Economics 312
Urban Land Economics
Introduction

Martin Farnham
University of Victoria
Spring 2018
Some topics will we study in Econ 312

• Why do cities form?
  – Why don’t we all just spread out nicely and live on a couple acres of land each? Why do we crowd together to endure pollution, congestion, disease, and high rents?

• What causes cities to rise and fall?
  – Why is Vancouver a world-class city?
  – Why is Detroit a basket case?

• What determines land prices?

• What determines land-use patterns?
  – Unlike most econ topics, there is a strong spatial component to 312. Where production happens matters.
Some topics will we study in Urban Land Economics (cont)

• What are some urban problems and why do they arise?
  – Poverty
  – Crime
  – Congestion
  – Pollution
  – Sprawl
  – Homelessness

• What policies can be used to address urban problems (which work, which don’t)?
Course logistics

Professor: Martin Farnham
mfarnham@uvic.ca
BEC 354
Office Hours: Fri 11:30-1:00

There is no TA for the course.
Course logistics (cont)

• Evaluation
  – Midterm 1, 25% (Friday Feb 2, in class)
  – Midterm 2, 25% (Fri Mar 2, in class)
  – Final Exam 50% (details TBA)

• Required Text: Glaeser “Triumph of the City”
  – Optional Text: O’Sullivan “Urban Economics” 7th Ed

• Assignments
  – Ungraded problem sets
  – Readings from text or elsewhere
Course Logistics (cont)

• See department policies listed in course outline.

• Read course outline (on course website) for additional policies [http://web.uvic.ca/~mfarnham/312.htm](http://web.uvic.ca/~mfarnham/312.htm)
Course logistics (cont)

• Attendance
  – If you don’t sign the attendance sheet in the first three lectures, automatically dropped (notify me of intent to stay in course if you miss lectures)
  – Technically attendance not required; however, strongly recommended.
  – You are responsible for anything you miss; if you miss a lecture ask someone else what you missed
  – Lecture notes posted on course website but notes aren’t necessarily complete (e.g. they don’t cover all digressions, discussions from lecture)
A note on email etiquette

• Please don’t email me about
  – Information available elsewhere (course website, course outline, etc.)
  – What you missed if you skipped a lecture
  – What’s going to be on an exam
  – Things you could ask me in office hours
  – I ignore emails that I deem inappropriate

• Please use the standard letter format
  – Sign your email
  – Don’t use text message abbreviations (I won’t understand them!)
How to succeed in Econ 312

• Do readings, keep good notes
• Use office hours (I don’t bite)
• Think!
• MOST importantly, do problem sets carefully and thoroughly
• Your brain changes when you think carefully about things
  – Skimming material doesn’t significantly rewire the brain
Brief History of Western Urbanization

• First cities formed in fertile crescent (Mesopotamia) around 3000 BC
  – Followed agricultural breakthroughs
    • Domestication of grain
    • Development of irrigation
    • Invention of the plow
  – These breakthroughs created agricultural surplus which allowed some to move into cities and become craftsmakers
Guns, Germs, and Steel Hypothesis

• Developed by Jared Diamond: geographer, evolutionary biologist, linguist
  – Proposes “grand theory” of how the West came to be technologically and politically dominant in the world
  – Grand theories are nice. Economists and other academics tend to like theories that are simple and parsimonious; but that explain a lot—even if they do so imperfectly.
  – This theory dispenses with any notion that Europeans are morally or genetically superior to others
    • Instead argues that environmental and geographic circumstances made Europeans extremely lucky
    • Urbanization plays a key role in the story.
Grand Theories vs. Specific Theories

• If you want to explain why something happens, you can take different approaches
  – Specific theories: Explain in detail all the background that led to the particular event, noting how each detail led to the specific outcome(s).
    • Specific theories tend to explain a few things very well, but aren’t generalizable (not useful for explaining other things)
    • Example (largely made up): Adolf Hitler’s mother didn’t love him, and he had a teacher in high school who promoted theories of white superiority, and art school rejected him 6 times so he tried to take over the world.
Grand vs. Specific Theories

• Grand theories: These are simple theories that lack detail, but which can explain a lot of different things.
  – Tend to explain nothing perfectly, but lots of things pretty well.
  – Example: Newtonian physics. It’s wrong; it assumes a vacuum, no friction, etc.; but it’s a pretty good approximation of how objects move.
  • You can’t expect to land a rocket on the moon without taking into account some specific issues particular to your launch, but Newton’s theories get us a long way toward understanding/solving the basic problem and thousands of others.
Economists like Grand Theories

