The Origins of Liberal Democracy and the Economic Legacy of the Mongol Empire

Scott Auriat
University of Alberta

ABSTRACT

I explore the fact that the Mongol Empire invaded most of Eurasia but left Western Europe untouched. I hypothesize that differences in exposure to the Mongols resulted in divergent institutional paths. Where the Mongols invaded, they set up highly centralized autocratic institutions. Meanwhile, Western Europe developed comparatively more liberal and decentralized institutions. I suggest that these differences in institutions have persisted until the present day. Using the legacy of Mongol invasions as a factor in the rise of existing institutions as an instrument for current institutions, I find significant effects on current GDP/capita caused by these divergent institutional paths.

1. Motivation

1.1 Why Europe First?

Why did the Industrial Revolution start in Britain and quickly spread to Western Europe and its offshoots? What are the origins of Liberal Democracy? Why does it take root and flourish in certain countries but not in others? What is unique about Western Europe that allowed its emergence? Is there a connection between liberal democracy and economic growth? These are some of the most captivating questions in economics, and all have proven difficult to answer. The above questions are all related to a broad question, that question being, what is the fundamental cause of growth?

Many disciplines have employed numerous methods to address and shed light on the question. One approach economists promote is examining history to uncover natural experiments or instrumental variables (IVs).

The IV/natural experiment approach is perhaps most famously demonstrated in Acemoglu et al., 2001. (I will refer to this paper as AJR).[1] This paper, in many respects, complements the AJR paper quite well first of all because I use the same methodology, but more importantly, because it builds on the story AJR tell. The AJR paper explains variations in GDP/capita across borders by the adoption of inclusive vs. extractive institutions in a given colony during the colonial era. One can think of inclusive institutions as early forms of liberal democracy. AJR suggests that disease prevalence was the main determinant of which institutions were adopted in a given colony; where settlers could live, they set up inclusive institutions, where they could not live, they set up extractive institutions. But, what the paper does not explain is why European colonizers had access to these inclusive institutions? Why is it that European colonizers could, if they wanted to, replicate their mother country's institutions to a new colony? Where did these institutions come place?[2]

I go further back into history to find an exogenous shock, or IV, that pushed Western Europe down the path of liberal democracy while forcing other countries off this path. The paper considers exposure to the Mongols as an IV and shows robust results in a two-stage least squares (2SLS) regression. The suggestion is that Mongol invasion forced countries to adopt more autocratic institutions, which impeded growth. Considering that the Mongols did not invade Western Europe, the region developed comparatively more liberal institutions facilitating development. The results are robust to

[1] For Acemoglu, Johnson, and Robinson, the three authors.

[2] For similar work see (Rodrik et al., 2004; Miguel et al., 2004; Hall and Jones, 1999; Casey and Klemp, 2018). A vital contribution to this type of research was made by (Heckman, 1997), who showed that natural experiments are a type of IV estimation.

different model specifications and spatial correlation. Additionally, I will make the case that the only realistic violation of the exclusion restriction would bias the results downward, suggesting the findings are conservative.

The paper stands in contrast to many other theories as to why Western Europe initially ascended to prosperity. For example, the paper's findings do not support theories founded on geographic determinism, religion, human capital, or trade. In the broadest context, the paper's main contribution suggests that the emergence of Liberal Democracy in Western Europe was primarily caused by the area's relative isolation from war. Eurasia was destined to produce two highly incompatible worlds, an agrarian city-state world and a nomadic one, a war for dominance between them shaped the modern world. Luckily for Western Europe, they spent most of their time watching from the sidelines.

1.2 Empirical Motivation

> *For the specific context of Acemoglu, Johnson, and Robinson's work, the finding that mortality rates are correlated with growth differences is itself a data pattern of interest and one that theory ought to address.*
>
> (Durlauf, 2009)

I will straight away address a concern that will be on many people's minds. How can I plausibly make a case that something that happened hundreds of years ago affects economic output today? I will regress contemporaneous variables on a variable that represents events that occurred hundreds of years ago. How can I make a causal case? The reality is that causality is almost impossible to prove in papers like this. The critical question is: what is the alternative?

The above quote relates to a critique of growth regression made by Steven Durlauf. Durlauf makes both a very technical point and a rather obvious one. The technical issue is that growth regression suffers from what he labels model uncertainty, meaning there is no way to know from theory which variables are or aren't exogenous. This

leads to the rather obvious point that all growth regressions potentially suffer from endogeneity. So how do you proceed to uncover which variables are causal if growth regression can't shed light on causality? Well, as Durlauf alludes to, one method is to look at history to uncover data patterns, or correlations, to shed light on potential causal variables.

I have already talked about the Acemoglu, Johnson, and Robinson (AJR) paper above. Durlauf is pointing out that while the AJR paper is hard to prove, it is at least trying to find the answer in the right place. This is similar to the famous story of the person who loses his keys in the dark but looks for them in the light. While the AJR paper uses suspect data, historical anecdotes, and small sample size, there is hope to find the keys.

I go into detail with regards to this criticism because I will do something similar to AJR.

I will give the reader a correlation between history and growth differences and then offer a causal mechanism.[3]

1.3 Empirical Methodology

At the most basic level, the paper's goal is to estimate the effect of institutional quality on output. Essentially find β in the following equation.

$$\left(GDP/Capita\right)^{i}_{today} = \gamma + \left(Institutional\ Quality\right)^{i}_{today} + e_i$$

However, this is a classic example of endogeneity, and thus β is not accurate. Many techniques, some quite elaborate, have been utilized to address the problem. The approach I will employ is to add exogenous geographic controls and instruments for institutional quality. Like the AJR paper, I want to find a geographic variable proving that the following is true:

$$\text{Geographic Variable} \Rightarrow \text{Institutional Development}$$
$$\text{Output Today} \not\Rightarrow \text{Geographic Variable}$$

[3] Sala-i Martin (1997) make a similar case. Their famous paper runs a million growth regressions to point out the problem Durlauf alludes to.

That is, the geographic variable has an effect on institutional development, but output today could not plausibly affect this variable. This structure allows us to isolate the direct impact of institutions on growth and not pick up the backward causality. We should recall that in the AJR paper the geographic variable was the prevalence of certain diseases that affected only Western Europeans. My thesis then becomes the following:

Eurasian Steppe ⇒ Mongols (IV) ⇒ Institutional Development

Essentially the unique geography of the Eurasian Steppe created the Mongols. The Mongols then were a shock to institutional development, and clearly, output today would not affect the Eurasian Steppe or the territories invaded by the Mongols. Econometrically I will obtain something like the following:

$$\left(GDP/Capita\right)^{i}_{today} = \gamma + \beta \widehat{IQ}^{i} + \alpha G_i + \varepsilon_i$$

Where:

G = Geographic controls;

$\hat{IQ}$ is the predicted/instrumented institutional quality.

More precise equations will be presented in section 3.2. The critical point here is to connect the history to be discussed to the assumptions required for an accurate estimation. Thus, while the history to be presented can be detailed, it is important to keep in mind how it connects to the methodology and vice versa.

This is a brief road map of the paper: Section 2.1 discusses why looking at Eurasia offers a suitable control for geography. In section 2.2-2.3, I discuss the Eurasian Steppe in general and the Mongols more specifically to build a suitable instrumental variable and discuss the mechanism by which institutions were shocked and, importantly, only institutions were shocked, discussed in section 3.4-3.5. Following the empirical analysis in sections 3.1-3.3, I will turn to section 4 to discuss history to elaborate how this institutional shock has persisted until the present day.

2. Historical Context

2.1 Why Eurasia First?

To answer the "why Europe first" question, one must first answer the "why Eurasia first" question. Many archaeologists, anthropologists, and historians, along with social scientists in general, have noted that pre-industrial revolution Eurasia was more prosperous than the rest of the world. Why is this so? In short, the answer offered by most is that Eurasia had a geographic advantage over the rest of the world. The idea has been espoused by many but is most famously attributed to Jared Diamond (Diamond, 1999). Diamond pointed out that Eurasia had access to more tamable plants and animals, a temperate climate, the ocean, and a long east to west axis. These factors allowed for the development of agriculture and the diffusion of agricultural technologies.

I will focus more on the long east-west axis than on the other components (see Figure 1 showing each continent's longest axis). The benefit of a long east-west axis is relatively straightforward. Climates tend to change much slowly from east to west than from north to south. Thus, Eurasia had an extensive scope for the exchange of technologies. A technology invented in China might be adaptable to similar climates in far-off Europe and vice versa. Importantly, this isn't just theoretical; we have many historical accounts and archaeological evidences of the diffusion of technologies across Eurasia to a much greater extent than in any other continent.

Looking at historical empires gives strength to Diamond's hypothesis. Consider the map of 1200 CE (Figure 2)[4].

The first thing to notice is that empires primarily existed in Eurasia. Given the first thing required for an empire is agricultural productivity, as food abundance allows people to leave farming to become soldiers, it seems clear, merely looking at this map, that Diamond's claim appears accurate. If empires imply an agricultural

[4] The image is from a website that depicts the expansion and contraction of empires through time; see (GeaCron).

Figure 1
Eurasia's Long East-West Axis

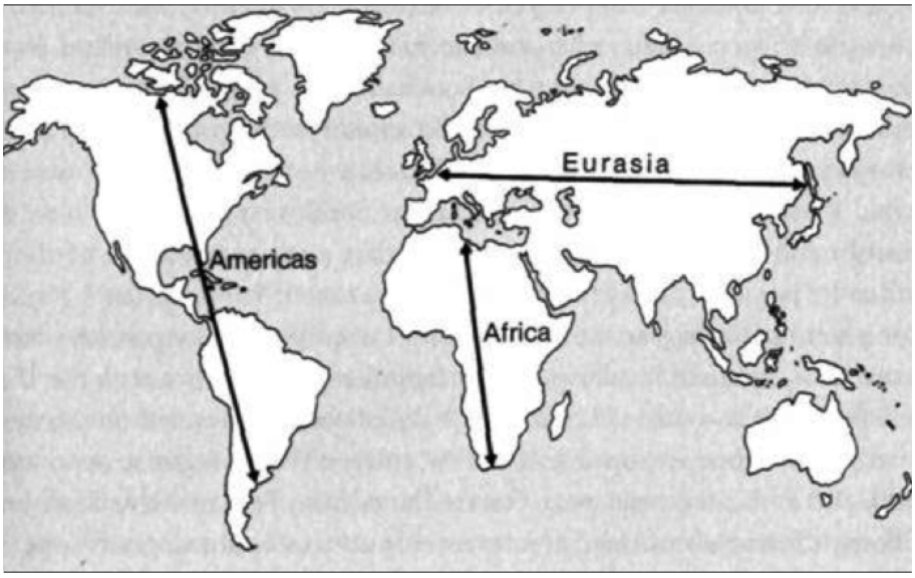
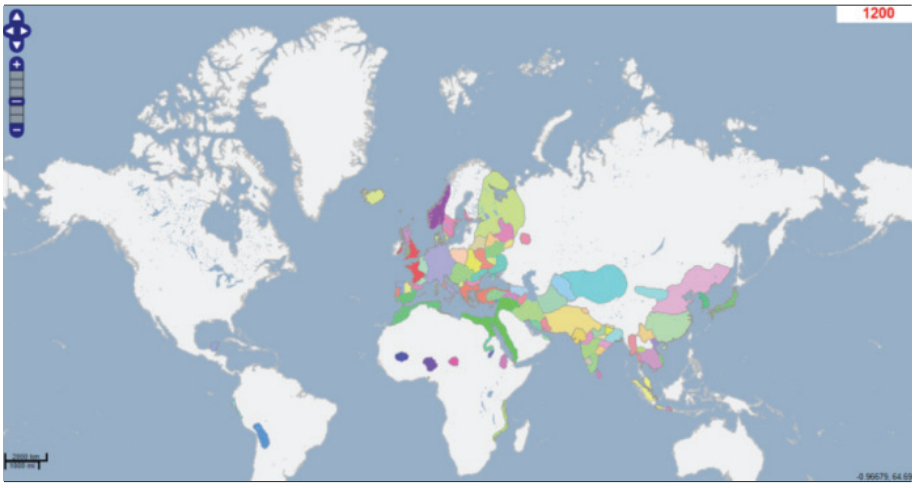


Figure 2
World Empires in 1200 CE



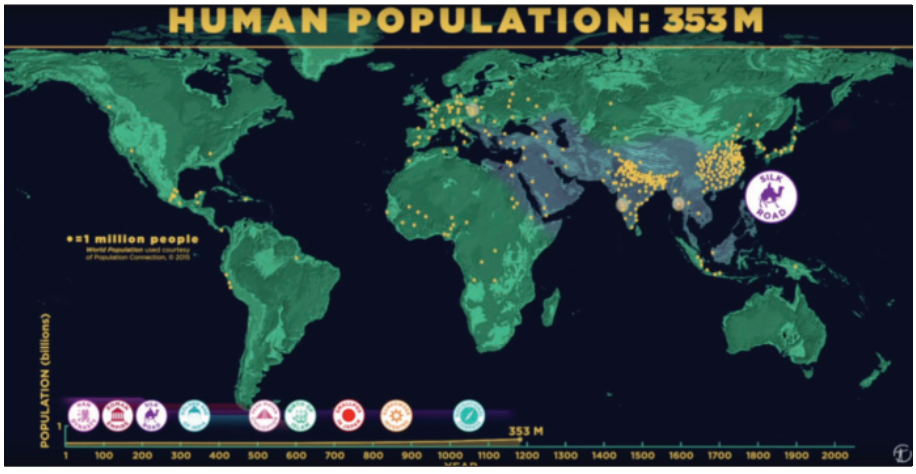
surplus, and being close to the eastwest axis implies an agricultural surplus, we would expect to see empires span out along the east-west axis. Indeed, this is just what we see. Note: from here on, I will

refer to the Eurasian east to west axis depicted in Figure 1 as the East-West axis.

This claim can be further backed by looking at the location of world population in the year 1200 (Figure 3). If the East-West axis implies agricultural surplus, and high levels of population imply an agricultural surplus, then we would expect to see a dense population along the East-West Axis. Indeed, this is what we see.

Along with agricultural surplus and subsequent population density comes the parallel development of complex institutions. Thus, the Eurasian geographic advantage allowed for the initial conditions required for the emergence of something akin to liberal democracy, which was a conduit for the Industrial Revolution. The next step is to look at an institutional shock that set Western Europe down the path of liberal democracy while knocking other regions off that path.

