Using Writing As a Tool for Economic Research

"The important thing in science is not so much to obtain new facts as to discover new ways of thinking about them."

Sir William Bragg

In Chapter 1 we observed that scholars create knowledge by constructing competing arguments. They construct these arguments by using their tools:
- Mental processes—thinking about an argument;
- Oral discourse—verbalizing the argument;
- Mathematics—manipulating equations to derive meaning; and
- Writing.

Though arguments can be developed using all of these tools, in this chapter we focus on writing as the principal one. McIvor (2000) makes this point early in her book Economic Writing, when she asserts that the practice of economics depends more on writing than on mathematics or statistics or any of the other technical skills normally associated with economics. Economists use writing for two purposes, the second of which you may not have considered:
- Writing as a Product, a form of communication to disseminate research results, and
- Writing as a Process for deriving the research results.

This chapter will focus on the second purpose, while the first will be the object of Chapter 5.
Writing to Learn

Writing is more than a product; it is also a process or a tool for creating knowledge. Students sometimes say, "I know it, but I just can't explain it." But if you can't explain an economic idea, you only know it on a superficial level. Writing forces you to think concretely, to figure out exactly what you mean. By contrast, when using purely mental processes, it is easy to be vague with your thoughts, to leave pieces out. When you write, those holes in the logic become readily apparent. In this context, writing is a tool of discovery, a way of working through ideas that you don't fully understand. In other words, writing is a positive-sum game. When you write, you don't merely put down what you already know; rather, you end up knowing more.

Composition As a Creative Process

Let's explore this idea. The process of writing is called composition. What does that mean? Composition includes both analysis (taking something apart to understand it) and synthesis (putting pieces together to make whole). Consider how you as a student "put together" a traditional term paper. You sort through the information, classify it, and decide what is important and what is not relevant. You arrange and rearrange so as to discover a structure, an organization that best displays the information on the index cards until a meaning reveals itself. In other words, composition involves searching for relationships among the facts and ideas that make up the raw material of your research. When you compose, you choose and arrange those facts and ideas; you try to put them in a meaningful order. It is the same when a director makes a film. The film is never completed in only one "take." Rather, different takes are filmed, edited, and combined in different ways until just the right story is developed.

Students often end this composition process too early, before it fully reveals its insights. Bean (1996, 7) notes, "A key observation among teachers of critical thinking is that students... tend to reach closure too quickly. They do not suspend judgment, question assumptions, imagine alternative answers, play with data, enter into the spirit of opposing views, and finally explain longer over questions." This problem is understandable if one views writing only as a product. Bean (1996, 15) characterizes this mistaken view with a metaphor: "Writing is like the box and wrapping paper into which a parcel is put, logically to the thesis as a conclusion. This is illustrated in a stylized version of reality or a model. A model is a simplified version of reality that provides insight into the most important aspects of the question, while leaving out the least important aspects. In this respect, an argument is like a model. It provides a structure or story to best explain the facts, but probably doesn’t explain or address them all. This is why the "throwing away" portions of your writing that upon review don’t contribute significantly to the argument is a natural part of the composition process.

The Structure of an Argument

The purpose of scholarly writing is to make an argument that is persuasive to experts in the field. Scholars use the composing process, described in the previous section, to discover and refine their arguments, in which the thesis is supported by a series of nested arguments that are connected logically to the thesis as a conclusion. This is illustrated in a stylized version of reality or a model. A model is a simplified version of reality that provides insight into the most important aspects of the question, while leaving out the least important aspects. In this respect, an argument is like a model. It provides a structure or story to best explain the facts, but probably doesn’t explain or address them all. This is why the "throwing away" portions of your writing that upon review don’t contribute significantly to the argument is a natural part of the composition process.
Composing with the Outline Function of Your Word Processor

The "Outline" function of your word processing software can be a very useful tool in the process of composing and revising your paper. For example, in Microsoft Word, the outline function allows you to convert your paper draft into an outline of the major points you made in the paper. The text for each section can be collapsed under each heading for expanded to show the complete text. Once the paper is in that form, it becomes very easy to reorganize the paper without having to cut and paste. Alternatively, the outline function can allow you to create an outline of your paper that consists of the major points you plan to make, and then flesh out those points to write the complete paper. To use the outline function in Word, open your document, then select "View" from the pull-down menu on the toolbar, and then select "Outline." Though the outline function can take a short while to master, it is well worth the effort. Indeed, I used Outline to organize and write this chapter.

