

TEACHER EDITION

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https://research.stlouisfed.org/publications/page1-econ/2016-09-01/why-is-it-so-difficult-to-buy-a-high-quality-used-car_SE.pdf.

National Common Core State Standards (see page 8)



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Why Is It So Difficult To Buy a High-Quality Used Car?

Scott A. Wolla, Ph.D., Senior Economic Education Specialist



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GLOSSARY

Adverse selection: The tendency of insurance to be purchased by those most likely to make claims.

Asymmetric information: A situation where one party to a market transaction has more information about a product or service than the other. The result may be an over- or under-allocation of resources.

Moral hazard: The risk that one party to a transaction will engage in behavior that is undesirable from the other party's view.

Premium: The fee paid for insurance protection.

"I discovered that the informational problems that exist in the used car market were potentially present to some degree in all markets."

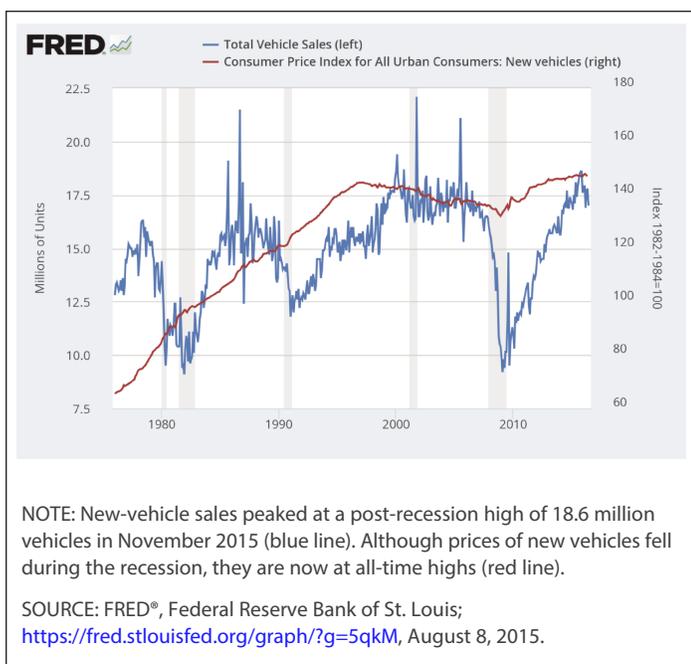
—George A. Akerlof, Nobel Prize winner, 2001

Are you in the market for a vehicle? During the 2007-09 recession, new-vehicle sales plunged to their lowest levels in nearly 30 years. They have since fully recovered as people replace their aging vehicles with shiny new cars, trucks, vans, and sport utility vehicles. Prices of new vehicles, however, are at all-time highs, leading many buyers to look for used vehicles. It can be a challenge, though, for buyers to figure out whether they are getting a good deal. The seller generally knows far more about the vehicle. Even with careful examination, the buyer still likely won't know everything the seller knows. When one party knows more about the product than the other party, there is "**asymmetric information.**" In the case of a used car, the seller has more information—and the advantage. The opposite can also be true in a transaction—the buyer can have more information and the advantage.

The Market for Lemons

The used-car market is often used to discuss the implications of asymmetric information. In this market, sellers have greater knowledge about the condition and quality of their cars than buyers. For example, a seller is likely to know about engine or transmission problems, the maintenance history, and any defective equipment. In other words, the seller is likely to know whether the car is a "lemon" (a car with defects). The buyer, however, is at a disadvantage. Even with a careful visual inspection or a test drive, defects can be missed or hidden. The seller is in the driver's seat (so to speak) in this market.

To better understand asymmetric information, consider a buyer looking for a particular car make and model. Let's call it the 2012 Econocar Utility Maximizer. The buyer is willing to pay up to \$14,000 for a high-quality used car (a "cherry") but only \$10,000 for a low-quality used car (a lemon). Imagine she visits two sellers advertising 2012 Utility Maximizers. One



seller is selling a cherry; the other is selling a lemon. Each seller knows the history of the car for sale—they have good information and know whether it is a cherry or a lemon. The buyer, however, doesn't see much difference between the two cars. She can't tell whether either car is a cherry or a lemon. In other words, there is asymmetric information. As such, because she can't know for sure, the buyer assumes that neither car is of high quality. So, she is willing to only offer a price *below* that of a high-quality car: \$12,000.