Figure 3
World population in 1200 CE



2.2 The Mongol Empire

2.2.a The Story of the Steppe

The overriding story I will tell is one where a geographic characteristic affects the institutional development. The story revolves around the Eurasian Steppe (Figure 4). The Steppe is an 8,000 km plain spanning from Hungary to China. While much of Eurasia is very suitable for agriculture, the Steppe was not. The Steppe is said to have two seasons, an eight-month harsh winter followed by a blazing hot summer. The Steppe's distance from any significant body of water creates vast swings in temperature and unreliable precipitation.

The Steppe, for most human history, until recent centuries, has been inhabited by nomadic people. While much of Eurasia saw the emergence of agriculture and city-states, the Steppe, until recently, remained a nomadic land. Following the domestication of the horse by nomadic people, the Steppe began to rise as a military threat. Horse domestication took centuries, but it's believed that humans began to ride horses around 3500 BCE.

Figure 4
The Extent of the Eurasian Steppes

Eurasia can be historically characterized by the presence of two worlds, a nomadic one and a sedentary one. These worlds have often not coexisted peacefully. When the worlds meet, they "rub up against each other like sandpaper" (Carlin, 2010). There are many reasons to believe that peaceful coexistence between the two groups would always be at odds, if not impossible. The most common economic theory as to why this is the case suggests common climate conditions generate shared food shocks. Poor agricultural yields happened as nomadic peoples experienced shortages of game to hunt. Thus, when the nomadic people needed to trade the most, prices for what they needed would be the highest. Therefore, the temptation to pillage and raid a sedentary society in tough times was inevitable. Furthermore, as the population grew, agricultural societies constantly desired more territory, which saw them encroach upon valuable nomadic hunting territory. Though there were extended periods of peace, the two sides' interests were "fundamentally irreconcilable, and confrontation between them was unavoidable" (Khodarkovsky, 2002). It is vital to note that while the Eurasian Steppe, and the nomadic tribes that inhabited them, do not play a significant geopolitical role in today's world, they played a central role in the past. Given nomadic lifestyles are very rare in modern world, it is hard for us to imagine that in Eurasia, the nomadic world would have competed with, and at times dominated, the agrarian city-state world. Yet, this indeed happened. And I suggest it had a significant impact on institutional and subsequent economic development. Yet, since we do not see this today, we are biased to understate the effect the interaction of these worlds has had on the modern world.

To this point, there is no justification to focus only on one tribe of the Steppe. However, it is clear that historically one tribe had a much more dramatic impact on the world than the others, that tribe being the Mongols.[5] Furthermore, the Mongols had a unique history

[5] It is more accurate to call the Mongols a collection, or confederation, of many tribes unified as one.

in that for somewhat random reasons, they, unlike other nomadic tribes, never made it to Western Europe (to be discussed in section 2.2.f). Thus, unlike the period when the Roman Empire, for example, had to deal with the Huns, Vandals, or other Steppe tribes, Western Europe was spared any contact with the greatest and most feared of all Steppe tribes.

It is worth noting that recent evidence supports the claim that climate shocks influenced relations between the Mongols/Steppe and the sedentary society. A recent paper suggests that there was an extreme drought before Mongol invasions, and then as invasions began, there was a period of intense rainfall. In essence, the Mongols had perfect conditions for their rise as drought caused the desire to unite and raid. Extreme rainfall then allowed for very healthy horses and soldiers, "Genghis was literally able to ride that wave" (Pederson et al., 2014). Having said that, there are many other reasons for Mongol success, which I discuss in detail in section 2.2.e.

Before proceeding further, I would like to clearly state that I do not intend to say something negative regarding nomadic people in general. The reality is that a sedentary life vs. a nomadic life would create the need for different sets of institutions and cultures. Unfortunately, these institutions and cultures seemed to conflict with each other. As with much of history, it is a tragedy that a peaceful solution didn't emerge. The important point here is not to compare lifestyles. Instead, I want to make the case that for a liberal democracy to emerge, sedentary societies needed to stay clear of the path towards autocracy. Interactions with nomadic tribes, and the Mongols in particular, took them down this path.

2.2.b Empires and Military Power

It is important to structure our thoughts regarding empires before focusing on the Mongols. By definition, an empire is: "an extensive group of states or countries under a single supreme authority" (Oxford Dictionary). While some grow very large and have long lives, like, for example, the British, the Roman, and the Mongol Empires, others are

small and short-lived. So why do some empires grow vast and last for long periods while others remain small and quickly die out?

The answer, in short, is the difference in military power. While there are historical examples of empires joining together peacefully, the reality is that almost all empires are formed through military invasions. Empires expanded as military power allowed them to. They got conquered when their military power faltered in the face of invasion. In short, the study of a great empire is the study of a powerful military. So what determines military power?

A shortlist of determinants of military power would include agricultural productivity, military technology, and authoritarian or autocratic control. I will focus on the last item in the list. Autocracy is crucial for military efficiency. Simply militaries operate best with one leader and a strict hierarchy of command beneath the leader. Alexander the Great once pointed out "a military of sheep led by a lion" is much more formidable than a "military of lions led by a sheep" (Tarn, 2003). Strong tactical leadership and compliant and obedient soldiers make a military formidable. Note there is a very similar quote attributed to Genghis Khan.

This fact leads to a critical trade-off. A given country could maximize its military power by giving supreme authority to one leader, but it will sacrifice individual liberties by necessity. Maximizing military power, you will necessarily minimize personal freedom and vice versa. Every society must, in some form or another, make this trade-off. Why countries mitigate this trade-off differently and progress in different directions is a critical theme of the paper.

2.2.c The Incredible Death Toll of the Mongols

In a recent book, historian Matthew White documents the 100 most deadly events in human history (White, 2011). White is well known as someone who studiously records historical death tolls; most consider him as an unbiased and reliable source, noting, of course, that there is always room for questioning such historical estimates. White puts Genghis Khan's conquests as the second deadliest episode in

human history, with a death toll of 40 million ranked second only to World War Two (WWII).

If correct, this is a remarkable death toll. Consider that the population of the world in 1200 CE, roughly when the conquests started, was about 5% of what it is today; this means that the conquests of Genghis Khan killed approximately 10% of the world's population. Even though it was not the first empire to be responsible for such cruelty, the sheer death toll makes the Mongol Empire distinctly different from anything the world had previously seen.

To add to this, many consider Timur's conquest as an extension of Genghis Khan's. Timur, or Tamerlane, who began his conquests in roughly 1360 CE, thought himself as a descendant of Genghis and felt it was his divine mission to unite the Mongol Empire under one leader once again. Timur carried out conquests in much the same way as Genghis did, with extreme force and brutality (Morgan, 2007). Timur's conquests are ranked ninth on White's list with a death toll of 17 million. Adding both death tolls together, as many historians do, gives us a toll very close to WWII. However, while roughly 2.5% of the world's population died in WWII, about 15% of the world's population died at Genghis and Timur's hands. These numbers are extraordinarily high and contemporaneously unprecedented. Note: this isn't even the end of death tolls attributed to the Mongol's, this is just the casualties attributed to the two deadliest rulers.

2.2.d The Largest Contiguous Land Empire in History

The paper's thesis suggests that the geographic expansion of the Mongols was a shock to institutions in the lands they invaded. The Mongol Empire was dynamic and changed from year to year, but it is worth looking at a few key snapshots to demonstrate the empire's geographic expanse; note that the Mongol Empire is considered as the largest contiguous empire in history. Figure 5 shows Eurasian empires in 1200.[6] Figure 6 shows the world just 27 years later, the

[6] Figure 5-9 and 15-16 taken from *History of the World*.

Figure 5
World Empires in 1200 CE - Just Before Mongol Invasions Begin

Figure 6
World Empires in 1227 CE - The Year Genghis Dies

year Genghis Khan dies. Note the incredible advance of the Mongol Empire under Genghis Khan.

Genghis spent much time contemplating the continuation of his empire after his death. Given this, he established legal codes for governance, called the Yasa, and strict rules for choosing a successor. He

demanded that the Mongol Empire stay unified under one leader. He named his third son Ogedei to be his successor. If we look at Figure 7, we see the Mongol Empire in 1241, the year Ogedei dies. Ogedei expanded the empire further into China, Russia, and Eastern Europe.

Figure 7
World Empires in 1241 CE - The Year Ogedei Dies

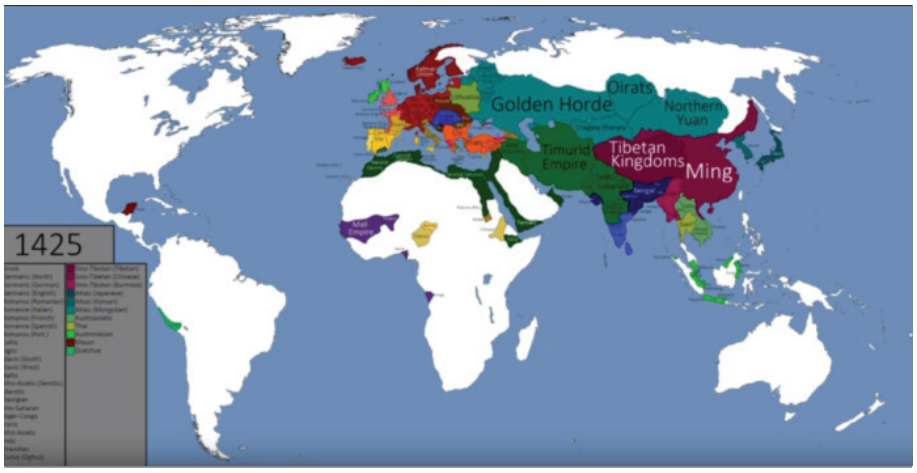
While Genghis did an excellent job in naming his successor and ensuring everyone that the empire would remain stable for a long time under said person, Ogedei failed because he died unexpectedly and named his grandson to be his successor. However, at the time of Ogedei's death, his grandson was too young, only eight years old, to become great Khan. Ogedei's unexpected death marks a crucial turning point in our story, to be revisited in section 2.2.f

Figure 8 shows the Mongol Empire at its greatest extent in 1279. At this point, it had fractured into the four parts in light green; The Golden Horde, Chagatai, Ilkhanate, and Yuan. The four pieces were divided among Genghis's four sons: Jochi, Chagatai, Ogedei (the successor to Genghis), and Tolui. While Genghis wished the empire to remain united, this did not happen. The various houses, aligned to each of these four sons, started to fight and the empire was never again unified.

Figure 8
World Empires in 1279 CE - Geographic Height of the Mongol Empire

About 80 years later Timur enters the story. If we look at Figure 9, we see the Timur Empire at its greatest expanse in 1425. It is worth quickly pointing out that if one looks at the East-West axis (roughly from Paris to Northern Japan) in this map, it cuts right through the heart of the empires in Eurasia, again substantiating Diamond's

Figure 9
The Timurid or Timur Empire in 1425 CE



claim. It is also worth zooming out, to see most of the world's empires are still in Eurasia.

Timur's biggest success compared to that of other Mongol rulers was his conquests in India. Timur's goal, as mentioned, was to reunite the empire under one ruler as it had been under Genghis, but he failed to do so. Notably, Timur's grandson Babur set up the Mughal Empire in northern India, which remained in power until 1857. Mughal is an altered spelling of the word Mongol. Note that Mongol rule did not disappear from the world until the 20th century; the last known descendant of Genghis ruled a part of modern-day Uzbekistan until 1920 (Ringmar).

2.2.e What Explains the Mongol's Success?

Consider the Steppe as a military development program, combining the horse with the bow and rider to evolve into increasingly dangerous armies. Then the Mongols were the culmination.

Concerning military technology, the Mongols perfected horse riding and arrow shooting as a method of attack. Their composite bow allowed their horsemen to pierce through armor from hundreds of meters away. They invented a type of stirrup that allowed the rider to shoot while standing up and turning in different directions (Figure 10; Inglis-Arkell). Mongol archers were incredibly accurate; it's been noted they could shoot birds out of the sky while riding a horse in full stride.

Tactically the Mongols had very advanced strategies of attack. Marco Polo describes how the Mongols never maintained one position but instead attacked by "perpetually riding around and shooting into the enemy." A famous scholar of military strategy points out that the German's borrowed many tactics from the Mongols during World War II. The German generals felt they needed to return to more mobile forms of attack to prevent trench warfare seen in World War I. The concept of Blitzkrieg came from generals who studied the Mongols. The idea being you should surprise, encircle, and cut the opposing armies before they could form a well-defended perimeter (Gabriel, 2006).

Figure 10
Mongol Bow and Stirrup

A key Mongol tactic was to keep the enemy from a strong defensive position while drawing them out into open areas where they could leverage on their superior cavalry. As a testament to their military power, Gabriel (2006) suggests the unified Mongol army was so advanced that a European army wouldn't have won a decisive victory against them until the mid to late 19th century holding Mongol technology constant at a mid-13th-century level.

Assuming all of the above, the most significant advantage the Mongols had was not technological or strategic but institutional. Before Genghis, the area in and around Mongolia, referred to as the Eastern Steppe, was fragmented into many small nomadic tribes. Genghis unified the peoples of this region to a remarkable degree. Great strategy and technology are useless without a strict hierarchy of command to implement them; that is a lion leading sheep. Genghis entrenched the necessary components for a highly autocratic, and militarily efficient, governance.

Genghis Khan is considered by many as the greatest military strategist in history. Great military strategy and unity form a dangerous feedback loop. The better the strategy, the more troops will

unify under the leader. The more soldiers a leader has, the better they can implement a strategy, and so forth. Genghis played this feedback loop as good as, if not better than, any person in history.

Given the above-noted supremacy of the Mongol armies in open battlefields opposing armies would almost certainly retreat into a city. Cities at the time usually had large walls surrounding them to prevent invasion. Thus, the Mongols spent much of their time laying siege to cities. While nomadic armies of the past often failed in breaching the fortification, the Mongols were much more advanced. During their initial invasions, they learned from the Chinese and developed cannons and other types of equipment that were quite advanced and able to breach defensive fortifications.

While the Mongols employed many highly effective military strategies, the most effective and deadly tactic was a rule – if you don't immediately surrender, you die. The vast majority of the deaths at the Mongols' hands resulted from mass killing in cities that did not surrender. For example, during the Mongol conquest of Baghdad, as many as 1.5 million people were killed in a matter of days (Frazier); I will revisit this story in section 4.2.d. While it was not the first time this tactic had been used, the Mongols utilized it on an unprecedented scale. Comparing them to a nuclear bomb, in practice, is quite apt. Given the credible commitment that not surrendering was met with death, over time cities began to submit and the Mongols began to win battles before their arrival.

2.2.f Why didn't the Mongols Invade Western Europe?

