Insights into Wage Distributions

How Many Make How Much?

Ross Evans, Texas Workforce Commission
Census LED Partnership Workshop, June 23, 2015
ross.evans@twc.state.tx.us

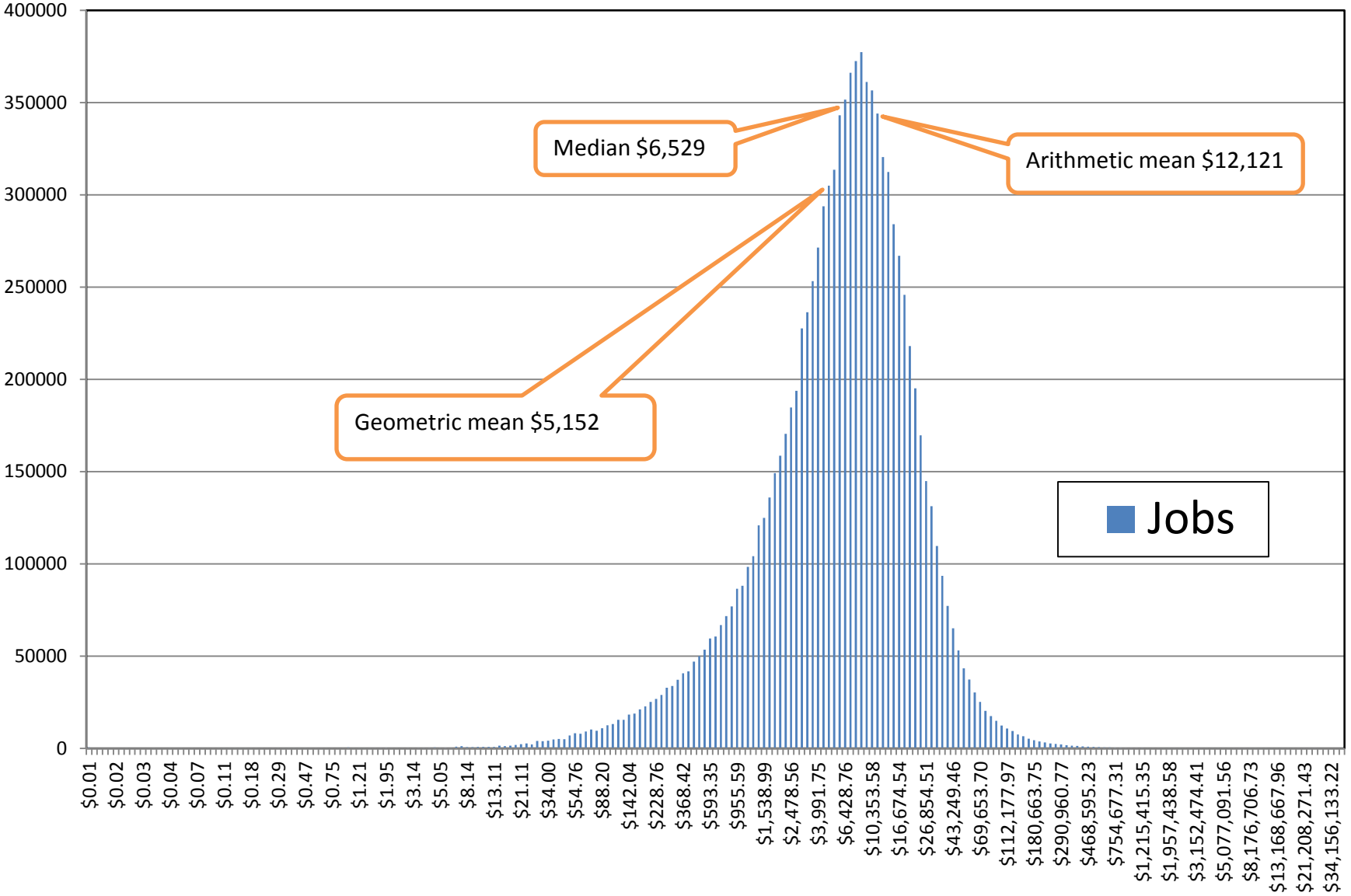
Background

- We now have accumulated 25 years (100 quarters) of wage microdata.
- The Texas LMCI department has maintained its own private copy of this microdata in its data warehouse for internal analysis.
- That is > 1 billion rows of wage data, linked relationally to our employer-level records.
- This presentation is based on analysis of that raw data, focusing mostly on the private sector.

