Two

RESISTANCE

Why Frictions Exist and How to Overcome Them

RE•SIS•TANCE *n.*
A force that tends to oppose or retard motion.

In chapter 1, GEOGRAPHY, we saw that the real world is organized in a structured way. Individuals choose where and how to live, and these choices lead to specific neighborhood clusters. That is, neighborhoods tend to be formed by people who share demographic characteristics, lifestyles, and preferences for certain types of goods and services. Birds of a feather do indeed flock together.

More than this, people who are in close (physical) proximity to one another tend not only to consume similar products and services, but also to share information about the things that they like. My friend and neighbor Lee often tells me about new bars and restaurants in Philadelphia; colleagues at work chat about the latest gadgets.

In this chapter, I'll look at how we navigate the real world and what that means for how we enlist the virtual world to help overcome frictions and get what we want.

Real-World Frictions

THE DIFFICULTY OF SEARCH

In the real world we all face obstacles to getting what we want. Markets don't always provide us with exactly what we'd like to know to make an informed choice, or exactly the right product for our needs and desires—let alone at the right price.

These kinds of impediments are quite stubborn and persistent, and they have been around forever. We'll use some helpful jargon and refer to them as "frictions."

This term really gets to the nature of these obstacles—they don't *absolutely prevent* you from doing things, but they do make your life more difficult. You've undoubtedly encountered them, and you have perhaps even tried to overcome them (or at least thought about how to do so).

A Fraction Too Much Friction

I am going to focus mainly on the two most pervasive and common frictions, although I'll mention one or two others along the way as well.

The first is "search friction," or the inability to get the information that you and I would like to have before making a decision. We are almost always better off having more information, such as more information about the prices we might expect to pay at certain stores, about the quality of food in restaurants, and about the experiences of others with local merchants and service providers.

Not surprisingly, economists have been studying "search" for a long time now (it's one of their most popular pursuits), so we know quite a bit about it. To see how this friction works in practice, imagine that it's 1987 and you want to buy a big-screen TV so you can watch the inaugural Rugby World Cup Final in Auckland, New Zealand.[1]

1 For those who like trivia, the finalists in this game were France and New Zealand, and the

Since we're back in 1987, the Internet can't help you.[2]

So you visit a local store and start to gather information about the prices and qualities of different sets. The set that you like is fairly pricey but you know there is another store across town that might have a better deal. At this point, you can either buy the set in front of you or drive across town to another store to see what they have.

Of course, to get across town you'll have to burn gas and time—i.e., incur *search costs* for the *possibility* that you will get a better product or a better price on the product that you are currently considering. The other store might have higher or lower prices, or a better (or worse) selection than the current store. Beyond this, it's impossible to know exactly what will be in stock. So, if you leave the bird in hand and traipse across town to the alternate store, you just don't know what you're going to get.

When I said that studying issues concerning search was a popular pursuit for economists, I wasn't joking. A Google search using the term "economics of search" turns up just over 500 million references!

This whopping number aside, the basic finding from the core academic literature is insightful: we keep searching for additional information until the *expected costs* of searching exceed the *expected gains*.[3]

Formal Search: Looking for a TV in the Real World

Let's continue with the TV example and imagine that the following happens: You're still standing in your local store, staring at the price tag. Kickoff time is fast approaching. You figure that it will take thirty minutes to drive across town and, based on past experience, decide that although there's a small chance the price will be better, any savings will be negligible.

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same teams met twenty-four years later in the 2011 Rugby World Cup Final—with the same result.

2 Come to think of it, big-screen TVs might not have been around either in 1987, but let's just proceed with our scenario.

3 The word "expected" is very important here. It reflects the fact that you just don't know for certain what you're going to find, should you decide to keep searching. Your expectations come from past experiences, advertising, and so on (as I illustrate next with the TV-buying example).

On balance, you decide that it's not worth the trip, so you take out your credit card and (fairly) happily spend $1,995 on your new Sony.

In this instance, the expected costs of *additional* search exceeded the benefit, so you stopped searching and started buying. Way back in the 1960s, the Nobel laureate George Joseph Stigler formalized this idea in his article "The Economics of Information."[4] Were the expected benefit of continued search higher than the cost, you would take the *additional* trip and go to a second store.

Also, it pays to keep in mind that since different people in the real world value their time and money differently, it's quite likely that someone else faced with exactly the same outcomes would have taken the extra shopping trip.

So what does this show?

The real world has an important and pervasive friction. You have to expend effort—incur *search costs*—in order to make better decisions. This could entail searching for better prices on consumer electronics or groceries, or even shopping around for a better person to date. The virtual world is a big help, so enter Milo.com, the SaveOn! app, and OKCupid.com to solve the electronics, groceries, and dating problems, respectively.

In fact, there are literally thousands of new businesses and innovations on the Internet that have arisen to help mitigate the broadly defined *problems of search*. This is actually no surprise, considering how valuable it is to consumers for such "search" problems to be solved.