This question is of vital importance, and it serves as a bridge to empirical analysis. I suggest the Mongols were a shock to institutional development in the areas they invaded/conquered, but, importantly, they never made it to Western Europe. Thus, it is essential to establish that this difference in exposure to the Mongols was primarily due to a historically lucky *break for* Western Europe and not to some other confounding factors.

Notably, the reason the Mongols didn't venture into Western Europe was not that they felt Western Europe was too powerful or difficult to conquer. The Mongols were ready to invade Western Europe after they invaded Poland and Hungary in 1241 but then turned back because they needed to return to Mongolia for the election of another great Khan. As mentioned before, this is the year Ogodei unexpectedly dies. Consider the following quote: "At that point, Bela – and Europe – were saved by a stroke of great fortune: Ogodei, the Great Khan, suddenly died. To high-ranking Mongols, it was vital to be present" (Hansen, 2012).

The flip side to being unified under one leader is that when that leader unexpectedly dies, what does the army do? Who do they take orders from? The answer is no one; they shut down and wait. The Mongol army was incredibly powerful at this point but had no choice but to turn itself off. As it happened, it did not start back up again for a decade.

It took years to name a successor to Ogedei. When in 1246 they finally elected Guyuk, Ogedei's son, he unexpectedly died just two years later. Ogedei did a lousy job in naming a successor, and Guyuk did an even worse job. The lack of clarity as to who should be the legitimate khan, and more importantly, who should get to choose, led to infighting, a problem that was never resolved. The Mongol Empire was never unified again. Amidst all the infighting Monke – the son of Tolui – was appointed next khan in 1251. However, Monke's immediate focus was on the Middle East rather than on Western Europe.

While Ogedei was focused on the immediate conquest of Western Europe, Monke was not. Mongol sentiment post-Ogedei was that "there were fatter and better targets elsewhere" (Hansen, 2012) or "put simply, Europe was not the best prize on offer" (Frankopan, 2015). They were " disappointed with the general poverty of the area compared with the Chinese and Muslim countries, turned away and did not bother to conquer the cities, loot the countries, or incorporate them into the expanding empire" (Weatherford, 2005). Even though Western Europe was not their most pressing concern, had the Mon-

gols remained united, they eventually would have returned to Western Europe, and there is little doubt they would have conquered the region. However, after Ogedei's death, too many resources got tied up fighting each other. Mongol power began to fade.

It is essential to note the Mongols were defeated by themselves rather than by any outside force. The first significant victory against the Mongols that pushed them territorially backward is considered 'the battle of Ain Jalut' in 1260 against a force known as the Mamluks (essentially modern-day Egypt) (Amitai-Preiss, 2004). It is important to mention that the army that lost in this battle was only a fraction of the unified Mongol army that had recently sacked Baghdad in 1258. In the years following 1258 Mongol forces began to rapidly get absorbed into internal battles. Most historians agree that a unified Mongol army would have won the battle of Ain Jalut easily. The Mongols greatest enemy came from within.

The unexpected death of Ogedei constitutes one of the great what-ifs in human history. Before invading Europe, Mongol leaders estimated it would take about ten years to capture all of Europe. In 1241, after the conquests of Poland and Hungary, the Mongols were ahead of schedule. Western Europe was saved from untold death and destruction by a stroke of good luck. One can only imagine how history would have changed had Ogedei lived ten more years!

2.3 The Suffocation of Democracy/Liberalism

In an in-depth book about the history of democracy, David Stasavage argues that we often falsely celebrate democracy as uniquely European (Stasavage, 2020). Stasavage argues against the simplistic yet standard view that democracy emerged with Greek thinkers and took early forms in ancient Greece and Rome. While disappearing for a while in the dark ages, it reemerged in Europe later on during the renaissance. And the rest is history. Counter to this, Stasavage suggests that early forms of democracy could be found all over the world. That there is nothing inherently European about democracy, and for that matter, liberalism. Instead, Stasavage argues that

democracy emerges when the state is sufficiently weak. Thus, the question becomes not why democracy is distinctly European; instead, why are weak states distinctly European?

The suggestion here is that a significant historical event, Mongol invasions, pushed the areas they invaded to accept more extensive, authoritarian, and powerful states. The road to autocracy was paved with external threats. Europe, and more precisely Western Europe, enjoyed relative security and peace compared to their Eurasian neighbors.

While the Mongol Empire had a very complicated and lengthy set of rules for governance, the following quotes sum up the core of their ideology "resistance would be met with death, loyalty with security" (Weatherford, 2005); or take a similar quote "peaceful submission was rewarded; resistance was punished brutally" (Hansen, 2012). Economist Deirdre McCloskey makes a simple yet powerful suggestion "when you have a war for survival you can't be liberal" (Trevor Burrus and McCloskey). Societies fighting the Mongols could not be liberal; when you fight for survival, you are forced to submit to complete subjugation to your conquerors. Individual freedom becomes secondary to survival.

Many note that under the Mongols, certain individual liberties thrived. The Mongol Empire was a vast region where trade was protected and flourished. Furthermore, the Mongols tended to support religious freedom.[7] However, even though some elements of freedom and individual liberty were present, one needs to ask: how could a genuinely liberal society enshrined in individual rights, ever come from a place where resistance is met with death? The Mongols saw death and destruction as completely necessary if they served to destroy individual identity. The only identity that was permissible was one that was first and foremost wholly loyal to the Mongols. Thus, while some liberties thrived under the Mongols, the foundation for a genuinely liberal society was eroded entirely.

[7] To be more precise, they supported religious freedom in the early era of the empire, but as many converted to Buddhism and Islam, they became less tolerant.

3. Empirical Analysis

3.1 Data Description

3.1.a The IV

Let's first define a variable: M^i will represent the degree to which a modern country, indexed by *i*, was affected by the Mongol Empire. There is no single clear choice of M^i, but a logical option would be:

$M^i_{\%,\,t}$ = a measure of time spent being invaded by the Mongols and the percentage of the $M^i_{\%,\,t}$ of the country invaded. I construct the variable using the (GeaCron) website. I mark the year the Mongol's entered and exited the territory of a modern-day country. I record the number of years the Mongol's occupied the region. I then multiply this number by the percentage of the country invaded. I then normalize it to be between 0 and 1.

Example: The Mongols entered Ukraine in 1242, exited in 1442, and conquered 75% of the country. So we get a value of (1442-1242) X 75 = 150. I then divide this number by the maximum value; which is Pakistan = 438. Thus, $M^{Ukraine}_{\%,\,t} = 150 \div 438 = 0.34$.

I will use this variable as my main instrument with additional instruments in robustness checks. To see how $M^i_{\%,\,t}$ was constructed, along with other instruments to be used, see the Appendix. See Figure 11 for a visual representation of the geographic distribution.

3.1.b Geographic Controls

Additionally, I will include a measure of geographic quality. My story suggests that many parts of Eurasia had a roughly equal likelihood of undergoing an industrial revolution. The emergence of different institutional structures resulted in Western Europe winning the race. However, while I suggest Eurasia had a geographic advantage over other continents, we should not consider this to be the same across Eurasia. Eurasia is a vast landmass that varies widely in terms of geographic quality.

The key variable I will include aims to capture the advantages

Figure 11
Map of $M^{i}_{\%,\,t}$

The darker the red the greater the effect of the Mongols. The countries with the lightest shade (see Western Europe) were not invaded at all.

of being on the Eurasian East-West Axis. Economic research often promotes either institutions or geography as the cause of long-run differences in GDP/capita across countries; I suggest both play a role.[8]

The issue with promoting geography as the fundamental cause of growth is that geographic variables are often endogenous to growth. While in a broad sense geography is exogenous, the earth was in place before modern growth, many measures of geographic quality are not exogenous. Instead, they are deceptively endogenous to other factors, such as institutions. As an example, consider disease prevalence. Many have argued that a high disease prevalence in some countries demonstrates a fixed geographic disadvantage, which caused lower growth rates. However, one can reason that disease prevalence is largely endogenous to institutions, the suggestion being

[8] For work supporting geography as the fundamental cause of growth see Diamond, 1999; Gallup et al., 1999; Sachs and Warner, 2001.

that a high incidence of diseases is caused by inadequate incentives to cure them. Thus, countries are not necessarily naturally endowed with more diseases, but rather, lack good institutions. The task then is to find a purely exogenous measure of geographic quality.

To construct an exogenous measure, what is essential to consider is the relative advantage a given country had with regards to its ability to share technologies (see section 2.1). The critical geographic variable I will use is a measure of the distance from the center of a given country to the East-West axis (roughly the 48th parallel). Let me define:

– East-West Axis Proximity – a variable between 0 and 1 that increases the closer you get to the East-West axis. For example, if a country is on the equator it would get a value of 0 while a country right on the axis would get a value of 1 (see appendix for a detailed description).

East-West Axis Proximity can be considered as an exogenous measure of geographic quality. The measure emanates from the good fortune of some to end up where agriculture had significant advantages via a temperate climate and a broad scope for the diffusion of technologies. Thus, while instrumenting for institutional quality with $M^{i}_{c,t}$, the East-West Axis Proximity variable does not require such treatment and can be viewed in terms of its direct effect.

Finally, in the primary regression, I will include a dummy variable that is 1 if landlocked and 0 otherwise. The argument for including this in the primary regression is straightforward. The Mongols were a land empire; perhaps all they did was conquer countries destined to be poor due to being landlocked. At the time of Mongol invasions, arguably the world's most important trade route was a land route, the Silk Road. However, with time trade began to be dominated by sea-going vessels. The dummy variable does a good job in taking care of this potential confounding factor. I will also consider other geographic variables in section 3.4.

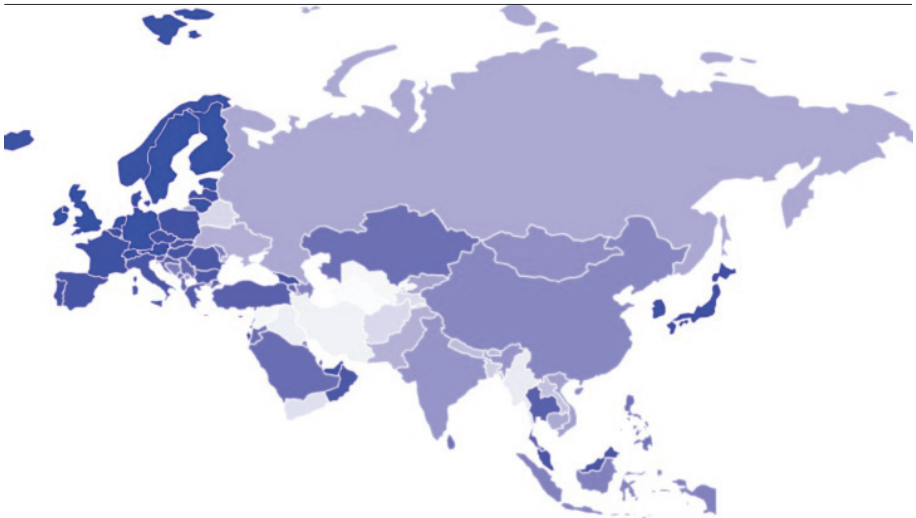
3.1.c Dependent Variables

For the dependent variable in the first stage, I will use a measure of institutional quality called "Civil Liberties" published by Freedom House; see (House). I will label it CL for short. According to Freedom House, Civil Liberties captures "Individual freedoms –ranging from the right to vote to freedom of expression and equality before the law." While there are many potential institutional quality measures, "Civil Liberties" emphasize democracy and individual freedom. Autocratic governance implies no adequate checks on the state's power and low levels of civil liberties, which prevents the development of institutions such as property rights vital for growth.

Looking at Figure 11 and 12 one can visually see a clear negative correlation between $M^{i}_{\%,t}$ and CL, $\rho = -.4$ (Note: the variable is measured from 0-60 and is increasing in institutional quality).

Finally, I will use GDP/capita as taken in the year 2016 as the second stage dependent variable; taken from the World Bank.

Figure 12
Map of Institutional Quality (CL)



The Darker the blue the higher percentile rank, i.e. the darker the better the institutional quality

3.2 Estimation Equations

The following equations summarize the first and second stage of the 2SLS analysis.

First Stage

$$CL^{i}_{2016} = \gamma + \theta M^{i}_{\%,t} + \omega G_i + \varepsilon_i$$

Where:

γ: a constant

CL: Civil Liberties

$M^{i}_{\%,t}$: Measure of how much a given country was affected by the Mongols

G: A vector of Geographic Controls

* East-West Axis Proximity
* Landlocked Dummy – 1 if country is landlocked, 0 otherwise

Second Stage

$$log\left(GDP/Capita\right)^{i}_{2016} = \Gamma + \theta \widehat{CL}^{i} \Omega G_i + u_i$$

Where:

Γ: the predicted intercept from the first stage

G: the same as in the first stage

$\widehat{CL}$: is the predicted institutional quality from the first stage

See Table 1 below for summary statistics. Note the average of $M^{i}_{\%,t}$ seems very low, but if weighted by population (to be discussed) it is a bit higher, equal to .3.

Table 1
Summary Statistics

Statistic	N	Mean	St. Dev.	Min	Max
$(GDP/capita)_{2016}$	91	24,462.530	32,753.800	571.074	193,745.600
CL_{2016}	91	34.971	18.261	2.000	60.000
$M^{i}_{\%,t}$	91	0.117	0.231	0.000	1.000
East-West Axis Proximity	91	0.706	0.266	0.011	1.000
Land Locked Dummy	91	0.275	0.449	0	1

The exclusion restriction implied by the IV estimation is that conditional on controlling for the variables in the regression, Mongol invasion did not affect GDP/capita today other than through a shock to institutional development. The regression will include all the countries in Eurasia (N = 91); see appendix for a full list of countries and summary statistics.

3.3 Regression Results

In the first stage we must verify that there is a statistically significant negative correlation between *CL* and the lands invaded by the Mongols. We can see this is indeed the case (Table 2). Note with a F-statistic of 24.496 in (1), 24.133 in (2) and 19.871 in (3), the instrument is suitably strong.

Regression (1) uses no weights, while regression (3) shows results weighted by population. Weighting by population is logical as I suggest that the Mongols largely determine a country's population. The logic being that the countries invaded would end up being geographically bigger and thus more populated (see further discussion

Table 2
First Stage Least Squares

	Dependent variable:		
	CL_{2016}		
	(1)	(2)	(3)
$M_{\%, t}$	-40.400***	-40.118***	-50.042***
	(6.570)	(6.505)	(6.500)
Land Locked	-2.961	-3.051	7.758
	(3.604)	(3.677)	(6.054)
East-West Axis Proximity	38.906***	38.434***	16.485***
	(5.828)	(5.835)	(5.689)
Weights	None	Log(Population)	Population
Observations	91	91	91
R^2	0.458	0.454	0.407
F Statistic (df = 3; 87)	24.496***	24.133***	19.871***

Note: * p < 0.1; ** p < 0.05; *** p < 0.01

in section 4). Furthermore, there is a natural logic to weighting by population as we care about people, not about a country per se. That being said, the reality is that China, India, and Indonesia, to a significant extent, determine the results; this is a problem not in theory but practice. The best solution is to show that we get the same statistical significance with no weights and population weights. Thus, it would be true for any weights in between. Regression (2) shows weights by the log of population. There is no clear candidate for in-between, but natural log makes intuitive sense. Regardless, the log population results show that some in-between weights also result in statistical significance.

