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Super-Economics Man! Using Superheroes to Teach Economics

People the world over are familiar with comic book heroes. These characters have been portrayed on pages, television and movie screens and even in song for decades. Comic storylines change as time marches on keeping them remarkably current, and characters are relaunched regularly so new readers can continually jump into the action. This heretofore untapped genre with extensive character development and complex plots is full of economic content. Using superheroes to illustrate economic concepts expands the educator's tool bag for students in the K-12 space but certainly applies to undergraduates in a variety of classes as well. This paper will use superheroes to discuss several different topics including scarcity, opportunity costs, specialization, public goods, moral hazard, production functions, and utility.

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1. Introduction

Superheroes have undergone a renaissance since 2000 when the first X-Men movie premiered.[1] Movies showcasing Batman, Superman and Spiderman, along with slightly less prominent personas such as Ironman, Captain America, Ant Man and Dr. Strange have raked in tens of billions of dollars. According to the Motion Picture Association of America, since 2013, at least one film featuring comic book characters has been in the year's top three box office earners, and in 2013, and 2014, Iron Man 3, and Guardians of the Galaxy were the top earning movies (Motion Picture Association of America, 2014; 2015). Television shows based on superheroes, both live action and animated, are watched by millions on a weekly basis. These characters, born from humble comic book origins, have fired imaginations, sparked industries and generated legions of fans, many of whom are in the high school- and college-age demographic.

Graphic Policy, a website devoted to the comic industry, provides monthly demographics on comic fans collected through Facebook. Collecting data on users who "like" comics or graphic novels yielded a sample of 36 million users, nine million of whom were 21 years old or younger. Another nine million were between the ages of 22 and 25. Of these, the gender breakdown was 59 percent male and 41 percent female. Fifteen million likes came from college graduates, and another 2.2 million from currently enrolled college students (Schenker, 2016).[2] Boopsie, a mobile platform developer for libraries, reporting on the holdings of public libraries, found that 98 percent of public libraries have graphic novels or comics in their collections (Boopsie, Inc., 2017). Of these libraries, 67 percent state that their acquisition of these materials came as a result of patron demand, and 54 percent of borrowers of these materials were between the ages of 10 and 18. As a further signal of the popularity of comics, the annual ComicCon comic and science fiction convention in San Diego, California, which in 2000 sold 50,000 passes, now regularly sells out more than 130,000 passes in hours and is the largest convention in San Diego every year. In short, superheroes are big business and among those following some manifestation of the genre are our students.

While much of what happens in superhero storylines is predictable, the path of the superhero is filled with choices, trade-offs and strategies. Add to this the richness of the hundreds of characters who fill the pages of comics and the celluloid of video and you have fertile ground for teaching economics. The objective of the paper is not necessarily to explain the behavior of heroes or villains, although that sometimes flows out of the analysis. Rather, the goal is to illustrate how economic concepts are related to the culture outside the classroom. This paper will explore how superhero stories address basic concepts like scarcity, specialization and opportunity cost, along with more advanced notions of public goods, production functions, and utility.

A practical question is into whose classroom do superheroes fit? Comics are typically labelled as juvenile. As such, the assumption that they would only appeal to a K-12 curriculum is understandable. However, based on the demographics noted earlier, the college-age population is a large part of the superhero fan base, and as fans they are quick to warm up to these examples making them compatible with principles classes as well.

1 Though some might go back as far as 1989 when the relaunch of the Batman franchise began, the premiere of the X-Men launched a small frenzy of superhero based films. In 2002, Spiderman appeared in theaters followed in 2003 by Daredevil, the Hulk, and a second X-Men movie.

2 Due to parental limitations, it is presumed that those under the age of 16 are underrepresented in Facebook data.

2. Literature Review

Advocates for expanding the teaching tool bag, notably Becker (2000), Tinari and Khandke (2000), and Watts and Becker (2008) have implored the discipline to teach outside the constraints of chalk and talk and some have heeded the call. A rich literature has evolved showing how movies and television clips can be a useful tool for educators. Leet and Houser (2003), Mateer (2005), Sexton (2006), Mateer and Li (2008), Moulder (2009), Mixon (2010), Luccasson and Thomas (2010), Mateer, Ghent, and Stone (2011), Ghent, Grant, and Lesica (2011), Mateer and Stephenson (2011), Mateer, O'Roark, and Holder (2016), and Tierney, Mateer, Smith, Wooten, and Geerling (2016) provide pedagogical approaches and examples that integrate video media into the economics classroom.