Now consider the larger used-car market. Other buyers behave in similar ways. Because they cannot distinguish between lemons and cherries, they offer prices somewhere in the middle. Some sellers who really do have high-quality used cars aren't willing to sell them below their true value, so they keep the cars instead. Sellers of low-quality cars, however, gladly sell their lemons. Low prices, then, reduce the overall quality of used cars on the market, leading to a market dominated by lemons. With fewer cherries on the market, buyers offer even less, further reducing the quantity of high-quality cars on the market. This cycle leads to market inefficiency because transactions that would have benefited both buyers and sellers fail to take place. That is, although sellers are willing to sell high-quality used cars to buyers at a fair price, the transactions do not occur because the buyers are unsure about the condition of the cars.

Closing the Asymmetric Information Gap

Regulation has helped buyers receive better information. The 1975 Magnuson-Moss Warranty Act (also known as the Lemon Law) regulates warranties on vehicles (and other consumer goods), and a variety of state laws (also referred to as lemon laws) protect consumers from defective products, including vehicles.

To reassure used-car buyers—and to get them to pay a higher price—some sellers provide warranties or “certify” their highest-quality used cars. Generally, a car labeled certified has been inspected and repaired (if necessary) to meet high quality standards and may include a warranty. Buyers can also take several steps to help reduce the asymmetric information gap. First, research can help steer them to a generally more-reliable car. Third-party sources, such as *Consumer Reports* and J.D. Power, collect and analyze data to estimate the average reliability and quality of certain car models.

Once a seller finds a car, various sources can provide additional information about that car. For example, auto mechanics can look for defects hidden or overlooked. For a fee, they will look “under the hood” and run diagnostic tests. Additional information (such as maintenance, odometer, and accident history) is available by researching the car's VIN (vehicle identification number). Various companies will provide a VIN report for a fee.

In the future, buyers may be able to easily obtain even more information about a car's history from the car's event data recorder (EDR), which is similar to the “black box” on an airplane. Today, nearly all new cars have an EDR. These microcomputers collect data related to safety and accidents, including speed, braking, seatbelt use, and airbag deployment.¹ EDRs are likely to become more powerful and collect more data over time.

Consider the Cost

In the rush to close the asymmetric information gap, it is important to realize that obtaining information can be costly. Some information may have explicit costs (fees or subscriptions), while others have implicit, or opportunity, costs. Any time you spend researching a product is time you could have spent doing something else. Therefore, the more expensive a transaction is, the more beneficial your research may be. So it's wise to seek out information

before buying a house or car or choosing a college but less important for choosing a frying pan or a stapler.

Other Markets with Asymmetric Information

Other markets also have the challenge of asymmetric information. In the insurance market, for example, buyers usually have more information than sellers (insurance companies). The person wanting health insurance has more information about his or her current health than the insurance company. This imbalance can lead to two potential problems in the health insurance market. The first is **adverse selection**: People with health problems are more likely to buy health insurance than healthy people, who might decide they don't need health insurance. This imbalance can create a pool of insured people with more health problems than the general population. If this is the case, health insurance companies will likely pay more claims and charge higher premiums. The Patient Protection and Affordable Care Act has attempted to reduce adverse selection by creating financial incentives to encourage all people (even the young and healthy) to buy insurance.

The second potential pitfall is **moral hazard**: People with insurance tend to take on more risk (knowing insurance will pay some of the cost if anything bad happens) than they would otherwise. This increase in risky behavior could increase the number of claims insurance companies must pay and result in higher premiums. Insurance companies attempt to learn about a potential customer's health and other habits before granting medical or life insurance to reduce the risk to the company and ensure an appropriate monthly **premium** is charged.

Credit markets also notably feature asymmetric information problems. A potential borrower has better information about his or her own ability and willingness to repay a loan than the lender. Lenders attempt to learn about potential borrowers' credit and financial history from credit reports. This information improves the ability of

lenders to choose whom they should lend to and what interest rate they should charge.

