Economics from the Top Down

new ideas in economics and the social sciences

The Half Life of Empire

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> *Men make their own history, but they do not make it as they please.*
>
> — *Karl Marx, 1852*

A good way to think about human history is that it has two distinct scales. On the small scale we have the churn of daily events — the stuff of endless individual exploits. And on the large scale, we have the long-term evolution of human societies — a scale so sweeping that the actions of individuals are as insignificant as the shifting grains of desert sand. The task of social science is to somehow connect these two scales — to show how the characters of history act on a stage that they do not fully control.

Looking at the present political spectacle, it's clear that the world order is changing. In a matter of months, Donald Trump has taken a wrecking ball to the US-led regime that reigned since the end World War II. But here is an interesting question: if Trump had *not* been re-elected, to what extent would things be different?

The answer depends on our choice of scale. In a world without Trump, the eddies of small-scale history would surely be altered. There would be no 'department of government efficiency', for example. Nor would their likely be an unfolding US-led trade war. But on the scale of long-term history, many tides would remain the same. Chief among them would be the inexorable decline of US empire. To put things bluntly, the 'American century' is over and will never return.

The half life of an empire

Thinking about the rise and fall of imperial power, let's talk about lifespan. Unlike human lives, which have a distinct beginning and end, the lifespan of empires is more fluid. Empires are not 'born' so much as they *emerge*. And they do not 'die' so much as they *fade* into obscurity. This continuity makes it difficult to put exact dates on imperial tombstones. Still, if we take a cue from nuclear physics, we can quantify the imperial 'lifespan'.

When studying radioactive elements, physicists quantify an isotope's longevity in terms of its 'half life' — the period required for half of the substance to decay. Like radioactive matter, empires also have a half life, which we can define as the period spent above the halfway point *to* and *from* peak dominance. Figure 1 illustrates the concept. The half life represents a simple way to quantify the lifespan of imperial power.

To measure the imperial half life, the main question is how we should quantify 'dominance'. I suggest we use the empire's *share of world energy consumption*. The idea is that when it comes to empire, there is nothing more important than the exploitation of energy. The flow of energy is what makes biological life possible, and it is the lifeblood of all human societies, including those that choose the path to globe-spanning power.