- Economists tend to admire simple theories that explain a lot
  - Example: Supply-Demand model. Simple model of how price and quantity are determined in market
    - It’s based on assumptions that are generally unrealistic
    - Many other social scientists object that it leaves out important aspects of human behaviour
    - But the model can be applied to lots of different situations—it may be unrealistic for all situations, but it does a pretty good job of predicting outcomes and lending understanding.
    - Better (in my opinion) to have 1 model that half fits all situations than thousands of models, each fitting one situation perfectly.
Consider what makes a good road map

• If you’re trying to get downtown from campus, do you want a map with infinite detail? Do you want to see every crack on the pavement, each leaf on every tree?
• Or would a simple map that shows the main roads work better?
• The world is too complex for us to understand it in all its detail at once. It makes more sense for us to simplify things and approximate reality using simple models.
“Everything should be made as simple as possible, but not simpler.”

-Albert Einstein
Jared Diamond—Evolutionary Biologist and Linguist

• Not an economist! But has a great “Grand Theory” and does what I would argue is “good social science”
  – Proposes a fairly simple theory that I will discuss, which explains much of world history
  – Uses evidence to test his theory and test alternatives to his theory
  – While his theory is not strictly an economic theory, it does reference some key ideas in economics.
– Cities play a key role!
Big Question: How did Europeans come to dominate the world politically and economically, by the year 1900?

• 13,000 years ago, the ancestors of Europeans, Asians, Africans, the indigenous peoples of Australia and the Americas were all hunter-gatherers (i.e., no one had a technological advantage)

• Why did one society pull ahead?

• Ideas?
Some Alternative Hypotheses

1) Europeans had better genes
   – Smarter?
   – Harder working? But why? Evidence?

2) Colder climates promote ingenuity
   – e.g., people in Northern Europe had to struggle to keep warm; people closer to the equator could take it easy and survive

3) Farming in large river valleys required irrigation which required a central bureaucracy to manage; bureaucracy facilitated rise of organized military
Some Hypotheses

• Diamond debunks all of these hypotheses, using evidence that contradicts them
• He then builds a theory to replace these
  – Notes that European dominance in the world was primarily due to three related advantages over more primitive societies
    • Military superiority: “Guns”
    • Tendency to carry (but survive) communicable diseases like smallpox, typhus, influenza, diptheria: “Germs”
    • Technology: “Steel”
“Guns, Germs, and Steel”

• For example, Diamond describes how a Spanish conquistador (Francisco Pizarro) toppled the Inca Empire (in Peru) around 1530
  – Pizarro had 168 men and 69 horses
  – Atahualpa (Inca Emperor) had 80,000 troops
  – While capture of Emperor might be achieved through trickery, how did Pizarro manage to keep Atahualpa’s troops and people from freeing him?
    • Smallpox (introduced by earlier Spanish visits, had been devastating Inca population for years)
    • Superior weaponry
    • Superior military strategy, thanks to centuries of knowledge passed down through written records
“Guns, Germs, and Steel”

• If Pizarro and Atahualpa had a common ancestor (in Africa) and similar technology 13,000 years before, then how did Pizarro’s society become so much more advanced than Atahualpa’s?
  – All societies were hunter gatherers 13,000 years ago…why did Europeans advance (technologically) faster than other societies?
  – Diamond basically argues that it came down to good luck. The Europeans weren’t inherently better than others—they just got a lucky head start
1) Technological advancement requires an agricultural surplus; the larger the agricultural surplus, the more people are freed up to invent and develop new technologies

   – Agricultural surplus exists when farmers produce more food than they need, thus freeing other people to pursue non-farming vocations

   – Highly intuitive: If everyone in society needs to spend all day hunting and gathering in order to eat, no one has time to experiment with metal work or develop new farming techniques.
Pieces of Diamond’s Theory

2) Agricultural surplus will develop more quickly in areas with good environmental endowments

– Nutritious and easily domesticated grains
– Easily domesticated animals
– Note that such wild plants and animals were not equally distributed around the planet

• Some societies had a built-in advantage based on the environmental amenities in their area
3) Urbanization (people moving off the land into dense settlements) is also facilitated by an agricultural surplus

- Intuitive: Hard to live in a city if you’re a farmer. Rise of an agricultural surplus ➔ more people leave farming ➔ more people cluster in towns and cities working as craftspeople.