Later in this book we'll look at TripAdvisor.com—a business now valued at several billion dollars. TripAdvisor.com started as a small startup business and essentially exists thanks to *you and me* providing all its content.

For free.

So, I suspect there are still hundreds (if not thousands) of possibilities for new virtual-world businesses that will eliminate some of the real-world search frictions we all encounter every day.

Perhaps you'll start one of them.

4 George J. Stigler, "The Economics of Information," *The Journal of Political Economy* 69, no. 3 (June 1961), pp. 213–25.

MORE FRICTION: THE TYRANNY OF GEOGRAPHY

Take a look around the town or neighborhood that you live in. When it comes to location, size matters for two reasons. First, bigger markets (e.g., New York City, Los Angeles, and Chicago) have more people, and therefore more total demand and consumption needs and selection, than do smaller places (e.g., Sioux Falls, Iowa City, and Durham).

As a result, there's just more "stuff" around in places that are bigger. For some people, that variety, or at least the value of having options available that comes with it, makes big cities attractive places to live in.

Second, there's a higher chance there will be more people nearby like *you* when you live in a bigger city. Why, reasons of ego aside, does this matter? I explore this in more detail in chapter 5, ISOLATION, but when there are more people like you, there's a better chance that you'll get the things that you want.

Here's a quick preview.

Assume that you like corn beef hash (who doesn't?). If the chef at your local café believes that there are enough people in *total* in your neighborhood who like it, he or she might put it on the menu and make it available for breakfast. (Nice as you are, she's not making it just for you!)

Designer Jeans in Iowa, and Diapers (Again)

The Internet, however, is a great enabler for people who live in smaller markets. They can be released from the "tyranny of geography" simply by finding and ordering what they need online. If you want designer jeans that aren't available in the stores in Sioux City, you can simply go to Bluefly.com and order them.

This is how the Internet solves what I'll call geographic friction number one—you can live in Sioux City (a small market) but still have access to New York City (big market) variety.

Geographic friction number two is a little more nuanced. Even people in New York City may not get quite what they want, if what they want is a bit narrowly defined and there aren't enough others like them.

When the market is too small, no profit-seeking commercial provider will actually step in and offer something.

Of course, for certain types of products and services, the government will get involved, ensuring that things exist like broadband Internet in rural areas and libraries in small towns.[5]

The Internet liberates everyone by aggregating people, independent of their location, and creating a large, addressable market. We'll explore this aggregation idea in detail in the next three chapters, but here's a window into how it works.

Think back to Diapers.com. Would Marc and Vinnie have been as successful (or even had any success at all), if they had opened diaper stores throughout the United States?

Answer: probably not.

The reason? No matter how many babies there are in a certain location, it's unlikely that there are enough people to support a business that sells just diapers. On the other hand, if there are even a few people in each zip code who'd like to buy diapers and related products online, that quickly adds up to a lot of people! In this example, the Internet has liberated those who are "different" from those around them (even if they happen to live in a big city).

So the Internet creates markets made up of "similar" people, *independent of where they actually live.*

Think about that for a moment. It's a pretty powerful idea. We have only one physical world, and it pretty much stays put (the shifting of tectonic plates aside). Now with the Internet we can create *any number* of virtual worlds. A world of people who follow and discuss rugby? Sure, Rugby365.com. A world of people who need diapers for their newborns and who would rather not shop for them offline? Enter Diapers.com.

The key, of course, is that each virtual world can be impacted in different ways by the single, and relatively constant, real world.

5 For more examples of situations in which the government steps in (and why), see Joel Waldfogel's excellent book *The Tyranny of the Market: Why You Can't Always Get What You Want* (Boston: Harvard University Press, 2007).

Overcoming Search and Geographic Frictions

GETTING WHAT YOU WANT

So the Internet removes, or in many settings at least substantially mitigates, the two most intransigent and enduring market frictions. With it, you can find out the price of almost anything without leaving your house, connect with almost anyone, and buy pretty much whatever you like no matter where you live—so long as someone is willing to deliver it to you.

And you can do all this from anywhere if you have your smartphone in your pocket. (In chapter 6, I'll share a lot about how these frictions change when you and I use mobile devices versus laptops and desktops.)

Buying Stuff and Going Out

There are specific ways that we *actually use* the Internet to overcome frictions as a function of where we live. We'll discuss both products and information in this regard, but let's start with products, as this is a bit more intuitive.

If you live in New York City and I live in Iowa City, then, for me, the Internet makes up for the absence of a variety in local *products*. I can source designer jeans, organic household cleaners, and almost anything else through the miracle of the Internet. In short, the Internet acts as a *substitute* for the lack of variety at local stores.

You live in New York City, so your fashion shopping gets done in SoHo and household staples (even organic ones) can be picked up at any of the numerous Duane Reade drugstores, Whole Foods stores, and the like. Sure, you can shop online too, but for you, the need to do so is not urgent, because your local market already addresses most of your needs.