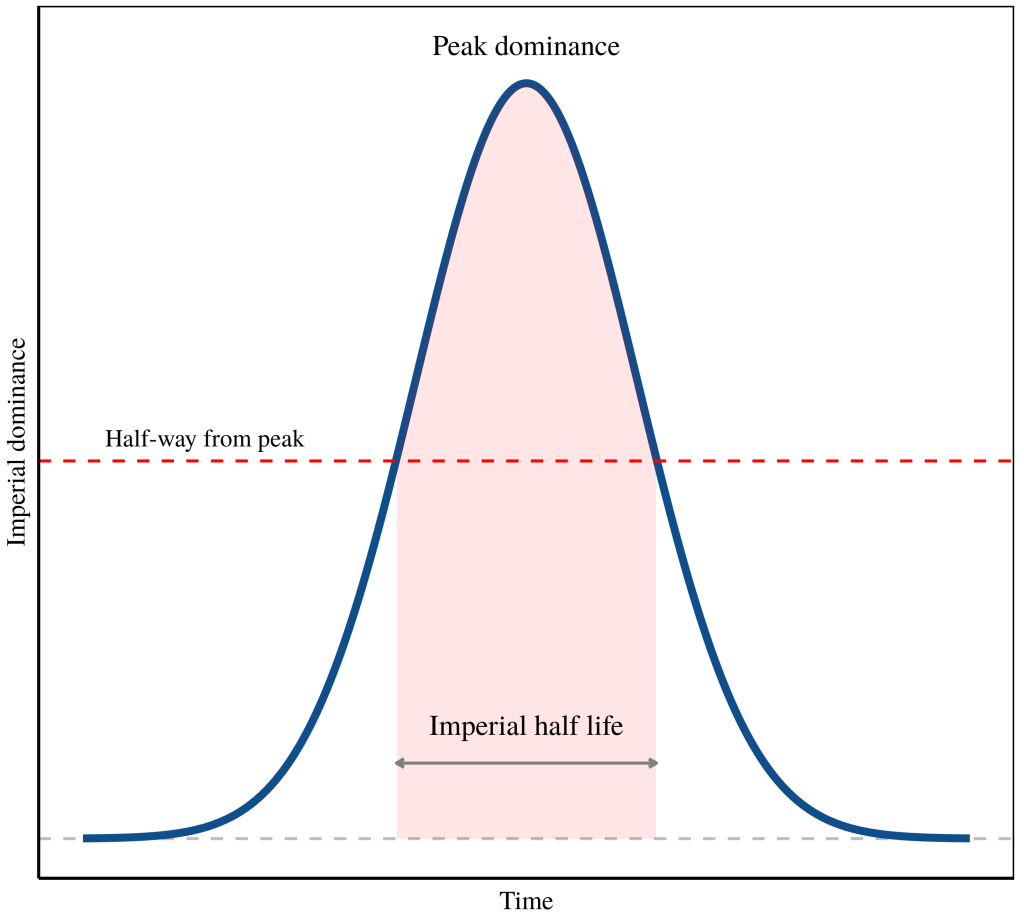

Figure 1: The imperial half life

I define the 'half life' of an empire as the time it spends above the halfway point to and from peak dominance.

The half life of the British Empire

Although human history has seen countless empires rise and fall, reliable energy data only appears in the last few centuries. At that point, empire building was largely a European game, played best by the British. At its high point in the late 19th century, the British Empire spanned about a quarter of the globe.

The goal of this imperial project, of course, was to enrich the British population by centralizing resources to the British isles. Figure 2 shows how this project played out in terms of energy consumption. From 1750 to 1900,