- Urban economists would add to Diamond’s theory by saying that clustering (in towns or early cities) facilitates transfer of knowledge, so that clustering can increase the rate of technological advancement.
4) Early towns had people living near each other and near livestock (e.g., ducks, chickens, pigs, cattle)
   − These types of livestock carry disease that can sometimes mutate and cross into humans
   − Societies to urbanize first were subject to repeated epidemics; those with genetic predisposition to survive went on to reproduce ➔ urbanization led to natural selection of individuals with strong immune systems. Primitive societies (with less dense settlements) weren’t as likely to develop this immunity.
Pieces of Diamond’s Theory

5) Large clusters of people (e.g., cities compared with small hunter-gatherer groups) require central government.

- Central governments can organize people into armies, issue orders, reward inventors who come up with new military technology
- Central governments also need to keep records (e.g., to tax people) and direct resources, which provides an incentive to develop more advanced writing systems
6) Written language allows for storage and transmission of information

- Orders to conquer indigenous peoples in the Americas came from kings in Europe
- Technology is no longer lost when an inventor dies...can be kept alive indefinitely through written records
- Military strategy developed by past generations can be passed down to today’s generals
- Societies with writing system have huge advantage over those without
7a) Geography affects transmission of agricultural technology; shape of Eurasia (long East-West, short North-South) facilitated “quick” transmission of agricultural tech. (e.g., domesticated grains/animals)

– Grains that grow well at one latitude, might fail at latitudes far to the north or south; longitude doesn’t tend to matter

– Means domesticable grains can “easily” move from east to west, but not so easily from north to south; “tall” continents like Africa and Americas are less likely to see broad transmission of technological gains in agriculture like Eurasia did.
Pieces of Diamond’s Theory

7b) Geography can affect the degree of political competition between jurisdictions

– Consider Europe: Lots of geographic barriers (mountains, rivers) → lots of small distinct societies in competition with each other (no one, after Roman Empire, could successfully conquer the whole of Europe)

– By contrast, consider China: Geography was less fractured; a single power could bring all of China under its rule → less competition from outside
Pieces of Diamond’s Theory

• 8) While constant warfare is not good for a society, a certain amount of military competition with others has some advantages
  – Provides an incentive for continual advancement of military technology
  – Provides an incentive to conquer territory
    • Either to weaken competitors or to gain resources that can be used against competitors
  – European conquest of the New World was largely driven by military competition between Spain, England, Portugal, and The Netherlands.
Putting the pieces together

• Let’s assemble the pieces of Diamond’s theory to see how it explains the rise of European power in the world.
Prehistory

• Societies developed slowly (and largely independently) after humans migrated out of Africa and dispersed around the globe
  – Humans were living on all continents (except Antarctica) by 40,000 years ago
  – All societies were originally based on hunting and gathering
  – Domestication of food and animals was a key technological breakthrough, leading to the rise of an agricultural surplus, but it was more successful for some societies than others
The most successful domestication in the world occurred in the fertile crescent (Middle East, around modern-day Iraq; sometimes called “Mesopotamia”)

- Nutritious wild grains were available
- e.g., Barley (fertile crescent) much easier to plant than maize (Americas); higher protein
- Wild precursors to pigs, cows, goats, sheep available to people in fertile crescent; wild animals in other parts of world much less easy to domesticate
The Fertile Crescent
Guns, Germs, and Steel (cont)

• Basically, Mesopotamians had a step up on other primitive societies.
  – Since becoming sentient farmers was (relatively) easy for them, they were (relatively) quick to develop proto-cities—early towns
  – Agricultural surplus made it possible to have people take up non-agricultural pursuits such as crafts and manufacturing (Steel)
  – Craftspeople move off farms to towns to develop technology that further increases ag surplus.
Guns, Germs, and Steel (cont)

- Ag surplus led to concentrated settlements
  - Concentrated settlements led to rise of disease and central governments
    - Disease resulted from people living in dense settlements with livestock (pigs, ducks, etc.—think swine flu, bird flu)
    - Centralized governments made rise of organized armies possible; as did technological growth that occurred as a result of clever craftspeople living in close proximity to each other
    - Dense populations allowed for gains from specialization ➔ increased productivity of urbanized societies
    - Writing systems developed where people needed records of crops and records of taxation
  - Disease (Germs) and military might (Guns) made Western domination of indigenous peoples in Americas possible
Guns, Germs, and Steel (cont)

- e.g. Pizarro showed up in Peru with a handful of Spanish conquistadors and toppled an empire effortlessly, thanks to smallpox, good weapons, and good intelligence and military strategy (made possible by written language)

- Diamond argues Europe did well because
  1) It was a lateral move from the Fertile Crescent, so crops that did well in the Middle East tended to do well in Europe; agricultural technology spread from Fertile Crescent to Europe
  2) Geographic barriers led to development of distinct societies and states within Europe: this drove military competition and competition drove quick technological growth
  3) Military competition amongst European states also drove exploration and conquest around the world.
Eurasia, Latitude, and the Potential for Migration of Domestication Technology
Why didn’t China become dominant like Europe?