The written word has a lot to offer as well. Some authors have taken to the supernatural. Wight's (2002) novel Saving Adam Smith, imagines how the spirit of Smith would view the modern world both in terms of economics and ethics. Miller and Felton (2002) provide examples of economic ideas in Greek mythology. Their focus is on how theories of truth inducement and separating equilibrium are used to teach game theory. As the authors note, students "find a good story far more interesting than an elegant theorem" (p. 77). This perspective seems to be particularly relevant in the efforts of others. One of the more ingenious applications of economics in fiction is Rockoff's (1990) evaluation of The Wizard of Oz as an allegory of bimetallism.[3] More recently, Deyo and Podemska-Mikluch (2013) have applied economic thinking to the world of Harry Potter.

Not to be left out, dystopian stories have been used to show the connection between economics and literature. Cleveland, Holder, and O'Roark (2016) turned to The Hunger Games to illustrate how a series of economic concepts including production possibilities, comparative advantage, the role of institutions, and income inequality, are part of this post-apocalyptic world. Roback (1985), Resch (1997), and Hamlen (2000) focus on the dystopian works of Orwell, zeroing in on the role of government and the free market, or lack thereof. Raj and Prayer (2012), calling Dickens' Hard Times a dystopian novel, explains the failures of Utilitarian philosophy.

Particularly relevant to this discussion of superheroes, Luccasson, Hammock, and Thomas (2011) examine the impact of cartoons in the classroom. They use four cartoon shows to illustrate concepts in principles of macroeconomics. In another cartoon-based analysis, Miller and Watts (2011) focus on the economics in Dr. Seuss stories. One of the more popular uses of cartoons to illustrate academic ideas is the wide-ranging dependency on The Simpsons. This cartoon family has been used to teach psychology (Brown & Logan, 2006), physics (Halpern, 2007) and religion (Pinsky, 2001) as well as economics (Hall, 2014).

One of the advantages of characters like those in The Simpsons and Dr. Seuss, is the great familiarity bred by longevity. Superheroes are much longer lived than Homer Simpson and his family, and more well-known world-wide than Dr. Seuss, making it surprising that no one has written about how to use them in a class. Familiarity with characters and conditions means a greater likelihood of connecting with students. This is the problem with some of the research in this review. Eventually shows are cancelled and fade from memory and some movies are no longer watched by younger viewers. Similarly, books become dated. The benefit of superheroes is that they live on, changing as the culture changes, making them a durable tool for teaching.

3 While Hansen (2002) disputes Rockoff's position claiming L. Frank Baum, author of The Wizard of Oz, was not sympathetic to populist themes, the economic link to The Wizard of Oz is an alluring one.

3. The Superhero World

Summarizing the superhero world in any detail would require far more space than will be given here. For instance, characters are regularly rebooted resulting in multiple storylines for major characters. Some heroes are killed off or lost to alternative dimensions to be replaced by some other incarnation.[4] The good guys don't always remain that way (don't bring up Hal Jordan – the Green Lantern – turning evil with a fan[5]), and neither do villains (Lex Luthor joined the Justice League in a 2014 story arc[6]). Nevertheless, there are some aspects that must be clearly established to set the stage for understanding the economics inherent in superhero stories.

The superhero type of comic book began in 1938 with the appearance of Superman in Action Comics #1. Prior to this the Shadow provided a masked man and Flash Gordon displayed extreme courage fighting battles in outer space, but the "Man of Steel" trumped them with his superhuman ability. It is here where a critical division within the superhero world develops. One group of superheroes possess skills acquired as a result of a change in their physical nature. Some heroes have alien origins, others are demi-gods, while others gained their powers from a science experiment gone wrong. The other group of heroes are decidedly human. Typically rich with limitless funds, they experience some tragedy in their lives and subsequently develop a specific skill set or adopt a futuristic technology. Matched with uncanny intellect, they defend those unable to defend themselves. Table 1 contains a list of some of the heroes who fall into each category.

Despite the intricacy of the superhero oeuvre, most stories center on the theme of good versus evil. Consider the primary job of a superhero. They are there to protect those weaker than themselves. The big-name heroes have a clear-cut purpose summed up in a motto Superman is out to defend "truth, justice and the American way." Spiderman knows that "with great power comes great responsibility." Batman is more loquacious, saying "I made a promise on the grave of my parents that I would rid this city of the evil that took their lives. By day, I am Bruce Wayne, billionaire philanthropist. At night, criminals, a cowardly and superstitious lot, call me... Batman." The X-Men are more direct. They are "sworn to protect a world that hates and fears them." Superheroes are part of a system that was a scary place at the time of their conception, the late 1930s through the 1940s. They were created to bring order and protect the law abiding. In essence, they exist to defend life, liberty and property. Yet, they do so in an outsized and dramatic way.

