Payday Matters: A Look at Trader Behavior within Pay Cycles

Ryan Garvey *(Duquesne)*
Fei Wu *(Massey)*

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Discussion brought to you by
Jonathan Reuter *(Oregon)*

Research Environment

- Data from single U.S. broker dealer on 361 **"employed"** traders matched with 595 **"self-employed"** traders
- Observe all trades between 10-07-1999 and 08-01-2003
  - 99.8% of employed traders' positions are closed out intraday
- Compensation Schemes:

	Loss	Gain	"Payday"
Employed	**100%**	**70-80%**	**T-3**
Self-employed	100%	100%	each day

- Monthly Averages:

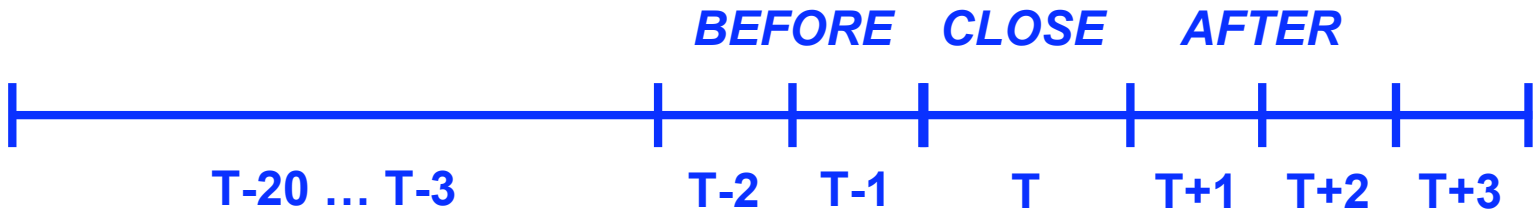
	Shares	# Trades	Profit	Profit / Trade
Employed	**2,870,833**	**1676**	**$1163**	**$0.69**
Self-employed	173,403	432	$889	$2.06

Research Questions

- Convex payoffs ⇒ **mutual fund strategery**
  - Brown, Harlow, Starks '96; Chevalier and Ellison '97; Carhart, Kaniel, **Musto**, Reed '02; Gaspar, Massa, Matos '06
  - *"Our concern is with how traders choose their level and allocation of trading effort over time in response to their compensation structure rather than with the strategic behavior of fund managers around quarter and year-ends" (page 2)*
- **Main hypothesis:**
  - Incentive compensation schemes with "infrequent evaluations" will cause traders to exert more effort at the end of the evaluation period
- **Secondary hypotheses:**
  - Payday effect is the result of intertemporal substitution between labor and leisure ⇒ *see, for example, growing literature on cab drivers*
  - Trading behavior reflects loss aversion, mental accounting, and/or learning to be overconfident ⇒ **behavioral finance smorgasborg**

Timeline & Predictions

- Trading days in month relative to ***CLOSE*** of pay period



  - *All other days fall into **OTHER** category*
  - *Cumulative trading profits (should be) measured from **T-20** to **T-3***

- Predictions:
  - $\beta_{CLOSE} > \beta_{OTHER}$ (for employed traders but not self-employed)
  - *Payday effect reflects intertemporal sub. between labor & leisure*
  - When cumulative trading profits "depart significantly from the break-even point, abnormal behavior will arise" (page 20)
    - Specific theory discussed *ex post* rather than *ex ante*

Results: The Payday Effect

- Trading volume (# shares and # trades) significantly higher on ***CLOSE*** for **E** traders but not **SE** traders (T2)
  - LHS variables normalized at trader-by-month level; authors drop trader-months with trades on fewer than 10 days
  - Robust to dropping various subsets of traders (T3); robust to inclusion of trader FEs, lagged LHS, (some) NASDAQ market condition controls, December dummy (T4)
  - Authors do not pool trader types and test for differences across types; nor do they estimate T4 for SE traders (in this version)
  - I would normalize at trader level and use all the months the trader is employed

    … Control for NASDAQ returns on days *t* and *t-1*

    … Control for trader returns on one or more prior trading days

    … Cluster standard errors on month

Labor vs. Leisure

- "Payday Effect" robust to requiring trader executes trades on 15 days instead of 10 (T6)
  - "payday effect does not appear to be driven by the decision to substitute labor and leisure intertemporally across the evaluation period" (page 4)
  - Why not estimate a model with separate dummy variable for each day in the pay cycle and plot the coefficients. Are they flat or do they increase monotonically throughout the pay period?
  - Similarly, does the probability of trading any shares increase monotonically throughout the pay period?
  - Is the decision to stop trading on a particular day driven by cumulative returns on that day (ala Coval and Shumway '05)?