• By the year 1000 and later, China was at least as technologically advanced as Europe—perhaps more so.
  – In 1500 Beijing was largest city in the world
  – China’s navy explored far afield in early 1400s with much larger ships and fleets than European explorers used

• But China had the luxury of isolation and lack of military competition with neighbours
  – In 1432, emperor abolished (and burned) the navy
Why didn’t China become dominant like Europe?

• China probably avoided conflict with Europeans in the short run, by looking inward
  – But Europe probably wouldn’t have been able to push China around (think of the Opium Wars) as much if China had engaged more with the world after 1500.
  – Greater military competition and the flow of information and ideas would have boosted China technologically.
  • China’s embrace of trade relations with the West have done much to boost its technological advancement
Guns, Germs, and Steel (cont)

- Diamond has his critics, but he paints an interesting picture of the interaction of environmental endowments with geography having major impact on the development of society
  - Note that urbanization plays a critical role in his story
  - Without cities, we don’t get the Guns, the Germs, or the Steel that are critical components of his theory.
  - Cities are the crucibles of invention where much of European technological advantages developed
  - Will continue to be birthplaces of new ideas and inventions going into the future.
Modern cities wouldn’t be possible without technological advancements of past 13,000 years

• We can now fit 30 million people into a city (think Toyko) thanks to modern
  – roads
  – water treatment
  – transit systems
  – communications
  – agriculture
  – government
Is Diamond’s theory testable?

• It’s difficult to test Diamond’s theory empirically.
  – So we can’t be sure the theory’s right
  – Could be completely wrong
  – Could be partly wrong
  – Good science includes testing theories with empirical evidence.
A note on empirical tests of theories

• Physical scientists can often test their theories in controlled laboratory settings
  – Difficult in the social sciences due to costs and ethical problems associated with experimenting on people
  – Ideally we’d like to test Diamond’s theory by winding the clock back, redistributing domesticable plants and animals, and watching this (counterfactual) history play out again
Empirical tests

• For example, if we put good environmental amenities in Africa and started back in 13,000 BC, would we see Africans colonize Europe and the Americas, and bring European slaves to the Americas to work in cotton fields?
  – There’s no way to run that experiment, and we probably wouldn’t want to run it if we could.
  – But Diamond finds some interesting “natural experiments” that he uses to back up his theory
New Zealand and the Chatham Islands: a Natural Experiment

• Polynesian farmers settled in New Zealand around 1000 A.D.; became people known today as Maori
  – Some of those Maori later sailed with NZ crops to Chatham Islands, about 700km east of New Zealand; became people known as Moriori
  – For several hundred years two societies with same genes and same initial technology developed in isolation of each other
New Zealand and the Chatham Islands: a Natural Experiment

• NZ Maori developed a highly advanced farming society with dense populations and strong technological growth
  – Wars with neighbours kept development of weaponry as a priority
  – Maori had armies, bureaucrats, chiefs

• Maori tropical crops didn’t fare well in Chatham Islands (cold weather)
  – Maori settlers couldn’t stick to farming—reverted to hunter gatherer society with stone tools
  – Moriori had no central government
What happened when Maori and Moriori met again in 1835?

• Two Maori ships sailed from New Zealand to Chatham Islands to seek fishing opportunities
  – Maori had superior technology, weapons, organization, experience fighting wars
  – Maori easily defeated Moriori population, wiped them out

• Arguably no genetic differences between groups, but Diamond’s theory predicts the outcome—the society endowed with better environmental amenities will dominate, due to technological advantages that result
Natural experiments

- One similarity between Diamond (evolutionary biologist) and modern economists is that in economics, natural experiments are often used to try to mimic laboratory experiments seen in natural sciences.

- To me, Diamond’s development of a grand theory and his use of evidence and natural experiments to back it up make his work an example of great social science.

