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The Time/Wage Index

A Framework for Applying Christian Ethical Teachings to Modern Economic Systems

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The ethical teachings of Jesus of Nazareth and Paul of Tarsus speak powerfully about economic issues including work, saving, spending, and care for the poor. However, these teachings arose in a significantly different context than that of modern Christians in Western nations. The ethical teachings can be applied to modern economic life using a framework consisting of the ratio of time and wages, which helps to better understand the purchasing power and economic costs of subsistence and luxury goods in the ancient context. This time/wage measurement helps to discern the ethical expectations for generosity and stewardship in the New Testament.

Introduction

The ethical teachings of Jesus of Nazareth and Paul of Tarsus speak powerfully about economic issues including work, saving, spending, and care for the poor. Nevertheless, these teachings arose in a remote time and in a radically different social and economic situation compared to the experience of most Christians in Western nations in the twentieth century.

To illustrate this point, consider that the percentage of people living in poverty has changed dramatically over the past two millennia. Estimates of the rate of poverty during the time of the New Testament suggest that more than 82 percent of people were exceptionally poor.[1] Therefore, the request from the early church to the apostle Paul to "remember the poor" (Gal. 2:10) referred to the vast majority of people at the time. According to the World Bank definition of extreme poverty at $2.15 per person per day at 2017 prices, the proportion of the population living in poverty remained at about 80 percent all the way up to the outset of the Industrial Revolution in 1800.[2] Half the world still lived in poverty in 1966, but this percentage declined dramatically to 8 percent by 2019.[3]

These data suggest that the request from the church leaders mentioned in Paul's letter to the Galatians was delivered at a time when about four out of five people were in poverty (an 80 percent ratio) whereas in the United States today it would apply to only one out of ten people (a 10 percent ratio). Further, in the United States, the Census Bureau sets a much higher standard for poverty relative to the size of the household. Using this criterion, in 2022 about 11.5 percent of the population lived below the U.S. poverty line[4] of $27,750 per year for a family of four.[5] This data suggests that the levels of resources to people in poverty are dramatically higher than in the first century, and this fact likely should impact any ethical considerations of interpretation of the New Testament teachings.

This example of a single economic measure indicates that historical and theological sensitivity is necessary to understand ancient ethical sources in their own contexts before fundamental principles can be applied to different financial contexts. This article seeks to develop an economic framework using the ratio of time and wages to better understand the purchasing power and economic costs of both subsistence and luxury goods in the first century of the ancient Near East and the Mediterranean world. While not without difficulties, this time/wage measurement can provide helpful insights to better understand the ethical expectations for generosity and stewardship in the writings of the New Testament.

To this end, this article will first develop a measure for the economic cost of goods and services using the number of hours of wages for an average worker that are required for a specific purchase. With this tool, ethical principles and economic ideas can be compared from the time of the New Testament to the modern day. The advantages and disadvantages of this framework will be explored, then this time/wage ratio will be used for comparison in three case studies. Finally, the outcome of the case studies will generate conclusions regarding generosity, economic temptations, and opportunities for gratitude.

The Time/Wage Index

Comparing the relative prices of the same goods over time has always been a challenge for economic historians. The Consumer Price Index (CPI) is a family of familiar indices used to measure the changes in prices experienced by urban consumers over relatively shorter periods of time, such as decades. Measuring changes in purchasing power over much longer periods of time, such as millennia, are complicated by changes in coinage, differences in goods available for purchase, and the life span of a consumer. In such cases it is important to consider not only the nominal price of goods at a point in history but also the earning power of individuals in the same time period.

In other words, simply tracking the changes in the price of a certain good at particular points in time is not sufficient to completely understand the full cost of obtaining that item. For example, the author's grandfather reminisced that he could purchase a loaf of bread for a nickel, but that was at a place and time in history when earning a nickel represented a considerable amount of work. In contrast, in the early twenty-first century few people are inclined to even pick up a nickel laying on a dirty sidewalk. While every era tends to have some groups of people that are wealthy and other groups that are destitute, the focus of this analysis will be on the average or median earner in each economy.