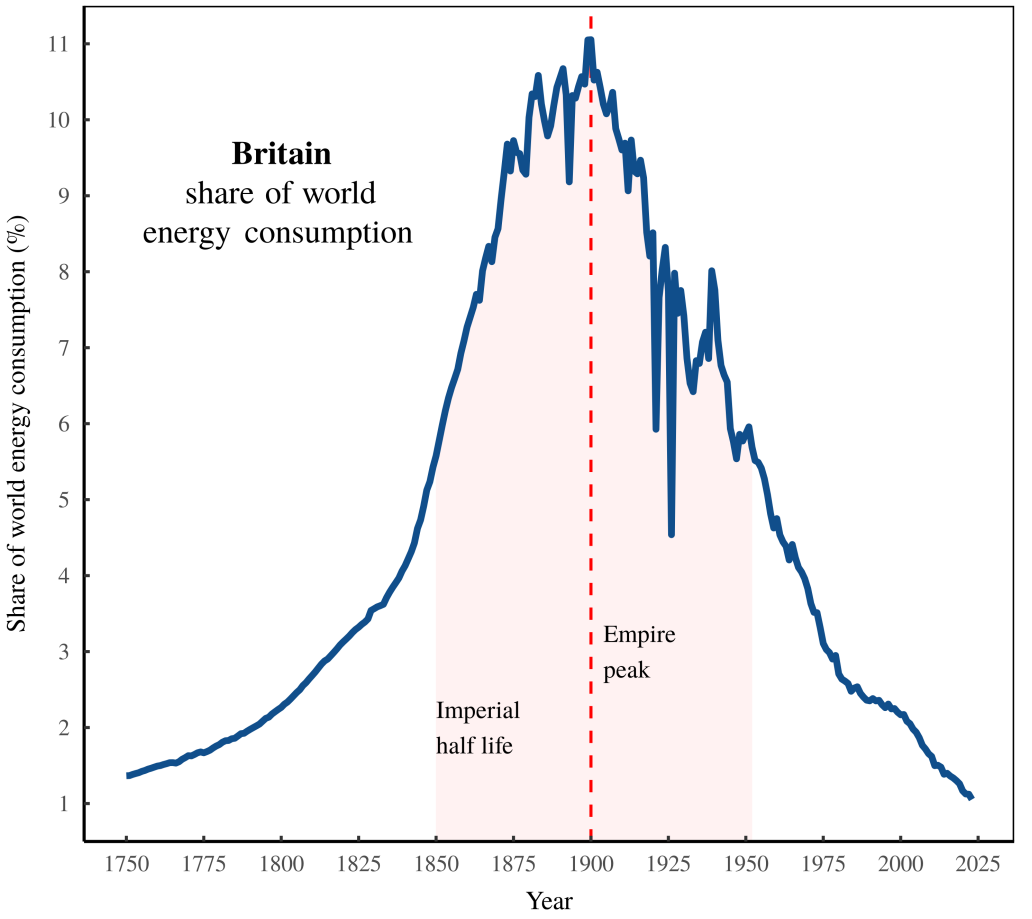

Figure 2: Britain's share of world energy consumption

This chart shows the rise and fall of the British Empire, as measured by Britain's share of world energy use. The shaded region shows the Empire's 'half life' — the period spent above the halfway point to and from peak energy consumption. Sources and methods

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Britain's share of world energy use rose tenfold. And from 1900 to 2025, Britain's share of world energy use *shrank* tenfold. In short, the British Empire faded as surely as it emerged.

Turning to our measure of imperial lifespan, the half life of the British Empire (indicated by the shaded region in Figure 2) spanned just over a century, from 1850 to 1952. Britons who lived and died during this period would have known only imperial dominance. And yet when placed on the grand scale of human history, the British Empire was fleeting. It reigned supreme for little more than a single human lifetime.