The thesis or primary assertion is at the top, the major points are underneath that thesis, and supporting explanation or evidence is under each major point. Nothing is added at random. Any points (or stray facts) discovered in the preliminary research that do not lead to the thesis directly or indirectly are omitted from the argument.

Let's examine this structure in more detail by looking at the nature of an argument. In Chapter 1, we defined an argument as an assertion supported by reasoning or evidence. An assertion is a claim or point of view. For example, McIlroy's statement mentioned at the beginning of this chapter is an assertion. In causal conversation, people often argue on the basis of assertions alone (what Missimer [1995] calls "loose arguments") or turn an argument around to support. Similarly, in professional or scholarly writing authors might refer to Missimer's "argument" that writing is more important to the work of economists than technical skills. But argument in the strict sense refers to both the assertion and the supporting reasoning.

What Does It Mean to Say That a Conclusion Follows from the Evidence?

For an argument to be persuasive, the reasons supporting it must be true, and the conclusion must follow from those reasons. What does it mean to say that a conclusion follows from the evidence? An inference is a conclusion reached after reasoning logically about facts and relationships. If we define an argument as a claim supported by evidence, then an inference is like an assumption—given certain relationships between the facts, if we can reason our way to a certain conclusion, then we say that the conclusion "follows." If the conclusion follows, then we have what Missimer calls a "warranted inference."
Consider, for example, the argument that consumer spending increased last year because of an increase in the unemployment rate. To assess this argument, one would ask two questions. First, is the reason true? Did unemployment increase last year? Suppose the answer is yes. The second question then is: Does the conclusion follow from the premise? In other words, is it reasonable or logical to conclude that an increase in unemployment would cause individuals to spend more? Probably not. An increase in unemployment would reduce incomes, at least for the unemployed. Lower incomes should translate into less spending rather than more. In this case, we say that the conclusion doesn’t follow from the premise, and the argument fails to convince. By contrast, if the argument stated that consumer spending increased because of a decrease in unemployment, then the conclusion would follow, and the argument would be sustained.

A logical fallacy is an argument that is flawed because the conclusion does not actually follow from the reasons stated, even though the argument is phrased in a way that makes you think it does. Logical fallacies often find their way into public arguments. Appendix 6A lists the most common logical fallacies, which you should learn to identify and avoid.

Exercising an Argument

Let’s examine the argument made by Robert Samuelson (2002), which is reproduced in the following box.

Samuelson’s Major Claim: A possible war with Iraq raises many unknowns, but “can we afford it?” is not one of them.

A War We Can Afford

By Robert J. Samuelson

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A possible war with Iraq raises many unknowns, but “can we afford it?” is not one of them. People inevitably ask that question, forgetting that the United States has become so wealthy it can wage war almost with pocket change. A war with Iraq would probably cost less than 1 percent of national income (gross domestic product). Americans have grown accustomed to fighting with little economic upset and sacrifice.

The last time the United States truly mobilized for conflict was World War II. Roughly 16 million Americans served in the military; that was two-thirds of all men from 18 to 34, reports historian James Paterson of Brown University. The costs were stupendous. In 1944, federal spending soared 44 percent of GDP, with military spending at 38 percent of GDP. At home, Americans savored ration coupons for key meat, gasoline, and other staples.

Ever since, two things have transformed the economics of war: The U.S. economy has gotten bigger, and wars have gotten smaller. Measured by what it produces—and adjusted for inflation—the economy is more than five times as large as it was in 1945. Meanwhile, America’s wars have become more localized, draining less of the nation’s wealth.

In the Korean War, the defense budget reached 14 percent of GDP in 1953, but much of that spending went for a massive buildup of forces in Europe. For every tank that went to Korea, two went to Europe,” says Historian Alan Grauman of the Industrial College of the Armed Forces. “The B-52s we built had nothing to do with the Korean War.” In August 1949, the Soviet Union unexpectedly exploded its first atomic bomb, prompting President Harry Truman to order the National Security Council to undertake a major review of U.S. strategy. The resulting document (called NSC-68) envisioned huge deployments of U.S. troops to Europe to counter a conventional Soviet attack, which—once the Soviets had their own nuclear weapons—seemed more credible.