With this short primer, let's begin looking at how these fictional creations can be used to teach economics; but first, a word of caution is in order. Using these characters in class may seem daunting. If you aren't a comic book aficionado, or you have students who are immersed in the genre, they might call you out on some minor details or bog the class down with questions. Therefore, it is recommended that you use these ideas with restraint. General application is better than specific, unless you really know your stuff. That being said, even a rudimentary knowledge of the superhero world can provide excellent examples and enliven your classes.

4 For example, there have been at least three characters to take the name "The Flash," along with a couple of kid Flashes, a reverse Flash and a lady Flash.

5 See "Green Lantern: Emerald Twilight," (Marz, 1994), Green Lantern, Volume 3, Numbers 48-50 as a starting point.

6 See "Justice League: Injustice League," (Johns, 2014), Justice League, Volume 1, Numbers 30-39.

Table 1 – Superhero Classifications

Supernatural Superheroes	
ALIEN:	• Hawkgirl • Martian Manhunter • Silver Surfer • Superman
EXPERIMENT:	• Captain America • Dr. Manhattan • The Fantastic Four • Flash • Hulk • Sentry • Spiderman
GODS:	• Thor • Wonder Woman
MAGIC:	• Captain Marvel • Dr. Strange
MUTANT:	• Aquaman • Black Bolt • Colossus • Deadpool • Scarlet Witch • Wolverine • X-Men
Human Capital Heroes	
	• Ant Man • Batman • Green Arrow • Green Hornet • Green Lantern • Iron Man • Nightwing • The Punisher

4. Economic Topics

Before getting to the topics, it might be useful to understand how these examples can be implemented. There are, of course, multiple ways to do this and I have provided a list of locations for material discussed below in Appendix A. Film clips can be used prior to or after the introduction of a topic to illustrate ideas and provide a launching point for discussions. A brief introduction to the topic might be useful so that students know what they are looking for. Using the clips after presenting the topic can be coupled with a question asking students to note how a concept was displayed in a scene. Another option would be to have students watch a clip outside of class and come prepared with suggestions of the economic concepts that appear in the video.

Copies of scenes from comic books are also good sources of content. Particular scenes can illustrate concepts extremely well and a Google search will often provide you with a rendering of a comic book page. The useful site readcomiconline.to provides access to full comic books online as well. Providing a scene and then asking students to identify the economic ideas present is a way for students to apply what they have learned.

A final approach is to ask students to create their own superhero. I have used this as an extra credit assignment where students must provide an economic-inspired name for their hero along with what superpowers the hero would possess. A brief backstory of how the hero acquired their powers and a credo to accompany the hero are also required. Students often will create an arch-nemesis for the hero, also with an economic name. Of course, this assignment could be expanded to include any other hero-related accoutrements.[7]

A. Scarcity

One of the great allures of superheroes for readers is that they have powers or skills that allow them to overcome the natural limitations of humans. In the Flash, we see that time and travel constraints can be reduced. For the Hulk, there is nothing that can't be lifted, moved, or thrown out of the way. Wolverine's quick-healing abilities allow him to overcome physical limitations brought on by injury or illness.

Nevertheless, there are still curbs on heroes. In a world of superhuman ability, sometimes heroes must face the facts that scarcity still exists. In some cases, the storyline is advanced by considering scarcity; in other cases, the story moves along because writers navigate around the issue of scarcity. So how do superheroes deal with scarcity? Superheroes could simply take what they want. Their powers allow them to do this. But even the most marginal of hero does not cross that line. One way they deal with these things is to get a job. Clark Kent (Superman) and Peter Parker (Spiderman) work in journalism. Barry Allen (the Flash) is a crime scene investigator. Matt Murdock (Daredevil) is a lawyer.

Yet some heroes are poor in part because of their superpowers. In the Hulk television series that ran from 1978 through 1982, David Banner[8] lives in a near destitute state, wandering from place to place working odd jobs while trying to avoid an intrepid reported and discover a cure

7 There is actually an economic sounding villain in the comic Astro City called The Black Marketeer. He engages in a lot of black market arms trading.