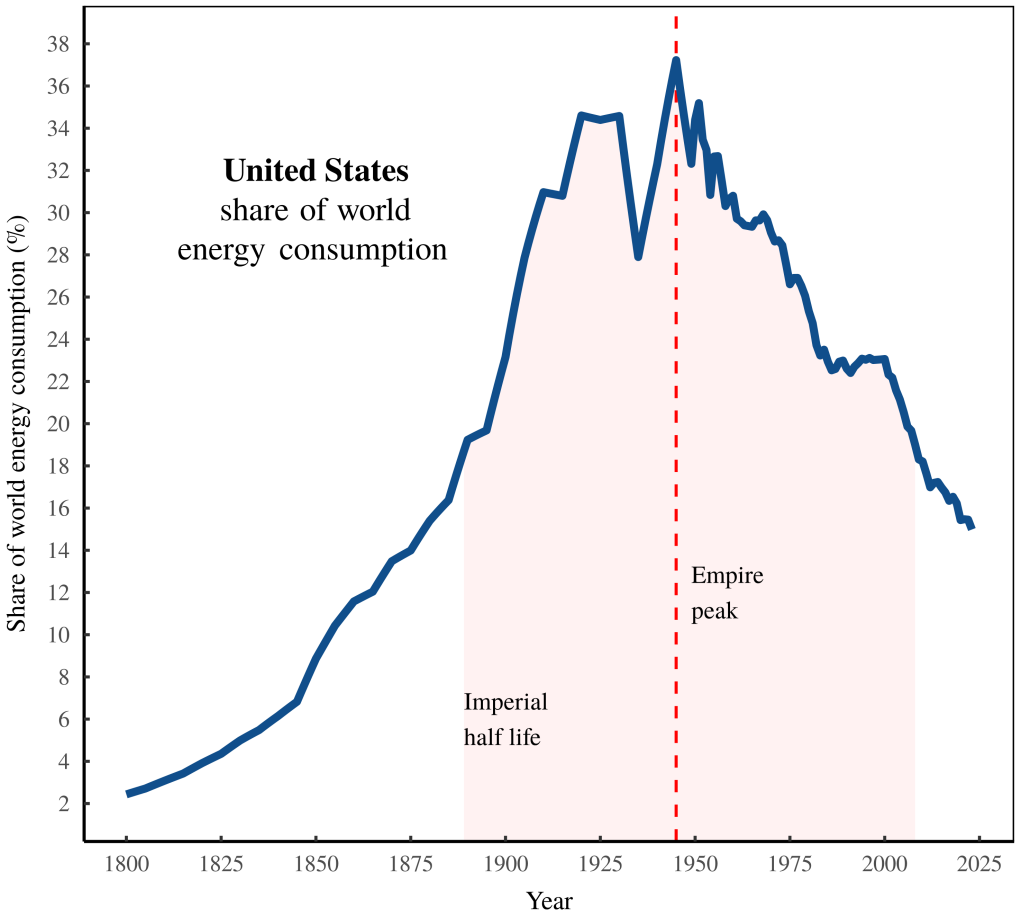

Figure 3: United States share of world energy consumption

This chart shows the rise and fall of the US empire, as measured by the US share of world energy use. The shaded region shows the empire's 'half life' — the period spent above the halfway point to and from peak energy consumption. Sources and methods

The half life of the US empire

As the British Empire began to fade, the US empire was on the rise. From 1800 to 1945, the US share of world energy consumption grew nearly twentyfold. When American power peaked at the end of World War II, the United States consumed slightly more than a third of the world's energy. Figure 3 plots this inexorable ascent.

In hindsight, the pinnacle of US power was brief. As post-war Europe was rebuilt and industrialization spread to all corners of the planet, US energy dominance waned for the remainder of the 20th century. Today, the US empire is well past its prime.

Turning to the US imperial half life, it lasted for about 120 years, from 1889 to 2008. As such, virtually every US politician who is now in power was born and raised during the period of US dominance — an era when America was 'exceptional'. But that era has now passed; the 'American century' is dead. Hence the widespread confusion among US elites, who still think in terms of US supremacy, but cannot fathom that America's halcyon days are gone and will never return.

The rhyme in imperial history

A defining feature of imperial regimes is that they think of themselves as exceptional. And of course, when in their prime, dominant empires *are* exceptional — they are mammoths among mice. Still, when we compare mammoths to mammoths, the exceptionality disappears and we see that imperial history has a curious rhyme.

For example, Figure 4 shows what happens when we plot the rise and fall of the British and US empires on the same scale. Their history, it seems, has a similar rhythm. Both empires rose and fell over the course of two centuries. And both empires had a period of dominance (a 'half life') that lasted roughly a century.

In my mind, this rhyme in imperial history demonstrates the limits of political agency. When it comes to the rise and fall of empires, individual politicians are basically powerless to alter the long arm of history. Empires shrink as surely as they expand, leaving post-peak rulers (especially those who long for 'greatness') pushing on rope. Their bloviation changes nothing about the long-term imperial descent.