Finally, asymmetric information problems also plague labor markets. Job seekers know more about their own job skills and work ethic than potential employers. Employers generally conduct interviews and check references but may also give assessments and seek additional information online, including on social media. In addition, some employers review credit reports,² require drug testing, and/or perform a criminal background check.

Conclusion

When one party to a transaction has more information than the other, the party with more information has the advantage. This circumstance is a problem not only for the party with less information, but also for the market itself as transactions that would have benefited both buyers and sellers fail to occur. For example, even though some people are willing to sell high-quality cars for a suitable price, buyers won't pay top dollar because they are unable to assess a car's true condition. So, the car owners won't sell, and the beneficial transactions never occur. However, the growing availability of information—if you seek it out—may help close the asymmetric information gap. ■

Notes

¹ Rafter, Michelle V. "Decoding What's In Your Car's Black Box." Edmunds.com, July 22, 2014; <http://www.edmunds.com/car-technology/car-black-box-records-capture-crash-data.html>.

² Eleven states have banned the use of credit checks in employment decisions (Traub, Amy and McElwee, Sean. "Bad Credit Shouldn't Block Employment: How to Make State Bans On Employment Credit Checks More Effective." Demos, February 25, 2016; <http://www.demos.org/publication/bad-credit-shouldnt-block-employment-how-make-state-bans-employment-credit-checks-more-e>).

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Name _____ Period _____

Federal Reserve Bank of St. Louis *Page One Economics*®:**“Why Is It So Difficult To Buy a High-Quality Used Car?”****After reading the article, complete the following:**

1. Explain how the seller has an advantage in the used-car market.

2. How does asymmetric information in the used-car market influence the price and quality of used cars available for purchase?

3. How can asymmetric information lead to inefficient markets?

4. How can buyers in the used-car market try to reduce the asymmetric information gap?

5. For each of the following, circle which market participant (buyer or seller) has the information disadvantage and then identify strategies the disadvantaged participant uses to close the asymmetric information gap.
 - a. Health insurance market
 - Information disadvantage: Buyer / Seller (circle one)
 - Method(s) used to fill the information gap:

 - b. Credit market
 - Information disadvantage: Buyer / Seller (circle one)
 - Method(s) used to fill the information gap:

 - c. Labor market
 - Information disadvantage: Buyer (potential employer) / Seller (job seeker) (circle one)
 - Method(s) used to fill the information gap

Teacher's Guide

Federal Reserve Bank of St. Louis *Page One Economics*®:

“Why Is It So Difficult To Buy a High-Quality Used Car?”

After reading the article, answer the following questions:

1. Explain how the seller has an advantage in the used-car market.

The seller is likely to know about engine or transmission problems, the maintenance history, and any defective equipment. In short, the seller is likely to know whether the car is a “lemon” (a car with defects).

2. How does asymmetric information in the used-car market influence the price and quality of used cars available for purchase?

Because buyers cannot distinguish between low-quality cars (lemons) and high-quality cars (cherries), they offer prices somewhere in the middle. Some sellers who have high-quality used cars aren't willing to sell them below their true value, so they keep the cars instead. Sellers of low-quality cars, however, gladly sell their lemons. Low prices, then, reduce the overall quality of used cars on the market, leading to a market dominated by lemons. With fewer cherries on the market, buyers offer even less, further reducing the quantity of high-quality cars on the market.

3. How can asymmetric information lead to inefficient markets?

Asymmetric information leads to market inefficiency because transactions that would have benefited both buyers and sellers fail to take place.

4. How can buyers in the used-car market try to reduce the asymmetric information gap?

Buyers can seek out information from third-party sources, such as *Consumer Reports* and J.D. Power, to estimate the average reliability and quality of certain car models. The buyer can also hire an auto mechanic to look “under the hood” and run diagnostic tests. Buyers can also pay a fee for information tracked by the car's VIN, such as maintenance records, the odometer reading, and accident history.

5. For each of the following, circle which market participant (buyer or seller) has the information disadvantage and then identify strategies the disadvantaged participant uses to close the asymmetric information gap.