With this in mind, the time/wage ratio can provide a useful framework for measurement. This measure shows that the nominal price of any good is equal to the hourly wage of the average worker multiplied by the number of hours required to pay for such a good (as shown below). With simple mathematical rearrangement, the price of a final good can be divided by the average wage per hour to yield the number of hours of work required for the typical worker to obtain a good or service. This measure is consistent with the understanding of Adam Smith who recognized that the true price of anything was the "toil and trouble of obtaining it."[6]

(Wage per hour) x (Hours worked) =
Cost in terms of life of a specific good or service

Subjective cost measured in hours worked =
(Price of a specific good or service) ÷ (Wage per hour)

What is the advantage of measuring costs in hours of work? First, utilizing hours as an economic measurement helps to reveal the subjective value of individual goods across cultures and over time. Second, this measure remembers that life is a gift from God and that "He himself gives everyone life and breath and every-hing else" (Acts 17:25). Accordingly, a person only has a finite amount of life to devote to economic activity to acquire more things. Third, applying the time/wage cost to similar goods provides a helpful point of comparison to standardized prices over time. For example, in the United States in 1913 the average nominal price for a dozen chicken eggs was about $0.37 and the average wage for a typical worker was $0.23 per hour.[7] Thus the hourly cost for a dozen eggs was 1.6 hours of labor. By August 2023, the average hourly wage was $33.60.[8] That same year, the average price of eggs was $2.21 per dozen which cost a modern worker only .07 hours or 4 minutes of labor.[9] In other words, the price of the dozen eggs fell 96 percent over a century as measured in terms of hours of human life. This example demonstrates once again how the time/wage ratio provides a framework to consider ethical economic insights. Products that were considered luxury goods (i.e., automobiles or cell phones) in the last century can now become commonplace when the cost is measured in terms of human life.

A further consideration for the time/wage ratio is the length of life for the typical person. Average life expectancy at birth in the first century was between 22 and 25 years according to census data preserved from Roman Egypt.[10] As a result, individuals in New Testament times had to devote more hours of life to acquire individual goods, and also a higher percentage of their lifetime earnings since they typically had much less life available. In contrast, life expectancy at birth in the United States in 2023 was 76 years, or more than double the average life in the first century, even after two years of decline associated with the Covid-19 pandemic.[11] Viewed in this light, first-century Christians reached much higher levels of sacrificial generosity than would be typical among believers in a twenty-first-century church. The nature of this dynamic will be explored in the case studies in the next section of this article.

Ethical Case Studies

This section of the article will utilize the time/wage ratio as a framework for three scenarios that will shed light on several New Testament passages, including generosity to the poor, tithing to the church, and purchasing luxury goods.

Generosity to the Poor

When Paul made his appeal to the Corinthian church for a collection for the destitute saints in Jerusalem, he cited the generosity of the churches of Macedonia. Paul boasted that these churches "in a severe test of affliction, their abundance of joy and their extreme poverty have overflowed in a wealth of generosity on their part. For they gave according to their means, as I can testify, and beyond their means" (2 Cor. 8:1–3). The apostle was not specific as to the precise amount of the gifts nor the extent of the Macedonian impoverishment, but the time/wage measurement might make it possible to formulate an estimate using other information provided in the New Testament.

As a point of comparison, when the crowds asked John the Baptist what actions they should pursue to bear good fruit, he stated "Whoever has two tunics is to share with him who has none, and whoever has food is to do likewise" (Luke 3:11). First, it should be noted that John did not even assume that every person had more than one tunic because articles of clothing were so expensive in the ancient world. Even before further calculations, this example demonstrates the stunning economic distance between New Testament times and believers in the modern church who likely have a closet bursting with a variety of clothes and valuable shoes.[12]

To provide a more quantitative measurement, the research of Botticini and Eckstein on the first and second centuries suggests that a cloak of average quality sold for around 15 *denarii*.[13] This estimate fits well with Sperber's estimates of 30 *denarii* for a good suit and 4 *denarii* for clothing of rough sacking for a slave.[14] Likewise Drexhage found a range of tunic prices between 8 and 32 *denarii* in documents from Roman Egypt.[15]

The *denarius* (plural: *denarii*) was a silver coin issued by the Roman government that represented one day's wage for the average laborer.[16] Even without an adjustment for the longer Roman workday, the value of this coin provides extremely helpful information for a time/wage analysis to compare the relative values of clothing over time. Translating the true worth of the average Roman tunic into modern terms could be accomplished by multiplying the average hourly wage of $33.60 times eight hours for a workday times 15 days of work (represented by 15 *denarii*). This computation yields an equivalent value for an average tunic of more than $4,000 in 2023.

Putting this into the context of Luke 3, John the Baptist was calling for extraordinary generosity to help clothe a neighbor in need. One tunic represented the entire clothing budget for a year for the average worker.[17] Therefore, when Paul the Apostle states that the Macedonian churches overflowed in a "wealth of generosity," that donation likely was a sacrifice that would be staggering to modern churchgoers.

