

After the Harvest

Seasonal Timing of the Roman Egypt Poll-Tax

Introduction

After Egypt became a Roman province in 30 BCE, the Roman state introduced a poll tax in the region, known in Greek as the *laographia*, meaning “registration of people” (Monson, 2014). The tax was tied to the implementation of a provincial census, initially conducted every seven years and later at fourteen-year intervals (Bagnall and Frier, 1994). Within the broader context of Roman fiscal policy, Egypt’s poll tax was a provincial form of the *tributum capitis* (head tax) levied on subject populations—a practice Rome extended to other Eastern provinces around the same time. The decision to impose a poll tax in Egypt aligned with Roman goals to finance the state and assert imperial authority. Politically, it also symbolized Rome’s domination over Egypt. The poll tax was assessed annually and levied on all Egyptian males aged between thirteen and sixty-one years, regardless of income, property ownership, or other taxes owed. Heinz argues for a slightly different age range of fourteen to sixty (Heinz, 1991), but the general scope remains consistent. Notably, slaves were not taxed as individuals, since they were considered property—though their owners could be subject to additional fees. Children and women were also exempt. In essence, the poll tax targeted Egypt’s productive male population.

There is evidence that poll-tax rates varied by location and social status. Egyptian males paid the full rate, which was 16 drachmas in Upper Egypt and 40 drachmas in the Arsinoite nome.

Residents of *metropoleis* paid a reduced rate. In contrast, citizens of Greek cities—most notably Alexandria, Antinoopolis, Naucratis, and Ptolemais—as well as Roman citizens, were exempt

from the tax (Langellotti, 2015; Heinz, 1991). Although the literature presents slightly different figures across regions, the key point is that the tax varied geographically.

The poll tax is estimated to have remained in effect until 297 CE, during the reign of Emperor Diocletian (284–305 CE), when fiscal reforms were introduced that restructured Egypt's tax system and replaced the poll-tax (Heinz, 1991).

The objective of this analysis is twofold. First, I seek to determine whether poll-tax payments were made at random points throughout the year or, instead, collected on one or a few fixed due dates between the period 50 BCE - 200 CE. Graham et al. show that taxpayers paid the poll tax according to their own system, implying that the Roman state did not impose strict deadlines (Graham et al., 2016). This would suggest that the tax was paid without a specific structure.

My hypothesis, however, is that despite the absence of a strictly imposed deadline, taxpayers paid the tax when they were most liquid. Given that Roman Egypt was primarily an agricultural society, known for supplying the city of Rome with grain (the "breadbasket" of the Roman Empire), it is reasonable to believe that Egyptians were most liquid after the harvest season.

The literature shows that agriculture in Roman Egypt followed the traditional Nile-based cycle of three seasons. After the summer flood, when the Nile floodwaters receded, farmers sowed their fields during the cooler winter months. Wheat and barley were grown as winter crops, relying on the flood's moisture. They matured as the weather warmed, so that by spring the fields were ready for harvest. The grain harvest generally took place during the spring, roughly between March and early June, with some variation. (Rowlandson, 1999)

The harvest began slightly earlier in Upper Egypt and somewhat later in Lower Egypt. The warmer climate and earlier receding of floodwaters in Upper Egypt allowed farmers there to start

planting, and therefore harvesting, sooner. In Upper Egypt, the wheat harvest could begin by late March or April, whereas in the Lower regions it often peaked in late April through May.

(Rowlandson, 1999)

For the sake of analysis, I treat the months of April, May, and June as the harvesting season; a period in which grain was harvested across Egypt. I shift the period one month forward to account for the time it would take to sell the produce, and therefore hypothesize that May, June, and July were the months during which taxpayers were generally most liquid and when we would see most poll-tax payments being made.

My second hypothesis is that the timing of poll-tax payments remained relatively consistent throughout the period from 50 BCE to 200 CE. This consistency would support the idea that taxes were generally paid after the harvest season. My hypothesis rests on two key premises: first, that the Roman Empire experienced relative political stability during this period, with no major disruptions that would have altered tax policy or payment schedules; and second, that Egypt's agricultural calendar—particularly the grain harvest—was set on the cycle of the Nile flood. Since the flooding and resulting harvest seasons followed the discussed three-season pattern with little variation, a consistent tax payment period over time would strongly suggest a link between liquidity following the harvest and tax payment. If the data shows that poll-tax payments cluster around the same months year after year, and if those months correspond to the post-harvest period, it will provide strong evidence that the poll tax was routinely paid when taxpayers were most liquid, namely after the harvest.

Next, I briefly discuss prior research on the Roman-Egyptian poll tax. One of the earliest studies of Roman Egyptian taxation is Sherman LeRoy Wallace's *Taxation in Egypt from Augustus to Diocletian* (1938). Wallace used papyrological and literary evidence to trace the origins of the

poll tax, arguing that it was a continuation of the late Ptolemaic capitation taxes. Building on this, Andrew Monson (2014), through analysis of late Ptolemaic tax receipts and early Roman census data, showed that the Roman administration essentially reorganized existing personal taxes without significantly increasing the burden on taxpayers.

