

Labor Income Dynamics: Evidence for Argentina

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Outline

Motivation

Data

Inequality, Volatility, and Mobility

Wage Setting

Conclusions

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Argentina

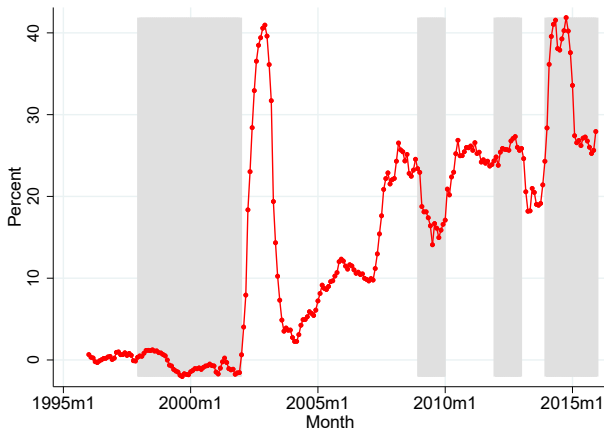


Figure: Inflation Rate

Questions

- How does the distribution of earnings evolve?
 - Drop in inequality after the 2001/2002 crisis with a decade-long decline.
 - Mobility patterns remain stable in different inflation regimes.
 - In the 2001/2002 crisis, wages fell significantly except for the very top.
- How does the wages adjustment vary in different inflation regimes and across workers?
 - Frequency of positive changes increases with inflation
 - With low inflation, changes in wages are asymmetrical.
 - With high inflation, changes in wages are symmetrical.

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Global Income Dynamics Project (GID)

GID Project is a research consortium of groups with expertise on administrative microdata for 13 countries... and growing. Headed by Fatih Guvenen (Minnesota), Luigi Pistaferri (Stanford), and Gianluca Violante (Princeton).

To study inequality, volatility, and mobility, want:

- High-quality and large-scale panel microdata
- Standardized empirical methods
- Micro-/macro-relevant measures
- Updated online database with 10,000s statistics/country.

Data sources

Sistema Integrado Previsional Argentino (SIPA)

- Matched employer-employee monthly panel data
- Covers all formal workers (private and public in national govt')
- Period: 1996-2017
- Data on 4.5 million workers per year
- Key variables: worker ID, gender, age, job start and end month, monthly earnings

Sample Selection

- Ages 25-55
- Earnings include salary, bonus, vacation, 13th salary
- No top-coding in SIPA
- Compute total annual earnings, y_{it} , for person i in year t
- Drop observations with incomes below threshold

$$y_{it} \leq \frac{1}{2} \times 48 \frac{\text{hours}}{\text{week}} \times 4.3 \frac{\text{weeks}}{\text{month}} \times 3 \text{ months} \times \text{National } MW_t$$

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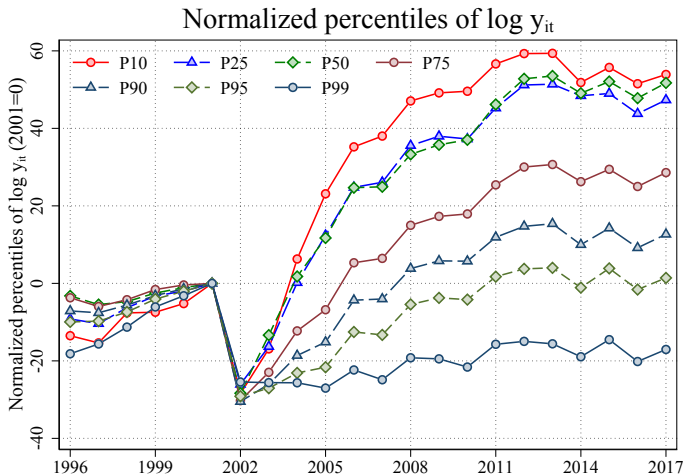
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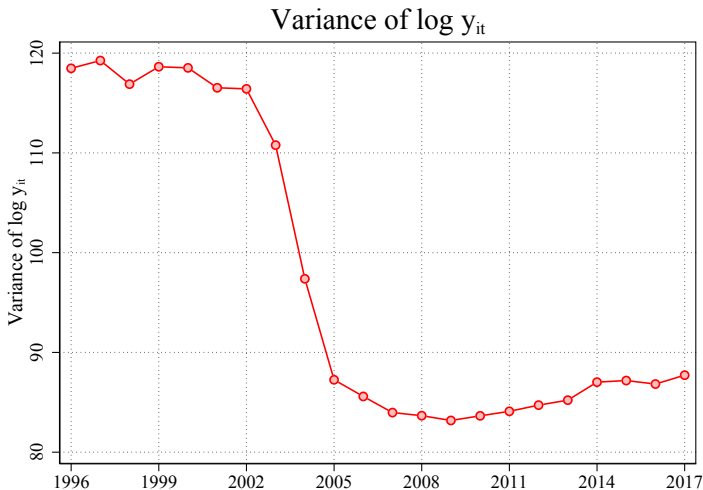
Normalized Log Earnings Percentiles

25% drop during 2002 devaluation and economic crisis, and rapid bottom-driven growth after 2002 devaluation.