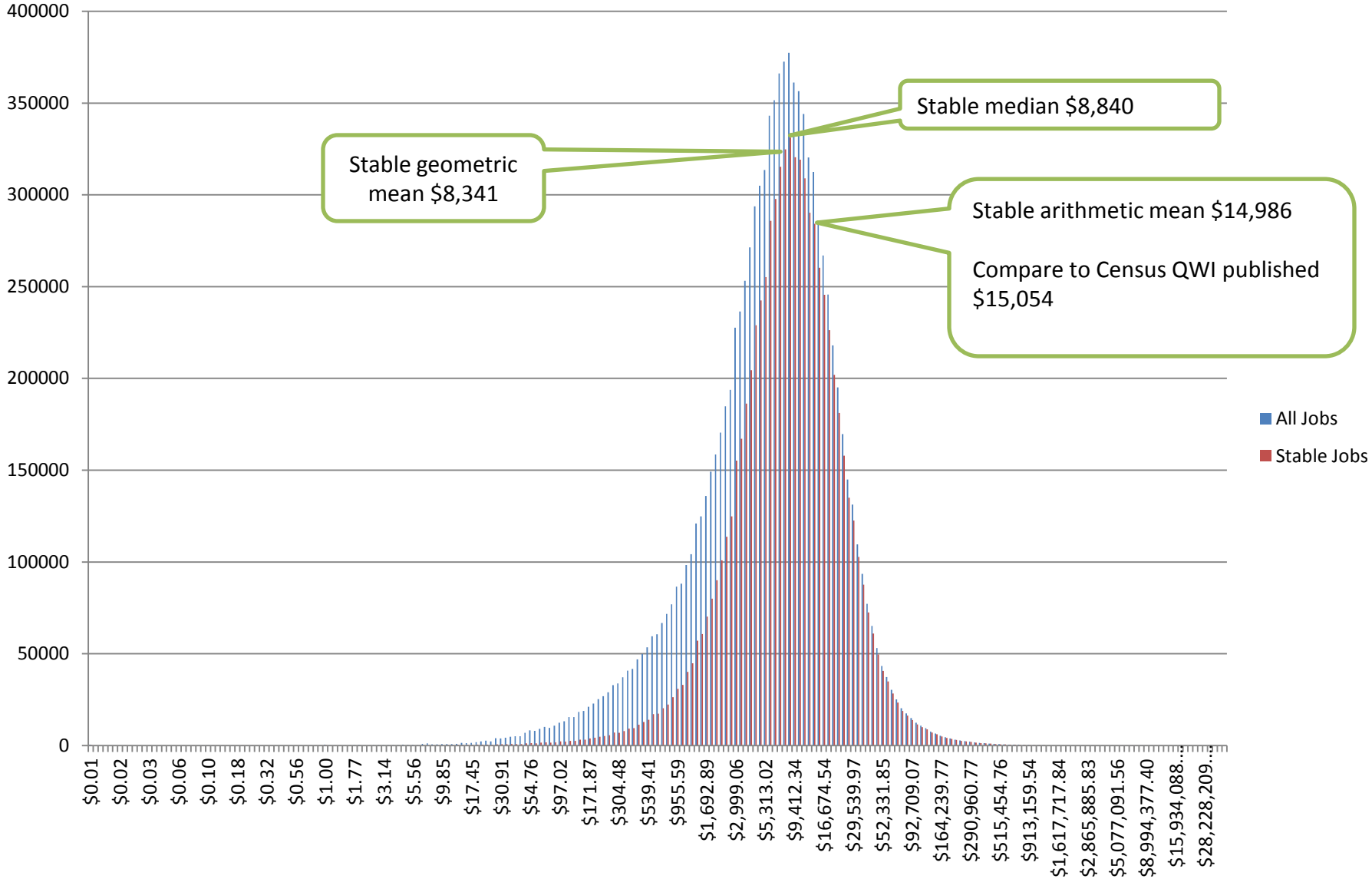
Wage Distributions

- The distribution of wages (a subset of income) have always been a core issue for economists to study.
- The underlying data we study here include wages, salaries and bonuses – not capital gains or other forms of income or wealth.
- Simple arithmetic distributions – and arithmetic averages – are not very useful.
- These data naturally scale logarithmically – they grow by multiplying, not by adding.