Micaela Langellotti's (2015) and Heinz (1991) summarize how the poll tax functioned within Roman Egypt's fiscal system. The introduction above draws primarily from their insights, which provide answers to questions such as who paid the tax and how much was owed.

A different approach is taken by Roger Bagnall and Bruce Frier in *The Demography of Roman Egypt* (1994), which investigates the social impact of the poll tax through population data. For instance, they found that at the household level, many census declarations appear to underreport young males around the age of liability for the poll tax or misstate their ages, which could be an indication of tax avoidance strategies by families.

Notably, little scholarship has addressed the question of when during the fiscal year the poll tax was paid. Pinpointing the timing can help us understand what factors influenced the flow of money from households to the state in the ancient world.

Methodology & Results

I performed a literature search on the Papyrus.info database on April 1, 2025, using the search query shown below.

Phrase: poll tax OR laographi* OR poll tax receipt X	Date on or after: 50 BCE X
Target: metadata	
No Caps: On	Date before: 200 CE X
No Marks: On	

Figure 1: Search query applied to the Papyrus.info database on April 1, 2025.

The search returned 353 records. I manually reviewed each record and extracted its day, month, and year data. Notably, some records included only the month and year, only the year, or a time range. This information was similarly recorded. Duplicates, clearly unrelated hits (i.e., receipts not related to a poll tax), and records that did not include a date were excluded. The resulting corpus included 251 titles. The complete dataset is available in the project repository linked in the bibliography section.

Next, I cleaned the dataset. Specifically, I excluded all titles that included only a year or a year range. Since it would not be possible to determine when during the year the poll tax was paid based on yearly data, these records were removed. After this filtering, the dataset consisted of 158 hits.

To test the first hypothesis, I first aggregated the number of receipts from each month to examine the distribution of poll tax payments throughout the year. The distribution is shown in Figure 2 below.

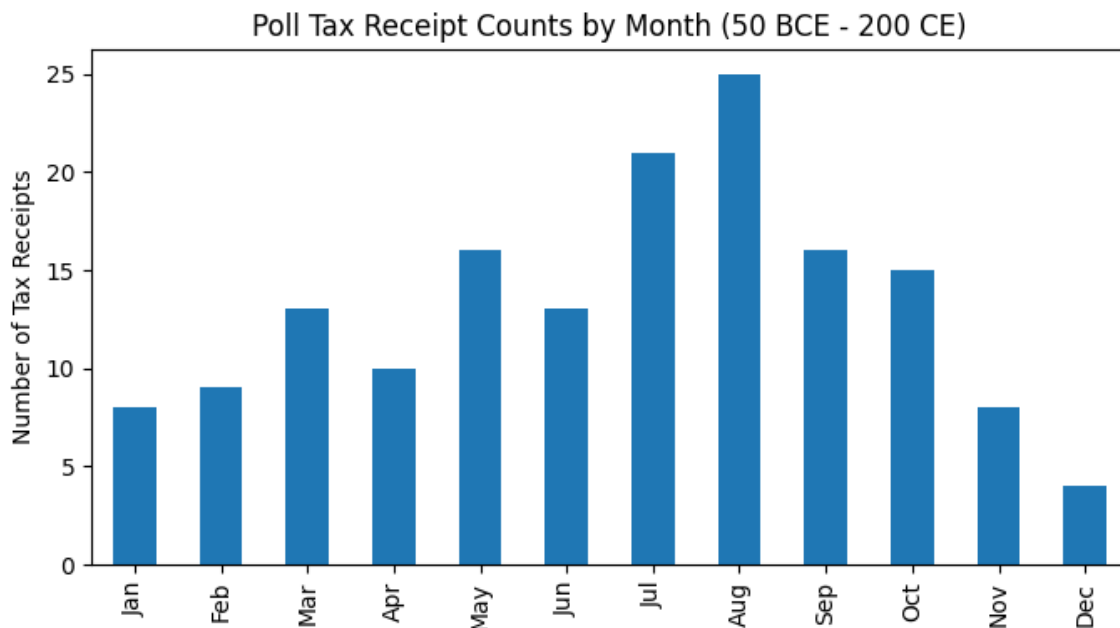


Figure 2: The distribution of poll-tax receipt counts by month (50 BCE - 200 CE).

I then performed a Chi-square test. The null hypothesis stated that the receipts are uniformly distributed across the months of the year, implying that the poll tax was not paid during any specific period. The alternative hypothesis was therefore that the receipts are not uniformly distributed but instead would cluster around certain months. I set the significance level at $\alpha = 0.05$.

The test yielded a p-value of approximately 0.002. Since $0.002 < \alpha$, I rejected the null hypothesis. This provides strong evidence against the idea that poll-tax payments were uniformly distributed throughout the year, suggesting instead that they tended to occur during specific periods. This arguably aligns with the distribution of poll tax payments in the table, with certain months clearly having more tax receipts than others.