In the second stage results are as expected with regards to $\widehat{CL}$ (Table 3).

Table 3
Second Stage Least Squares

	Dependent variable:		
	log(GDP/Capita) in 2016		
	(1)	(2)	(3)
$\widehat{CL}$	-0.072***	0.070***	0.045***
	(0.014)	(0.013)	(0.010)
Land Locked	-0.126	-0.186	-0.996**
	(0.316)	(0.319)	(0.461)
East-West Axis Proximity	-0.582	-0.378	2.854***
	(0.669)	(0.652)	(0.397)
Weights	None	Log(Population)	Population
Observations	91	91	91
R^2	0.367	0.370	0.386

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

The coefficient is positive and highly statistically significant both with no weights and with population weights. Landlocked is statistically significant in the population weighted case. East-West Axis Proximity is only statistically significant when weighting by population. The sign is positive as predicted. Figure 13 depicts the second

stage of the regression. Note the coefficients on CL changes very little when adding East-West Axis Proximity. East-West Axis Proximity and $M^{i}_{\%,\,t}$ are almost orthogonal when regressed on each other (Table 4).

Figure 13
Log(GDP/Capita) against predicted/instrumented institutional quality

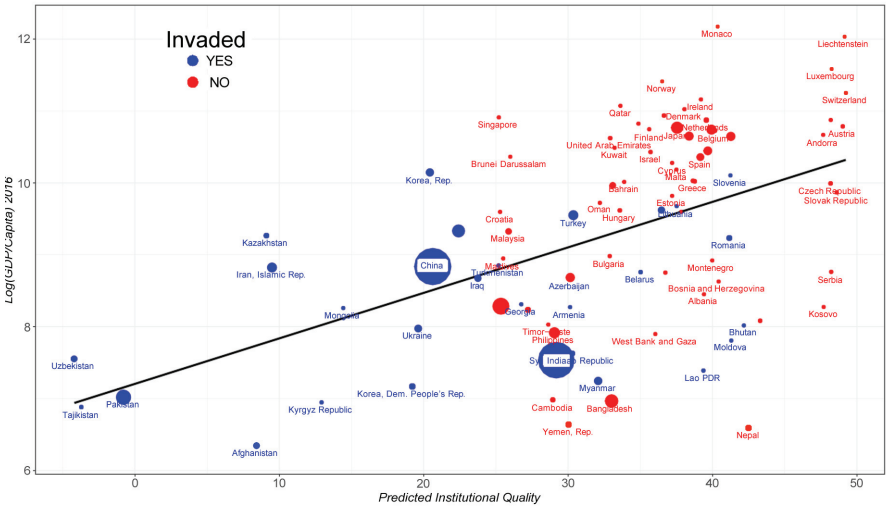


Table 4
Instrument on Geographic Quality

	Dependent variable: $M^{i}_{\%,\,t}$	
	(1)	(2)
East-West Axis Proximity	0.140	-0.032
	(0.091)	(0.112)
Weights	None	Population
Observations	91	91
R^2	0.026	0.001

Note: * p < 0.1; ** p < 0.05; *** p < 0.01

3.4 Validity of the Exclusion Restriction

The correlation between being invaded by the Mongols and a lower economic output relies on the validity of the exclusion restriction to

establish a causal link. The exclusion restriction implies: (1) no backward causality, and (2) no correlation between other growth and $M^{\%}$ (I will loosen this to no positive relationship). Let's first look at (1).

Assuming GDP per capita today doesn't directly affect the land invaded by the Mongols is logical, since the future can't shape the past. However, less straightforward is if there is a correlation between the position of the lands invaded by the Mongols and GDP per capita before the Mongols. Simply, if the areas the Mongols didn't invade were already richer, the implication is that a higher GDP per capita before the 13th century is what caused a higher GDP per capita today, thus potentially having nothing to do with Mongol invasions.

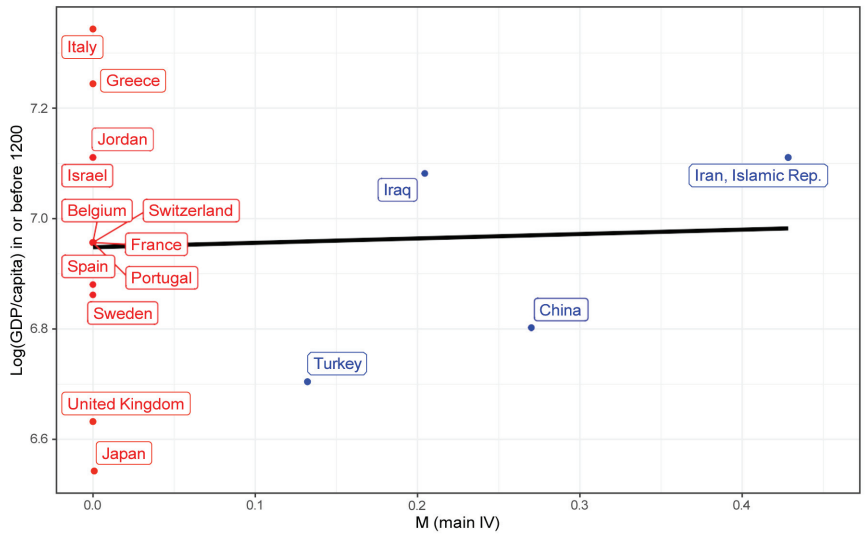
Using the Maddison data tables to get estimates for pre-Mongol GDP per capita, we can see no significant relationship between being invaded by the Mongols and GDP per capita pre-1200 (Figure 14) (Maddison Project Database). Furthermore, many historical accounts can bolster the claim that Western Europe was no richer and likely poorer than the rest of Eurasia before the Mongols; see for example (Landes, 2015). Thus, we can plausibly rule out backward causality given both the Mongols (see section 2.2.f) and historians agree that Western Europe was more impoverished.[9]

To validate (2), I need to show that Mongol invasion has either no correlation or a negative correlation with other potential fundamental causes of growth. Growth literature is rich with stories and theories as to what ultimately drives growth. Generally, it is accepted that all these potential causes can be distilled into a relative shortlist; for example, see discussion in Chapter 3 of (Acemoglu, 2012). With this in mind, I will deal with the list below and the necessary restrictions in turn.

– Other Geographic Variables;
– Trade;
– Human Capital.

[9] For books documenting the prosperity of the Middle East before the Mongols see Freely (2010) and Lyons (2011). For a book documenting the wealth of China before the Mongols see Suzuki (2009).

Figure 14
GDP per capita before 1200 on $M_{\%, t}$



Source: Maddison Data Tables.

As a starting point, consider three geographic factors that Jeffery Sachs promotes as fundamental drives of growth (Sachs, 2003). They are a tropical climate, access to ocean ports, and distance of the country from the world's major trading centers (Rotterdam, New York, and Tokyo). All of Eurasia has and historically had little or no tropical diseases. When the Mongols invaded, the most important trading centers were along the silk road at the center of the empire. Thus, it doesn't make much sense to consider distance to modern trading centers as this could be a result of the poor institutions the Mongols left. Looking at ocean ports, China, the Middle East, Russia, India, and Western Europe all have similar access to ocean ports. While some areas are geographically isolated, like Tibet, I have already shown that including a landlocked dummy doesn't change the results.

Furthermore, I added a variable for the amount of coastline (a proxy for ocean ports), KM of navigable waterways, percentage of the country that is arable land, deaths by communicable diseases (a

proxy for prevalence of disease), as a robustness check. The coefficient on C-L2016 is lower but still positive and significant (Table 5). While many of the results are statistically significant, it should again be noted they are potentially highly endogenous (note: for the remainder of the paper, I will not report the log(population) weighted results to save space).

Table 5
Second Stage Least Squares with Additional Geographic Variables

	Dependent variable:	
	log(GDP/Capita) in 2016	
	(1)	(2)
$\widehat{CL}$	-0.047***	0.027***
	(0.010)	(0.007)
Land Locked	-0.029	-0.698***
	(0.238)	(0.222)
East-West Axis Proximity	0.531	1.232***
	(0.456)	(0.275)
Coastline	-0.00000	0.00001**
	(0.00001)	(0.00000)
Percentage of Arable Land	-0.016**	-0.013???
	(0.006)	(0.003)
KM of Navigable Waterways	0.00001	-0.00001***
	(0.00001)	(0.00000)
Communicable Diseases Deaths	0.002	-0.038???
	(0.021)	(0.011)
Weights	None	Population
Observations	87	87
R^2	0.715	0.922

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$
Coastline is simply miles of coastline with the ocean. KM of Navigable Waterways measures KM of rivers that a large boat can use. Communicable Diseases is a proxy for disease prevalence, given most tropical diseases are spread communicably.

Moving down the list, another view is that trade is the fundamental drive of growth. The argument suggests that at first countries

begin to trade and, this generates wealth, and then they invest in high-quality governmental institutions.[10]

Importantly, the Mongol Empire was a center of trade. During their reign, the Silk Road was considered the most extensive, or at least one of the most significant trade routes in the world (Frankopan, 2015). The Mongols actively protected the Silk Road, which led to a boom in trade; "As a result of the Mongol Empire, international Mongol trade was born on a level never seen before" (History on the Net). Some historians suggest the Mongol Empire should be considered as the first genuinely globalized trade system; see (Hill, 2010). However, if trade drives growth, we should have the opposite finding; that is a positive correlation between the lands invaded by the Mongols and GDP per capita. Thus, it is remarkable that such a vast trade network negatively correlates with GDP per capita. The clear implication is that trade is not a fundamental cause of growth but rather a proximate one.

Finally, another view is that the fundamental drive of growth is human capital.[11] The suggestion is that high levels of human capital cause growth and productivity from human capital generates good institutions, not the other way around.

However, historical accounts suggest the Mongols were conducive to high levels of human capital. English scientist Roger Bacon observes that the Mongols "succeeded by means of science." It is well documented that the Mongols would take the best engineers, merchants, and scholars from the lands they conquered; see Marco Polo's infamous stay in the Yuan Dynasty. It has been noted that Europe borrowed technologies from the Mongol Empire much more so than the Mongol Empire borrowed from Europe. Jack Weatherford writes that after European exposure to the Mongols, Europe "absorbed the technologies for printing, firearms, compass, and the abacus." Weatherford continues, "the new technology, knowledge,

[10] For influential articles suggesting trade is the fundamental cause of growth see Frankel and Romer, 1999; Alcal. and Ciccone, 2004.
[11] For influential work see Glaeser and Resseger, 2010; Ehrlich, 2007; Glaeser et al., 2004.

and commercial wealth created the Renaissance" (Weatherford, 2005).

The above begs the obvious question: If the Mongols had more advanced technology, better engineers, and used the scientific method (suggesting more human capital), why are those areas more impoverished today? Why did these technologies spread so fast into Western Europe and did not create wealth where they originated? If human capital drives wealth, why then it didn't work this way in the Mongol Empire? It appears that the institutional structure left by the Mongols had such a negative effect on growth that it outweighed the positive impacts the Mongols had on trade and human capital.

3.5 Difficult Counterfactuals

In this section, I will discuss some counterfactuals that are difficult to address quantitatively. With work addressing broad historical questions, it is difficult or even impossible to test against every alternative theory. And, even to test against alternative stories couched in the assumption that the Mongols played a huge role in explaining the Industrial Revolution, but did so in a different way than presented in this paper. I will offer a brief discussion of three competing hypotheses that are difficult to test against. I will title them (1) distinctive geographic features, (2) plague, and (3) the Weatherford Effect.

By distinctive geographic features, I refer to granular physical characteristics that are different from one region to the other in some dimensions. For example, we can say Europe, the Middle East, and China had access to the ocean, but which ocean and the precise port of entrance will always differ. In (Diamond, 1998) and (Diamond, 1999) the author offers many explanations as to how different geographic features in Europe vs. China generated different paths of development.[12]

[12] For example, Diamond suggests that the mountainous nature of Europe led to different development paths. However, many, including Hoffman (2015), have pointed out this isn't, in fact, true.

Given these geographic differences will always exist, it is difficult to rule out each one. For example, in Fernandez-Villaverde et al. (2020) the authors build a model suggesting that differences in prosperity between Western Europe and China can be explained by the degree to which river basins conducive to agriculture are situated in a region. Essentially, they argue that given China has one large agricultural basin, between the Yangtze and the Yellow Rivers, the result was a large state. Meanwhile, Western Europe contained pockets of such basins conducive to agriculture that were more geographically dispersed, which led to more dispersed countries. The important counterfactual questions become – would have the more fragmented European geography mattered had the Mongols invaded? If this basin in China wasn't, by luck, very open to the Steppe and Mongol invasion, would we see a large unified China?

To counter this argument, let's note that China has not always been unified, and Europe has not always been fractured (to be discussed in more detail). In fact, before the Mongol invasion, the central basin in China saw three different empires controlling different parts of it. Thus, it is hard to argue that these geographic differences were destined to result in China being unified while Europe wouldn't be. Also, it is worth noting that Russia has dispersed river basins, very similar to Western Europe, and ended up with a large unified empire. Ideally, I would add this type of geographic microdata into the paper as a control. With that being noted, the more general point is that controlling all such arguments based on distinctive geographic features is tricky.

The plague known as The Black Death is a very difficult counterfactual to address.[13] How would the world have looked without either this plague or the Mongols, or both? Mongol invasions began about 120 years before The Black Death spread across Eurasia; in fact, the Mongols played a part in spreading it. Thus, the plagued literally followed the Mongols. Given the variables essentially coex-

[13] The Black Death spread all over Eurasia between 1346 to 1353 (Wikipedia).

isted at the same time and in nearly the same places, it is hard to infer the effects of each element considered singularly.

That being said, it would seem the variation needed to do so is present. While The Black Death continued its spread into Western Europe, the Mongols didn't. It seems Mongol invasions have a better track record in explaining the variation we seek to explain. However, some, most notably (Voigtländer and Voth, 2009), have argued The Black Death had very different effects in Europe compared to the rest of Eurasia, leading to very different development paths. Addressing this would ideally be done with microdata, thus showing differing effects of Mongol invasions vs. the spread of this plague. It would be ideal to look at areas of Europe that experienced The Black Death in the same way as did the rest of Europe but had Mongol invasions; for example, Hungary and Poland.