Even the Good Samaritan of Jesus' parable in Luke 10:29–37 left two *denarii* with the innkeeper along with a promise to pay off any further expenses incurred on credit. Using the average wage of $33.60 times an eight-hour day for two days yields more than $500, which is remarkably generous for an ethnic stranger in need. Considering this time/wage framework, the modern believer should be sobered to read Jesus' command at the conclusion of this parable: "You go and do likewise" (Luke 10:37).

Tithing to the Church

Many modern Christians look to God's command in Malachi 3:10 to "bring the whole tithe into the storehouse" as an injunction to donate 10 percent of their income to a local church. Supporting this conclusion, Jesus condemned the Pharisees because they neglected the weightier commands of the law, yet still gave a tenth of the harvest of even the smallest herbs like mint, dill, and cumin. Specifically, Jesus says of their tithes, "These you ought to have done, without neglecting the others" (Matt. 23:23, cf. Luke 11:42). In other words, Jesus presupposes that giving a tithe should be a generous level of giving to the kingdom. Since tithing represents a proportion of the income earned, one might be tempted to argue that tithing already is transcultural and spans the time of history.

On the other hand, the time/wage measurement suggests that modern Christians are not as generous as believers who tithed in the first century. Remember that a Christian living in the first century likely was scraping along at a level near subsistence, such that a 10 percent reduction in income (not to mention the heavy Roman taxation) was a significant challenge to survival. This is consistent with Jesus' commendation of the generous widow who gave to the temple treasury "all that she had to live on" (Luke 21:3). Further, her generous gift displayed a radical devotion to God during a time in history devoid of any social safety net such as Social Security or food programs.

While it is difficult to estimate a dollar value for the full income of workers in the first-century world, the average wage earner in the United States earns $33.60 per hour and is paid for 34 hours each week for 52 weeks each year (assuming at least two weeks of paid vacation). In 2023 this translates into about $59,400 per year, which would leave $53,460 after tithing 10 percent to a local church. While charitable donations of nearly $6,000 per year are quite generous relative to most people in the United States, the amount left over is still more than a hundred times above the world poverty level and would represent a staggering amount of wealth to a person with only one tunic in the New Testament world.

This scenario is intended to inform the church today without condemning the liberality of any individual Christian. Nevertheless, the ethical weight of the first-century commands seen through the lens of the time/wage analysis should nudge the modern believer to go beyond tithing to consider Paul's admonition to the Corinthian church, "Whoever sows sparingly will also reap sparingly, and whoever sows bountifully will also reap bountifully. Each one must give as he has decided in his heart, not reluctantly or under compulsion, for God loves a cheerful giver" (2 Cor. 9:6–7).

Luxury Goods and Signaling Wealth

At the other end of the spectrum, Paul wrote instructions to Timothy at the church in Ephesus, saying, "I desire then that in every place the men should pray … likewise also that women should adorn themselves in respectable apparel, with modesty and self-control, not with braided hair and gold or pearls or costly attire, but with what is proper for women who profess godliness—with good works" (1 Tim. 2:8–10). Once again, Paul is not specific about an exact sum defining "costly attire," but it is possible to make an estimate based on two of the specified goods: gold and pearls.

Consistent with the United States today, the prices for pearls in the Roman Empire varied depending on the size, luster, and color of the individual specimen. Nevertheless, pearls of any type were universally considered luxury items and were expensive. For example, Pliny the Elder recognized that pearls imported with other goods from India were sold in Rome at one hundred times the original cost.[18] Indeed, Donkin notes that "pearls in particular came to symbolize the willful extravagance of early imperial Rome."[19] Therefore it should be no surprise that the apostle John portrayed "Babylon," thought to signify Rome, as an extravagant city "adorned with gold, with jewels, and with pearls" (Rev. 18:15).

The New Testament itself testifies to this first-century understanding of the value of pearls. Jesus told a parable of a merchant who found a single pearl worth all the rest of his possessions (Matt. 13:45) and warned in the Sermon on the Mount, "Do not throw your pearls before swine" (Matt. 7:6). In Revelation, the New Jerusalem is described with streets of gold and "the twelve gates were twelve pearls, each of the gates made of a single pearl" (Rev. 21:20). Since high-quality pearls traded for their weight in gold in ancient markets, pearls were an unimaginable luxury for an average worker in the first century.[20]

The price of gold is also difficult to translate since coinage of the Roman Empire was made of gold. Nevertheless, if the woman in question indeed was wearing a combination of gold and pearls, the value of this outfit would have been considerably higher. The concept of "signaling wealth" expresses the reality that some goods have little intrinsic worth, but rather are valuable only when viewed by other people as a signal.[21] Paul seems to have understood that gold and pearls signal wealth and were to be avoided by Christians.

