

Analyzing ancient price data with modern methods

Some insights and puzzles

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Digital antique price data...

Example: The Babylonian „Astronomical Diaries“

- The Astronomical Diaries are a collection of cuneiform tablets from first millennium Babylon.
 - They record celestial, ecological/climate-related, economic and historic events, including the „silver equivalents“ of 6 goods (barley, dates,...)
 - Much of the data are available in digital form:
<http://www.iisg.nl/hpw/babylon.php>
- It appears that, also more generally, price/wage/rent data are often found in antique texts.
- The „Topoi“ cluster has built the expertise for digitising these and other data.
 - This is particularly useful if the data are combined with some „keys“/identifiers that appear in various datasets.

Measuring Babylonian risk aversion

...in a nutshell

- The prices recorded in the Astronomical Diaries vary to a surprising extent.
 - This strongly suggests that the prices are market prices. Even then, why do we observe so many extreme price changes over relatively short periods?
 - Harvest risk appears to have caused much of the price variability: The barley growing period was a high-risk period.
- We use the last discovery to measure the risk aversion (RA) of a representative crop trader. In a nutshell:
 - Expected date price growth = $RA \times \text{Covariance}(\text{price growth}, \text{SDF})$.
 - SDF means „stochastic discount factor“. We specify the variation in the SDF as variation proportional to the growth rate of the silver equivalent of barley.
 - We can measure RA using the harvest cycle as a cause of variation in the terms of the above-stated equation. (Don't do this! Use a better method.)

Future research?

...putting the price data into context

- To which extent are the price fluctuations driven by harvest risk? What were the relevant „amplification mechanisms“?
- Can we link the data to data about other (more complicated) prices (e.g., interest rates)?
 - This requires economic theory, but „non-computability“ must be taken into account. This is my research agenda.
 - Links between markets are very interesting. This can be studied using the archives of businesses and other institutions.
- With other kinds of data can be linked to price data?
 - Data about inequality?