- Note: this is just one example…the evidence for the GGS hypothesis would be much stronger if we had lots of Maori-Moriori type cases and a similar pattern held true across multiple cases.
First Cities

• Early cities thought to have served defensive and religious purposes
  – Food surplus required storage; centralized locations easier/cheaper to defend (scale economies)
  – Rise of large-scale religion coincides with rise of cities
    • Perhaps large temples led populations to cluster nearby? See Nat’l Geog. article on Gobekli Tepe
    • Or perhaps population clusters led to the rise of large-scale religion?

• Rise of cities led to rise in military conflict
  – Increasing religious wars
  – Wealth accumulation made for tempting targets
  – On the other hand, defense of cities easier than defense of dispersed sites.
First Cities (cont)

• Rise of cities also lead to exchange of ideas and innovation—a key theme in this course
  – Serve as intellectual crossroads between cultures
  – Allow smart people to find other smart people to collaborate with (e.g. Socrates and Plato arguing in the market)
Greek and Roman Cities

• Athens, 500 BC, was trading city with population of 150,000
  – Traded crafts and processed foods with established farm and extracting colonies
  – Developed money (one of the first societies to do so)
  – Assessed taxes on colonies to support city
  – Declined after war with Sparta
Greek and Roman Cities (cont)

• Rome, 300 A.D., had population of 1 million
  – Established colonies throughout Europe
  – Engineering advances aided growth of cities in empire
    • Road building
    • Water engineering (supply of clean water to cities)
  – Fed itself through trade and taxation
    • Heavy reliance on tributes made it susceptible to uprisings by colonies (barbarians)
Feudal Cities

• Society was structured around manors with land worked by serfs
• Small towns housed craftspeople, exchanged crafts for local farm surplus
• London in 1000 (a trading city) had population of only 16,000
• Decentralized power of dispersed manors meant trade, not tribute, was source of income for cities⇒competition, innovation
  – Though markets were small, because it was hard (and dangerous) to travel long distances to trade
  – Means limited economies of scale; limited gains from specialization
Mercantile Cities

- Military advances led to consolidation of power in Europe starting in 15th cent.
  - Advances in siege technology
  - Rise of professional armies
- Economies of scale in defense made large cities more sensible
- Consolidation led to larger trading areas
- Rise of long-distance trade (with New World and within Old World) contributed to rise of large trading centers
  - Also means potential for greater economies of scale in production; greater gains from specialization
The Rise of Industrial Cities

• Industrial revolution began shift from rural economy, to industrial economy
  – 3% of world’s population lived in cities in early 1800s; 39% by 1970; just over 50% now.
  – By 2050 UN projects that 64% of world population will be in cities
  – Driven by innovations in agriculture, manufacturing, transportation, construction, water treatment
Industrial Revolution (cont)

• Agricultural innovations ==> increased demand for manufactured goods; increased population movement into cities
  – Farmers were more productive, needed less labour, so workers were displaced
  – Those who kept farming used machines built in cities

• Manufacturing innovations ==> Increased scale economies in production
  – Production moved from home to factory as relative cost of production in factories fell, relative factory wage rose
Industrial Revolution (cont)

• Transport innovations==> Larger markets, greater specialization, access to better inputs, greater productivity
  – Resulting increase in income caused greater demand for output

• Construction innovations==>higher density
  – Increased population potential of cities by reducing commuting costs
  – Steel construction and elevators were key to achieving height in buildings (see Glaeser chapt 6)
  – Clean water supply made cities safer, more attractive; allowed higher density without disease
Urbanization in Canada

- Canada’s economy originally based on farming and resource extraction
- Trading cities important
  - Atlantic ports: Halifax, St. John
  - St. Lawrence Seaway ports: Montreal, Quebec City, Toronto
- In 1867 majority of Canadian workers worked in agriculture/resources
Urbanization in Canada (cont)

• Massey’s reaper and mower example of agricultural innovation, mass-produced in Toronto

• Railroads critical to urbanization
  – 1860s, Quebec City and Toronto both had about 60,000 residents
  – One got railroads in 1860s, one didn’t
  – Montreal also got railroad
Urbanization in Canada

• In 1800, approximately 15% of European North America lived in cities (vs. 20% in Europe)
• By 2011 2/3 of Canada’s population lived in 27 Census Metropolitan Areas (CMAs)
• By 2011, 81% lived in clusters of 10,000 or more population
Some Current Issues in Canadian Urbanization

- Rapid growth
- Sprawl/congestion
- Affordable housing
- Increasing fiscal difficulties
  - Revenue growth to municipal governments has risen much more slowly than to Federal and Provincial governments
  - Cities want bigger piece of fiscal pie
  - Victoria is an example of a city that is struggling with some economic issues—much to talk about here.