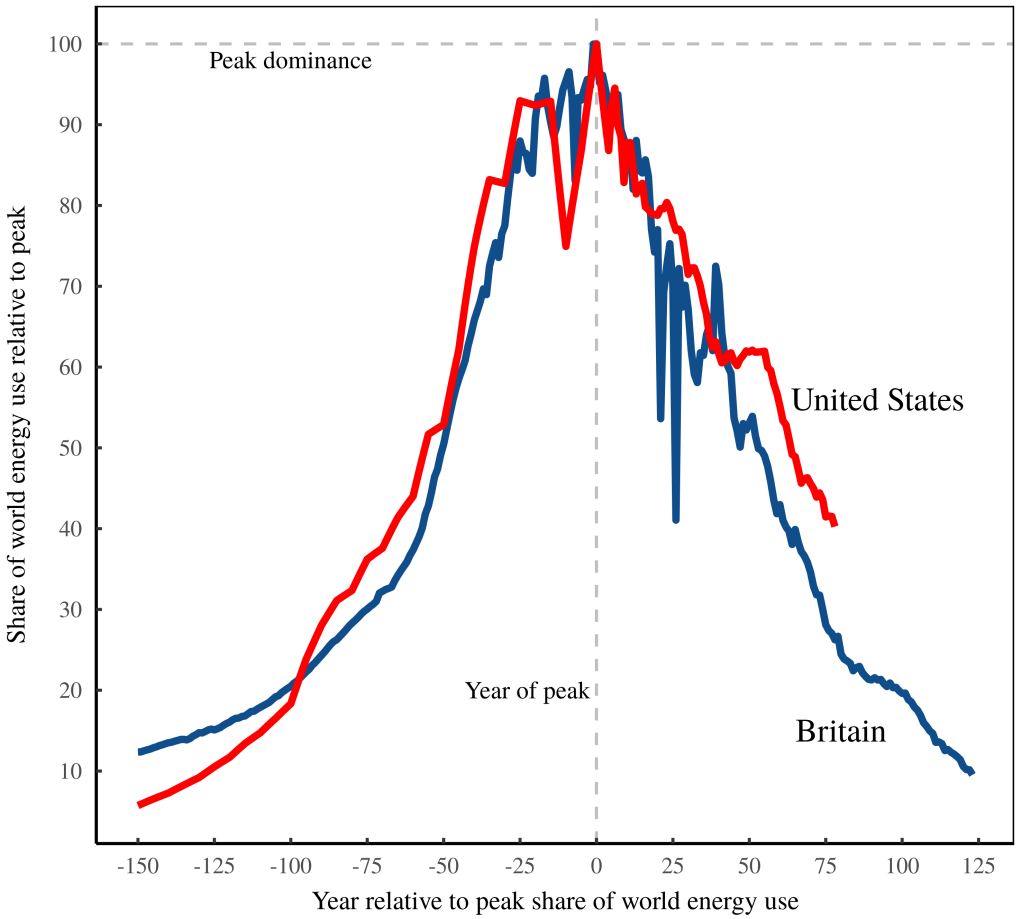

Figure 4: The rhyme in imperial expansion and collapse

This figure plots the rise and fall of the British and US empires on the same energy scale. The horizontal axis shows time measured relative to each empire's peak of energy dominance. The vertical axis shows the empire's share of world energy consumption, measured relative to the peak. Sources and methods

A new hegemon

By definition, the full pulse of imperial power is visible only in hindsight, once the pinnacle of dominance is a distant memory. As such, we can say little about the imperial future, other than that the next century will likely be dominated by China. Indeed, the era of Chinese supremacy has already begun.

It happened with little fanfare in 2009. (See Figure 5.) In that year, China's share of world energy consumption first surpassed that of the US. Intriguingly, it was also in 2009 that the US exited its imperial half life, consuming (for the first time since 1889) less than half its peak share of world energy use.