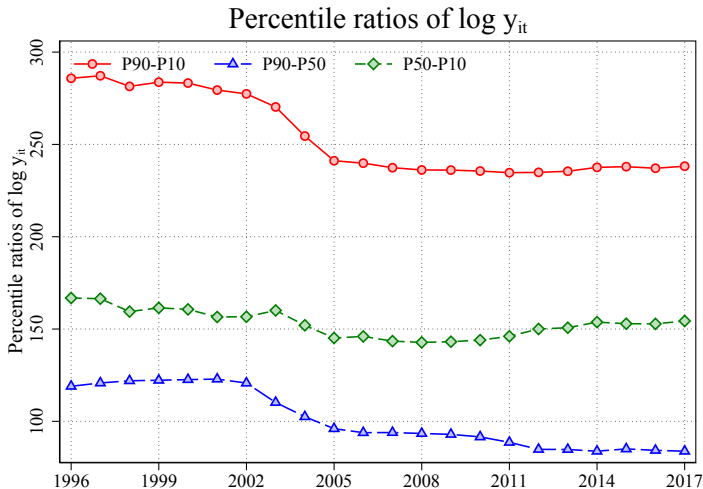
Variance of Log Earnings

Compression of income distribution coinciding with 2002 devaluation.



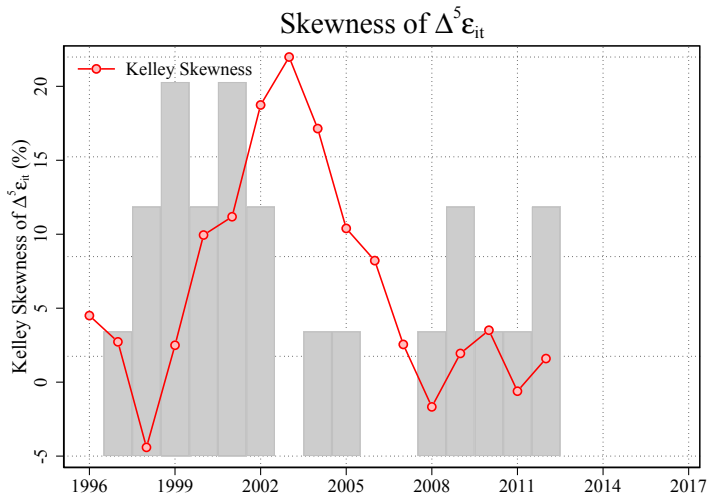
Log Earnings Percentile Ratios

Decline in overall inequality (P90-P10) driven by decline of P90-P50.



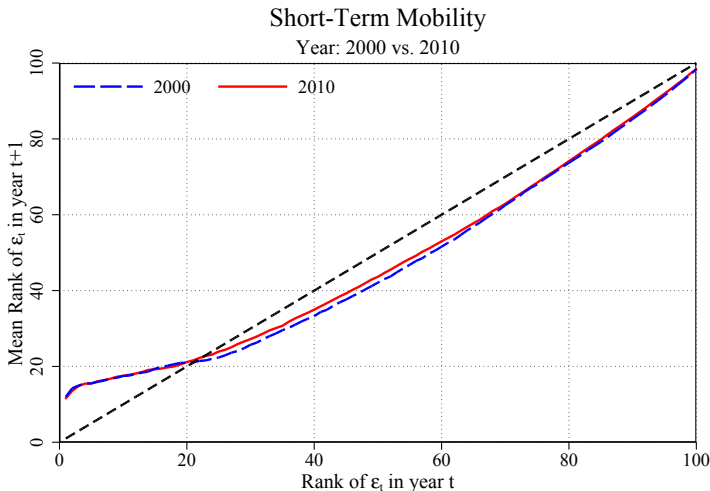
Skewness of 5-Y. Resid. Earnings Change

Countercyclical skewness.



Mobility in Res. Inc., 2000 vs. 2010

Upward (downward) mobility below (above) 20th percentile, and stable mobility patterns over time.