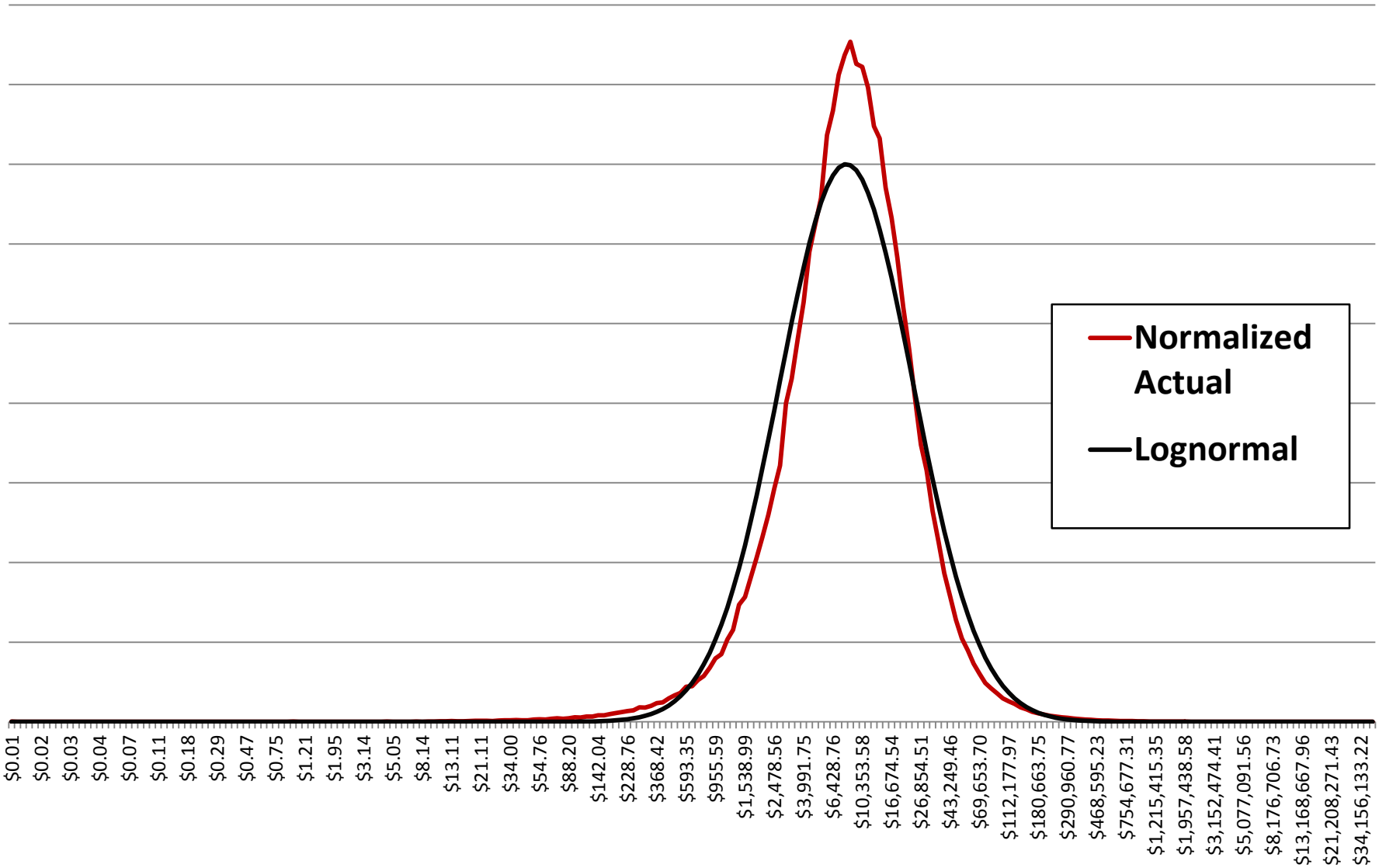
Texas Private Sector Jobs, 2014 Q1
Distributed by Quarterly Wages Logarithmically