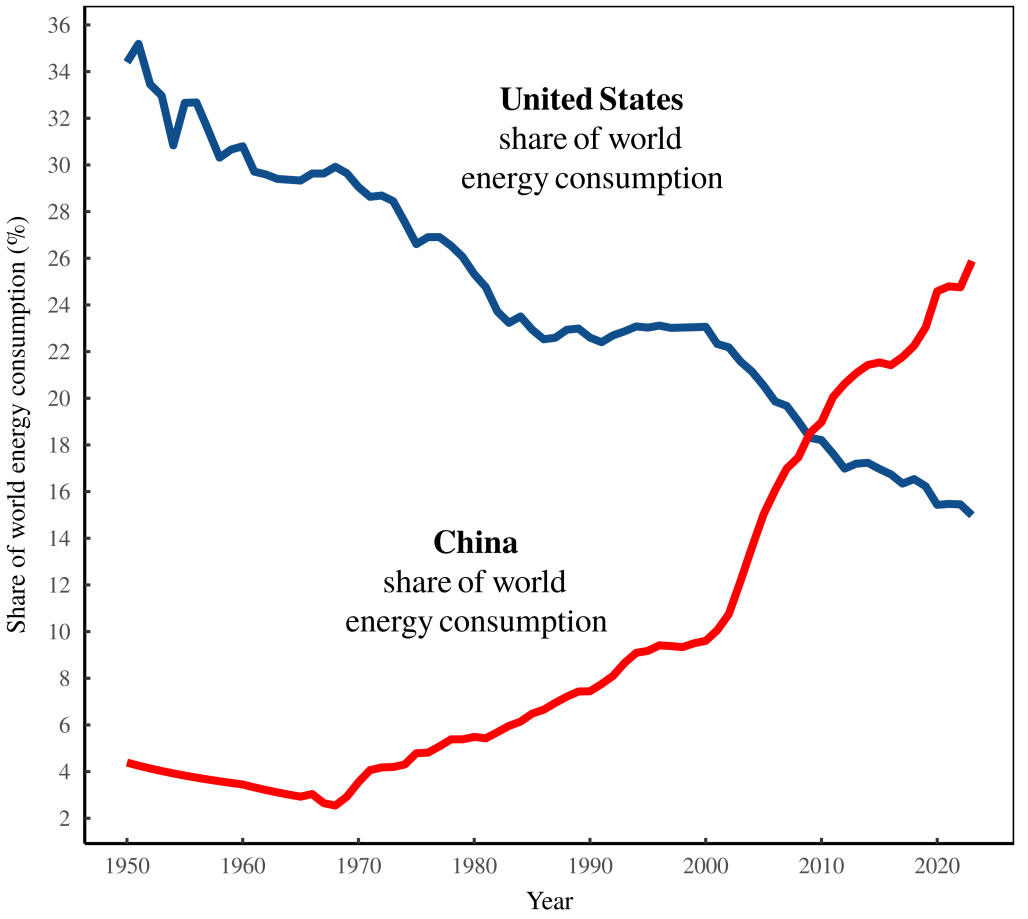

Figure 5: The rise of China

In terms of energy use, the United States is no longer the world hegemon. In 2009, China surpassed the US as the world's dominant energy glutton. Sources and methods

Since then, the tide of US power has continued to ebb, undeterred by the minutia of partisan politics. And the tide of Chinese power has continued to rise. Within a few years, China will consume *double* the energy of the United States.

It's surely for this reason that China has responded to US tariffs with a nonchalant shrug. China holds all the cards, and Beijing leaders know it. In Washington, American elites still strut like Roman generals. But to the rest of the world, they look increasingly like senile peacocks.

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Sources and methods

World energy consumption

Data for world energy consumption is from the following sources:

- 1800 to present: Our World in Data, Energy Production and Consumption
- Prior to 1800: data is from Ian Morris' book *The Measure of Civilization*, Table 3.1 & 3.4. Morris reports data for energy use per capita in the East and West. Using population data from Angus Maddison, I use Morris' data to estimate world energy use. I then splice this data to the OWD data in 1800.

Britain energy use

Data is from the following sources:

- 1965 to present: Energy Institute Statistical Review of World Energy
- prior to 1965: data is from Paul Warde, Energy consumption in England and Wales, 1560-2000

US energy use

Data is from the following sources:

- 1949 to present: Energy Information Agency, Table 1.3, Primary energy consumption estimates by source
- prior to 1949: Appendix E1 in the EIA 2009 Annual Energy Review (available here)

China energy use

Data is from the following sources:

- 1965 to present: Energy Institute Statistical Review of World Energy
- prior to 1965: I use Morris' estimates for per capita energy consumption in the East, coupled with Angus Maddison's estimates of China's population

Further reading

Morris, I. (2013). *The measure of civilization: How social development decides the fate of nations*. Princeton: Princeton University Press.

Smil, V. (2018). *Energy and civilization: A history*. MIT press.

Warde, P. (2007). *Energy consumption in England & Wales, 1560-2000*. Consiglio nazionale delle ricerche, Istituto di studi sulle societa del Mediterraneo.