Finally, I will address something I will call the Weatherford Effect. In section 3.4 I suggest that if there were a violation of the exclusion restriction, it would bias the results and understate them. In the book (Weatherford, 2005), the author makes the case the Mongols were paramount in causing the Industrial Revolution by promoting the spread of innovation via fostering human capital and trade across Eurasia. What if, indeed, this is correct, Weatherford just doesn't account for the fact that the Mongols would negatively affect institutional development and thus force this innovation to take root outside the Mongol Empire?

Thus, we can't say what counterfactual would have occurred if the Mongols had never existed. It might be that the Mongols either ushered in the Industrial Revolution but pushed it to areas outside the empire or deterred it. It is a thought-provoking question that is difficult to deal with. Clearly, the Mongols played some role in the Industrial Revolution; the suggestion here is they played a prominent role in where it would occur. But can we say anything about when it would occur? Did the Mongols push it forward or backward in time? It shows how difficult addressing such broad questions can be. That being said, it is what makes economic history both frustrating and fascinating.

3.6 Robustness Checks

3.6.a Specification

The following section intends to show that the results hold up to different specifications of the model. Table 6 shows the basic regression with different measures of institutional quality. Listed as the independent variable instead of C-L are other measures of institutional quality offered by the World Bank; see (World Bank). In every case, except regression (8), the measure is still statistically significant.[14] Though some of the models do not fit well with the data, the coefficient is still positive and significant for institutional quality suggesting the variable has the proposed impact.[15]

Table 7 demonstrates the same basic regression with different groups of countries. Regression 1-6 removes sequentially bigger groups of Western European countries. Western Europe, in general, is a loosely defined group of countries. I start with the narrowest groups and move east to include all European countries not invaded by the Mongols. Finally, I look at all countries that had a value of $M^{i}_{\%,\,t}$ greater than zero; that is, all countries with at least some %,t exposure to the Mongols. The results hold up and change little across the groups. This is important as it shows that $M^{i}_{\%,\,t}$ has an effect that isn't just a result of some uniqueness of Western Europe independent of the Mongols. The results suggest that countries outside Western Europe and not invaded by the Mongols also ended up better off. Western Europe ended up as the richest both because it was not invaded but and also for the geographic advantage of being close to the East-West Axis. Importantly though, countries not in Western Europe and not invaded did better as well. The effect isn't just an anomaly of Western Europe. Table 8 shows the results are robust to different specifications of the IV. Regression 1-2 uses only the per-

[14] Note that some of the regressions have negative R squared values; normally with a constant term a negative R squared is impossible, in a 2SLS it is possible given the constant term is the predicted intercept from the first stage; see discussion (STATA).

[15] The R squared is only negative for population-weighted regressions. The negative R squared results from India having high scores on these measures of institutional quality; if India is excluded, the R squared becomes positive.

TABLE 6
Second Stage Least Squares with various Measures of Institutional Quality

	Dependent variable:											
	log(GDP/Capita) in 2016											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Control of Corruption	0.044***	0.081***										
	(0.005)	(0.014)										
Government Effectiveness			0.053***	0.093***								
			(0.006)	(0.017)								
Rule of Law					0.044***	0.110***						
					(0.005)	(0.032)						
Voice and Accountability							0.050***	0.241				
							(0.010)	(0.264)				
Political Stability									0.046***	0.058***		
									(0.007)	(0.007)		
Regulatory Quality											0.047***	0.066***
											(0.006)	(0.008)
Land Locked	-0.174	0.656	-0.081	1.551*	-0.149	0.715	0.111	-0.348	-1.066***	-1.332***	0.055	-0.046
	(0.198)	(0.629)	(0.196)	(0.782)	(0.199)	(1.082)	(0.354)	(3.673)	(0.230)	(0.377)	(0.229)	(0.426)
East-West Axis Proximity	0.621*	0.534	0.409	-0.319	0.374	1.444	-1.178	7.751	1.092***	1.242***	0.171	1.118***
	(0.330)	(0.610)	(0.330)	(0.777)	(0.342)	(0.902)	(0.750)	(6.303)	(0.391)	(0.366)	(0.385)	(0.404)
Weights	None	Population	None	Population								
Observations	89	89	89	89	89	89	89	89	89	89	89	89
R^2	0.741	0.117	0.756	-0.063	0.740	-.156	0.281	-0.354	0.595	0.601	0.691	0.531

Note: * p < 0.1; ** p < 0.05; *** p < 0.01

TABLE 7
Second Stage Least Squares While Excluding Various Groups of Countries

	Dependent variable:							
	W/o Western Europe Narrow		W/o Western Europe Broad		W/o Western Europe Broadest		Countries Invaded by the Mongols	
	log(GDP/Capita) in 2016							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\widehat{CL}$	0.047***	0.065***	0.044***	0.072***	0.043***	0.075***	0.052**	0.082**
	(0.006)	(0.010)	(0.007)	(0.013)	(0.008)	(0.015)	(0.025)	(0.037)
Land Locked	0.033	-0.196	-0.061	-0.193	-0.063	-0.108	0.168	0.356
	(0.245)	(0.428)	(0.263)	(0.486)	(0.278)	(0.538)	(0.760)	(1.259)
East-West Axis Proximity	0.138	1.736***	0.100	1.971***	0.083	1.980***	-0.786	1.819
	(0.411)	(0.505)	(0.408)	(0.540)	(0.414)	(0.573)	(2.352)	(1.428)
Weights	None	Population	None	Population	None	Population	None	Population
Observations	81	81	75	75	70	70	32	32
R^2	0.656	0.524	0.635	0.333	0.574	0.256	0.074	0.059

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$
Western Europe Narrow includes: Belgium, France, Ireland, Luxembourg, Monaco, Netherlands and United Kingdom. Western Europe Broad includes the Narrow group but also: Spain, Portugal, Italy, Switzerland, Lichtenstein, and Germany. Western Europe Broadest includes the Broad group but also: Denmark, Sweden, Norway, Finland, and Austria. Finally, (7) and (8) are only countries with $M^{i}_{\%,t}$ not equal to 0.
%,t

TABLE 8
Second Stage Least Squares with different IV's

	Dependent variable:									
	Percentage Invaded IV		Duration of Invasion IV		Invaded Dummy IV		DNA of Genghis Khan IV		Distance to Eurasian Steppe	
	log(GDP/Capita) in 2016									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$\widehat{CL}$	0.043***	0.061***	0.047***	0.071***	0.044***	0.049***	0.059	0.032**	0.065***	0.051***
	(0.005)	(0.007)	(0.006)	(0.010)	(0.005)	(0.006)	(0.037)	(0.013)	(0.014)	(0.008)
Land Locked	-0.020	-0.119	0.048	0.028	-0.004	-0.297	0.289	-0.561	0.381	-0.254
	(0.219)	(0.390)	(0.230)	(0.472)	(0.217)	(0.324)	(0.381)	(0.355)	(0.373)	(0.360)
East-West Axis Proximity	0.302	1.237***	0.184	0.998**	0.275	1.526***	-0.233	1.954***	-0.415	1.457***
	(0.369)	(0.364)	(0.387)	(0.458)	(0.365)	(0.301)	(1.274)	(0.406)	(0.639)	(0.346)
Weights	None	Population	None	Population	None	Population	None	Population	None	Population
Observations	89	89	89	89	89	89	89	89	89	89
R^2	0.708	0.603	0.693	0.442	0.705	0.723	0.540	0.686	0.465	0.702

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$
Percentage is percentage invaded. Duration is the time spent invaded. Dummy is a variable indicating if invaded at any point or not. DNA is the percentage of people in the country with DNA from Genghis Khan (note this likely is a bias IV). Distance from the Eurasian Steppe is distance from capital city to the closest point of the Eurasian Steppe. See Appendix for description

TABLE 9
Second Stage Least Squares using different Empires

	Dependent variable:							
	Mongol Empire		Timur Empire		Mughal Empire		Ottoman Empire	
	log(GDP/Capita) in 2016							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\widehat{CL}$	0.047***	0.031***	0.047***	0.030***	0.050***	0.031***	0.065***	-0.033
	(0.007)	(0.006)	(0.007)	(0.006)	(0.009)	(0.007)	(0.019)	(0.324)
Land Locked	0.055	-0.574?	0.055	-0.591*	0.119	-0.572*	0.394	-1.54
	(0.237)	(0.312)	(0.237)	(0.315)	(0.267)	(0.316)	(0.439)	(4.98)
East-West Axis Proximity	0.173	1.975***	0.171	2.002***	0.062	1.972***	-0.414	3.56
	(0.399)	(0.293)	(0.400)	(0.298)	(0.452)	(0.307)	(0.750)	8.00
Weights	None	Population	None	Population	None	Population	None	Population
Observations	89	89	89	89	89	89	89	89
R^2	0.691	0.748	0.691	0.748	0.574	0.256	0.468	-0.715

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$
The table shows results separating the Mongol, Timur, and Mughal Empire.

centage part of $M^{i}_{\%,\,t}$; recall $M^{i}_{\%,\,t}$ is constructed by multiplying the country's invaded percentage by the duration of the invasion. Regressions 3-4 use the duration part the $M^{i}_{\%,\,t}$. The results are consistent using either as an IV. In regression 5-6, a simple dummy variable is used; 1 if ever invaded by the Mongols, and 0 otherwise (see appendix for further discussion). Finally, I use an IV that is constructed based on the percentage of Genghis Khan's DNA found in a given country; data from (Zerjal et al., 2003; Derenko et al., 2007). There is a thorough discussion of this variable in the appendix. This variable was the initial choice of IV, but I feel it is biased as the papers listed above did not test for the DNA in countries far from Mongolia, and simply, it is likely that most of this DNA came from Mongolia as that is where Genghis spent the majority of his time, as well as many of his offspring.

It is essential to consider a time-invariant IV. As noted in section 2.2.a, the Mongols come from a bigger story. The Eurasian Steppe repeatedly created a world where competition between two ways of life emerged. This is something that has been noted before. Consider historian Walter Scheidel who has noted that regions further from the Eurasian Steppe are more fragmented; he notes "This hypothesis proceeds from the premise that antagonistic relationships between steppe pastoralists and settled agriculturalists precipitated scaling-up of state power and size in response to competitive pressures;" see (Scheidel, 2019, Chap. 8).

Naturally, it is no longer the case that the interplay between these two worlds dramatically affects sedentary societies; the Steppe has been tamed; see (Legg, 1990). However, this aids in building the story of persistence. While the Steppe no longer plays a role, nor do the Mongols, in current geopolitics, the threat that it could has existed until recently[16] The push to "tame" the Steppe and eradicate

[16] I am using recently loosely, most of the Steppe, aside from Afghanistan, was divided up between Russia and China by 1727, though there was still a major rebellion and effort to revive the Mongol Empire as late as 1924 which the USSR had to deploy troops to quell (Isono, 1979)

the threat is what is ultimately very persistent. If the Steppe resulted in this type of interaction for thousands of years, the geographic effect should still be alive today, and indeed it is. If we look at Table 8, rows (9) and (10), we see the results of using the distance of capital cities to the closest outer edge of the Steppe (Figure 4) as an IV gives similar results. Note this IV is time-independent; the Steppe is still there, as it was during Mongol invasions.

Finally, Table 9 distinguishes between the Mongol, Timur, and the Mughal Empire. As discussed above, there are many reasons to think of them as one empire, but not all historians agree on that. The results indicate that they have a very similar effect. The results are not just driven by one of the 3 empires, rather all three of them separately have the same significant effect. I will discuss the Ottoman Empire in section 4.2.d.

3.6.b Spatial Correlation

A paper by (Kelly, 2019) noted an important critique to persistence papers. Kelly points out that many such articles have error terms that are highly spatially correlated; that is correlated with the distance between countries. This is clearly a violation of the simple premise that the error term is random (uncorrelated) noise. Technically if the error term is significantly spatially correlated the reported t-stats would be inflated, thus potentially implying spurious causality.

In a broader sense, the critique is that IVs in this context pick up historical differences between regions that will always exist. Thus, the explanatory variables reflect the impact of time and not of an exogenous shock. This is, of course, a valid concern. The reality is history usually doesn't give us sufficient control for this. Thus, a fix in place of more rigorous controls is to see the degree to which the error term is, or isn't, spatially correlated. Practically, we should be concerned if this correlation is abnormally high as it implies a high likelihood of spurious results.[17]

[17] It is worth noting that spatial correlation doesn't necessarily invalidate the results.

The standard way of doing this is to conduct what is known as a Moran I test, which tests the hypothesis of significant spatial correlation among the error terms (Kelejian and Prucha, 2001). The analysis can get complex as there is no standard way to measure the distance between countries. For brevity, I will discuss different measures and results in the appendix C.

To summarize, there is evidence of spatial correlation, but it isn't that conclusive or high enough to invalidate the results. Furthermore, and importantly, the results show that the regions invaded by the Mongols have no significant spatial correlation. The implication is subtle but is in line with the hypothesis. The hypothesis is that the Mongols forced regions to become similar, i.e., autocratic. If true, we should find no spatial correlation among the countries invaded. However, the hypothesis doesn't suggest there would be no spatial correlation in regions the Mongols didn't invade. Thus, the presence of spatial correlation in the regions not invaded isn't as significant. In a way, Western Europe's advantage is that it got to keep its heterogeneity and it wasn't forced by an outside entity (the Mongols) to become similar in this dimension. With this noted, it is important to state that the findings of some spatial correlation should be considered when interpreting the results.

4. The Persistence of Autocratic Institutions

4.1 Mechanisms of Persistence

So how did the Mongols push states down the path of autocratic governance? The answer put forward here is Mongol invasion increased the perceived need for military power for protection. The Mongols altered the anticipated cost and benefit inherent in the trade-off between military efficiency and individual liberties. After invasion at their hands, the perceived need for military power grew,

---

The main critique of Kelly is that spatial correlation likely results in abnormally high t-stats, not per se that the papers are invalid altogether.

thus pushing countries towards autocracy and away from individual liberties.

The above is the mechanism by which invaded regions became more autocratic, but this doesn't explain why this has persisted until modern-day long after Mongol power has faded. I suggest the institutional shock has persisted for two reasons:

1) The Iron Law of Oligarchy - Sociologist Michels first developed the idea (Michels et al., 2012). However, I will use the term as described by (Acemoglu and Robinson, 2012): the "iron law of oligarchy means that even when oligarchs are overthrown, the revolutionaries, like the pigs in Animal Farm, often come to resemble them. New leaders overthrowing old ones with promises of radical change bring nothing but more of the same;" thus, institutions can be remarkably persistent.
2) A Cultural Shift - Culture supports institutional persistence, given societies with different shared experiences have different core values. These different values result in different economic and political decisions. Conquest by the Mongols resulted in a culture that valued more centralized institutions. Importantly this value system has been passed down through generations, even though the threat that created these values is no longer real.