Now that we've seen what happens with products, let's turn to information. There are an overwhelming number of bars, restaurants, events, and activities in New York City. Wading through them all is quite difficult, perhaps even impossible. (It certainly would not be feasible to try

to eat in every single restaurant in the city.) Hence, information about what is going on and where—and what's worth checking out—is very useful to you.

As a result, those of us who live in large cities tend, on average, to be heavier consumers of local information. The Internet *complements* the existing goods and services already in abundance—providing large-city dwellers with information that enables them to navigate all of the activities in their variety-laden locations.

Now of course both New Yorkers and Iowans buy things online *and* use the Internet for information too. What matters here is the *relative* emphasis. People in locations with less product variety and selection are more apt to turn to the Internet for goods. People in locations that offer an abundance of things to do turn to the Internet for information about how to enjoy them.

Academic studies have calculated just how important and numerically significant these effects are.

Dollars Per Mile

Central place theory (CPT), as mentioned in chapter 1, formalizes the idea that bigger markets bring about more variety of goods and services than smaller markets do. And beyond that, CPT states that there are certain natural thresholds for offerings. For example, if you live in a really small town, there might only be one supermarket and one gas station. If the town grows a bit, one more of each might spring up to accommodate the increased demand.

This concept is easy to understand when we think about physical goods and services, but as I'll show in a moment, it turns out to be true for information (or "content") too.

So, how exactly does an offline deficit in goods push you to go online?

Well, all else being equal, the farther away you live or work from a particular offline seller, the less money you'll spend there. If the seller is "too far" then you won't visit it at all.

This is retail or commerical gravity at work again.

Relatedly, the farther you have to travel to reach particular offline stores, the more likely you are to shop online. For example, if Wal-Mart is too far away, you're more likely to go to Soap.com for your detergents and household cleaning supplies.

For every extra mile that you must travel to visit a physical store, the greater the chance that you buy the item you're seeking online. One study by researchers at the University of Pennsylvania found that if you move from one mile away to five miles away from the nearest store, the gap between your online and offline spending increases by about three percent.[6] This is actually a pretty big effect!

Here's one final point about the difference between small towns and large cities.

Because of Tiebout sorting, as discussed in chapter 1,[7] it's quite likely that people who've chosen to live in smaller places just have lower consumption needs to begin with. In fact, that's almost always the case.

The Tiebout explanation is quite subtle. People who live in smaller locations have chosen them for a reason. Perhaps they have less inherent need for access to wide variety of local goods and services, or perhaps they have less income, or both. Regardless, on average, and for people in small towns especially, living a greater distance from physical stores increases a person's chance of shopping online.

Sites Per Million and Traffic Patterns

Traveling long distances to buy goods is something that we'd all rather be able to avoid doing; naturally, we'd like everything to be close by. This is what retail gravity is all about. Quite surprisingly, there are also patterns to be found in how far we are willing to "travel" for information.

Consider popular "national" websites like ESPN.com and CNN.com and ask yourself: "Where do their customers come from?" In a sense

6 Todd Sinai and Joel Waldfogel, "Geography and the Internet: Is the Internet a Substitute or Complement for Cities?," *Journal of Urban Economics* 56, no. 1 (July 2004), 56–74.

7 In case you didn't read chapter 1 or have forgotten what you read, Tiebout sorting refers to the fact that you and I "sort" into (or choose) neighborhoods that have the right mix of costs and benefits for us; e.g., high property taxes but excellent public schools.

there is really no "distance" or "gravity" involved in visiting a virtual location like ESPN.com. It's the same number of keystrokes away whether you live in Iowa City or LA. Hence, national sites such as ESPN.com and CNN.com draw traffic numbers from physical locations that are *roughly proportional* to the sizes of the populations of those cities.

Los Angeles has about 3.8 million residents and Iowa City has about 70,000, so that means LA is around 55 times as big. Given this, we may assume that the national sites SI.com (sports) and CNN.com (news) will have approximately fifty times as much traffic from LA as they do from Iowa City.

Now, in addition to national sites, of course, there are also myriad local ones such as PhillyToDo.com and LATourist.com, as well as "narrower" sites, like NorthernLiberties.org (which addresses the goings-on in the Northern Liberties section of Philadelphia) or Weho.org (focused on West Hollywood in Los Angeles). The sheer *number* of these kinds of sites and their *traffic patterns* are also explained by their users' physical locations.

To see what happens here, let's first focus on the *number* of local sites.

Research shows that the larger the city, the *more* local sites there are that serve up content devoted to the people, places, and activities that define it. One study found that adding an additional one million residents in a US Metropolitan Statistical Area (MSA), an area that can cover more than one city, brings forth about another 50–60 sites devoted solely to content pertaining directly to it.[8]

Back in the 1930s, way before the virtual world even existed at all, CPT told us that in the real world the supply of goods and services increases along with the population. Moreover, Reilly's retail gravitation model told us that physical stores have fixed trading areas, beyond which they have no hold over customers. So it's fascinating to see, more than eighty years later, how these ideas have a similar message about the production and consumption of information in the virtual world as well.

