We ended before with the idea that the selection of cost drivers and cost allocation methods changes behavior, often in unintended ways. This discussion expands the notion of behavioral consequences for something that you would think would be a fairly straightforward accounting decision. In order to discuss these consequences, we need to take a look at causality.

What is causality?

Webster’s defines causality as “the interrelation of cause and effect.” Burried in that definition is the assumption that every effect has a cause AND that you will be able to identify it. To quote Shakespeare, “therein lies the rub”. How do you go about identifying the right cause? What if there is more than one cause? How would you know you were correct? The Freakonomics reading is an entertaining discussion of the difficulty in proving causality.

The assumption of linkages between cause and effect are a basic part of everyday living. It is how we control or attempt to explain what happens to us. For example, I am planning to drive across town for a meeting. I need to reach the meeting location by 8 AM. I have two main choices of driving routes, a faster more direct route via the freeway or a longer route through side
streets. It will be rush hour and the freeway is currently undergoing heavy construction. I decide to use the side streets. I have assumed that the combination of rush hour traffic and road construction (i.e., the causes) will make the freeway route take longer, not to mention more dangerous (i.e., the effects).

[Slide Content]:

*Cause and Effect*

*Picture of NYPD vehicle*

- Murders – 2,000 per year in 1980’s
- 471 murders is 2009
- Stop-and-frisk
- 685,724 actions is 2011 with 780 guns collected

[Jeanne H. Yamamura]:

Another example is an updated version of one of the stories from Freakonomics. The NY police department reported that the number of murders had dropped from about 2,000 per year in the 1980s to 471 in 2009. The reason cited was the implementation of stop-and-frisk, where police stop and check “suspicious” individuals for weapons. 685,724 stop-and-frisk actions were taken in 2011 with 780 guns confiscated. It certainly sounds good even though the proof of a direct relationship between stop-and-frisk and murders isn’t necessarily present. The point here is that causal assumptions are made (and publicized) all the time.

[Slide Content]:

*Proof of Causality*

*John Stuart Mills*

- Three criteria for causality to be inferred:
  1. Cause must precede effect (temporal precedence)
  2. Cause must be related to effect (covariation)
  3. No plausible alternative explanation (constant conjunction)

[Jeanne H. Yamamura]:

To prove causality, we turn to John Stuart Mills, a 19th century philosopher. Mills identified three criteria that have to be present for causality to be inferred: Number one: The cause must precede the effect, this is known as temporal precedence. Number two: The cause must be related to the effect, in other words, there must be a covariation between the presumed cause and effect. And number three: There is no plausible alternative explanation for the effect other than
the cause, and this is known as constant conjunction. Although these criteria seem simple, verification turns out to be extremely difficult.

[Slide Content]:

Temporal Precedence

[Figure Shown]

- Cause must take place BEFORE effect
- How much time?
- The longer the time, the greater the potential for confounding factors

[Jeanne H. Yamamura]:

Let’s take temporal precedence. Cause has to go first. Okay. How early does it have to be? How much time has to lapse between cause and effect? The longer the amount of time allowed in between, the easier it is for something else to be present, other factors which could also be the cause.

[Slide Content]:

Food Poisoning in Germany in 2011

[Picture Shown]

- E-coli attack
- Time between consumption and illness
- Spanish cucumbers initially suspected
- Organic bean sprouts from German farm

[Jeanne H. Yamamura]:

Remember the food poisoning outbreak in Germany in 2011? The effects were clear – a virulent E-coli attack causing serious liver damage and death. But identifying the cause was a problem because of the time lapse between consumption and illness. Spanish cucumbers were initially suspected then all fresh vegetables, regardless of the country of origin. The final conclusion: it appeared to be bean sprouts from an organic German farm.

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Covariation
Positive association between the cause and effect
Correlation alone is NOT proof of causality

[Covariation or correlation is often mistaken for a causal relationship. The fact that two things increase (or decrease) at the same time does not mean one causes the other. Fat in the diet was alleged to cause cancer. As proof, this diagram which plotted breast and colon cancer rates against fat consumption was shown. The fact that the diagram slopes up provides some support – countries with higher fat intake have higher cancer rates. But if you think about this some more, you realize that heavy fat diets are expensive. The countries with heavy fat consumption have higher incomes and their members can spend their money on other expensive foods like sugar and alcohol. So while diet is likely a contributing factor in the higher cancer rates, it is not clear what exactly in the diet really causes cancer. It could be many different dietary elements.