8 The television show changed the name of the Hulk's alter ego to David because David Banner sounded less campy than Bruce Banner, which is the name of the doctor who becomes the Hulk in the comics.

for his condition. Being the Hulk means he can't hold a job, relegating him to live on the outskirts of civilization for everyone else's safety. Peter Parker may have a job, but he doesn't make much money and even gets fired in one issue (Waid and Peyer, 2010). Therefore, in some cases, superheroes don't deal with scarcity very well. They can overpower bad guys, but because they choose not to use their powers for personal gain, they remain poor.

To avoid the problem of scarcity, some superheroes are placed by the writers in situations where they have almost limitless resources. Batman's and Green Arrow's personal fortunes provide them access to a plethora of technological gadgets, surveillance, research, and weapons allowing them to fight crime so successfully one might wonder why criminals try at all. Similarly, Xavier's School for Gifted and Talented Youngsters (the home of the X-Men) offers guidance and opportunities to aspiring mutants. Resource scarcity, financial or technological, is not a barrier for the X-Men.

Avoiding issues of scarcity is also apparent in the construction of hero headquarters. From Superman's Fortress of Solitude, to the Batcave, to the Justice League's Watchtower space station, the limitations faced by mortals are not an issue. Alien technologies, super powers, and large cash reserves allow heroes to construct awesome hideouts. Yet consider why heroes need a place to get away. Privacy is scarce. This explains in part why heroes wear masks. The secret identity is perhaps the most scarce resource in the comic book world.

Scarcity isn't just about money though. Deadpool is variously poor and rich, but after hitting it rich, Deadpool finds his ability to help people is limited so he hires six mercenaries to dress up like him and provide hero services. "Heroes for Hire" (Duggan, 2016a-d) illustrates a way to deal with Deadpool's scarce time.[9]

B. Opportunity Costs

Superheroes are followed as much for their humanity and the choices they struggle with as for their powers. While those powers allow the heroes to surmount some limitations, they are often faced with other dilemmas on a grander scale. Being a hero isn't always what it's cracked up to be. It can be lonely because relationships are threats that could be exploited by villains. Professional advancement is often sacrificed. Sometimes impossible choices need to be made. Occasionally, we see heroes give up and, at least temporarily, throw the costume away. In short, there are a lot of opportunity costs to being a superhero.

Relationships between heroes and non-heroes are difficult. The desire to keep an identity secret and to not give villains an opening is weighed against the desire to have a personal life. Nearly all heroes fall in love at some point and have to consider the ramifications of continuing the relationship versus being a hero. In some cases the relationship wins out and the hero gives up the costume. For instance, Green Lantern quits the Green Lantern Corps because he can't be near the woman he loves (Wein, 1984).

Another sacrifice comes on the professional front. Clark Kent, Peter Parker, and Barry Allen are constantly at risk of losing their jobs because of disappearances at key moments. The Daredevil series on Netflix illustrates the opportunity costs of Matt Murdock, a blind lawyer, trying to make the Hell's Kitchen area of New York City a better place (Goddard, 2015). By day, he tries

9 Incidentally, "Heroes for Hire" was trademarked by Luke Cage, aka Power Fist, so Deadpool has to change the name of his business to "Mercs for Money."

cases for low income defendants. By night, he cleans up the streets. Each of these characters would be a superior journalist, crime solving specialist, or lawyer, but they can't rise through the ranks due to the conflict between work and being a hero.

The quintessential example of a hero facing the pain of a choice is shown when they decide to quit. Sometimes the pressures of the job are just too much. Most of the big-name heroes have quit at one time or another. In the case of Wonder Woman, she leaves "man's world" and returns to Paradise Island (Conway, 1980). Iron Man (a.k.a. Tony Stark) is worried about his health and quits (Goodwin, 1970). Peter Parker decides that college life is better than web-slinging and literally cans his Spidey suit (Lee, 1967). Superman leaves earth, flies to another planet, and becomes a scientist (Bates, 1967). These situations show that heroes have alternatives and the next best choice is sometimes more attractive than continuing on as the hero.