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Wage Setting

Wage rigidity is the core mechanism in many macro models

- Effect of a monetary shock (Christiano-Eichenbaum-Evans, '05)
- Optimal monetary policy (Levin et. al., '05)
- Cyclicalities of unemployment (Shimer, '05)
- Recovery after sudden stops (Schmitt Grohé-Uribe, '16)

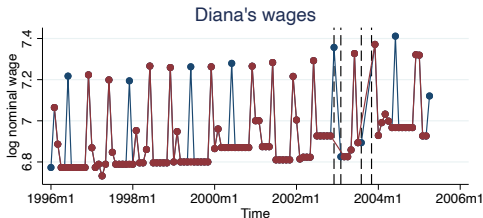
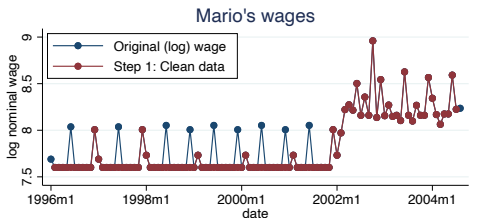
Measurement of wage rigidity still scarce

- minimize measurement error → administrative data
- avoid time aggregation bias → high-frequency data

⇒ Additional measurement can help discipline macro models!

Step 1: Clean Data

- Remove first and last wage in each job
- Remove wages $< 0.5 \times$ minimum wage
- Replace wage in June/Dec by avg. in annexed months if equal



Step 2: Construct regular wage

Construct regular wage (w^r) using filters from pricing literature: Nakamura-Steinsson, '08; Kehoe-Midrigan, '14; Stevens, '19; Barattieri et al., 14'. In particular, we use Kolmogorov-Smirnov test:

1. Solution to measurement challenge: Kolmogorov-Smirnov test

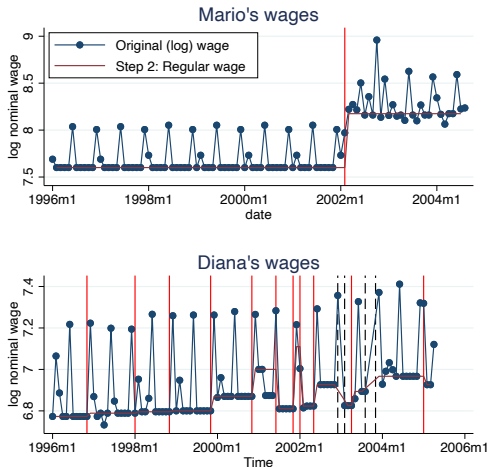
- Nonparametric test of equality of two distributions
- Intuition: add breaks when wage subsamples are different
- Regular wage w^r is median wage between breaks
- Main parameter: K measures cutoff value of differences in subsamples

2. To calibrate K

- Estimate statistical model for wages
- Cross-validation exercise

Regular wage

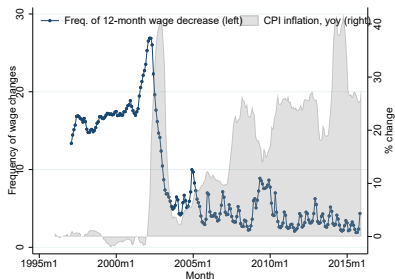
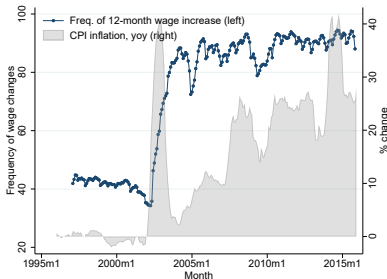
Regular wage does not incorporate: i) sequence of wage changes near June/December, ii) inverse v-shape wage changes, iii) sequence of wage changes close to a “target” value



Frequency of Wage Changes

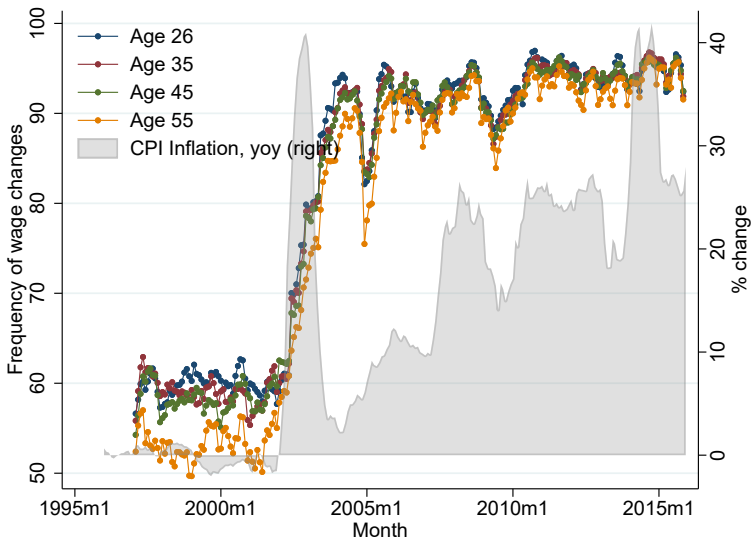
Low inflation period (pre-2002): avg. annual frequency of 58% (avg. of 65% in the US, Grigsby, et. al., 2020).

