

The 17th-century origins of a modern finance tool

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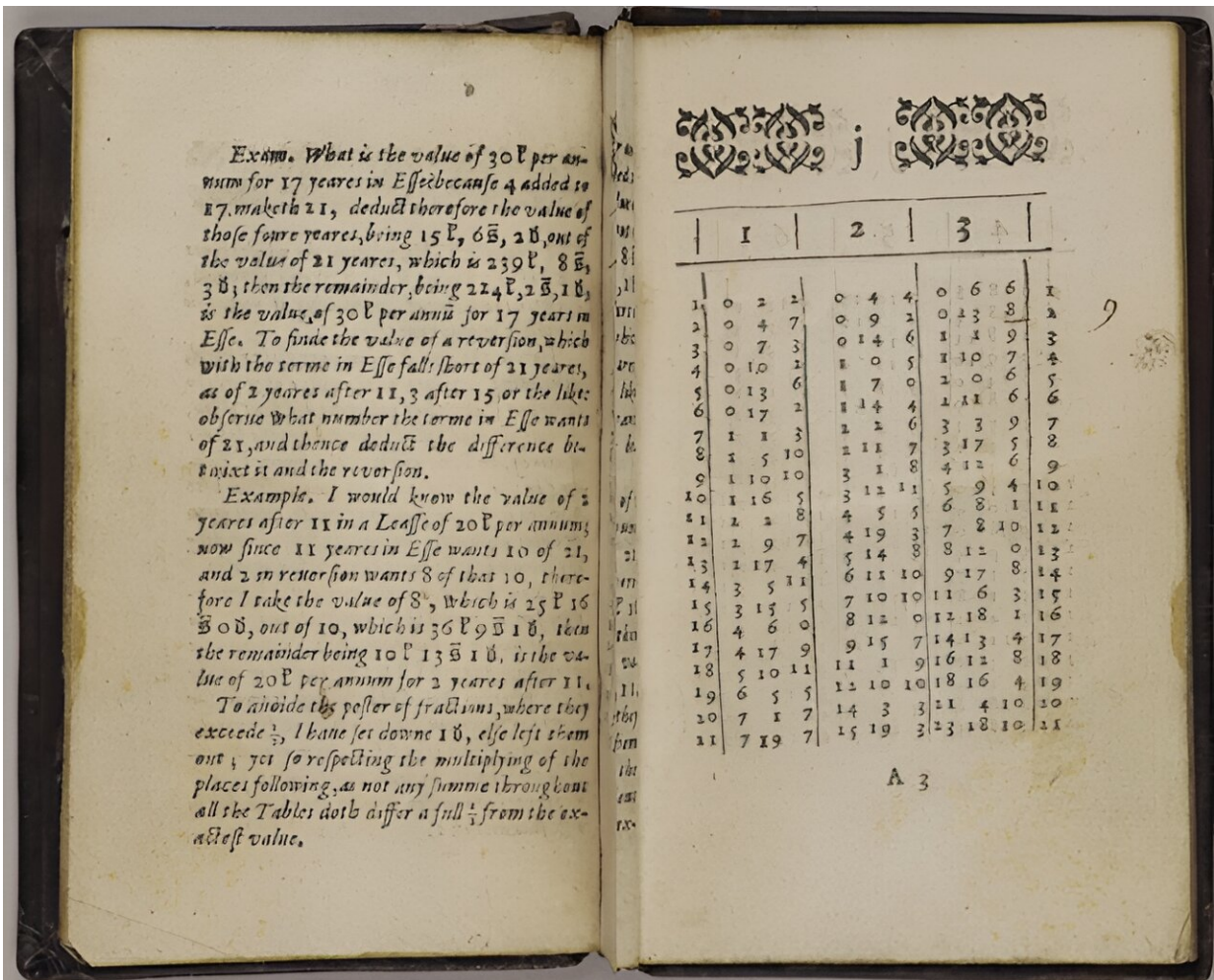


Table "i" and accompanying text from Acroyd's Tables of Leases and Interest, sig. A3r. Canterbury Cathedral Archives and Library, Canterbury, United Kingdom (reference: W/P-5-36). Reproduced courtesy of the Chapter of Canterbury. Credit: *The Journal of Modern History* (2024). DOI:

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In the early 1600s, the officials running Durham Cathedral, in England, had serious financial problems. Soaring prices had raised expenses. Most cathedral income came from renting land to tenant farmers, who had long leases so officials could not easily raise the rent. Instead, church leaders started charging periodic fees, but these often made tenants furious. And the 1600s, a time of religious schism, was not the moment to alienate church members.

But in 1626, Durham officials found a formula for fees that tenants would accept. If tenant farmers paid a fee equal to one year's net value of the land, it earned them a seven-year lease. A fee equal to 7.75 years of net value earned a 21-year lease.

This was a form of discounting, the now-common technique for evaluating the present and future value of money by assuming a certain rate of return on that money. The Durham officials likely got their numbers from new books of discounting tables. Volumes like this had never existed before, but suddenly local church officials were applying the technique up and down England.

As financial innovation stories go, this one is unusual. Normally, avant-garde financial tools might come from, well, the financial avant-garde—bankers, merchants, and investors hunting for short-term profits, not clergymen.