Some of the most dramatic scenes in the movies involve impossible choices. Villains propose no-win situations for heroes in many of the comic based films. In the first series of Spiderman movies (Raimi, 2002), Spidey is presented with the choice of saving his girlfriend or a cable car full of schoolchildren. Goblin's "sadistic choice" clearly presents an opportunity cost for the friendly, neighborhood Spiderman. Batman is presented with a similar scenario in the movie The Dark Knight (Nolan, 2008) when he is forced to choose between saving the woman he loves (Rachel) and the district attorney for Gotham City. Unfortunately, these choices sometimes create unintended consequences as the district attorney saved by Batman becomes the villain Two-Face and blames Batman for the death of Rachel.[10]

C. Specialization

Even a short investigation of superheroes reveals many more than the average man on the street might be able to name. There are many hundreds of heroes who have graced the pages of comic books over the years. A reasonable question is why? The cynical answer is that the comics have attempted to pack the consumer space. In a competitive world of comic book stories, you want to capture every angle. However, assuming the best motivations of story tellers, it might just be that a balance of skills helps fight the bad guys in the world of heroes.

A list of superhero abilities would include such things as speed, strength, smarts, healing power, the ability to fly, invisibility, super senses, and transfiguration. While some characters have combinations of these and other powers, no hero has them all. Very few superheroes are like Superman who does everything well. He is fast, strong, smart, and he can fly. Most heroes have a particular skill they are noted for and defeat criminals in their own way. You wouldn't want the Punisher in the ocean; after all, he isn't much of a swimmer compared to Aquaman. If you want a mind reader, you call Martian Manhunter, not Hawkgirl.

As a result, specialization can be used to explain why super heroes find it advantageous to form organizations. Why, would Superman join the Justice League? Since most heroes are gifted in particular ways, even the mightiest and most productive can benefit from specializing in the work for which they have a comparative advantage. At least from time to time.

10 In the movie, the Joker gives Batman bad information about who is trapped where. Given his preferences, Batman would have saved Rachel.

D. Public Goods and Other Problems

Most heroes would never consider charging for their services. One of the problems in doing so is when would you collect? Can you negotiate a price when time is of the essence? The hero has no bargaining power once the saving is complete. Add to this the great codes of the heroes. For those looking to do good, asking for a fee seems unsavory. Deadpool's "Heroes for Hire" make readers cringe because of the perception that a hero is asking to be paid to save someone (Duggan, 2016b, p. 4). Hero work is more akin to the fire department than to going to a restaurant. Charging for the service would put people at risk while the negotiations over price take place. Additionally, the demand for the service at the time it is needed is very inelastic. So, how do heroes respond? They usually just nod and say, "Just doing my job, ma'am."

Heroes are essentially providing public goods. The actions of heroes are both non-excludable and non-rival in consumption. If Silver Surfer stops an alien invasion, thereby saving the people of earth from a life of servitude, he can't exclude those who think Silver Surfer should not be on Earth in the first place. Silver Surfer's actions are non-excludable. Furthermore, everyone on Earth benefits at the same level as everyone else. These actions are non-rival. On a scaled down version of this, when Ant Man reduces crime in his city, or when Nightwing stops a jewel heist, the reduction in crime benefits the entire city and everyone, save the criminal, is made better off.

This raises a critical issue. To what extent do superheroes take responsibility for negative externalities? This is a curious problem for heroes. When they battle villains to save the city or the world, there tends to be a lot of destruction. This is a motivating factor for bringing Superman out of retirement in the graphic novel Kingdom Come (Waid, 1996). A younger generation of heroes and villains is wreaking havoc around the world. They battle each other while civilians suffer the consequences, evoking the comment from the narrator that "they're ready to battle over territory – without bothering to care who's caught between them!" (p. 62). A lot of property is destroyed, and in some cases lives are lost. An interesting question to pose to students is how to internalize those externalities.

One way to internalize the externalities would be to create a system of accountability. We get glimpses of this in The Dark Knight Returns when Superman makes a deal with the President of the United States (Miller, 2016). Superman explains that, "They gave me license and let us live. No, I don't like it, but I get to save lives" (p. 132). In Marvel's Civil War (Miller, 2007) The Avengers go to war to determine how much freedom they will give up. Some superheroes accept a degree of regulation to limit their activities; otherwise, the revolt of the population would be the cost paid.

Other problems arise in the comic book world, ones that are particularly economic in nature. One of those is the tragedy of the commons. The commons problem is solved by assigning property rights, but who owns something like the ocean? Aquaman "claims the oceans as his domain" (Abnett, 2016, p.2) and views himself as the "protector of the oceans as a whole" (p. 3). Aquaman is constantly plagued with how best to balance the interests of the underwater kingdom of Atlantis with those of the surface dwellers. Nevertheless, it is clear he takes his role of the protector of the oceans very seriously. He is an environmentalist to be sure, but as an invested protector of the oceans, Aquaman has the incentive to protect fish populations and prevent polluting activities. The natural question for students is how an owner of the oceans, someone like Aquaman, changes the dynamic of environmental protection.