Quarterly Wages for All Texas Private-Sector Jobs vs Stable Jobs 2014 Q1



Distribution of Stable Private Jobs vs Lognormal Curve



Wage Inequality

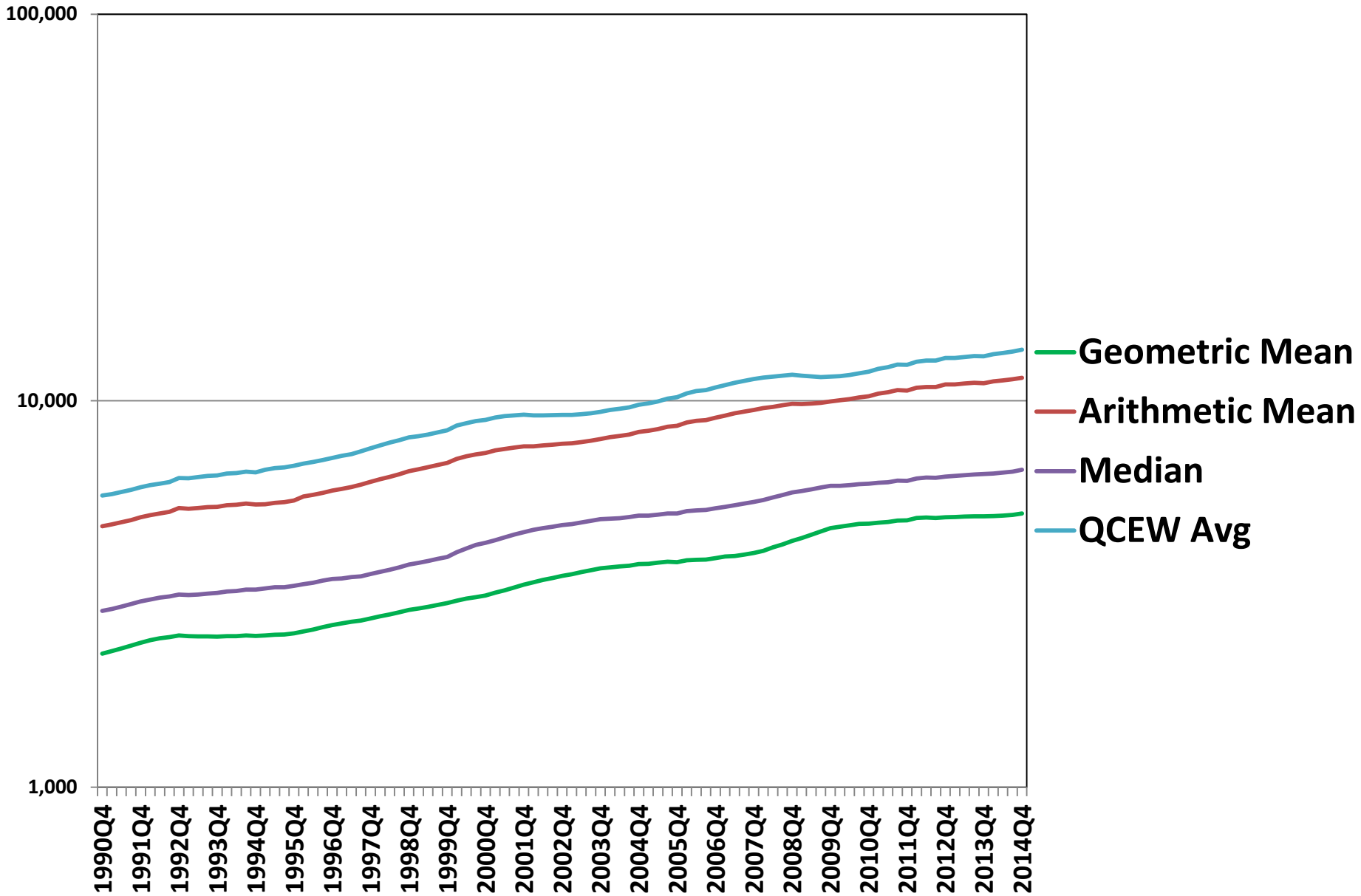
- It exists.
- It may be more meaningful to use the entire universe, not just Stable jobs, for these macroeconomic calculations. So hereafter that is what I am analyzing.
- The most popular metrics for income inequality generally are the Lorenz Curve, and its corresponding Gini Coefficient.
- Those metrics can be calculated for our wage microdata.
- These calculations are computationally expensive.

Lorenz Curve for All Texas Private Sector Wages, 2014 Q1

Wage Inequality as a Time Series

- I looked to see how relative wage inequality varied over time – the 25 years of our data.
- The inequality data do *not* exhibit a secular trend toward greater or less inequality.
- The data *do* exhibit strong seasonal and cyclical swings.