The fact that such wide income and wealth disparities existed in the audience of Paul's letters should be a source of concern for believers. Nevertheless, the average daily wage in the United States in 2023 is nearly $270, which is over 140 times greater than the international poverty level established by the World Bank. In other words, the shocking disparity of the first century has not changed much for the church today. Granted, the cost of living for food and shelter is higher in the United States, though these higher prices also bring a greater variety of goods than were available in Paul's day.

Many more case studies could be explored, such as the impact of the statement, "You are the light of the world" (Matt. 5:14), which would have been much stronger in an economic culture where olive oil lamps cost a hundred times more for light at night compared to LED bulbs. Nevertheless, at this point it is appropriate to draw together the conclusions from this analysis.

Ethical Conclusions

Several ethical inferences can be drawn from this time/wage framework and the case studies examined above. First, this time/wage measurement provides a conservative measurement. In computing the 96 percent decrease in the hourly cost of a dozen eggs, for example, the analysis did not include the fact that the quality, packaging, and hygiene of the eggs also improved dramatically over time. In the same way, clothing in 2023 utilizes synthetic fibers, metal fasteners, and zippers, which would not have been available in the highest-quality tunics of the first century, much less in an average tunic as analyzed in this article. From an earnings perspective, a farmer in the first century was limited by land and weather in creating value, whereas the average modern factory worker or computer programmer can produce a value without interruption from inclement weather or lack of daylight. In this way, lifetime earnings and the ability to trade decrease the hourly cost of goods and increase the variety of opportunities available. In addition, life expectancy at birth is not only double that of the first century, but the quality of life, health, and security is also much higher. For these reasons, the following conclusions could be made much more emphatic based on the further understanding of the qualitative data beyond the time/wage framework used in this analysis.

Second, it is self-evident that the standards, expectations, and practices of generosity in the first-century church were much higher than is expressed currently in local churches. The parables of Jesus assumed an elevated level of generosity even to ethnic strangers while John the Baptist directly commanded penitent people to practice radical generosity toward the poor and naked. When Paul was exhorted to "remember the poor" (Gal. 2:10), the percentage of poor people was eight times higher than is faced by the modern church. Commensurately, the believers in existing churches have many more resources to support a much smaller percentage of poor people who themselves are much further away from a subsistence lifestyle than even the average person in the first-century church. For these reasons, the time/wage framework would be helpful for reconsidering biblical admonitions such as “the rich in this present age … are to do good, to be rich in good works, to be generous and ready to share” (1 Tim. 6:17–18).

Third, people today face much higher temptations toward luxury and have many more opportunities for signaling wealth. The relative cost of pearls and gold is much lower when measured in human life today because the methods of collecting pearls and mining gold are much more automated and efficient compared to the first century. These lower hourly costs suggest that the competition to signal wealth has grown even greater in both dollar amounts and in the variety of signals. In other words, it is likely that if Paul were to repeat his admonition against signaling wealth in 1 Timothy 2:9, one could assume that he would include not only gold and pearls, but also houses, cars, and designer handbags.

Finally, rather than feeling guilt for the blessings of abundance, the time/wage index illustrates that opportunities for generosity, gratitude, and worship are much more plentiful today than in the first century. Paul encouraged the early church to “rejoice always, pray without ceasing, and to give thanks in all circumstances; for this is the will of God in Christ Jesus for you” (1 Thess. 5:16–18). If the early church was able to obey these commands, then a modern local church with a superabundance of both opportunities and material goods should be able to rejoice all the more today. Nevertheless, Jesus encouraged his disciples not to focus too much on present circumstances but instead to “rejoice that your names are written in heaven” (Luke 10:20). Indeed, the time/wage index demonstrates that the modern church now experiences such abundance relative to the first century that believers today must hold fast to Peter’s admonition and encouragement: “Though you do not now see him, you believe in him and rejoice with joy that is inexpressible and filled with glory, obtaining the outcome of your faith, the salvation of your souls” (1 Peter 1:8–9).

Notes

1. Longenecker's careful estimate suggests that 55 percent of people lived at or below subsistence level with an additional 27 percent living with only a small surplus beyond survival. Bruce W. Longenecker, *Remember the Poor: Paul, Poverty, and the Greco-Roman World* (Grand Rapids, MI: Eerdmans, 2010), 53.

2. R. Andres Castaneda Aguilar et al., "September 2022 global poverty update from the World Bank: 2017 PPPs and new data for India," World Bank Blogs, September 14, 2022, https://blogs.worldbank.org/opendata/september-2022-global -poverty -update-world-bank-2017-ppps-and-new-data-india.