As we've established, larger cities have a greater number of sites devoted to them, and the amount of traffic that a national site such as

8 Sinai and Waldfogel, "Geography and the Internet."

ESPN.com gets from a given location is roughly proportional to the population in that location. The patterns for local sites however, are quite different. (Hint: keeping thinking about our principle of gravity—the farther away you get from a particular good or service location, the less likely you are to use it.)

PhillyToDo.com generates almost all of its traffic from people residing within the greater Philadelphia area. Thus, a local site serving up information is a bit like an offline store selling goods. Retail gravity plays an important role. It's still more important for physical stores than it is for virtual sites—no one will drive from Philadelphia to buy groceries at the Ralph's supermarket in West Hollywood, but some West Hollywood residents may be inclined to "travel" to PhillyToDo.com if they're planning an upcoming trip to the City of Brotherly Love.

Buying Coffee Makers Online

Some really fascinating and counterintuitive things unfold when real worlds, virtual worlds, products, and information are all combined as part of an overall shopping option for consumers.

Let's dig into an example.

Specifically, let's consider what happens when a store offers you BOPS. Not sure that you want this painful-sounding service? Relax, it's just another retail acronym—it means "Buy Online, Pick up in Store." When a store offers BOPS, you can go online and check out, say, a new espresso maker or a duvet, buy it, and then wander by the store and pick it up from there.

Let's look at all the ways this option helps you. You can reduce your *search* friction because you know the price of the espresso machine, and you also know that it's in stock (if it wasn't in stock the store wouldn't give you the option of picking it up). On top of that, you don't have to deal with a major pain point of online shopping: waiting for that package to arrive with your new shoes, duvet, coffee machine, or what have you.

This is an important issue for shopping in the virtual world, so let's take a short detour and explore a key research finding. George Low-

enstein at Carnegie Mellon University conducted a clever study with a series of three experiments to measure just how annoying waiting is.[9]

The subjects in the experiments were exposed to hypothetical purchases of VCRs (remember them), gift certificates for restaurants, and gift certificates for local record shops (remember them as well?) and told that their purchases would be delivered to them in a set time period. Subjects in a "delay" condition were asked how much they would need to be compensated for the inconvenience of an unexpected two-day delay. Other subjects were told that their shipments could actually be expedited if they so desired. They were asked how much they would be willing to pay for the delivery to be expedited.

So, one group has to *be paid* for a two-day delay and another is *asked to pay* for a two-day speed up.

In each experiment, the subjects in the "delay" group wanted more compensation than those in the "expedited" group were willing to pay, even though the amount of time involved was *exactly the same* for both groups. This phenomenon was coined the "delay premium," and means that you and I need to be *paid more* to have to wait longer than expected, compared with how much we'd be *willing to pay* to shorten the wait time by the same amount.

So in some sense, BOPS gives you the best of both worlds (full information before purchase and no waiting for delivery, although you do of course have to stop by the store to pick the thing up). As a side note, *geographic* friction doesn't really apply in this example—to the extent that the store is at least offering you a decent selection of coffee machines and other products that you're interested in.[10]

Santiago Gallino at Dartmouth College and Toni Moreno at Northwestern University dug into the effect of BOPS and analyzed the sales

9 For details, see George F. Loewenstein, "Frames of Mind in Intertemporal Choice," *Management Science* 30, no. 2 (February 1988), 200–214. Some shoppers also take note of whether the prices they see in stores are favorable, compared with what they recall from their last shopping experience. When they are favorable, consumers accelerate their purchases, and when they're unfavorable, they delay them. For details, see David R. Bell and Randolph Bucklin, "The Role of Internal Reference Points in the Category Purchase Decision," *Journal of Consumer Research* 26, no. 2 (September 1999), 128–43.

10 Throughout the book I'll continue to use the term "geographic friction" to mean that a specific location is "trapping" customers by not giving them enough variety.

data for a major US retail chain specializing in housewares and with more than eighty stores.[11] One very nice feature of the study is that the chain had stores in both the United States and Canada, and the BOPS option was offered only to shoppers in the former. Gallino and Moreno could then see what happened to sales in the two countries—one that had BOPS and one that didn't.[12]

After BOPS was made available to US consumers, Moreno and Gallino expected to find that online sales in the States would go up. US shoppers should be much more willing to buy online now that they could do so without the downside of waiting for their stuff to arrive.

Surprisingly, that didn't happen—at all.

Online sales went *down*.

Yes, that's right. Online sales went *down*, even though website traffic went *up*.

So, what happened? Well, the explanation for this paradox relates to one final "friction" that applies when certain kinds of goods are available online.

I'll give the details in a moment but a little historical segue helps here.

In 1994 Jeff Bezos founded Amazon—arguably one of the most brilliant innovations in retail. (And I'm not just saying that because Amazon is publishing this book!) At that time, not much was being sold online at all; however, there had been a rather large catalog business in the United States for the best part of the past one hundred years.