Many economists have issues with the validity of regressing a contemporaneous variable on a variable representing events that occurred hundreds of years ago. How does one justify that something occurring hundreds of years ago affects today's world? Indeed, this is a valid concern. The validity of the results rests on the belief institutions, and in particular autocratic ones, are very persistent through time. It would be ideal if there were perfect institutional quality measures for all empires in history through time. Then, one could show the trajectory of institutions over the period in question. However, these measures do not reliably exist. Thus, I feel the best solution is a middle ground between an assumption (that autocratic institutions are by their very nature persistent) and statistical proof. Proof being, of course, ideal, but also impossible.

In reality, there is no reason to believe institutions are like fossils

in ice that remain perfectly preserved for thousands of years. However, there are also reasonable grounds to believe they can be very persistent. Section 4.2.a will illustrate how a movement towards more autocratic, militaristic, and inward-looking institutions in the areas the Mongols invaded has persisted until the present day. Given a complete look at each country's history would be too lengthy, I will aim to show the broad outline of the sequence of events going from the Mongols to the state of present-day institutions in certain regions.

4.2.a Conquest? Consolidation

> "*He who fights with monsters should be careful lest he thereby become a monster. And if thou gaze long into an abyss, the abyss will also gaze into thee.*"
> (Nietzsche, 1911).

The above quote in the context of the paper can be understood in the following way, if you engage in a battle with someone, you potentially need to become like them to defeat them. A significant reason the Mongols were such a formidable army, at times a seemingly unstoppable force, was because they were so unified. Instead of seeing themselves as individuals, they identified themselves as part of one larger unit and cause. So it was a widespread opinion that to beat them, you had to become like them.

The period of the Mongol invasions and the centuries after are often called the era of "conquest and consolidation." I have talked about the conquest part, but it is essential to also talk about consolidation. Consolidation refers to the fact that after the Mongols, empires began to expand geographically and militarily to protect their borders. In other words, the process of "consolidation" encapsulates the shock the Mongols had on institutional development. To beat them, countries began to mimic them. In the following, a brief set of anecdotes that supports this claim.

4.2.b China

While China had been unified under the Han and Tang Dynasties, prior to the Mongol invasion, China was fractured into four different empires: The Jin, Song, Xixia, and Tibetan. The empires actively traded with the rest of the world[18] via the silk road and sea. That is to say, the empires were open and outward-looking.

A key reason the Mongols were able to conquer most of what is modern day China was the disunity of the above-noted empires. On occasion, a given empire was happy to help the Mongols if it meant defeating their enemy. The problem with this tactic was failing to realize that they were next on the chopping block. For example, see how the Song dynasty allied with the Mongols against the Jin dynasty, only for the Song to see a mighty unified Mongol army on their borders shortly after (Graff and Higham, 2012). The Mongols had excellent reconnaissance and would often strike at opportune times when empires were fractured and weak; in brief, this is the story of the Mongol conquest of China.

After the Mongols were expelled, Chinese rulers, under the Ming, chose to "look inward;" focusing on consolidating the empire and avoiding future weaknesses caused by disunity. They spent considerable resources building the Great Wall and invading Tibet to fortify their borders, thus protecting them from further invasions from the Mongols (Elverskog, 2006).

Following the Mongols, many historians have noted that China had superior sailing ships compared to the empires of Western Europe. Note the Chinese fleet led by Zheng He that sailed the Indian Ocean between 1405 and 1433; this fleet consisted of 28,000 sailors on 300 ships vs. Columbus, who had 90 sailors on three ships in 1492. Furthermore, Zheng He's largest ships were over four times longer than those of Columbus (Morris, 2010). Following these voyages, China's rulers dictated laws that forbade citizens to sail. Zheng He's vast fleet rotted in harbors; many speculate that Zheng He

[18] For an excellent overview of China's history before the Mongols (Fukuyama, 2014).

would have beaten Columbus to the Americas if not ordered to stop. Imagine how different the world would look today if this had occurred!

Cutting funding to Zheng He was part of a broad policy of looking inward to consolidate power. Money that was previously spent on sailing would be used to build the Great Wall. Funding went from discovery to protection. This decision was a historical blunder of monumental proportions. The future of powerful empires would be built by sea voyages. China was destined to be conquered by skilled sea-going empires; see the first opium war with the British. China looking inward stopped the diffusion of important technologies into the country leading to backwardness that can still be seen today.

While China saw periods of upheaval and rule by different dynasties following the Mongols, one thing remained: it was always ruled as one consolidated body under an autocratic leader – The Iron Law of Oligarchy at work. This long shadow of history seems only too visible today. After Mao died in 1976, the country seemed to be moving away from autocracy towards a gradual transition to democracy. This bubble burst in 2018 as China's current leader Xi Jinping declared himself ruler for life, essentially bestowing on himself the power Mao had possessed. Or, for that matter, the power that Kublai Khan gave himself, which emanated from Mongol conquests.

As Mark Twain allegedly said, "history does not repeat itself, but it rhymes." A perceived external threat backs the desire for autocratic government, and once this justification sets in the minds of citizens, it is tough to displace it. Authoritarian rulers are followed by others as new external threats, real or imagined, emerge. The destruction of China at the Mongols' hands represented the ultimate external threat. The Mongols attempted and almost succeeded in destroying a culture and subjugating an entire people. The Great Wall was designed to keep the Mongols and other external threats out. However, in equal measure, it began to trap the Chinese in.

4.2.c Russia

> "*It is wrong to think that Mongol-Tatars invaded Russia as a single state, because the state actually formed as a response to the invasion, to resist and overthrow it*" (Manaev).

Before the Mongols invasion, the country was anything but unified. The area was known as Kievan Rus and was organized as a loose federation of many different principalities. The Kievan Rus Empire was just a fraction of the size of Russia today; one can see this looking at the maps from the year 1200.[19] Before the Mongols, the largest and most important city in the region was Kyiv. After the sacking and devastation of Kyiv at the Mongols' hands, Moscow rose to prominence as the surrounding geography made it easier to defend. The leader most responsible for the defeat of the Mongols was Ivan the Great, who became known as the "gatherer of the Russian lands" (De Madariaga, 2005). Ivan pushed the Mongols back and claimed vast territories. In the process, Russia started to look more like it does today. The geographic expansion consolidated power to prevent further invasion. While the Chinese built a Wall, the Russian's barrier was territory.

One history book accounts for how Ivan the Terrible (coming to power soon after Ivan the Great) put into practice "attack as defense," a plan to attack the Mongols and push them back to make sure they would never be a threat again. That is attacking them before they attack you. Furthermore, Russia gained strategic physical barriers to protect against further invasion, "Russia gained access to the Caspian, and later the Black Sea, thus taking advantage of the Caucasus Mountains as a partial barrier between itself and the Mongols."

Russia is a fascinating example of the Golden Law of Oligarchy. In 1917 Russia stood on the precipice of a remarkable social experiment. A communist revolution that promised power would reside in the people's hands and that wealth would once and for all be

[19] For an excellent history of Russia see (Hosking et al., 2001).

taken from the wealthy oligarchs and given to the poor. More than 100 years later, the communist experiment failed. A democratic and egalitarian promise ended. Today, the country is still very unequal and ruled by a de facto dictator, Vladimir Putin. Russia is a prime example of the persistence of institutions. During the reign of the Mongols, the fractured regions were forced together under one leader, a path that is difficult to abandon.

4.2.d The Middle East and Ottoman Empire

Prior to the Mongols the area had seen large empires, the Umayyad and the Abbasid for example, however just prior to invasions "The Muslim world was anything but united" (Ansary, 2009). There were significant fractures in the Islamic world, with the largest schism between Sunni and Shia factions. This division left the Islamic world divided, which largely accounts for the Mongols ease of conquest.

Before the Mongols, the Muslim world experienced what is known as the "Islamic Golden Age". This was a period of incredible[20] innovation and insight, advancing philosophy and mathematics. This period is dated as ending with Baghdad's sack in 1258, carried out by the great Khan Monke's brother Hulagu. While death tolls, as previously mentioned, are debated, as many as 1.5 million people were killed at the hands of the Mongols in a matter of days. The Mongols sacked and looted the city. The Mongols destroyed the "House of Wisdom," the largest library in the world at the time. They threw enough books in the river to create a bridge a man could ride across on horseback (Norman). Historical accounts suggest the Tigris River literally ran black with ink and then red with blood. The destruction of life and literature marked a resounding end to a period of relative enlightenment and prosperity.

After the Mongols, the area was unified under the Ottoman Empire. There is an in-depth historical connection between the Mongols

[20] See Ansary (2009) again.

and the Ottoman Empire, or the Turks. Mongol- Turkish culture is bound together by a similar past. The Turks were a nomadic tribe that predated the Mongols. When the Mongols invaded the Turk's region, around modern-day Turkmenistan, a complicated relationship between the two groups emerged. They were often friends and foes. When the nomadic Turks formed the Ottoman Empire in 1299, the founder Osman the Great carried out conquests in much the same way as the Mongols did. Thus, to some extent, you could consider the Ottoman Empire as an extension of the Mongols. Regardless of how you fit the Ottomans into the story, the critical point is that after the Mongol conquests, in this new world of domination and rule by nomadic tribes coming from the outside, a new, more violent type of Islam emerged. There was a dramatic transition from the Islamic Golden Age to a more militant Ottoman age. One can consider the critical turning point as the sacking of Baghdad.

If one treats the Ottomans in the same light as the Mongols, we can see similar results. Table 9, column (7) and (8), shows that non-population-weighted results are quite similar; however, population-weighted results are not a good fit at all. This is to be expected; essentially, the Ottomans did not invade China or India. Regardless, there is good evidence to suggest the Ottomans had a similar impact as the Mongols. Whether one treats them as an extension of the Mongols or an empire born out of the ruin the Mongols brought, we see evidence for a negative shock to institutional development.

Consider the following excerpt from Machiavelli's famous "The Prince" written in 1513. Machiavelli speaks of the difference between the Turks, or Ottoman Empire, and that of France "The whole monarchy of the Turks is governed by one lord; the others are his servants... but the king of France is placed in the midst of an ancient multitude of lords" and that these lords " have their privileges, and the king cannot take them away without danger to himself" (Machiavelli, 2008). A remarkable excerpt as it is written hundreds of years before the Industrial Revolution. We see already that France had many more checks on power than the Ottoman Empire.

It is difficult to fit the Middle East into the story as there is no

single large country in the region today; thus, it is unlike China and Russia. However, if we consider that autocratic power can consolidate in a religion rather than in a state, we could see the trend expressed today in the form of religious extremism. The Islam of the pre-Mongol world was characterized by logic and tolerance, which proved to be weak and prone to conquest. Today there is a robust binding militaristic set of institutions not embodied in the state, but rather a religion. While after WWI the Ottoman Empire was split up, the consolidation it engendered is still alive and well.

In general, social scientists tend to explain the world with factors that they can see or are contemporaneously present. For example, see the religious explanations of the Middle East's divergent development vs. Europe. We still see religion[21] dividing the world today; thus, it seems like a very plausible causal mechanism. Yet history continuously uncovers factors that are not seen today but were very real in the past. The suggestion here is the critical factor is not Islam vs. Christianity per se, but the break from the golden age of Islam to the Ottoman age. This break was not caused by something inherent in Islam. Instead, Islam changed with an existentially shocked culture.

4.2.e Europe: East vs. West and the Golden Bull

There were signs that Western Europe would become more unified under one leader in protecting against invasion from the Mongols. Consider the following quote describing Europe after the initial Mongol invasions: "Fear of the Mongols now provoked a game of religious dominoes in Europe. The Armenian church entered into discussion with the Greek Orthodox patriarchate in order to build an alliance and gain protection in the event of a future attack" (Frankopan, 2015). There are similar accounts of alliances between many of the Western European powers. There is a strong suggestion

[21] See, for example, the recent work by Rubin (2017).

that if the Mongols had invaded Western Europe, it would not have looked like it does today. Instead, it would look more like Russia or China, i.e., one large 'consolidated' state.

Consider an interesting observation made by (Roberts and Vincent) when discussing the history of the Magna Carta. Vincent compares the Magna Carta to the Golden Bull of 1222, presented to the king of the Hungarian Empire. Vincent points out how both documents were almost the same at their core. Yet, while the Magna Carta is celebrated as the first document that inscribed rights to the individual under the King, the Golden Bull of 1222 has almost no historical significance.

The suggestion here is straightforward. The Golden Bull failed in its attempts to limit power given decades later the Mongol Empire invaded the region. The Mongol invasion killed millions as they sacked cites and defeated the Hungarian army rather easily. The attack put Hungary in a state of shock, after which individual liberties inevitably fell down the list of priorities below protection. While the Magna Carta took root, the Golden Bull did not.

4.2.f The West and the Origins of Liberal Democracy

There is a long-standing argument that Western Europe benefited from competition between states while the rest of Eurasia prioritized security and thus tended towards large empires that dominated whole regions, Western Europe tended towards many small states fostering competition. If someone wasn't willing to support your invention in country x, you moved to country y; "in Europe, emerging nation states... competed economically and militarily" and "such competition discouraged states from opposing technological or institutional innovation" (Szostak, 2021). For further supporting work see (Jones, 2003; Mokyr, 2016).

History is full of examples of empires that reached a peak in terms of both geography and prominence and then began to fracture. One can look at how the Roman Republic began to fracture as its geographical expanse got sizable (Sage, 2013). Indeed, one could

also point to the splintering of the Mongol Empire. At a certain point an empire becomes so large it is unwieldy to maintain. Only if acted upon by an outside force this tendency to reach a certain size and fracture will be impeded. I believe this is the difference between Western Europe and the other areas of Eurasia. The external force being the Mongols specifically and the Steppe in general. Exposure to the Mongols/Steppe resulted in a tendency towards a more extensive, militaristic, and by necessity, more autocratic state. Simply put, states exposed to the Mongols/Steppe became more glued together (see Figure 15 and 16 below of Eurasia in 1700 and 1800, Russia, the Ottomans, Mughal, and Chinese Empire grow large)

The Mongols, as discussed, did not discourage innovation directly; in fact, in many ways, they sped up the pace of innovation. What they suppressed was competition between states. The Mongols supported science, trade, and human capital, but they eroded the industrial revolution's bedrock – property rights. Property rights emerged when states had to compete with one another. Ruling powers do not have a natural incentive to give inhabitants property

Figure 15
World Empires in 1700 CE

Figure 16
World Empires in 1800 CE

rights; why would they? The many small European states had to provide individual rights, or simply, all the good inventions would go elsewhere. The competition between states drove the race towards better and better institutions. When science and innovation were ready to explode, only Western Europe had the governmental structure to facilitate this explosion. Only Western Europe had governments sufficiently small and competitive to allow creative destruction.