Although the Cold War’s costs remained large, defense spending during the Vietnam War was only as high as 5.4 percent of GDP, in 1968. Even so, Lyndon Johnson’s early attempt to finance the war without any tax increase—to have both guns and butter—helped raise inflation. After Vietnam, defense spending (again, as a share of GDP) drifted down and dropped sharply once the Cold War ended.

It now runs about $386 billion annually. That’s a lot of money, but, in an economy producing more than $10 trillion annually, it’s not much of a burden. It’s slightly more than 3 percent of GDP. How much a war with Iraq would cost is guesswork. It would vastly exceed the toll in Afghanistan,
To summarize Samuelson’s argument:
Assuming that we can measure the financial burden of a war on a nation by its cost as a share of GDP.
then since World War II, U.S. GDP has increased dramatically. At the same time, wars have become more localized and thus less costly; therefore, we can conclude that the United States is better able to afford a war with Iraq than we were able to afford World War II.

Samuelson’s conclusion does follow from the evidence.

Three Types of Reasoning: Deductive, Inductive, and Warrant-Based

Every argument consists of assertions and evidence. Or, looking at it backward, every argument consists of premises (or assumptions) and conclusions (or inferences). Let’s examine more carefully the ways in which scholars reason. There are three different approaches to reasoning: deduction, induction, and warrant-based. An argument can include all three types, but to keep things simple let’s look at them one at a time.

Deductive reasoning starts from one or more general principles and derives specific predictions from them. These predictions are what Sherlock Holmes called “deductions.” The principles need not be all that weighty; you can think of them as premises or assumptions or as the “givens” in the exercise. A valid deduction is one in which the conclusion must follow from the premises. In other words, if the premises from which the reasoning begins are true, then the conclusion must be true also. In a sense, a deduction is a logical proof. Consider a simple example: Start with the premise that all men are mortal; in some version of the quantity theory of money, Milton Friedman is a man; and hence he must believe in the quantity theory of money. The deduction is that Friedman believes in the quantity theory of money. Samuelson’s argument in the article we examined previously was another example of deductive reasoning.

Note that, strictly speaking, a deduction is considered valid as long as its conclusion follows from the premises, even if the premises aren’t true. To be persuasive, what we really want is a sound argument, that is, a valid deduction in which all the premises are true.

When scholars “theorize,” they are typically using deductive reasoning. For example, consider the origins of the law of demand. Assume that individuals derive satisfaction or utility from consuming goods and services...
but that their consumption is limited by each individual's budget. So the sum of each individual's expenditures on all goods purchased must not exceed the individual's income. Assume further that the utility individuals derive from consumption follows certain general principles: that increasing consumption of any good or service yields more utility, but at a decreasing rate. Thus, consumers are subject to the law of diminishing marginal utility. Finally, assume that individuals wish to spend their income on the combination of goods and services that maximizes their (total) utility. This can be shown by manipulating these assumptions that if the price of good or service rises, the amount of that good or service that individuals will purchase should fall. This is, of course, the law of demand. The process of theorizing will be addressed more fully in Chapter 7.

An inductive argument is one that reasons in the opposite direction from deduction. Given some specific cases or situations, what can be inferred about the underlying general rule? The reasoning process follows the same steps as in deduction: one reason from one or more premises to conclusion. The difference is in whether the premises or the conclusion is the general principle or the specific case. An inductive argument is no proof in the sense that a deduction is. Rather, induction is a probabilistic inference. If the truth of the premises increases the likelihood that the conclusion is true, then we have an inductive inference. It is still possible for the rule to be false, however, despite the cases that lead one to believe that it is true.