Having established that the tax was likely paid during specific periods, I next tested whether it was concentrated in the months of May, June, and July, as specified when defining the

hypothesis. The null hypothesis stated that 25% of all receipts would fall within these three months and 75% within the other nine months, assuming a uniform distribution. The alternative hypothesis was that a significantly higher proportion of receipts were concentrated in these three months, suggesting that this was the primary period for poll-tax payments.

The test yielded a p-value of approximately 0.0537, which is right at the boundary of our alpha level. I do not reject the null hypothesis but argue that, given the low p-value, there is evidence that a significant number of tax receipts are from this period. Notably, I performed the same test on the months of July, August, and September, which produced a p-value of approximately 3.568×10^{-5} , providing very strong evidence for rejecting the null. As shown in Figure 2, most receipts were paid during this later period.

Importantly, this does not necessarily contradict my original hypothesis that the poll tax was paid after the harvest season. Rather, it suggests that July, August, and September were the primary months for poll-tax payments. It is possible that taxpayers needed more time to exchange their harvested crops for coin, and that the initial assumption—that this process took only one month—was too short.

I next consider the second hypothesis. I divided the data into 50-year intervals and performed a Chi-square test, where the null hypothesis was that the distribution of poll-tax payments across the months did not differ by period. The alternative hypothesis was that the distribution did differ over time.

The test yielded a p-value of approximately 0.339, which is above the predefined alpha level. We fail to reject the null hypothesis, suggesting that the timing of poll-tax payments within the year did not change significantly over the period from 50 BCE to 200 CE.

The Google Colab which the analysis was done is available in the project repository linked in the bibliography section.

Discussion & Conclusion

The analysis shows a clear clustering of tax receipts around specific months, with July, August, and September accounting for the highest number of payments. This supports the hypothesis that the poll tax was paid after the harvest season, when taxpayers were most liquid. While the initially defined "harvest season" (April–June) did not fully overlap with this peak, the delay may reflect a longer liquidation period than initially assumed.

Furthermore, the second analysis indicates that the timing of tax payments remained relatively stable over the 250-year period studied. I argue this strengthens the argument that the poll tax was paid after harvest. Given that the agricultural calendar, anchored to the Nile's flooding cycle, was similarly stable throughout this period, this consistency further strengthens the link between the agricultural harvest and the timing of tax payments.

In summary, these results support the hypothesis that poll-tax payments were closely tied to the harvest season. I argue the observed payment pattern reflects the seasonal availability of liquidity in an economy largely dependent on agriculture.

Limitations & Critique

Numerous limitations must be considered. First, there is a survival bias in the data. Papyri survive best in dry conditions, meaning regions such as Upper Egypt—which is known for its

dry climate and from which much papyrological material originates—are overrepresented in my study. Considering Egypt as a whole is therefore misleading.

Second, the one-month lag assumed for harvest liquidation was arbitrarily set and could be incorrect. It is possible that farmers liquidated their harvest more quickly, making spring or early summer the primary period of liquidity, which would not explain the observed clustering of receipts in July, August, and September. The fact that we are relaxed about the liquidation lag, combined with the limited direct evidence on this point, could make the conclusion misleading.

Third, the study does not assess the size of the taxes paid, but only whether a tax payment occurred. Graham et al. present evidence that payers of the poll-tax could pay in installments (Graham et al., 2016). Hence, while the number of receipts peaks during July, August, and September, it could be that larger tax amounts were paid at other times of the year—resulting in fewer receipts but higher total payments. This limitation transitions into my recommendations for further study, discussed below.

Throughout the analysis, I encountered additional questions I wished to answer but was limited by the difficulty of retrieving the relative size of the tax from the papyri data. Specifically, I wanted to understand whether the poll tax differed based on the taxpayer's societal group, comparing farmers to urban residents. As discussed in the introduction, there is evidence that poll-tax rates varied by societal status. I was unable to answer this question, primarily due to limited background information about the taxpayers in the receipts. Furthermore, I could not confidently translate the Greek text inscribed on the papyri to retrieve tax amounts for a large enough number of receipts.

Notably, of the 15 records I did consider, six recorded a payment of 8 drachmas, and only two recorded a payment of 16 drachmas, which would be the expected amount for Upper Egypt (Langellotti, 2015). Among the occupations I was able to retrieve, I found one slave (or possibly the owner of the slave) paying 5 drachmas and one hired gatekeeper paying 5 obols.

Second, I wanted to assess whether the poll tax was paid in full or split into multiple payments throughout the year as suggested by Graham et al. (Graham et al., 2016) This was very challenging. As discussed above, I had limited ability to retrieve tax amounts, and I was unable to link receipts to individual taxpayers, which would be necessary to track whether an individual made multiple payments during the year.

For researchers confident in Greek, I recommend that future studies target the retrieval of tax amounts, along with occupation and regional information. This would allow questions such as whether the tax amount changed over the period from 50 BCE to 200 CE, or how it differed based on geographical area or societal status, to be answered.

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Project repository: https://github.com/didrikwiigandersen/clst_1201_project