[Constant Conjunction]

Most difficult
Close to impossible in real world with people involved
Laboratory – controlled setting, limit factors
Real world problem – may be hundreds or thousands of factors

The last piece, eliminating all other likely factors, turns out to be close to impossible in real world settings, especially when people are involved. Unlike laboratories where it is possible to control or at least limit the number of factors, in a real world problem, there may be hundreds or thousands of potentially confounding factors that would need to be eliminated one by one. Because it is impossible to eliminate all other causes, this step is frequently ignored. As a result, you often see claims like the one made by NY – stop-and-frisk reduced the murder rate.
Performance measurement and causality

- Cost allocation methods
  - Identify and control costs
- Cost information
  - Measure performance

[Jeanne H. Yamamura]:

What does this have to do with cost drivers and cost allocation? Managers employ cost allocation methods in order to identify and control costs for a given cost object. This information, in turn, is used for performance measurement. For example, you need to know whether or not you are making money on a given product or whether a particular division is contributing to an organization.

[Slide Content]:

Measurement Consequences

- Performance measurement
  - Cost choices
  - Consequences – expected and unexpected
- Measurement changes behavior

[Jeanne H. Yamamura]:

Because the information is used for performance measurement, the choices made in selecting and applying the cost allocation schemes have consequences – both expected and unexpected. The simple act of measurement changes behavior. The measurements affect not only the business processes being measured but also the outcomes. Measurement choices, therefore, should not be taken lightly. You will need to identify the causal links and assumptions that are an inherent part of the organization’s system. You’ve got to make sure they are valid and then identify the resultant consequences to make sure the system is working properly.

[Slide Content]:

Example: Salesperson Bonus

- Accurate measures of effort
- Intent – to motivate positive behavior

[Figure shown]
Performance measurement would ideally produce accurate measures of performance efforts. This identification is intended to positively motivate performance. For example, a salesperson is told to increase his/her annual sales by at least 10% from the prior year. If he/she exceeds that goal and increases sales by more than 10%, a big bonus will be paid. The performance measure, sales growth, is intended to motivate the salesperson to sell more which, in turn, should improve the financial results for the organization.

But if the salesperson focuses solely on increasing sales and doesn’t take into account the customers’ ability to pay or perhaps offers large discounts, the results may not be better financial results for the organization. The selected performance measure, sales growth, may actually negatively impact the organization instead of having the intended and desired effect.

Assumption that Causal Relationships Exist

Despite this difficulty in linking performance measures to desired behavior and results, managers make decisions all the time which assume that causal relationships exist. “I need to keep my employees happy so I will simply give them more money.” “I need to get costs under control so I will cut all of the budget lines by 10%.”

Evaluation of “Assumed” Causal Relationships

Managers need to be able to evaluate the “assumed” causal relationships underlying their decisions. Assessing causality in business settings is difficult because you aren’t able to run controlled experiments. You will need more proof – proof obtained from triangulation. Triangulation simply means gathering evidence from multiple sources to enable you to conclude that the observed inputs lead to the outputs.
Cheating in Chicago

[Jeanne H. Yamamura]:

Chapter 1 of Freakonomics offered an example of triangulation in the story of cheating by teachers. Teachers in the Chicago Public School system were suspected of changing student answers on the standardized assessment tests used to evaluate student learning. The test results were also used to evaluate and reward teachers whose students did well. To determine whether teachers were cheating, the school system looked at four different data items: The responses on the tests were checked to see if patterns in a class appeared. The class performance before and after the test was compared. The characteristics of “cheating” teachers were considered. Students were retested in controlled conditions where teachers did not have access to the student tests. By utilizing evidence from multiple sources, the school system was able to “prove” that certain teachers cheated and, subsequently, to fire them.