So what product category, in 1994, was the leader in catalog sales? (Clue: it wasn't books.)

It was apparel.

Why didn't Jeff Bezos start selling apparel online at Amazon right off the bat? Because he realized that apparel might not be the best fit to the new medium of the Internet.

The reason?

Most of us like to try clothes on before buying them. Clothes have

11 Santiago Gallino and Toni Moreno, "Integration of Online and Offline Channels in Retail: The Impact of Sharing Reliable Inventory Information," *Management Science* (forthcoming).

12 This works as a sort of "natural experiment," in the sense that one group just so happened to experience something that the other did not. As such, it's an ideal approach for teasing out how particular interventions affect behavior or other outcomes. We will see a few more examples later in this chapter.

tactile, or "touch and feel," attributes that are hard to communicate online. Jeff Bezos rightly recognized that this would be a barrier to purchase, so he went way down to the twenty-fifth most popular product category sold at the time via catalogs: books. They were a perfect fit for the Internet. There is nothing about a book that you really need to touch and feel. If you know the price, the author, what it's about, and perhaps a bit of information from reviews, then you're good to go.

Now, back to the present.

Moreno and Gallino realized that the same kind of thing was happening with BOPS, since most of the products sold by the retailer they studied—housewares, home accessories, furniture, and related items—also had touch and feel attributes.[13]

Traffic at the website was up because shoppers could go online to get price and in-stock information before buying (the Internet had reduced their search friction), but they still wanted to turn on the coffee machine, sit on the sofa, or touch the duvet before buying.

So they didn't actually *buy* what they wanted online. Having confirmed the price and that the item was in stock, they went to the store to inspect the product. Hence, sales at the *store* went up.

The nice insight here is that the virtual world removed some of the frictions (i.e., knowledge of price and in-stock position) but not all of them. The real world still had a role to play because shoppers wanted to sample the products before buying them.

Nevertheless, BOPS was a great success because it led to—wait for it—ROPO (Research Online, Purchase Offline).

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13 Without wanting to confuse things, I should introduce a little more marketing terminology. This jargon is helpful for our discussion in this book and beyond, so please bear with me. Academics refer to three different kinds of products and product attributes: *search, experience,* and *credence*. The first term is a bit confusing, given the way we've already used "search," but here goes: A *search* good is one for which you know exactly what you are going to get, even before you buy it. Think of Dunkin' Donut's coffee. (Of course, this presumes that you've already purchased the coffee before in a real-world location.)You know how it will taste *before* you order it. There's no surprise. *Experience* goods on the other hand are those for which you don't really know what you're going to get until you start touching, feeling, or consuming them. Examples are men's suits and even MBA degrees. With *credence* goods, you often still don't know how you feel about them even *after* you've consumed them. Surgery and management consulting are examples. You paid for your surgery or consulting report, and yet you still don't know whether the surgery worked (although you might feel OK) or whether the advice was any good (although the consultants had fancy degrees and were always nicely dressed).

Amazon in the Virtual World Versus Booksellers in the Real World

Common occurrences when shopping for everyday products also afford us a nice window into how the real and virtual worlds interact. Most of us have bought a book from Amazon, and quite a few of us have shopped for books in a Walmart or a Barnes and Noble. So, imagine that you've been buying your books from Amazon and also that there are no physical bookstores near you. Now, let's see what might happen if Barnes and Noble suddenly opens a bookstore in your neighborhood just a few blocks away. Will your access to this new store change your book-buying habits on Amazon.com?

Well, for starters, you now might immediately be able to satisfy your craving to read. You can potentially get the book you want by just going down the street to the bookstore.

Researchers in the United States and Canada discovered there was a neat twist to how this happens.[14]

Say that you want a copy of *Harry Potter and the Sorcerer's Stone* to read on your Fourth of July vacation—you might now just go directly to Barnes and Noble to get it. As a result, Amazon.com starts to lose sales on *Harry Potter* in the zip codes around the area where the new store has opened. Again, because sales at physical stores are subject to commerical gravity, Amazon.com will *not* lose sales in zip codes that are more distant from the new store, since by definition they are outside the trading area for the store.

If your reading tastes lean a little more eclectic—say you want to read *Richie McCaw: The Open Side*—then Amazon.com isn't likely to suffer. This is because you're going to think twice about trudging to the store to buy this particular book.

Why the difference?

Well, when an item is as *popular* as the Harry Potter book most certainly is, then Barnes and Noble—a store with limited space—will make sure to stock it. Thanks to this fact, you can happily wander over to Barnes and Noble, safe in the knowledge that the book will almost

14 Chris Forman, Anindya Ghose, and Avi Goldfarb, "Competition Between Local and Electronic Markets: How the Benefit of Buying Online Depends on Where You Live," *Management Science* 55, no. 1 (January 2009), 47–57.

surely be available and that your craving to read it right away will be met.

