For centuries, historians, political theorists, anthropologists and the public have tended to think about the political process in seasonal, cyclical terms. From Polybius to Paul Kennedy, from ancient Rome to imperial Britain, we discern a rhythm to history. Great powers, like great men, are born, rise, reign and then gradually wane. No matter whether civilizations decline culturally, economically or ecologically, their downfalls are protracted.

In the same way, the challenges that face the United States are often represented as slow-burning. It is the steady march of demographics – which is driving up the ratio of retirees to workers – not bad policy that condemns the public finances of the United States to sink deeper into the red. It is the inexorable growth of China’s economy, not American stagnation, that will make the gross domestic product of the People’s Republic larger than that of the United States by 2027.

As for climate change, the day of reckoning could be as much as a century away. These threats seem very remote compared with the time frame for the deployment of U.S. soldiers to Afghanistan, in which the unit of account is months, not years, much less decades.

But what if history is not cyclical and slow-moving but arrhythmic – at times almost stationary but also capable of accelerating suddenly, like a sports car? What if collapse does not arrive over a number of centuries but comes suddenly, like a thief in the night?

Great powers are complex systems, made up of a very large number of interacting components that are asymmetrically organized, which means their construction more resembles a termite hill than an Egyptian pyramid. They operate somewhere between order and disorder. Such systems can appear to operate quite stably for some time; they seem to be in equilibrium but are, in fact, constantly adapting. But there comes a moment when complex systems “go critical.” A very small trigger can set off a “phase transition” from a benign equilibrium to a crisis – a single grain of sand causes a whole pile to collapse.

Not long after such crises happen, historians arrive on the scene. They are the scholars who specialize in the study of “fat tail” events – the low-frequency, high-impact historical moments, the ones that are by definition outside the norm and that therefore inhabit the “tails” of probability distributions – such as wars, revolutions, financial crashes and imperial collapses. But historians often misunderstand complexity in decoding these events. They are trained to explain calamity in terms of long-term causes, often dating back decades. This is what Nassim Taleb rightly condemned in “The Black Swan” as “the narrative fallacy.”

In reality, most of the fat-tail phenomena that historians study are not the climaxes of prolonged and deterministic story lines; instead, they represent perturbations, and sometimes the complete breakdowns, of complex systems. To understand complexity, it is helpful to examine how natural scientists use the concept. Think of the spontaneous organization of termites, which allows them to construct complex hills and nests, or the fractal geometry of water molecules as they form intricate snowflakes. Human intelligence itself is a complex system, a product of the interaction of billions of neurons in the central nervous system. All these complex systems share certain characteristics. A small input to such a system can produce huge, often unanticipated changes – what scientists call “the amplifier effect.” Causal relationships are often nonlinear, which means that traditional methods of generalizing through observation are of little use. Thus, when things go wrong in a complex system, the scale of disruption is nearly impossible to anticipate.

There is no such thing as a typical or average forest fire, for example. To use the jargon of modern physics, a forest before a fire is in a state of “self-organized criticality”: It is teetering on the verge of a breakdown, but the size of the breakdown is unknown. Will there be a small fire or a huge one? It is nearly impossible to predict. The key point is that in such systems, a relatively minor shock can cause a
disproportionate disruption.

Any large-scale political unit is a complex system. Most great empires have a nominal central authority – either a hereditary emperor or an elected president – but in practice the power of any individual ruler is a function of the network of economic, social and political relations over which he or she presides. As such, empires exhibit many of the characteristics of other complex adaptive systems – including the tendency to move from stability to instability quite suddenly.

The most recent and familiar example of precipitous decline is the collapse of the Soviet Union. With the benefit of hindsight, historians have traced all kinds of rot within the Soviet system back to the Brezhnev era and beyond. Perhaps, as the historian and political scientist Stephen Kotkin has argued, it was only the high oil prices of the 1970s that “averted Armageddon.” But this did not seem to be the case at the time. The Soviet nuclear arsenal was larger than the U.S. stockpile. And governments in what was then called the Third World, from Vietnam to Nicaragua, had been tilting in the Soviets’ favor for most of the previous 20 years.

Yet, less than five years after Mikhail Gorbachev took power, the Soviet imperium in central and Eastern Europe had fallen apart, followed by the Soviet Union itself in 1991. If ever an empire fell off a cliff, rather than gently declining, it was the one founded by Lenin.

If empires are complex systems that sooner or later succumb to sudden and catastrophic malfunctions, what are the implications for the United States today? First, debating the stages of decline may be a waste of time – it is a precipitous and unexpected fall that should most concern policymakers and citizens. Second, most imperial falls are associated with fiscal crises. Alarm bells should therefore be ringing very loudly indeed as the United States contemplates a deficit for 2010 of more than $1.5 trillion – about 11% of GDP, the biggest since World War II.

These numbers are bad, but in the realm of political entities, the role of perception is just as crucial. In imperial crises, it is not the material underpinnings of power that really matter but expectations about future power. The fiscal numbers cited above cannot erode U.S. strength on their own, but they can work to weaken a long-assumed faith in the United States’ ability to weather any crisis.

One day, a seemingly random piece of bad news – perhaps a negative report by a rating agency – will make the headlines during an otherwise quiet news cycle. Suddenly, it will be not just a few policy wonks who worry about the sustainability of U.S. fiscal policy but the public at large, not to mention investors abroad. It is this shift that is crucial: A complex adaptive system is in big trouble when its component parts lose faith in its viability.

Over the last three years, the complex system of the global economy flipped from boom to bust – all because a bunch of Americans started to default on their subprime mortgages, thereby blowing huge holes in the business models of thousands of highly leveraged financial institutions. The next phase of the current crisis may begin when the public begins to reassess the credibility of the radical monetary and fiscal steps that were taken in response.

Neither interest rates at zero nor fiscal stimulus can achieve a sustainable recovery if people in the United States and abroad collectively decide, overnight, that such measures will ultimately lead to much higher inflation rates or outright default. Bond yields can shoot up if expectations change about future government solvency, intensifying an already bad fiscal crisis by driving up the cost of interest payments on new debt. Just ask Greece.

Ask Russia too. Fighting a losing battle in the mountains of the Hindu Kush has long been a harbinger of imperial fall. What happened 20 years ago is a reminder that empires do not in fact appear, rise, reign, decline and fall according to some recurrent and predictable life cycle. It is historians who retrospectively portray the process of imperial dissolution as slow-acting. Rather, empires behave like all complex adaptive systems. They function in apparent equilibrium for some unknowable period. And then, quite abruptly, they collapse.

Washington, you have been warned.