- a. Health insurance market (Teacher note: Buyers know more about their own health and habits than insurance companies.)

- Information disadvantage: Buyer / **Seller** (circle one)

- Method(s) used to fill the information gap:

Health insurance companies seek information about a person's health and habits. The Patient Protection and Affordable Care Act provides incentives for people to buy insurance.

- b. Credit market (Teacher note: A potential borrower has better information about his or her own ability and willingness to repay a loan than the lender.)
- Information disadvantage: Buyer / Seller (circle one)
 - Method(s) used to fill the information gap:
Lenders attempt to learn about potential borrowers' credit and financial history from credit reports.
- c. Labor market (Teacher note: In labor markets, the job seeker is the seller [of labor] and has better information about his or her own job skills and work ethic than potential employers.)
- Information disadvantage: Buyer (potential employer) / Seller (job seeker) (circle one)
 - Method(s) used to fill the information gap
Employers conduct interviews, give assessments, and check references but may also seek additional information online, including on social media. In addition, some employers review credit reports, require drug testing, and/or perform a criminal background check.

For Further Discussion

Labor markets offer a particularly interesting example of how to overcome asymmetric information, where job seekers know more about their own job skills and work ethic than potential employers. Because individual labor productivity is difficult to predict, employers often use level of education as a “signal” of productivity. As such, earning a college degree is important because it allows students to gain knowledge and acquire skills to increase their productivity. A degree also serves as an indicator of productivity for employers; in other words, a college degree can help reduce the employer’s information disadvantage.

Use the following *Page One Economics*® Classroom Edition to discuss asymmetric information and the benefits of education:

“College: Learning the Skills to Pay the Bills?”; <https://www.stlouisfed.org/education/page-one-economics-classroom-edition/college-learning-the-skills-to-pay-the-bills>.

EXTRA! EXTRA! Read all about it!

Starting in October, a new middle school edition will join *Page One Economics*® and *Page One Economics*®: *Focus on Finance*. Each middle school edition will address the same topic as the regular edition, but at a middle school reading level. In addition to an essay, the new edition will provide resources to teach key economic and financial literacy content using close reading strategies. And, this new resource will give high school teachers the opportunity to make accommodations for students with different learning needs by offering similar content at a lower reading level.

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Common Core State Standards

Grades 6-12 Literacy in History/Social Studies, Science, and Technical Subjects

- **Key Ideas and Details**

RH.11-12.1: Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole.

RH.11-12.2: Determine the central ideas or information of a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas.

- **Integration of Knowledge and Ideas**

RH.11-12.7: Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, as well as in words) in order to address a question or solve a problem.

- **Research to Build and Present Knowledge**

WHST.11-12.7: Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

Kindergarten-Grade 12 Reading Standards for Informational Text

- **Key Ideas and Details**

RI.9-10.2: Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.

RI.11-12.1: Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.

National Standards for Financial Literacy

Standard 2: Buying Goods and Service

People cannot buy or make all the goods and services they want; as a result, people choose to buy some goods and services and not buy others. People can improve their economic well-being by making informed spending decisions, which entails collecting information, planning, and budgeting.

- **Benchmark: Grade 12**

5. People incur costs and realize benefits when searching for information related to their purchases of goods and services. The amount of information people should gather depends on the benefits and costs of the information.
7. Governments establish laws and institutions to provide consumers with information about goods or services being purchased and to protect consumers from fraud.

Standard 4: Using Credit

Credit allows people to purchase goods and services that they can use today and pay for those goods and services in the future with interest. People choose among different credit options that have different costs. Lenders approve or deny applications for loans based on an evaluation of the borrower's past credit history and expected ability to pay in the future. Higher-risk borrowers are charged higher interest rates; lower-risk borrowers are charged lower interest rates.

- **Benchmark: Grade 12**

5. Lenders make credit decisions based in part on consumer payment history. Credit bureaus record borrowers' credit and payment histories and provide that information to lenders in credit reports.
7. In addition to assessing a person's credit risk, credit reports and scores may be requested and used by employers in hiring decisions, landlords in deciding whether to rent apartments, and insurance companies in charging premiums.