When scholars use statistical evidence as proof of a hypothesis, they use inductive logic. Suppose a researcher believes that the price of the product affects the amount a firm chooses to produce. The researcher collects a sample of data, runs appropriate statistical tests, and discovers that based on the data sample, an increase in the price of the product corresponds to an increase in the quantity supplied by the firm. We call the general rule the law of supply, which in this example was validated by a specific data set. In short, the specific data resulted in the general rule. This is induction. The use of empirical methods to test hypotheses will be explained in detail in Chapters 10 and 11.

Missimer (1995) suggests that we can learn more by focusing on the logic of arguments than by labeling the reasoning as inductive or deductive. This suggestion is especially true since complex arguments can include both types of reasoning, as well as the third type: warrant-based reasoning.

Warrant-based reasoning is often used in scholarly writing. Warrants are unstated or underlying assumptions on which an argument stands. Often, warrants are higher-order assumptions or axioms that are not testable.
some reader will and may find that it didn't. Similarly, when you analyze data, a key part of empirical research, you need to confirm that your data are correct. Something as trivial as a data-entry error can completely change the results of a statistical analysis.

Evidence should also be authoritative. If you are using data, is it from a reputable source? A student of mine once investigated the demand for Beanie Babies. She concluded that the demand for Beanie Babies as a collectible should depend on their expected future price as well as the current price, the buyer's current income, and other items one might expect to see in a demand function. She obtained data for expected future prices, which her statistical analysis revealed to be the most important determinant of demand for Beanie Babies. Unfortunately, she obtained the data from the manufacturer, which was not an objective source, since it stood to benefit significantly if its products were seen to be a good investment.

Similarly, if you support an assertion with a quotation, is the quotation from an authoritative source? If you cite an argument, is it from a respected publication? In Chapter 5, we discussed the way in which scholarly publications are vetted, making them authoritative. The Internet provides wonderful examples of the pitfalls of using evidence that lacks authority. Since virtually anyone can publish virtually anything on the Internet, one needs to be extremely cautious about basing conclusions on evidence covered on the Internet. Booth et al. (1995, 102) declare that if you are not an expert in the field, "do not trust any source as authoritative unless you know the research in the area."

Additionally, evidence needs to be precise. Arguing that welfare reform had policy because it harmed many people is weaker evidence than arguing that 5.7 million people lost benefits. Imprecise or outright vague language will weaken the reader's perception of evidence, just as mistakes or carelessness do. Imagine trying to hit a baseball with a Nerf bat versus a wooden one. The Nerf bat will diffuse the energy of your swing, so it is hard to hit the ball with any force. In the same way, a vague reason lacks power. (Note, however, that there is such a thing as too much precision; for example, reporting regression coefficients to eleven decimal points is meaningless.)

Evidence is rarely self-evident. One nearly always needs to explain. This is especially true of statistical results. Undergraduate research sometimes believe that statistical results must merely be presented as convincing, but as we will explain in Chapter 12, statistics must be interpreted for the reader. If the evidence is not clearly explained, readers may not see how the conclusion follows from the reasoning. If a reason is clear to the reader, it will not help persuade him or her that the argument is true. In fact, it may do the opposite. Booth et al. (1995) emphasize that it is often helpful to ask the question: Will the reader see it? Is there additional information that you have that establishes the relevance of the evidence? If so, you may need to provide it.

Deep reasoning requires you to think deeply about causes and effects. Why might unemployment have risen? A student might respond, "Perhaps because businesses are producing less output, so they require fewer workers." There is nothing wrong with that reasoning, except that it doesn't go far enough. If that was the extent of an answer to an exam question, it might be labeled a "shallow argument," one that lacks depth. A better answer would go on to ask, why are businesses producing less output? The answer could be "Because sales are off." Why then have sales fallen? Perhaps it is due to the decline in the stock market, which makes consumers feel less wealthy and businesses feel pessimistic about the future. When you reason deeply, you follow the train of cause and effect as far as you can.