When the item is rarer or a niche product (as a Kiwi, I can't bring myself to deem any book about our national game, rugby, or an All Black captain as "unpopular"), you'll make a different choice. You will (rightly) suspect that it's not really in the interests of the store to carry a book that doesn't have broad appeal. You're safe to bet that the product will *not* be available offline.

It will, however, probably be accessible from Amazon in a single click.

This is why sales of popular items at Amazon.com will go down in zip codes contained in the trading of the new store after it opens, but sales of niche items will not. Beyond this, Amazon's discounts will be less effective—Amazon has to do more to get your business once a physical competitor enters your market. Once again, the characteristics of the physical world have an important sway over shopping and selling in the virtual world.[15]

Gravity and "Cross-Border" Trade in Goods and Information

The Noble laureate and popular *New York Times* columnist Paul Krugman is a pioneer in the academic field of economic geography, and his core ideas are quite relevant for our discussion. A key one is that *international trade* between countries is shaped by gravitylike principles. (Yes, gravity again!)

Specifically, trade is *less* likely when countries are far apart and when their economies are of relatively disparate sizes. Trade is *more* likely between countries that are close geographically and similar in size economically.

15 As you might imagine, Amazon of course carries considerably more titles to begin with. Some researchers at MIT calculated that the entry of Amazon into the book market led to significant gains for consumers in terms of access to variety. See Erik Brynjolfsson, Jeffrey Hu, and Michael Smith, "Consumer Surplus in the Digital Economy: Estimating the Value of Increased Product Variety at Online Booksellers," *Management Science* 49, no. 1 (January 2003), 1580–96.

Again, this is largely due to frictions—New Zealand and the United States not only are far away from each other but also have very different size economies (the United States has the largest economy of any country; New Zealand is much further down on that list).[16]

There are generally significant *travel frictions* between the two countries, and greater disparities in business cultures among countries of disparate sizes. Thus, a simple application of commercial gravity suggests that there should be more trade between and Australia and New Zealand and between the United States and Canada than there is between the United States and New Zealand.

VIRTUAL-WORLD GRAVITY

It's pretty obvious that trade in physical goods, which have to be moved around, would be constrained somewhat by the distance between trading partners. And this is especially true for things that are heavy, bulky, expensive, and just plain hard to move. Researchers at the University of Chicago discovered a nice parallel fact when they looked at sales being transacted online.[17] They found that goods with a high value-to-weight ratio were the most likely candidates to be sold via e-commerce.

Now let's push our intuition a bit and try to imagine whether *virtual goods* would be affected by distance in the same way.

Why Americans Get Rugby News from South Africa and Pornography from Canada

Imagine that you live in Philadelphia and are interested in hardy sports. (If you live in Philadelphia, then you certainly need to be a hardy fan, given the typical performance of our pro teams.)

16 I am, however, happy to report that New Zealand is, according to the *Economist*, number one on the corruption index (i.e., the least corrupt country and, of course, less corrupt than neighboring Australia is).

17 Ethan Lieber and Chad Syverson, "Online Versus Offline Competition," in *The Oxford Handbook for the Digital Economy*, ed. Martin Peitz and Joel Waldfogel (New York: Oxford University Press, 2011), 189–223.

Let's say that you are interested in rugby in particular.

RugbyHeaven.com (hosted by the *Sydney Morning Herald*) is an option for content, as is Rugby365.com, based in Cape Town. Each site is just a click away, but Australia is a bit farther from the United States than South Africa is. So, to which site will you, our intrepid rugby lover, go?

Incredibly, it turns out that *content on the Internet is subject to the laws of gravity as well*, even though there are no apparent "travel costs." (Of course, we need to control for the obvious effect of language—even if you live in San Diego, you are unlikely to visit the website of the Spanish-language *El Sol de Tijuana* if the full extent of your Spanish is *Yo no hablo español.*)

A clever study by researchers in Canada examined this issue by looking at the country of origin of over nine thousand sites visited by US consumers. The sites were hosted in thirty-seven different countries—alphabetically from Australia to Slovakia (yes, New Zealand was included too)—and covered a range of different types of content, from software to games to music.

It may not come as a revelation to know that for fourteen of the thirty-seven countries, the most popular content category visited by US citizens was pornography! In fact, it was the *only* thing from Hungary, Indonesia, and Luxembourg that this particular sample of US surfers consumed.

Surprisingly, and counter to our likely instinct that distance should have no impact on consumption of content, the authors of the study found that, on average, for every 1 percent increase in the distance between the country that you live in and some foreign place, there's a corresponding 2 percent decrease in the chance that you will visit a site hosted in that country.[18] This effect of distance holds *after controlling for* (or eliminating) the effects of language differences and demographic factors.

Now, this average effect has some interesting nuances. When consumers have to pay for the content, information, or goods, the deterring effect of distance on "travel" to a foreign website for content strengthens to 2.7 percent; when these things are free, the deterring effect weakens

18 Bernado Blum and Avi Goldfarb, "Does the Internet Defy the Law of Gravity?" *Journal of International Economics* 70, no. 2 (December 2006), 384–405.

and declines to 1.1 percent. But perhaps the most interesting nuance is the difference between taste-dependent categories (gambling, games, music, and pornography) and non-taste-dependent categories (encyclopedias, software and technology information, and financial content).