High inflation period (post-2002): i) avg. annual frequency of 90%, ii) the frequency of wage changes increases with inflation and is procyclical, iii) the frequency of upward (downward) wage changes significantly increases (falls) with inflation



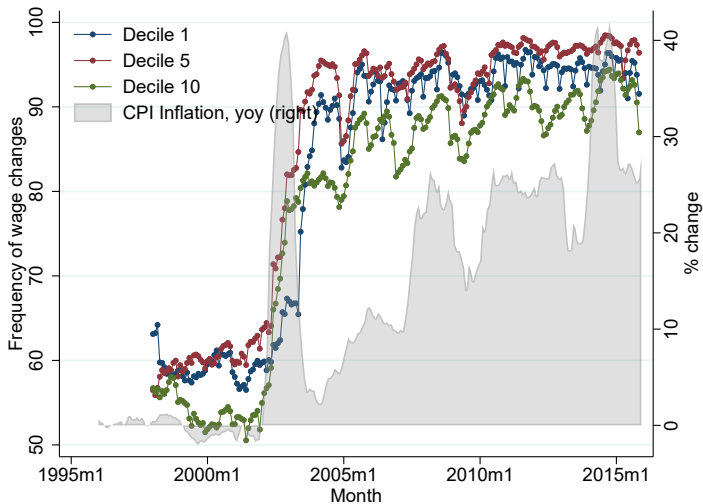
Frequency of Wage Changes by Age

Frequency of wage changes falls monotonically with age.



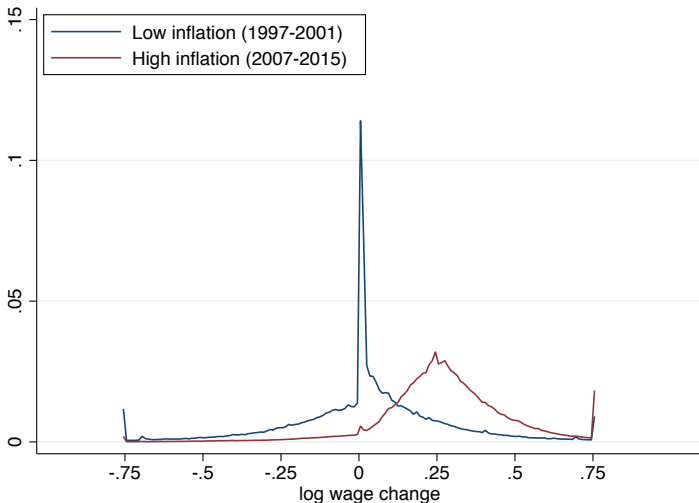
Frequency of Wage Changes by Workers

Frequency of wage changes decreases in income across workers under low- and high-inflation periods.



Distribution of 12-month wage changes over time

Distribution of wage changes evolves from asymmetric to symmetric with high-inflation.



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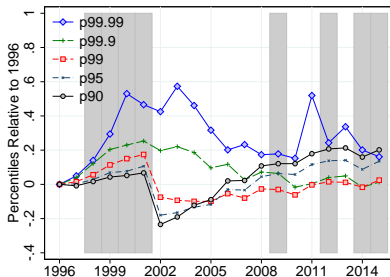
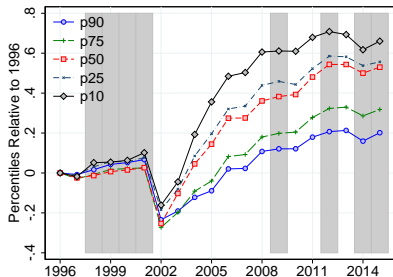
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Conclusions: Income Dynamics



- Except at the very top, there is a drop of 20% in real terms amidst the crisis for most workers.
- Post-crisis recovery of earnings driven by the bottom

Conclusions: Wage Setting

- Under low-inflation:
 - Asymmetric around zero: mass in $[-25\%, 0\%)$ versus $(0\%, 25\%]$ = 24 p.p.
 - Low mass of real wage cuts
- Under high-inflation:
 - Symmetric around average inflation rate (25%)
 - Symmetric: mass in $[0\%, 25\%)$ versus $(25\%, 50\%]$ = 4 p.p.
 - Higher prevalence of real wage cuts

Conclusion

- New evidence in different macroeconomic environments with high frequency.
- Future work:
 - Aggregate implications of heterogeneous wage change frequencies.
 - Study the transition of the wage setting from a low to high-inflation.
 - Measure of wage rigidity.

THANK YOU!