I should briefly note, there is a deep irony here. By far, the most significant wars of the 19th and 20th centuries were in Europe. The irony is that less militaristic states ended up more likely to create advanced military technology and immense armies. Inter-state competition, which promoted liberalism, also encouraged military innovations. Which often lead to very illiberal outcomes: colonialism and the World Wars. Thus, a set of small European countries with vibrant economies set up massive empires; the 20th century saw the largest empires emanating from a fragmented Europe of the 19th century.

The years surrounding the French Revolution proved a pivotal turning point for Western Europe. Following this, people felt they had rights; that is, people became citizens of a republic to a greater or lesser extent. They then felt a willingness to go to war to defend those rights. The size of Europe's militaries exploded; see Napoleon's Grande Armée. Kings and rulers further ceded power to raise money for wars and colonization. This yielding of power further cemented property rights, which further cemented innovation, leading to further war and a race to capture more colonies. This dynamic process was largely absent in the rest of Eurasia.

Here, we come full circle, recall the AJR paper's discussion in the introduction (Acemoglu et al., 2001). I discuss how the paper illustrates how colonial Europe would significantly impact discrepancies in GDP per capita across borders in the modern world. The choice these empires would now make as to what type of institutions they would set up in their colonies would matter greatly. Would they set up institutions of extraction or the newly emerging institutions based on liberty and democracy? The important point being, Western Europe now had multiple blueprints to choose from.

5. Concluding Thoughts

Ultimately the goal of much of economics, and science, is finding an exogenous shock. While Genghis Khan was endogenous to Steppe politics and lifestyles, he was an unimaginable and unprecedented shock to the areas he invaded. The exciting thing about history, perhaps ironically, is that it is a very dynamic and evolving field as new evidence is revealed. The Mongols are a perfect example of this; much evidence about the Mongol Empire has only come to light in recent decades. While I do not want to simplify the story overly, a couple of points seem clear. (1) The Mongols brought with them incredible destruction previously unseen on such a scale, and (2) it is very plausible this had a longlasting effect on institutions. Once this is established, it is entirely believable that this effect on institutions

has resulted in much of the cross-country disparity in living standards we see today.

As a final note, it is important to maintain humility regarding the findings. While the paper makes a strong case for the importance of the Mongols in history, it still leaves many questions unanswered. The paper explains why the Industrial Revolution occurred in Western Europe, but it does not provide complete clarity on whether the Mongols had a positive or negative impact on the timing, nor does it offer any real explanation as to why it occurred. The paper addresses the "where" but not the "when" or the "why".[22]

An interesting point to note regarding the "why" is that the paper illustrates how the Mongols were advanced both strategically and technologically. This is not surprising in the context of history, as humans have always sought better tools and organizational structures to thrive. However, the paper does not attempt to answer why humans possess this drive for advancement. With this in mind, I hope that the reader finds the paper interesting and that it sheds some light while encouraging thought on some of these big questions.

References

Acemoglu D. (2012), "Introduction to Economic Growth", in *Journal of Economic Theory*, 147(2), pp. 545-550.

Acemoglu D., Johnson S., Robinson J.A. (2001), "The Colonial Origins of Comparative Development: An Empirical Investigation", in *American Economic Review*, 91(5), pp. 1369-1401.

Acemoglu D., Robinson J.A. (2012), *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*, Crown Books.

Alcalá F., Ciccone A. (2004), "Trade and Productivity", in *The Quarterly Journal of Economics*, 119(2), pp. 613-646.

Amitai-Preiss R. (2004), *Mongols and Mamluks: The Mamluk-Ilkhanid War, 1260-1281*, Cambridge University Press.

[22] See the translation of the *The Secret History of the Mongols* (Waley, 2008).

Ansary T. (2009), *Destiny Disrupted: A History of the World Through Islamic Eyes*, PublicAffairs.
Carlin D. (2010), *The Wrath of the Khans*.
Casey G., Klemp M. (2018), *Instrumental Variables in the Long Run*.
De Madariaga I. (2005), *Ivan the Terrible*, Yale University Press.
Derenko M., Malyarchuk B., Wozniak M., Denisova G., Dambueva I., Dorzhu C., Grzybowski T., Zakharov I. (2007), "Distribution of the Male Lineages of Genghis Khan's Descendants in Northern Eurasian Populations", in *Russian Journal of Genetics*, 43(3), pp. 334-337.
Diamond J. (1999), *Guns, Germs, and Steel*, WW Norton.
Diamond J.M. (1998), "Peeling the Chinese Onion", in *Nature*, 391(6666), pp. 433-434.
Durlauf S.N. (2009), "The Rise and Fall of Cross-Country Growth Regressions", in *History of Political Economy*, 41, pp. 315-333.
Ehrlich I. (2007), *The Mystery of Human Capital as Engine of Growth, Or Why The US Became the Economic Superpower in the 20th Century*, Technical report, National Bureau of Economic Research.
Elverskog J. (2006), *Our Great Qing: The Mongols, Buddhism, and the State in Late Imperial China*, University of Hawaii Press.
Fernández-Villaverde J., Koyama M., Lin Y., Sng T.-H. (2020), *The Fractured-Land Hypothesis*, Technical report, National Bureau of Economic Research.
Frankel J.A., Romer D.H. (1999), "Does Trade Cause Growth?", in *American Economic Review*, 89(3), pp. 379-399.
Frankopan P. (2015), *The Silk Roads: A New History of the World*, Bloomsbury Publishing.
Frazier I., *Invaders*.
Freely J. (2010), *Aladdin's Lamp: How Greek Science Came to Europe Through the Islamic World*, Vintage.
Fukuyama F. (2014), *Political Order and Political Decay: From the Industrial Revolution to The Globalization of Democracy*, Macmillan.
Gabriel R.A. (2006), *Genghis Khan's Greatest General: Subotai the Valiant*, University of Oklahoma Press.
Gallup J.L., Sachs J.D., Mellinger A.D. (1999), "Geography and

Eeconomic Development", in *International Regional Science Review*, 22(2), pp. 179-232.
GeaCron, *Interactive World History Atlas Since 3000 BC*.
Glaeser E.L., La Porta R., Lopez-de Silanes F., Shleifer A. (2004), "Do Institutions Cause Growth?", in *Journal of Economic Growth*, 9(3), pp. 271-303.
Glaeser E.L., Resseger M.G. (2010), "The Complementarity Between Cities and Skills", in *Journal of Regional Science*, 50(1), pp. 221-244.
Graff D.A., Higham R. (2012), *A Military history of China*, University Press of Kentucky.
Hall R.E., Jones C.I. (1999), Why Do Some Countries Produce So Much More Output Per Worker Than Others?, in *The Quarterly Journal of economics*, 114(1), pp. 83-116.
Hansen V. (2012), *The Silk Road: A New History*, Oxford University Press.
Heckman J.J. (1997), "Instrumental Variables: A Study of Implicit Behavioral Assumptions in One Widely Used Estimator", in *Journal of Human Resources*, 32(3).
Hill B. (2010), *History of the Mongols*.
History of the World, I. *History of the World*.
History on the Net, H. o. t. N. *History on the Net*.
Hoffman P.T. (2015), "Why Did Europe Conquer the World?", in *Why Did Europe Conquer the World?*, Princeton University Press.
Hosking G.A. et al. (2001), *Russia and the Russians: A History*, Harvard University Press.
House, *F. Freedom House*.
Inglis-Arkell E., *The Mongols Built an Empire With One Technological Breakthrough*.
Isono F. (1979), "Soviet Russia and the Mongolian Revolution of 1921", in *Past & Present*, (83), pp. 116-140.
Jones E. (2003), *The European Miracle: Environments, Economies and Geopolitics in the History of Europe and Asia*, Cambridge University Press.
Kelejian H.H., Prucha I.R. (2001), "On the Asymptotic Distribution

of the Moran I Test Statistic With Applications", in *Journal of Econometrics*, 104(2), pp. 219-257.
Kelly M. (2019), *The Standard Errors of Persistence*.
Khodarkovsky M. (2002), *Russia's Steppe Frontier: The Making of a Colonial Empire, 1500-1800*, Indiana University Press.
Landes D.S. (2015), *Wealth and Poverty of Nations*, Hachette UK.
Legg S. (1990), *The Barbarians of Asia*, Marboro Books.
Lyons J. (2011), *The House of Wisdom: How the Arabs Transformed Western Civilization*, Bloomsbury Publishing USA.
Machiavelli N. (2008), *The Prince*, Hackett Publishing.
Maddison Project Database, *Maddison Historical Statistics*.
Manaev G., *The Mongol Invasion Was the Reason Russia Formed*.
Michels R., Paul E., Paul C., Lipset S.M. (2012), *Political Parties: A Sociological Study of the Oligarchical Tendencies of Modern Democracy*, Free Press.
Miguel E., Satyanath S., Sergenti E. (2004), "Economic Shocks and Civil Conflict: An Instrumental Variables Approach", in *Journal of Political Economy*, 112(4), pp. 725-753.
Mokyr J. (2016), "Institutions and the Origins of the Great Enrichment", in Atlantic Economic Journal, 44(2), pp. 243-259.
Morgan D. (2007), *The Mongols*, volume 12, Wiley-Blackwell.
Morris I. (2010), *Why the West Rules-For Now: The Patterns of History and What They Reveal About the Future*, Profile books.
Nietzsche F.W. (1911), *The Complete Works of Friedrich Nietzsche: The Dawn of Day*, tr. by JM Kennedy, volume 9, TN Foulis.
Norman J., Historyofinformation.com.
Oxford Dictionary, I. *Oxford dictionary*.
Pederson N., Hessl A.E., Baatarbileg N., Anchukaitis K.J., Di Cosmo N. (2014), *Pluvials, Droughts, the Mongol Empire, and Modern Mongolia*, Proceedings of the National Academy of Sciences, 111(12), pp. 4375-4379.
Ringmar E., *Muhammed Alim Khan, the Last Emir of Bukhara*.
Roberts R., Vincent N., *Nicholas Vincent on the Magna Carta*, The Library of Economics and Liberty.
Rodrik D., Subramanian A., Trebbi F. (2004), "Institutions Rule: The

Primacy of Institutions Over Geography and Integration in Economic Development", in *Journal of Economic Growth*, 9(2), pp. 131-165.

Rubin J. (2017), *Rulers, Religion, and Riches: Why the West Got Rich and the Middle East Did Not*, Cambridge University Press.

Sachs J.D. (2003), *Institutions Don't Rule: Direct Effects of Geography On Per Capita Income*, Technical report, National Bureau of Economic Research.

Sachs J.D., Warner A.M. (2001), "The Curse of Natural Resources", in *European Economic Review*, 45(4-6), pp. 827-838.

Sage M. (2013), "The Rise of Rome", in *The Oxford Handbook of Warfare in the Classical World*.

Sala-i Martin X. (1997), *I Just Ran Four Million Regressions*.

Scheidel W. (2019), *Escape from Rome*, Princeton University Press.

Stasavage D. (2020), *The Decline and Rise of Democracy: A Global History from Antiquity to Today*, volume 96, Princeton University Press.

Stata, *Negative and Missing r-squared for 2sls/iv*.

Suzuki S. (2009), *Civilization and Empire: China and Japan's Encounter With European International Society*, Routledge.

Szostak R. (2021), *Making Sense of World History*, page 957, Routledge.

Tarn W.W. (2003), *Alexander the Great: Volume 2, Sources and Studies*, volume 2, Cambridge University Press.

Trevor Burrus A.R.P., McCloskey D., *Why Liberalism Works*, The Library of Economics and Liberty.

Voigtländer N., Voth H.-J. (2009), *The Three Horsemen of Growth: Plague, War and Urbanization in Early Modern Europe*.

Waley A. (2008), *The Secret History of the Mongols and Other Pieces*, House of Stratus.

Weatherford J. (2005), *Genghis Khan and the Making of the Modern World*, Broadway Books.

White M. (2011), *Atrocities: The 100 Deadliest Episodes in Human History*, WW Norton & Company.

Wikipedia, *The Black Death*.

World Bank, *D. World Bank Data*.
Zerjal T., Xue Y., Bertorelle G., Wells R.S., Bao W., Zhu S., Qamar R., Ayub Q., Mohyuddin A., Fu S. et al. (2003), "The Genetic Legacy of the Mongols", in *The American Journal of Human Genetics*, 72(3), pp. 717-721.

A. Data Description for Chapter 1

In the following, a description of how each M_i data set was constructed:

- M_δ - If a country was ever invaded by the Mongols, it is listed as 1. If not, it is listed as 0.

The Countries listed as 1 and thus being invaded by the Mongols are:

– Afghanistan, Armenia, Azerbaijan, Belarus, Bhutan, China, Georgia, Iran - Islamic Rep., Iraq, Kazakhstan, Kyrgyz Republic, Korea - Rep., Lao (PDR), Lithuania, Moldova, Myanmar, Mongolia, Pakistan, Poland, Korea - Dem. People's Rep., Romania, Russian Federation, Slovenia, Syrian Arab Republic, Tajikistan, Turkmenistan, Turkey, Ukraine, Uzbekistan, and Vietnam.

Just as there are controversial inclusions, there are some controversial exclusions. For example, Japan. The Mongols spent much time and resources invading Japan. However, it was considered as a great military disaster. They lost thousands of troops and never in any sense occupied Japan. So I will list it as 0, but I will show that it could be listed as 1 as well. The other significant notable exclusion is India. As mentioned above, the Mongol Empire was followed by the Timur Empire. While India only had a tiny fraction of its country occupied by the Mongols, it suffered substantial invasions from the Timur Empire. I will look at the results, both including and excluding India.

The Countries listed as 0 and thus not invaded are:

– Albania, Andorra, United Arab Emirates, Austria, Belgium, Bangladesh, Bulgaria, Bahrain, Bosnia and Herzegovina, Brunei

Darussalam, Switzerland, Cyprus, Czech Republic, Germany, Denmark, Spain, Estonia, Finland, France, United Kingdom, Greece, Croatia, Hungary, India[23], Indonesia, Ireland, Iceland, Israel, Italy, Jordan, Japan, Cambodia, Kuwait, Lebanon, Liechtenstein, Sri Lanka, Luxembourg, Latvia, Monaco, Maldives, Malta, Montenegro, Malaysia, Netherlands, Norway, Nepal, Oman, Philippines, Portugal, West Bank and Gaza, Qatar, Saudi Arabia, Singapore, San Marino, Serbia, Slovak Republic, Sweden, Thailand, Timor-Leste, Kosovo, and Yemen Rep.