3. While the trend is extremely encouraging, millions of people persisting in poverty remains a tragedy. United Nations, "End poverty in all its forms everywhere," United Nations Statistics Division, accessed October 28, 2023, https://unstats.un.org/sdgs/report/2020/goal-01/.

4. United States Census Bureau, "Income, Poverty and Health Insurance Coverage in the United States: 2022," last modified September 26, 2023, https://www.census.gov/newsroom/press-releases/2023/income-poverty-health-insurance-coverage.html.

5. Note that an income of $27,750 would be almost nine times higher than the World Bank standard of $3,140 for a family of four. "Federal poverty level (FPL)," HealthCare.gov, accessed September 17, 2023, https://www.healthcare.gov/glossary/federal -poverty-level-fpl/.

6. Adam Smith, *The Wealth of Nations*, ed. Edwin Cannan (New York: Modern Library, 1994), 33.

7. Jonathan Church and Ken Stewart, "Average Food Prices: a snapshot of how much has changed over a century: Beyond the Numbers," U.S. Bureau of Labor Statistics, February 26, 2013, http://www.bls.gov/opub/btn/volume-2/average-food-prices -a-snapshot-of-how-much-has-changed-over-a-century.htm. Nominal and adjusted wages are available from Donald M. Fisk, "American Labor in the 20th Century," U.S. Bureau of Labor Statistics, January 30, 2003, http://www.bls.gov/opub/mlr/cwc/american-labor-in-the-20th-century.pdf.

8. "Table B-3. Average hourly and weekly earnings of all employees on private nonfarm payrolls by industry sector, seasonally adjusted," U.S. Bureau of Labor Statistics, last modified October 6, 2023, https://www.bls.gov/news.release/empsit.t19.htm.

9. "Average Price: Eggs, Grade A, Large (Cost per Dozen) in U.S. City Average," FRED Economic Data from the Federal Reserve Bank of St. Louis, last modified June 2023, https://fred.stlouisfed.org/series/APU0000708111.

10. Specifically, 22.5 years for women and 25 years for men. Males who lived past the first year could expect to live an average of thirty-six years. Roger S. Bagnall and

Bruce W. Frier, *The Demography of Roman Egypt* (Cambridge: Cambridge University Press, 1994), 77, 100.

11. "Life Expectancy in the US Dropped for the Second Year in a Row in 2021," Centers for Disease Control and Prevention, last modified August 31, 2022, https://www.cdc.gov/nchs/pressroom/nchs_press_releases/2022/20220831.htm.

12. Gildas Hamel notes, "One must bear in mind that clothing was a very rare commodity in the ancient world, particularly in those areas without the more sophisticated looms already in use. This is obvious from the care with which one treated clothes. Worn out garments were mended, kept, sold, treasured," Gildas Hamel, *Poverty and Charity in Roman Palestine, First Three Centuries C.E.* (Berkeley: University of California Press, 1990), 72.

13. Maristella Botticini and Zvi Eckstein, "From Farmers to Merchants, Conversions and Diaspora: Human Capital and Jewish History," *Journal of the European Economic Association* 5, no. 5 (2007): 885–926.

14. Daniel Sperber, "Costs of Living in Roman Palestine," *Journal of the Economic and Social History of the Orient* 8, no. 3 (1965): 248–71.

15. Hans-Joachim Drexhage, *Preise, Mieten, Pachten, Kosten und Löhne im römischen Ägypten bis zum Regierungsantritt Diokletians* (St. Katharinen, DE: Scripta Mercaturae, 1991), 368.

16. See the vineyard workers of Matthew 20:2 and the table of comparisons in Sperber, "Costs of Living in Roman Palestine."

17. As Drexhage aptly notes, "Der Preis für die Anschaffung eines Chitons den gesamten 'Bekleidungsetat' pro Jahr für weite Teile der Bevölkerung ausmachte." Drexhage, *Preise*, 368.

18. Pliny the Elder, *Natural History*, trans. David Edward Eichholz et al., Loeb Classical Library (Cambridge: Harvard University Press, 1961–1968), 4:417.

19. R. A. Donkin, *Beyond Price: Pearls and Pearl-Fishing: Origins to the Age of Discoveries* (Philadelphia: American Philosophical Society, 1998), 90.

20. Donkin, *Beyond Price*, 87.

21. For an extended biblical discussion of signaling wealth, see David Kotter, "Working for the Glory of God: The Distinction Between Greed and Self-Interest in the Life and Letters of the Apostle Paul" (PhD diss., Southern Baptist Theological Seminary, 2015), 90–96.