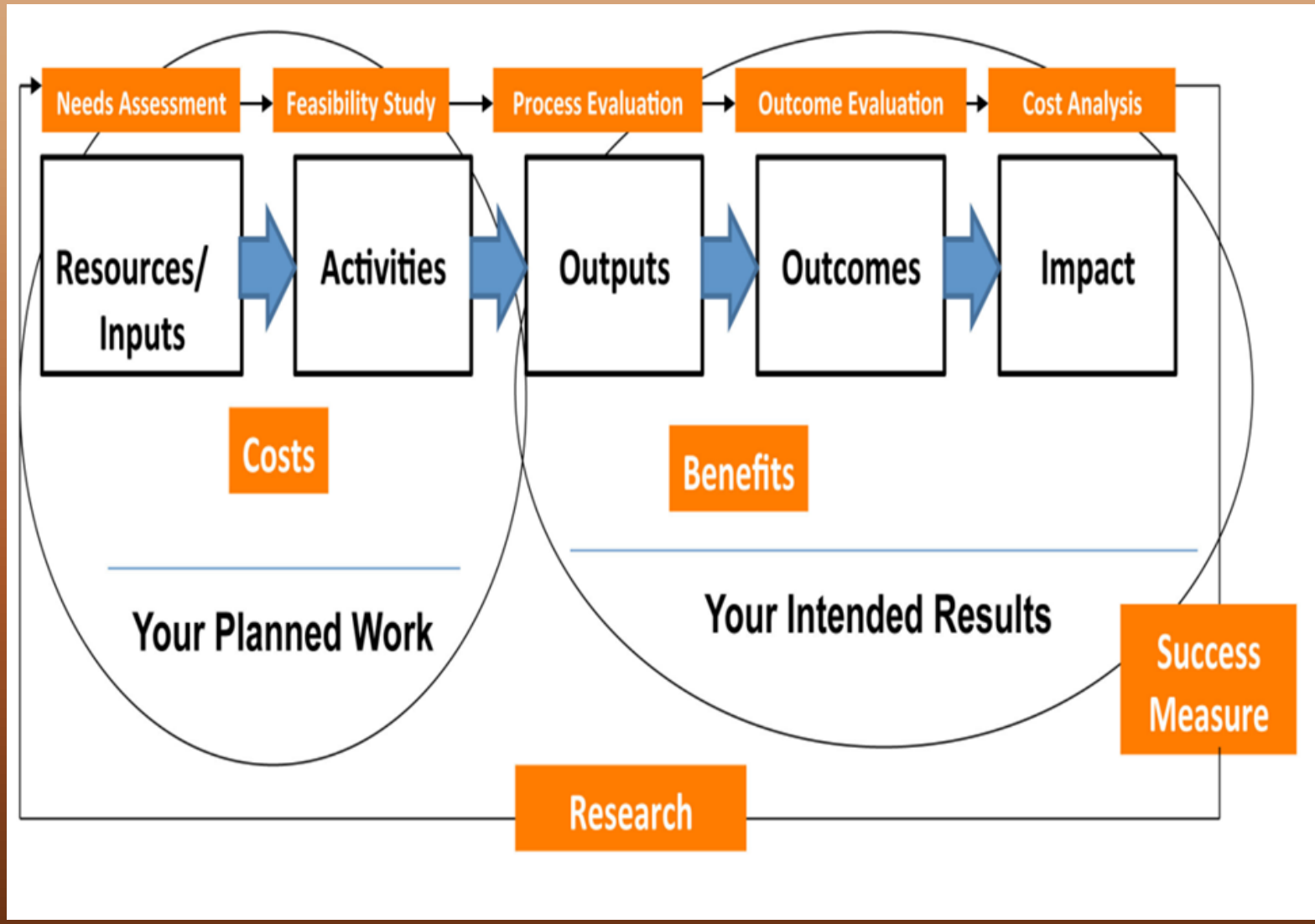
B. Can program succeed with given constraints?

C. How is Implementation progressing?

D. Were Program Goals Achieved?

E. Was Program Financially worthwhile?

An ROI Logic Model



3 Approaches to ROI

1. Social Benefits
2. Case Study
3. Common Framework

Social Benefit - AEE

The Economic Benefits from Halving the Dropout Rate

A BOOM TO BUSINESSES IN THE NATION'S LARGEST METRO

"The best economic stimulus pack

GOVERNOR BOB

This single class of new graduates would likely earn as much as **$4.1 billion** in combined earnings in the average year compared to their likely earnings without a diploma.