Finally, the moral hazard problem is addressed in comics. This arises in the graphic novel Red Son (Millar, 2014). This alternate reality poses the question of what would have happened

if Superman had landed in communist Russia instead of Kansas. One of the outcomes is that accidental deaths in Russia plummet. Superman, unencumbered by privacy concerns, scans the country to prevent fatalities. Superman notes that "nobody wears a seatbelt anymore. Ships have even stopped carrying life jackets. I don't like the unhealthy new way that people are behaving" (p. 64). If superheroes are always going to prevent untimely accidents, why not take more risks? It is like having free insurance, but no real freedom. Superman concludes by noting "the K.G.B. are always pushing me to take more and more control, but I already feel like I'm holding on too tight" (p. 64). Near the end of the novel, we find out that there is no crime, no unemployment, everyone is getting eight hours of sleep a night, and no one complains – "even in private" (p. 96).

E. Production Functions

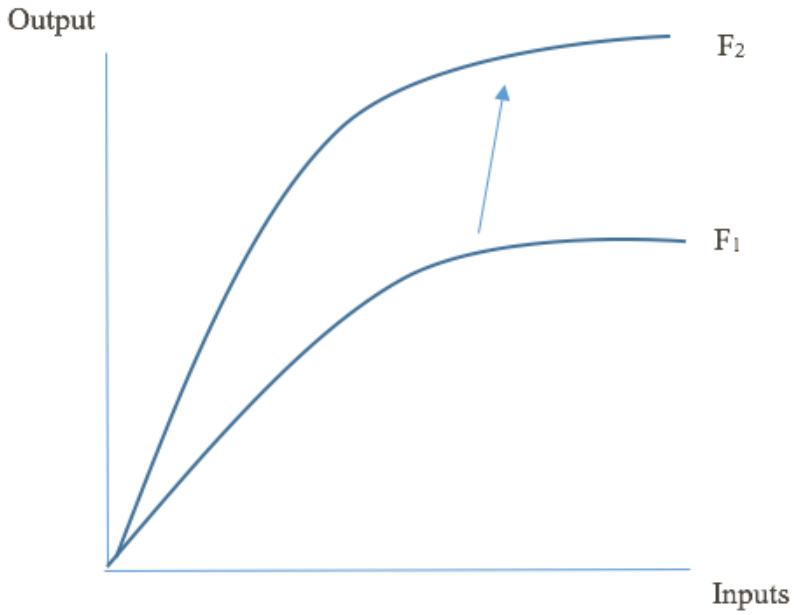
What would a world of superheroes look like? One of the fantasies of being a superhero is having a specific superpower, a skill that allows you to be better than you are. From an economic perspective, you essentially become more productive. To illustrate how much more productive superheroes are than say, the police, you can explore the production function of criminal apprehension. Rather than looking at how many widgets you produce you can show how quickly a superhero captures the small-time crooks, or how the city the hero is defending pulls back from the brink.

Consider the pre-hero state of Captain America, the Fantastic Four, the Hulk, or any hero who got their powers through an experiment or accident. In the origin stories of these characters, you can see their mystification as they learn about their powers. Now they can accomplish things they never could before. In some cases, like Peter Parker and Barry Allen, these powers help them to perform their existing jobs better. For heroes like the Green Hornet or Iron Man, who are helped not by mutation or alien powers but by skill development or scientific advances, we see them able to accomplish greater feats than the average human. These changes, skills, and tools all cause shifts in the individuals' production functions.

In Figure 1, the production function of a representative superhero is shown shifting upwards from F1 to F2. This is akin to a change in technology. Heroes can do certain things prior to becoming super with a given amount of inputs, but when they acquire powers the output they can produce, whether it be in catching criminals, solving problems, or even getting groceries, increases substantially. Superheroes are eventually limited by something – it appears most need to sleep and eat – so fighting crime eventually takes its toll on them. Production doesn't grow exponentially forever because there are diminishing returns, but when it reaches a steady state it does so at a much higher level.

This can be extended to macro models of growth. Consider if everyone on the planet gained a super power. The output of the world's economy would change dramatically. A discussion of what this means might center on whether the sudden granting of such powers changes the level of GDP or its rate of growth.