"Most people have assumed these very sophisticated calculations would have been implemented by hard-nosed capitalists, because really powerful calculations would allow you to get an economic edge and increase profits," says MIT historian William Deringer, an expert in the

deployment of quantitative reasoning in public life. "But that was not the primary or only driver in this situation."

Deringer has published a new [research article](#) about this episode, "Mr. Aecroid's Tables: Economic Calculations and Social Customs in the Early Modern Countryside," in the current issue of *The Journal of Modern History*. In it, he uses archival research to explore how the English clergy started using discounting, and where. And one other question: Why?

Enter inflation

Today, discounting is a pervasive tool. A dollar in the present is worth more than a dollar a decade from now, since one can earn money investing it in the meantime. This concept heavily informs investment markets, [corporate finance](#), and even the NFL draft (where trading this year's picks yields a greater haul of future picks).

As historian William N. Goetzmann has written, the related idea of net present value "is the most important tool in modern finance." But while discounting was known as far back as the mathematician Leonardo of Pisa (often called Fibonacci) in the 1200s, why were English clergy some of its most enthusiastic early adopters?

The answer involves a global change in the 1500s: the "price revolution," in which things began costing more, after a long period when prices had been constant. That is, inflation hit the world.

"People up to that point lived with the expectation that prices would stay the same," Deringer says. "The idea that prices changed in a systematic way was shocking."

For Durham Cathedral, inflation meant the organization had to pay more

for goods while three-quarters of its revenues came from tenant rents, which were hard to alter. Many leases were complex, and some were locked in for a tenant's lifetime. The Durham leaders did levy intermittent fees on tenants, but that led to angry responses and court cases.

Meanwhile, tenants had additional leverage against the Church of England: religious competition following the Reformation. England's political and religious schisms would lead it to a midcentury civil war. Maybe some private landholders could drastically increase fees, but the church did not want to lose followers that way.

"Some individual landowners could be ruthlessly economic, but the church couldn't, because it's in the midst of incredible political and religious turmoil after the Reformation," Deringer says. "The Church of England is in this precarious position.

"They're walking a line between Catholics who don't think there should have been a Reformation, and Puritans who don't think there should be bishops. If they're perceived to be hurting their flock, it would have real consequences. The church is trying to make the finances work but in a way that's just barely tolerable to the tenants."

Enter the books of discounting tables, which allowed local church leaders to finesse the finances. Essentially, discounting more carefully calibrated the upfront fees tenants would periodically pay. Church leaders could simply plug in the numbers as compromise solutions.

In this period, England's first prominent discounting book with tables was published in 1613; its most enduring, Ambrose Acroyd's "Table of Leases and Interest," dated to 1628–29. Acroyd was the bursar at Trinity College at Cambridge University, which as a landholder (and church-affiliated institution) faced the same issues concerning inflation

and rent. Durham Cathedral began using off-the-shelf discounting formulas in 1626, resolving decades of localized disagreement as well.

Performing fairness

The discounting tables from books did not only work because the price was right. Once circulating clergy had popularized the notion throughout England, local leaders could justify using the books because others were doing it. The clergy were "performing fairness," as Deringer puts it.

"Strict calculative rules assured tenants and courts that fines were reasonable, limiting landlords' ability to maximize revenues," Deringer writes in the new article.

To be sure, local church leaders in England were using discounting for their own economic self-interest. It just wasn't the largest short-term economic self-interest possible. And it was a sound strategy.

"In Durham they would fight with tenants every 20 years [in the 1500s] and come to a new deal, but eventually that evolves into these sophisticated mechanisms, the discounting tables," Deringer adds. "And you get standardization. By about 1700, it seems like these procedures are used everywhere."

Thus, as Deringer writes, "mathematical tables for setting fines were not so much instruments of a capitalist transformation as the linchpin holding together what remained of an older system of customary obligations stretched nearly to breaking by macroeconomic forces."

Once discounting was widely introduced, it never went away. Deringer's *Journal of Modern History* article is part of a larger book project he is currently pursuing, about discounting in many facets of modern life.

Deringer was able to piece together the history of discounting in 17th-century England thanks in part to archival clues. For instance, Durham University owns a 1686 discounting book self-described as an update to Acroyd's work; that copy was owned by a Durham Cathedral administrator in the 1700s. Of the 11 existing copies of Acroyd's work, two are at Canterbury Cathedral and Lincoln Cathedral.

Hints like that helped Deringer recognize that [church leaders](#) were very interested in discounting; his further research helped him see that this chapter in the history of discounting is not merely about finance; it also opens a new window into the turbulent 1600s.

"I never expected to be researching church finances, I didn't expect it to have anything to do with the countryside, landlord-tenant relationships, and tenant law," Deringer says. "I was seeing this as an interesting example of a story about bottom-line economic calculation, and it wound up being more about this effort to use calculation to resolve social tensions."

More information: William Deringer, Mr. Aecroid's Tables: Economic Calculations and Social Customs in the Early Modern Countryside, *The Journal of Modern History* (2024). [DOI: 10.1086/728594](#)

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