$4.
IN IN
EARN

This single
as much as
average year
a diploma.

INCREASED
HOME SALES
OF $10.5 BILL
AND AUTO SAL
OF $340 MILLIO

By the midpoint of their
would likely purchase ho
much as **$10.5 billion** mo
would have spent without a
would likely spend up to an
vehicle purchases each year.

$536 MILLION IN INCREASED TAX REVENUE

As a result of increased wages and hi
spending, state and local tax revenue within these
regions would likely grow by a total of up to **$536**
million during the average year.

After earning a high school diploma, **65**
these new graduates

These areas are home to 4,900
high schools. Over 900 of these are
considered dropout factories,
schools where

Case Study

JFF – ROI In Early College High Schools (2006)

- 4 States, 7 schools
- $1.33 to $2.57 ROI over 15 years
- 4 Outcomes
  - Dropouts
  - Persistence
  - Graduation rates
  - College credits/degrees

ROI on Adult Education

McGraw-Hill Research Foundation
Policy Paper: ROI of Adult Education

McGraw-Hill Research Foundation

THE RETURN ON INVESTMENT (ROI) FROM ADULT EDUCATION AND TRAINING

Measuring the Economic Impact of A Better Educated and Trained U.S. Workforce

By

Dr. Lennox McLendon, Executive Director,
National Council of State Directors of Adult Education
National Adult Education Professional Development Consortium

and

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California Director of Adult Education
Chair, NAEPDC Research Workgroup