In a similar way, broad reasoning requires you to think widely about causes and effects. Instead of being satisfied with just one or two reasons for an assertion, you should try to identify all possible reasons. Booth et al. (1995) suggest that you try to imagine all the questions a thoughtful reader might have about your argument, and then address those questions in your argument. The evidence presented in your argument should also be representative of thought on an assertion. For example, students sometimes think they should only report the evidence that supports their assertion. Nothing could be further from the truth! Aside from being intellectually dishonest, this opens your argument to the correct criticism that you haven't considered the opposing viewpoint. Failure to do so will lead knowledgeable readers to label you ignorant at best, and fraudulent at worst. You are not trying to win a debate, but rather determine the best answer to the question of the strength of one's argument by admitting its limitations and conceding contrary evidence. In a statistical context, the same issue arises: one's sample sometimes should be representative of the underlying population if inferences based on the sample are to be valid. This important point will be discussed in detail later in Chapter 10.
Example: Evaluating an Argument with Unrepresentative Evidence

Suppose the average GPA of students who graduate from college is a B. Does that imply that grade inflation is occurring? After all, if there were no grade inflation, shouldn’t the average grade be a C? There are at least two reasons why this may not be a warranted inference. The first involves the GPA requirement for graduation. Most schools require seniors to have a least a C average to graduate. Thus, even if the average GPA of the senior class is a C, the GPA of graduates must be higher, since those seniors with lower GPA are by definition excluded from graduation. In other words, the sample of data used in this argument (i.e., seniors who graduate) is not representative of the population of students.

The second reason the conclusion does not follow in this argument involves the courses students take over their undergraduate careers. Most students probably end up taking courses in and perhaps majoring in subjects in which they do well, or at least better than average. This implies that almost certainly the GPA of the "average" graduate will be higher than C. Again, the sample of data used is probably not representative. A better test might be to examine the grades students earn in their general education courses, which every student must take, and especially those taken in their first or second year of college.

Example: Constructing a Simple Argument

Consider the following assertion: “At the next meeting of the Federal Open Market Committee, the Federal Reserve will almost certainly decide to lower interest rates again.”

What might be some reasons in support of this assertion? What might lead the Fed to pursue a more expansionary monetary policy?

- The unemployment rate is the highest it has been in four years.
- Consumer confidence is falling.
- Business investment spending is down.
- Inflation is negligible.

What might be some underlying reasons that support these larger reasons? For example, what might explain the high unemployment rate or the falling consumer confidence? What is the implication of low inflation?

- U.S. production has slowed substantially in the wake of the stock market decline over the past year.
- Households are worried about the future.
- Given the decline in U.S. production, the capacity utilization rate is down.
- The lack of inflation allows the Fed to pursue a more expansionary policy than it might otherwise be comfortable with.

Notice how the principal assertion and the major and minor reasons form the pyramidal structure of the argument, as illustrated in Figure 4.1. Assuming that the assertion follows from the reasons and that the reasons are valid, then the more complete the reasoning, the more solid will be the base of the pyramid and the more solid the argument.

Note also that when you begin to construct an argument, you may not know how which way you will end up arguing. Rather, you should start with the research question. Next, you consider all possible answers pro and con.

How broadly and how deeply must one think? One rule of thumb is to consider the weightiness of the primary assertion one is arguing. A controversial thesis with large implications will require broader and deeper explanations than a more commonplace assertion. Consider the reasons that the information age has fundamentally changed the workings of the U.S. economy with the result that U.S. productivity growth has significantly increased. This assertion, if true, will have major implications for the standard of living in the United States, as well as for macroeconomic policy. Though a great deal of evidence supports this thesis, the weight of its implications means that for most analysis, it remains an open question.
An Important Caveat

A conclusion can follow from the evidence, the evidence can be correct, and the argument may still be incorrect. In other words, internal consistency in an argument is necessary but not sufficient if another conclusion explains the evidence better and more correctly. In the real world, scholars rarely have all of the relevant evidence. Rather, they construct their arguments based on a sample of the evidence that they think is the most relevant. It is always possible that they will miss some critical piece of evidence (an assumption, a piece of data, a relationship between parts of the evidence). As a result, their argument will be incorrect.

The way to minimize this possibility is to ensure that your argument has the features outlined in the last section, including broad and deep thinking. But you can never be certain. Therefore, a modicum of humility is always in order when presenting a scholarly argument, even a good one.

SUMMARY

- Writing is a tool for creating arguments.
- When you develop an argument you need to think deeply and broadly about your reasoning.
- Each conclusion should follow from its premises.
- Can any assertions be made more convincing with more elaboration?
- Are there other reasons to support the conclusion?
- Is an alternative explanation more plausible?