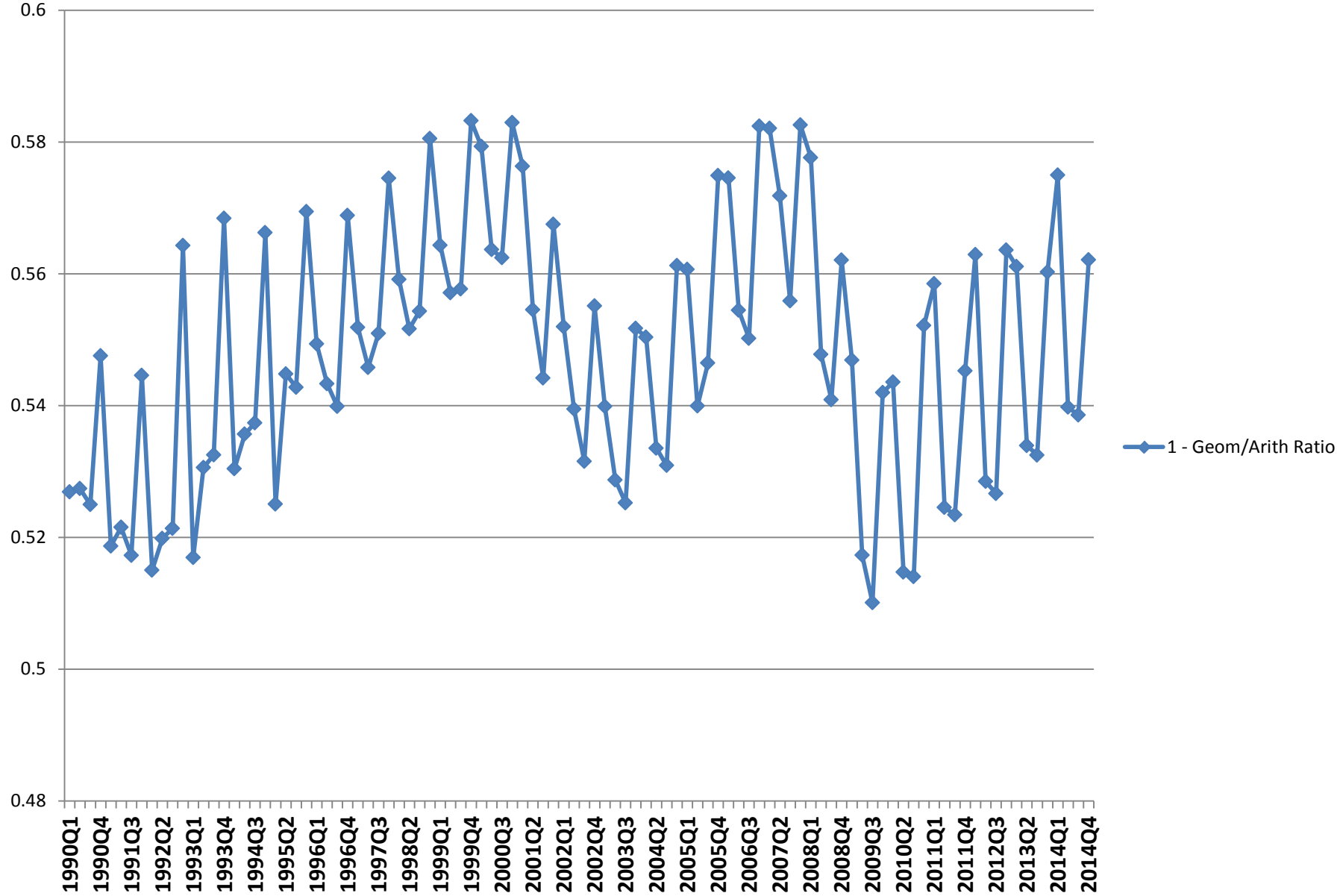
Alternate Metrics for Quarterly Wages, All Texas Private Jobs, 4-Qtr Moving Averages



Another Metric for Inequality

- The arithmetic mean is dominated by high-earners.
- The geometric mean is dominated by rank-and-file earners.
- Compute the ratio of these two means, yielding a coefficent between 0 and 1.
- Following D.G. Champernowne (1973), subtract this ratio from 1 to yield an index of inequality.
- This correlates highly with the Gini Coefficient, but is much more easily computable.

Champernowne Index of Inequality as a Quarterly Time Series



Champernowne Index with seasonality removed = the Business Cycle