and

Mitch Rosin, MA, MS, MS, Editorial Director,
McGraw-Hill School Education Group

Common Framework Approach to ROI

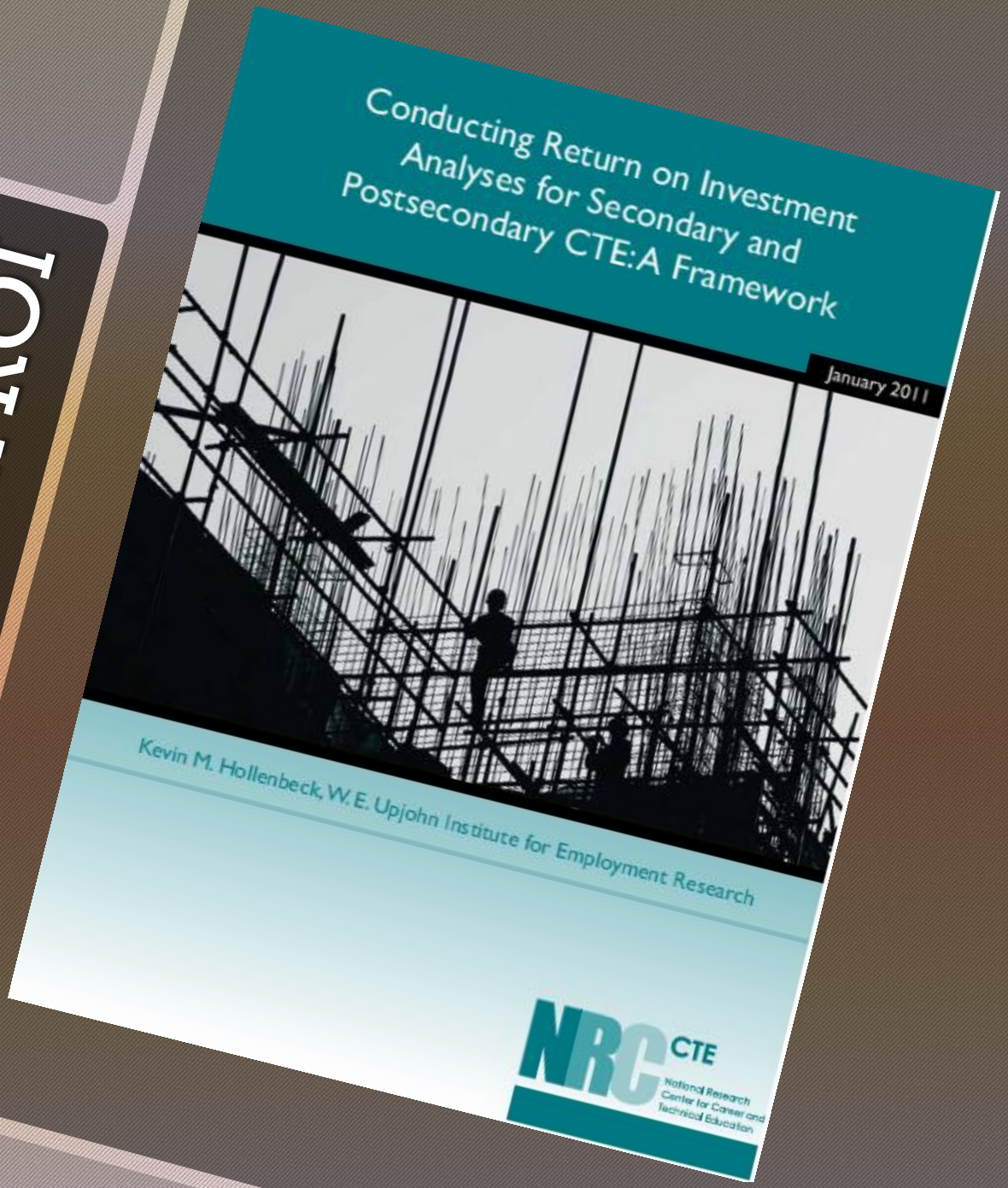
Four Preconditions

- Integrated Conceptual Framework
- Institutional Capacity/ Expertise
- **Highly Connected Data Systems**
- Sound Data Administration/ Management

Why will this be difficult?

- Standardization of inputs, process measures, outputs, and outcomes has been limited in scope
- No common data system
- Treating accountability and evaluation synonymously
- Weak connectivity between data and measurement; accountability and evaluation; and, research
- Institutional research capability limited
- Absence of a set protocols

Recent Center Publication on ROI



But wait, there are more… Challenges

- The treatment (CTE) defined to capture a sizable group of program participants (not too general).
- Data must be available for a group who are reasonable source of cases for a comparison group.
- Outcome data must be available for both the treatment and comparison groups.
- The time periods of observation and treatment for program participants and the comparison group must be reasonably close to each other.

Hollenbeck, 2011

Common Framework Approach to ROI

This technique requires, at a minimum, the explicit linking of education and workforce databases to measure the impact of a particular investment on both direct and indirect beneficiaries.

In Case You Were Wondering . . .

$$E[Y_i(1) - Y_i(0) \mid X, W_i = 1] =$$
$$E(\Delta Y \mid X, W = 1)$$
$$= E[Y(1) \mid X, W = 1] -$$
$$E[Y(0) \mid X, W = 0]$$
$$+ E[Y(0) \mid X, W = 0] -$$
$$E[Y(0) \mid X, W = 1]$$
$$= (X) - (X) + BIAS$$

where (X), $k = 1, 0$, are the outcome means for the treatment and comparison group samples, respectively, and BIAS represents the expected difference in the $Y(0)$ outcome between the comparison group (actually observed) and the treatment group (the counterfactual.)

A Common Protocol for CTE ROI

A common protocol for ROI for CTE has to address the following nine components:

1. Perspective on goals
2. cost analysis;
3. comparators;
4. program effects;
5. outcome measures;
6. distributional consequences;
7. time effect analysis;
8. sensitivity analysis;
9. decision rule.

Hummel-Rossi & Ashdown (2002)

An Implementation Strategy for CTE ROI

- Begin with the case study technique, testing each separately. Begin with Program Level Analyses.
- Build to social benefits analysis combining results from case studies
- Finally, both the case study and the social benefit approaches give rise to data and information that can be linked to one another placed into a single comprehensive data system.

Then apply the common framework approach to ROI

Go and have fun in the meadows...


YEAH, FINE. BUT ONE DAY, YOU'LL MAKE A MISTAKE - and I'M GONNA Be THERE!
$\bar{x}_1 = \frac{138}{10} = 13.8$ $\bar{x}_2 = \frac{90}{10} = 9.0$
$s^2_1 \frac{10(2608) - (138)^2}{} = 78.18$
$s^2_p = \frac{(10-1)(78.18) + 10-1)\ 25.11}{(10-1) = (10-1)} =$
$s_{\bar{x}_1 - \bar{x}_2} = \sqrt{\frac{51.65}{10} + \frac{51.65}{10}} = 3.21$
$= \frac{(13.8 - 9.0) - 0}{3.21} = 1.50$
11/30
AT the STATISTICS SMACKDOWN = ROAD HOUSE
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