Figure 1 – Production Function of a Superhero



F. Utility

At some point the question should be asked: Why do these humans with superhuman powers choose to be good at all? Lord Acton's precept that absolute power corrupts absolutely seems completely relevant here. These characters have powers that enable them to take over cities and nations, yet they remain ready to fight evil and defend the helpless. For some, there is mortal danger involved. For most, as noted earlier, there is personal sacrifice. For still others, there is no connection to the people of Earth. Brenzel (2008) notes that "to be a plausible character at all, the super-powered individual must choose to be good, and must go on being good in some broadly recognizable way" (p. 149).

Layman (2008) offers an interesting twist on Spiderman's credo. He suggests that it could be "With great power comes great personal satisfaction" (p. 195). Powers certainly could be used to help yourself, your friends and your family, and harm those who get in your way. But heroes don't do that. Why not? A series of essays deals with superheroes and philosophy, where the question of superhero morality is debated. In economics, we have another explanation for why superheroes are good: utility.

Layman goes on to suggest that one reason to be good is to avoid unintended consequences. Another is captured in an exchange between Spiderman and the Green Goblin. The Goblin asks Spiderman why he bothers trying to protect people who hate him. The reply is that it is the right thing to do (Raimi, 2002). Another theory Layman proffers is that that being good brings peace of mind. He also suggests that being good pays off in the long run. Waid (2008) though provides what might be the best insight as he discusses the motivation of Superman. He says that by being heroic, Superman is "acting in his own self-interest" (p. 10). Regardless of why they do it, superheroes receive a benefit beyond any gratification the public might bestow.

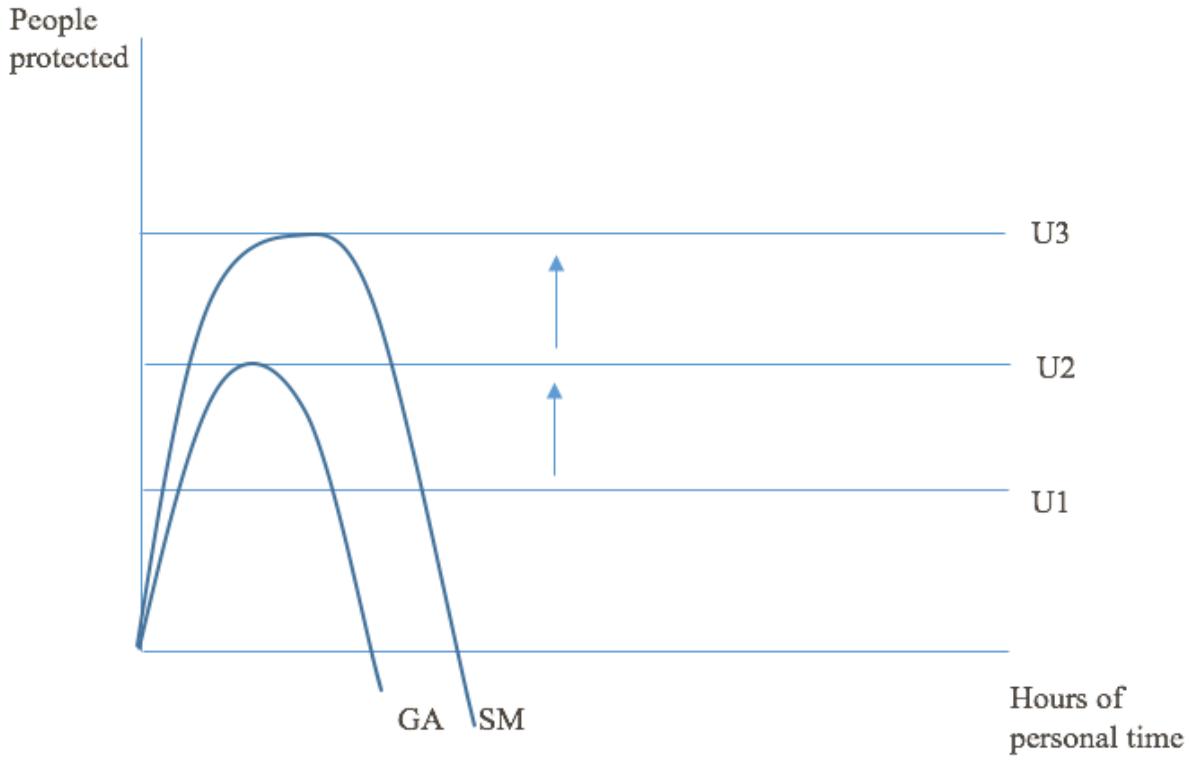
They do it because it is part of their being and to not act heroically would yield less happiness.