For non-taste-dependent categories, distance doesn't matter at all; i.e., there is no statistically significant effect of distance on consumers' behavior. US consumers are just as happy getting financial information from Australia as they are getting it from South Africa.

Not so for taste-dependent categories, where the deterring effect of distance on "travel" to foreign websites is a whopping 3.5 percent for every 1 percent further the host country is from the US. Now in the interests of taste, I'll move away from pornography (the most popular category of foreign content overall for US citizens) and instead consider "rugby chat" as a cultural or taste-dependent product category for the purposes of an example to illustrate the point that I just made.

The distance between Philadelphia and Sydney is about 9,100 miles, and the distance between Philadelphia and Cape Town is about 7,800 miles. Getting to Sydney involves about 17% more distance to travel. So, whatever chance our Philly rugby fan has of going to Rugby365 .com (hosted in Cape Town, South Africa), he is more than 50 percent *less* likely to go RugbyHeaven.com (hosted in Sydney, Australia)! This is because Sydney is about 17 percent farther "away" and each percentage point reduces the likelihood by 3.5 percent, for a total of 51.5 percent.

What makes this so interesting is that there is literally no additional cost or travel time to clicking on a South African versus an Australian site about essentially the same thing.

The theory underlying this finding is that the closer that creators and users of content are to each other in the real world, the likelier they are to have similar interests or tastes. This means that the consumers of content—people like you and me—are more comfortable getting our content from sites hosted in places that are physically closer to us. Distance is a proxy for cultural similarity.

There's actually a nice parallel here to our "Folgers in San Francisco and Budweiser in St. Louis" story from the last chapter. There we learned that location matters a lot in our choice of undifferentiated products. And here we see that it seems to matter for content that is at least some-

what generic as well. Believe me, there isn't *that* much difference between the news at Rugby Heaven (www.smh.com.au/rugby-union) or at Rugby365, the South African–based site (www.rugby365.com/).

Even though the entire virtual world is now fully accessible to anyone with an Internet-enabled device, people who live in different places are, after all, still quite different in important ways. Culture and affinity affect the ways in which you and I search the virtual world.

So, there you have it.

Location and gravity matter even though the travel cost (in this case a few clicks) is, for all practical purposes, zero.

Washing Machines, Beer, and the Price of "Mesothelioma"

We've already seen that *what* you search for online, and *how often* you search, depends quite a lot on where you live. It turns out that what sellers are willing to pay to be noticed via online ads when we do these searches depends a lot on real-world factors too.

To get some feeling for this insight, let's reflect again on the real world. Many of us (myself included) are quite used to feeling the effect of local laws on our behavior. Local liquor laws, for example, can dictate whether you can buy alcohol on a Sunday, or whether you can get a beer from the supermarket.

If, like me, you live in a city like Philadelphia that charges sales taxes on white goods, you might drive elsewhere (Wilmington, Delaware, in my case) to buy your next washing machine or refrigerator. By doing so, you can save a few hundred dollars. You feel good about the money in your pocket—and perhaps also that you thwarted the (Tax) Man.

For years people have been doing this throughout the United States (and throughout the world in places where countries and states have conveniently traversable borders) and for all sorts of products. Beer is a notable category. Shoppers in Clarksville, Indiana, often cross the Ohio River on Sunday to buy cold beer in Louisville, Kentucky.[19]

19 "Indiana's Peculiar Liquor Laws May Drive You to Drink," editorial, *Indiana Star*, May 18, 2013, www.indystar.com/article/20130518/OPINION08/305180019/Editorial-Indiana-s-peculiar-liquor-laws-may-drive-you-drink.

Likewise, Diapers.com gets a boost in sales from locations with high offline sales taxes. The reason? Until recently, shoppers in many states could avoid paying taxes on online purchases. As a result, people living in those states with high offline taxes made relatively more online purchases.[20]

These examples and those of our earlier discussion highlight that there are times when each of us might free ourselves from the limits of our physical locations. And while these examples have focused on physical goods, we see similar patterns for content as well. If you've driven down Interstate 95 near Philadelphia recently (post May 2013) you might have seen a billboard for (855) U-CAN-SUE, hosted by the "Philly Legal Eagles."[21]

Now, what if the Legal Eagles were unable to place their sign on I-95? (Some might say that would be a good thing.) Let's say that the state did not allow lawyers to advertise. If they were barred from advertising offline in the real world, would they have to pay more online, in the virtual world, to position their business online to reach some aggrieved, would-be plaintiffs doing Google searches?

The answer is yes, they would.