This is a simple way to construct such a data set, but it gives a good overview of the countries involved. Most of the countries should not be controversial. There are clear historical accounts of Mongol invasion of most of these countries. However, the inclusion of some is controversial and not necessarily well documented in history. For example, Estonia and Latvia are not included while Lithuania is. While attacking Poland, it appears the Mongols went just North into Lithuania, but it's not exactly clear how far north (i.e., did they reach Latvia and Estonia). It is challenging to resolve all these issues; what I will do is include and exclude all these controversial countries to show they do not affect the results. Given the historical nature of this paper, there will also be some disagreements. The important part is to ensure that any significant disagreement will be looked at from all angles.

- M_{dna} - This data set was constructed using the two noted genetics papers above. The paper took samples from various ethnic groups and gave a percentage of people found with DNA believed to be a direct lineage of Genghis Khan. I used Wikipedia to find out where these tribes live today. There were reasonably accurate estimates. I then estimated the number of people in each country today that would have this DNA trait based upon the given estimate. That is, I took the estimate and multiplied by the total population of the country.

[23] India is marked as not invaded but for reasons to be discussed I will look at it as an invaded country in later analysis.

Unfortunately, there appear to be some errors with the data set. For one, there were no estimates for many places the Mongols invaded; thus, much of the Middle East and Eastern Europe are omitted. It is not clear why they did not do the testing in these regions. It is also possible the data suffers from severe migration effects. It is historically documented that the Mongols would take women back to Mongolia to serve mainly as slaves. Thus, if most of the DNA were spread through the women brought to Mongolia, then it would not accurately show the effect of the Mongols in other parts further from Mongolia. Efforts have been made to contact the writers. However, as of this writing, it appears the lack of detail required for a good approximation of the effect of the Mongol Empire will exclude it from being used in the analysis.

- $M_{\%,\,t}$ - This variable, as of this writing, should be considered as the most accurate measure. M%,t takes care of many problems that the dummy variable and others do not. It takes into account every country but also gives a measure of magnitude. For example, as discussed that Japan was invaded but didn't suffer much. This variable clearly shows that the Mongols did occupy a tiny part of the Country for about four years. Thus, the measure shows there was nearly zero effect, but it accounts for some effect.

The variable is constructed by using the geacron website discussed above. A marker is used to indicate precisely the geographic location of a modern country on the map generated by the website. The website is then moved forward year by year until it showed that the Mongols have invaded (on this website a distinctive green color marks the Mongol Empire). By the same method, I signify when they left. Of course, it is possible to have the Mongols enter and go many times, as history would have it this never occurred. Every country that was entered was only entered and thus exited once. Therefore, the number of years of occupation was calculated this way.

The percentage of the country invaded is not easy to estimate as it would change over the years. Instead of trying to be overly precise, I used an estimate of 0,.1,.25, .5,.75, and 1. In most cases, this seemed

to be quite adequate to capture a good approximation of how much of the country was invaded. The number of years being occupied is multiplied by the percentage giving an aggregate measure. The variable will then be normalized to be between 0 and 1. There are no natural units, but keeping it between 0 and 1 keeps the interpretation the simplest.

Moving forward, I hope I can improve upon this method. Perhaps with some more advanced techniques to estimate the area occupied, it can be developed. However, it should be considered as a good approximation to the degree to which a given country was affected by the Mongol Empire.

I will also construct a variable for the Timur Empire as mentioned above; it will be called $T_{\%,t}$. I can then add this variable as a robustness check.

- $M_{deathtoll}$ - I will not spend much time on this variable, given that as of this writing, I still need to construct it fully. Using the book noted above, White (2011), there are estimates of lives lost in areas. The book gives estimates for China, the Middle East, and Eastern Europe. Looking at maps, you can see which cities the Mongols invaded, that is maps of movement by year of the Mongols. Usually, there are reasonable estimates of the death toll in each city. I will use these estimates – cross corroborated with the aggregate data – to get a measure of the death toll.
- East-West Axis Proximity - A final variable worth discussing before moving forward is East-West Axis Proximity. The East-West Axis is simply the longest straight line you can draw across Eurasia. It is roughly on the 48th parallel and goes from about Paris to Northern Japan. The measure that I will construct is a number between 0 and 1 that measures the distance from the 48th parallel. For example, if the geographic center of a country is on the 48th parallel, they get a weight of 1. This weighting makes sense as I want to look at the countries with the most significant geographic advantage.

It is not realistic that, for example, Indonesia would have had an Industrial Revolution. They could not take part in the benefits de-

scribed by being in Eurasia. Thus, we want to weight more on the countries that had the most significant geographic advantage.

As an explanation, consider the example of China. If you Google "latitude of China," you obtain the geographic center of the country, which is 35.8617 N. To construct the measure, I take 48 - 35.86 and divide by 48 (since 48 is the max distance a country could be from the Axis). Then subtract 1 and take the absolute value; this is done to have it increasing the closer you get to the Axis and positive. Thus, China receives a measure of 0.75 after rounding.[24]

B. Expanded Summary Statistics for Chapter 1

Table 10
Summary Statistics Expanded (for the year 2016 if applicable)

Country	Gdp per/capita	Institutional Quality	East-West Axis Proximity	$M_{i\%,\,t}$	Population in Millions
Afghanistan	571.07	14.42	0.71	0.98	35.38
Albania	4683.74	59.13	0.87	0.00	2.88
Andorra	42949.67	78.37	0.90	0.00	0.08
United Arab Emirates	41045.11	82.69	0.48	0.00	9.36
Armenia	3917.38	61.06	0.85	0.27	2.94
Austria	48300.95	91.35	0.99	0.00	8.74
Azerbaijan	5812.58	46.15	0.85	0.27	9.76
Belgium	45598.74	88.46	0.92	0.00	11.33
Bangladesh	1062.04	18.27	0.48	0.33	157.97
Bulgaria	7966.88	70.67	0.91	0.11	7.13
Bahrain	22336.76	76.44	0.54	0.00	1.43
Bosnia and Herzegovina	5591.03	47.60	0.93	0.00	3.39
Belarus	6372.40	14.90	0.85	0.19	9.50

(continued)

[24] Indonesia, by this measure, is negative as it has a geographic center south of the equator. I will give it a value of 0 and note this is the only country with this feature, that is being centered south of the equator.

(continued)

Country	Gdp per/capita	Institutional Quality	East-West Axis Proximity	$M_{i\%, t}$	Population in Millions
Brunei Darussalam	31685.23	76.92	0.06	0.00	0.42
Bhutan	3035.66	26.92	0.57	0.00	0.74
Switzerland	76934.32	95.19	1.00	0.00	8.37
China	6883.90	44.23	0.76	0.27	1378.66
Cyprus	29081.82	80.77	0.74	0.00	1.17
Czech Republic	21863.64	82.21	0.93	0.00	10.57
Germany	46167.83	94.23	0.90	0.00	82.35
Denmark	61370.79	94.71	0.79	0.00	5.73
Spain	31539.51	75.48	0.86	0.00	46.48
Estonia	18387.77	93.27	0.74	0.00	1.32
Finland	46438.82	98.08	0.64	0.00	5.50
France	42054.53	83.65	0.99	0.00	66.86
United Kingdom	42201.64	98.56	0.81	0.00	65.60
Georgia	4074.93	78.85	0.90	0.21	3.73
Greece	22666.29	66.83	0.83	0.00	10.78
Croatia	14718.93	65.38	0.96	0.25	4.17
Hungary	15032.14	74.52	0.99	0.25	9.81
Indonesia	3968.06	46.63	0.02	0.00	261.55
India	1874.23	39.90	0.42	0.52	1324.51
Ireland	70298.66	97.60	0.86	0.00	4.76
Iran, Islamic Rep.	6794.29	6.73	0.68	0.43	79.56
Iraq	5846.51	7.21	0.70	0.20	36.61
Iceland	50188.50	86.54	0.60	0.00	0.34
Israel	33839.83	86.06	0.65	0.00	8.55
Italy	34397.65	73.56	0.89	0.00	60.63
Jordan	3241.25	54.81	0.64	0.00	9.55
Japan	47444.14	85.10	0.76	0.00	126.99
Kazakhstan	10582.70	53.37	0.97	0.64	17.79
Kyrgyz Republic	1042.28	34.62	0.87	0.55	6.08
Cambodia	1079.63	31.73	0.24	0.00	15.77
Korea, Rep.	25484.04	83.17	0.76	0.27	51.25
Kuwait	35887.10	48.56	0.61	0.03	3.96
Lao PDR	1621.74	23.56	0.40	0.00	6.85

(continued)

(continued)

Country	Gdp per/capita	Institutional Quality	East-West Axis Proximity	$M_{i\%,\,t}$	Population in Millions
Lebanon	6330.42	43.75	0.71	0.00	6.71
Liechtenstein	168146.02	90.87	0.99	0.00	0.04
Sri Lanka	3769.16	51.92	0.13	0.00	21.20
Lithuania	15944.63	87.02	0.82	0.02	2.87
Luxembourg	107479.51	92.79	0.94	0.00	0.58
Latvia	14713.02	81.25	0.78	0.00	1.96
Monaco	193745.57		0.93	0.00	0.04
Moldova	2461.05	51.44	0.99	0.00	3.55
Maldives	7699.71	37.50	0.03	0.00	0.48
Malta	26510.07	84.62	0.76	0.00	0.46
Myanmar	1403.77	8.65	0.45	0.00	53.05
Montenegro	7492.86	60.10	0.91	0.00	0.62
Mongolia	3866.24	41.83	1.00	0.56	3.06
Malaysia	11219.63	74.04	0.05	0.00	30.68
Netherlands	52727.10	96.63	0.88	0.00	17.03
Norway	90402.60	92.31	0.70	0.00	5.23
Nepal	729.66	24.52	0.59	0.00	27.26
Oman	16692.26	71.63	0.44	0.00	4.48
Pakistan	1119.04	28.85	0.63	1.00	203.63
Philippines	2743.20	52.40	0.24	0.00	103.66
Poland	15101.36	80.29	0.89	0.05	37.97
Korea, Dem. People's Rep.	1300.00	0.00	0.86	0.32	25.31
Portugal	22511.73	79.33	0.83	0.00	10.33
West Bank and Gaza	2694.52	55.77	0.67	0.00	4.37
Qatar	64303.19	73.08	0.52	0.00	2.65
Romania	10236.86	72.12	0.98	0.00	19.70
Russian Federation	11298.48	32.21	0.67	0.22	144.34
Saudi Arabia	21270.47	54.33	0.49	0.00	32.44
Singapore	54764.86		0.01	0.00	5.61
San Marino	52811.28	100.00	0.94	0.00	0.03
Serbia	6394.46	57.21	0.94	0.00	7.06
Slovak Republic	19298.07	75.00	0.96	0.00	5.43
Slovenia	24445.56	72.60	0.98	0.00	2.07

(continued)

(continued)

Country	Gdp per/capita	Institutional Quality	East-West Axis Proximity	$M_{i\%, t}$	Population in Millions
Sweden	56195.88	97.12	0.71	0.00	9.92
Syrian Arab Republic	2058.00	4.33	0.73	0.11	17.45
Thailand	5911.95	63.46	0.31	0.00	68.97
Tajikistan	976.14	13.94	0.82	0.80	8.66
Turkmenistan	6987.07	1.92	0.82	0.34	5.66
Timor-Leste	3072.42	15.87	0.22	0.00	1.22
Turkey	14062.73	62.50	0.82	0.13	79.82
Ukraine	2909.65	29.81	0.97	0.34	45.00
Uzbekistan	1909.44	3.85	0.88	0.95	31.85
Vietnam	1752.53	35.58	0.27	0.02	93.64
Kosovo	3925.27	43.27	0.91	0.00	1.82
Yemen, Rep.	765.60	12.02	0.30	0.00	27.17

C. Discussion of Spatial Correlation

The most conventional method is to use Euclidean distance measured in latitude and longitude (that is the hypotenuse of a right angle triangle). In Table 11, I report two p-values, the first for the non-population weighted regression, the second for population-weighted. Using Euclidean distance shows significant p-values, with the null being no spatial correlation. Thus, this indicates a significant spatial correlation.

However, with considerable variation in distances, this is not necessarily the best measure to use. Countries very close together explode in importance if they are sufficiently far from other countries in the sample. Thus, it can be susceptible to slight changes in specifications. For example, if I remove countries that are within 100 km of each other there is no longer significance. Another popular method that bypasses this concern is to use a binary term that says a country is connected or not given a certain distance apart. However, no distance is accepted as sufficiently "close." I will start with 5 and show each step by 25. Thus, if a country is within 5, as measured in the Euclidean distance, it is considered a 1, if not a 0. Then

Table 11
Morin I Test for Spatial Correlation

Distance Measurement	Non-Population Weighted p-value	Population Weighted p-value
Euclidean	0.0742*	0.0004***
Binary 5	0.0173	0.3501
Binary 30	0.8193	0.0001***
Binary 55	0.5167	0.0776*
Binary 80	0.3507	0.0003***
Binary 105	0.7833	0.7952
Binary 130	0.5167	0.0776*
Euclidean (invaded only)	0.7833	0.7952

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

repeat for 30, 55, 80 etc. Note: the range goes from 2 (Israel to the West Bank) to 166 (Iceland to Timor Leste, which is about 12,500 km apart).[25]

The results are mixed. If looking at non-population weighted, there is no evidence of spatial correlation. If using population-weighted, there is some evidence. The best measure is likely somewhere in between no weights and population weights, as discussed in the results section. Thus, though population-weighted results indicate spatial correlation, the results are generated mainly by China and India. Given that they are similar and closer together than most countries in the sample, they will almost guarantee to generate spatial correlation in a population-weighted regression.

Finally, I report a test using the initial Euclidean distance but only using countries invaded by the Mongols. Suppose all I am picking up is correlations in this region before the Mongols, i.e., another historical event causing similarities among the countries, then it would show up here. Essentially, in the countries invaded, there is no spatial correlation. In many ways, this fits the story. No one would want to state different regions were all the same. Of course,

[25] Latitude ranges from -90 to 90, and longitude from -180 to 180.

history would dictate every region would be different. The point is the Mongols forced regions to become similar, i.e., autocratic. So it makes sense there is no spatial correlation among the countries invaded. The advantage Western Europe has is precisely that it got to keep its heterogeneity.