NOTES


2. Booth et al. (1995) define an argument as including an assertion (or claim), evidence to support the claim, a warrant (or general principle), and qualifications (or limits on the assertion). The last three elements are what are referred to as "supporting reasoning" in our definition of "argument."

3. This section draws heavily from Booth et al. (1995).

4. This is called the fallacy of special pleading. See Appendix 4A.

Logical Fallacies

A logical fallacy is an argument that is flawed because the conclusion does not actually follow from the reasons stated, even though the argument is phrased in a way that makes you think the conclusion follows and even though the reasoning has appeal. Logical fallacies often find their way into public arguments since they can be persuasive to many people. Here is a list of some commonly used logical fallacies:

1. **Straw Man**—Mistakenly attributing a position by omitting its strongest reasoning, often by caricaturing it in a way that no one would agree with. Thus, one is not addressing the actual argument posed. For example, "Alan Greenspan is opposed to budget deficits because he is concerned that the U.S. government might go bankrupt." (Greenspan has consistently opposed budget deficits on the grounds that deficits increase real interest rates, which diminish capital investment and ultimately reduce for capital GDP. The extent to which this occurs is an empirical question about which reasonable economists disagree.)

2. **Special Pleading**—Selectively using the available evidence; only using evidence that supports your position; ignoring any evidence in opposition. For example, "We should run a budget deficit since it will stimulate the economy." (Yes, it will in the short run, but it may also adversely affect the economy in the long run.)

3. **Begging the Question**—Making an assertion in which the reason given doesn't really support the conclusion; hence, a non sequitur. Often this appears as a type of circular argument, where the "reason" is only a re-statement of the assertion. For example, "Consumers buy less at a higher price because of the law of demand!" (The law of demand can be paraphrased as an inverse relation between price and the amount consumers buy. Thus, the statement doesn't explain why consumers buy less.)

4. **Affirming the Consequent**—Drawing conclusions based on unexamined premises. For example, "Government fine-tuning of aggregate demand would result in a more stable macro economy." (Theoretically, yes, but this assumes that government is capable of fine-tuning—an assumption that many macro economists question.)
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- **Ad Hominem**—Refuting an argument by attacking the person, rather than his or her argument; rejecting an assertion because of who is making it rather than because of the evidence. For example, "His argument about the budget deficit must be wrong because he's a liberal"; "Her argument about tax cuts must be wrong because she's a conservative."

(Assumption should be evaluated on the basis of its logic. Note that this is somewhat the opposite of an appeal to authority.)

- **Appeal to Authority**—Accepting an argument because an expert endorses it. (Think about this fallacy the next time your instructor makes an assertion.) The "expert" may have no particular expertise on this issue. Alternately, this may be a question on which different experts disagree. The argument may be correct, but it is a fallacy to accept it without examining the logic and evidence. For example, "Budget deficits should not be a concern since President Bush is not worried about them."

(Bush may not be worried about them, but he is a political leader rather than an economist. Some economists have a different view of deficits.)

- **Appeal to the People/Appeal to the Many**—Accepting (or rejecting) a position because many others do, again without examining the argument. For example, textbook sellers often tell faculty, "You should use this book in your class because many other schools do." (My course is not the same as the courses at all those other schools; my students are not like the students at all those other schools.)

- **Post Hoc, Ergo Propter Hoc** (literally, "After this, therefore because of this")—What comes before was the cause. Though it is intuitive to think that what comes before causes what comes after (e.g., a college degree leads to a good career), it is not necessarily true. In fact, the cause may come after the effect. For example, does the buildup of toy inventory in the first three quarters of every year "cause" Christmas? This is a violation of the important dictum that correlation is not necessarily causation. For example, in a cleverly titled study invoking this fallacy, John J. John asked "Does the Fed cause Christmas?"

(Though the money supply trends to grow in the fourth quarter of every year, this is in anticipation of Christmas rather than a cause of it.)

- **Fallacy of Composition/Fallacy of Division**—What's true at the micro level must be true at the macro level, and vice versa. For example, if classical economists argued that the solution to widespread unemployment of the Great Depression was to decrease real wages.