Payday Effect and Prior Returns

- Payday effects largest when cumulative trading profits through **T-3** are ≤ -$500 or ≥ $500 (T7)
  - Estimate four regressions.
  - I would estimate single regression in which ***BEFORE, CLOSE, AFTER*** interacted with four dummy variables

    ≥ $500, $500 to $0, $0 to -$500, and ≤ -$500

    (Observations "almost evenly distributed" across four categories)

    and test whether $CLOSE \times I_{\{\geq \$500\}} = CLOSE \times I_{\{\$500 \text{ to } \$0\}}$, etc.
  - Do traders really learn to become overconfident within monthly pay periods?
  - Do self-employed traders exhibit similar patterns with respect to prior returns and future trades (e.g., at the end of the month)?

Payday Effect and Current Returns

- Trades on ***CLOSE*** are associated with lower normalized profits (T5)
  - Trading profits -0.0514 std dev lower than normal (no controls) and -0.0369 std dev lower (with controls)…
  - … but 0.0572 std dev (univariate) and 0.0526 (multivariate) higher over next two days. What is the story here?
  - Why not estimate version of T5 that conditions on prior returns (in same way as T7)?
  - What happens if you restrict estimation to months with positive NASDAQ return (to get at the authors' conjecture that low trader profits are a function of mixed returns during sample period)?

Standard Compensation Scheme?

- Some examples
  - General: $a + b^{+}(x^{+}) + b^{-}(x^{-})$
  - Convex: $a + b^{+}(x^{+})$ MF managers
  - Linear $0 + 1.0x^{+} + 1.0x^{-}$ Self Employed traders
  - **Concave: $0 + 0.8x^{+} + 1.0x^{-}$ Employed traders**
- What about limited liability? Trader puts up own capital with the firm; puts up more capital after a loss!
  - Why can't **I** think of **E** trader as **SE** trader who prefers partial insurance ($0.8\mathbf{x}^{+} + 1.0\mathbf{x}^{-}$) to paying **c** for access to firm's trading technology ($1.0\mathbf{x}^{+} + 1.0\mathbf{x}^{-} - \mathbf{c}$)?
  - Authors state $\mathbf{b}^{+}$ is "typically 70-80%." Is there any variation in $\mathbf{b}^{+}$ within set of Employed traders?
  - What do trades look like when trader is capital constrained or immediately before **E** trader leaves the sample?

Who are these Traders?

- Since compensation depends entirely on profits, I was shocked to see average monthly gross profit of $1163
  - Typical PhD student earns higher stipend each month!
  - How persistent are a trader's profits from one month to the next? Are there a few good traders and lots of bad ones (who quit)?
  - Is this a tournament for a better paying job? A training program? **A get rich quick scheme?**
- I was also surprised to see E underperforms SE
  - Authors: lower profits per trade ($0.69 for **E** vs. $2.06 for **SE**) could reflect lower levels of risk or fact that best **E** switch to **SE**
  - Are firm's traders representative of other institutional traders?
  - How many traders are employed on desk in given month? How many stocks do they trade in a given day? **Are they being told which stocks to trade?** Are the trades of different employed traders positively or negatively correlated?

Does the Payday Effect Matter?

- "Our findings should not be taken to mean that incentive compensation schemes are undesirable" (page 23)
  - But authors are concerned that evaluations are too infrequent
  - What is the alternative? Wouldn't shorter evaluation periods distort behavior on more trading days and/or lower **E** payoffs?
  - How much money is the firm "losing" due to bad trades on ***CLOSE?*** Do the authors know if the firm previously used or considered using other pay periods?
- "The traders concentrate their trading in certain stocks on certain days and they often account for a sizeable portion of trading volume on the stocks they choose to trade" (page 7)
  - Interesting fact that appears in intro but does not re-appear. Is this especially true at the end of the pay cycle? If so, there may be asset pricing implications…