Catherine Tucker from MIT and Avi Goldfarb from the University of Toronto looked into this issue. They examined how much sellers in different states (in this case attorneys) were willing to pay to bid on certain keywords to advertise their services. It just so happens that some states don't let lawyers "chase ambulances," i.e., try to contact people who have recently experienced a painful injury or a wrongful death in their immediate family.

Tucker and Goldfarb examined the prices bid for keywords in states in which direct solicitation (through offline mail, for example) by attorneys for personal injury or wrongful death suits was prohibited.[22] Then they compared the prices in these locations with the prices that were paid in states in which offline solicitation was allowed.

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20 Jeonghye Choi, David R. Bell and Leonard Lodish, "Traditional and IS-Enabled Customer Acquisition on the Internet," *Management Science*, 58, no. 4 (April 2012), 754–69.

21 "The Philly Legal Eagles, Rizio, Hamilton & Kane, P.C., Debuting New Billboard Location On I-95 May 13th," press release, PRWeb, May 9, 2013, http://www.prweb.com/releases/prweb2013/5/prweb10716174.htm.

22 Avi Goldfarb and Catherine Tucker, "Search Engine Advertising: Channel Substitution When Pricing Ads to Context," *Management Science* 57, no. 3 (March 2011), 458–70.

Sure enough, in states in which lawyers faced *offline* restrictions, sellers (lawyers) had to pay a lot more for terms like "car accident," "medical malpractice," and my all-time personal favorite, "mesothelioma."[23]

The overall price premium in those restricted states was perhaps 5 to 7 percent, which is really quite a lot. That is, attorneys would have to pay 5 to 7 percent more *online* for those words than they would have to pay in some *other* location where the offline billboards were allowed.

Inclement Weather, Social Networks, and WindSurfing in Switzerland

Academic creativity was running high when researchers at Columbia and Stanford Universities collaborated with a coauthor in St. Gallen, Switzerland, and became interested in understanding how a real-world phenomenon—changes in the weather—affected virtual-world activity (posting on blogs and social networks) and ultimately created value for sellers.[24]

The authors collected their data from Soulrider.com, a Swiss windsurfing and snowboarding website with over ten thousand members.[25] They found that the most blogging occurred at times and locations when there was more variation in wind speed in the real world—i.e., they found that a real-world phenomenon drove activity in the virtual one. The higher the speeds at a location, the more blogging that occurred at that location—so the geographic distributions of blogging and windspeeds were positively correlated. More than that, however, the authors found that social networks are subject to "network effects in content generation."

What does this mean, exactly?

This means that they found that this incremental blogging also led

23 This is often cited as one of the most expensive words one can bid on—costing up to $140 per click in some instances.

24 Scott Shriver, Harikesh Nair, and Reto Hofstetter, "Social Ties and User-Generated Content: Evidence from an Online Social Network," *Management Science* 59, no. 6 (June 2013), 1425–43.

25 As a former resident of New Zealand, a place with ample beaches that were immortalized in the movie *Endless Summer*, I feel it a bit hard to come to terms with "European surfing." Nevertheless, the insights from the study are worth knowing about!

to more friend requests, which in turn generated *more* blogging. So, if a given user generated more social connections, then that user would also generate more content. This creates a virtuous cycle of content creation and reciprocation, which can in turn increase the value of a social networking site (SNS).

While owners of an SNS can't control the wind, this finding is beneficial to sellers (in this case the owner of the SNS and the various clients who may want to advertise on it) because it clearly shows that events in the real world directly precipitate ties and content in the virtual one.

Summary

The real world puts obstacles in our way. Important information (e.g., about prices and product quality) can be hard to come by or costly to obtain, and not all products and services are offered in all locations. The virtual world helps us to overcome these search and geographic frictions, often eliminating them entirely. However, the Internet sometimes imposes frictions of its own—by making us wait for delivery of things bought online, or by making us uneasy about buying products with "touch and feel" components.

So, the real and virtual worlds compete with *and* complement each other. In the virtual world, you can get all the information you need about a great espresso machine for your home—you can check the price and see that it's in stock—but you still might want to visit a real-world store and "taste the coffee" before buying. You might begin your journey searching in the virtual world, and end it by shopping in the real one.

If you live in Philadelphia, you can get all the rugby news you want from either the Cape Town– or the Sydney-based website. Even though the "travel cost" of visiting either website is zero, you strongly prefer the former site because it's produced in a country that is closer to you. Among all the findings we've reviewed in this chapter, I find this especially intriguing. Gravity still holds sway over the way we consume *content and information goods* in the virtual world!

In chapters 1 (GEOGRAPHY) and 2 (RESISTANCE) we've laid the foundation for why the real world is so important and for why and how

the real and virtual worlds interact and compete to deliver goods, services, and information.

The key to overcoming resistance is to understand all the ways consumers are "frustrated by frictions." The next part of the book—section A-V-I—discusses how you and I learn about what's available virtually, how we affiliate with others online, and how we liberate ourselves from the deficiencies of our real-world locations.

Frictions frustrate in the real and virtual worlds—you'll succeed in both when you identify and eliminate them.