This question of motivation allows us to develop a set of utility curves for superheroes and perhaps answer why one hero is thought of as greater than another. The indifference curves for a typical superhero are flat, as shown in Figure 2. The hero would love to have a better personal life, that is be further to the right on the horizontal axis; however, given a predilection to heroic deeds, a hero won't trade crime fighting for a content personal life. The indifference curves are mapped upwards, so that the preferred line is higher, regardless of how much of a personal life is possible. Bundles on U2 are preferred to those on U1, and those on U3 are preferred to those on U2.

To find an optimal personal life, we need some sort of constraint. Rather than a budget constraint, there is a physical constraint. Heroes want to do as much as they can; however, their ability to do so is subject to some physical limitations. Heroes must recover at some point. Nevertheless, they try to protect as many people from the criminals who prowl about as possible. To determine the optimum point where the hero reaches the highest indifference curve, we locate where the constraint is tangent to the indifference curve.

This optimization problem helps us address an age-old question of who is the greatest superhero. The answer is the one who can reach the highest utility curve. Figure 2 compares two heroes: Superman and Green Arrow. Green Arrow has more physical limitations than the Man of Steel. This means that his optimum point occurs on U2. Superman's constraint shown in Figure 2 is labelled SM, while Arrow's is labelled GA. While neither of them has a lot of downtime, Superman saves more people than Green Arrow because he reaches U3. Based on this, we can reach the conclusion that Green Arrow isn't as great a hero as Superman.

Figure 2 – Utility maximization for a Superhero



G. Duopoly

Perhaps using superheroes still seems daunting and out of your comfort zone. Nevertheless, the comic industry itself provides an example that requires no knowledge of any of the characters or story arcs. In the comic world, a near duopoly controls the content side of the market. The most familiar hero names come from one of two sources, yet, they will never team up with each other or face the others' villains. DC Comics, most famously the home of Superman, Batman, the Flash, Green Lantern, Wonder Woman, and Aquaman, competes against the Disney owned Marvel comics, hosting the likes of Spiderman, Ironman, Captain America, the Hulk, the Fantastic Four, and the X-Men. Diamond Comic Distributors' data for comic sales reports that DC and Marvel accounted for 69.2 percent of sales in 2015 (Diamond Comic Distributors, 2016). Other, smaller companies exist at the margin, providing interesting storylines and content, but two firms dominate the market. If nothing else, knowing something about the comic industry can provide you with an alternative example when discussing duopolies.

5. Conclusion

Superheroes have stood the test of time. The storylines of good versus evil and the major players are familiar to students of all ages and nationalities, making them valuable tools for presenting economic concepts. Further, teachers who invest in teaching these storylines know that their lessons won't become dated – no need to replace television or movie clips that haven't aged well – which means greater benefits from using superheroes in lessons. For these reasons, teachers should considering implementing economic examples that use superheroes.

Superhero stories are also worthwhile for teaching because of the vast number of concepts that can be drawn from the relationships and situations in which heroes find themselves. This paper has addressed a number of topics but there are many more still to be explored. The labor-leisure trade off could be illustrated in a labor economics class. How do superheroes optimally divide their time? Additionally, an examination of how the supply of superheroes affects the number of police in a city could be undertaken. Perhaps heroes drive up the unemployment rate. Is it possible that heroes compete against each other in the market for crime fighting services? Like a street performer, could it be that too many superheroes in a geographic location drive someone out of business? There is certainly game theoretic logic behind the battles between the heroes themselves. Exploring the literature on the economics of crime could help explain why criminals in the world of superheroes keep trying to get away with things. This vast trove of characters provides an almost limitless number of fun, engaging examples for teaching economics. The sky is the limit. Up-up and away!

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Appendix A – Source Material

Topic	Source	Location
Externalities	Kingdom Come (1996)	Chapter 1, Graphic novel, published by DC Comics
Moral hazard	Red Son (2003)	Graphic novel, published by DC Comics
Opportunity cost	The Dark Knight (2008)	https://www.youtube.com/watch?v=c-Dqf6Ptjoo
Opportunity cost	Spiderman (2002)	https://www.youtube.com/watch?v=2taWpKv6C-DQ
Opportunity cost	Daredevil	Netflix series
Scarcity (also a good source for profits and losses)	Deadpool (2016)	Issues 1-4, published by Marvel Comics
Tragedy of the Commons	Aquaman: Re-birth (2016)	Issue 1, published by DC Comics
Utility	Spiderman (2002)	https://www.youtube.com/watch?v=vng-1P29QbX4