Diagnostic Expectations and the Global Financial Cycle

Do Lee

International Monetary Fund

November 21, 2026

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The global financial cycle

Across countries, **risky-asset prices** move together (Rey 2015)

- Equity returns, $\mathrm{Corr}(r) = 0.63$
- Gross portfolio-debt inflows, $\mathrm{Corr}(f) = 0.07$ (Avdjiev et al. 2022)
- The common move is a **revaluation** of existing holdings, not a flow
  - With a constant price impact of flows, $|\mathrm{Corr}(r)| \leq |\mathrm{Corr}(f)|$ for each pair
  - Where both series exist, average absolute correlations are **0.65** for returns and **0.13** for flows

This paper: over-extrapolation of **global earnings news** can generate the revaluation

This paper

Measure **over-extrapolation** directly from international analyst earnings forecasts

1. Long-horizon forecasts **over-react** to the **global belief factor**, not to local news
2. The global belief factor predicts a **boom-bust** in the global financial cycle
3. A new panel of analyst expectations: **95 countries**, 1–5 year horizons, 1995–2024

Model: two investor types with **diagnostic expectations**, partly absorbing local news

- A strong response of beliefs to global news moves prices in every market
- Flows come from foreign-home valuation gaps

Related Literature

Data

- **Forecasts.** I/B/E/S median consensus EPS, 35,871 firms, 95 countries, 1995–2024
- **Realized earnings.** I/B/E/S actual EPS; 7,094 country-quarters at 1 year, 4,573 at 5 years
- **Global factor.** Miranda-Agrippino and Rey (2020), quarterly
- **Weights.** Equity market cap by country (World Bank; OECD for Estonia, Lithuania)
- **Prices and flows.** MSCI ETF returns; debt inflows (motivation); equity inflows (model)

Data Details

The global belief factor

Country revision: $y_{c,t} = \frac{1}{n_{c,t}} \sum_{i \in c} \Delta F_{i,t}(t+h)$, the mean over the country's firms

1. **Factor model** (as Miranda-Agrippino and Rey), all countries c and horizons h:

   $$y_{c,h,t} = a_{c,h} + \lambda_{c,h}\, \xi_t + \lambda^r_{c,h}\, \xi_t^{r(c)} + u_{c,h,t}, \qquad \xi_t = \Phi \xi_{t-1} + \eta_t, \qquad \mathrm{Var}(u_{c,h,t}) = \frac{\sigma^2_{c,h}}{n_{c,h,t}}$$

   EM and Kalman filter, estimated each year on past data only

2. **Global belief factor**: $G_t = \xi_{t|t}$, the real-time filtered factor

3. **Local beliefs**: country deviation, net of what countries share that quarter

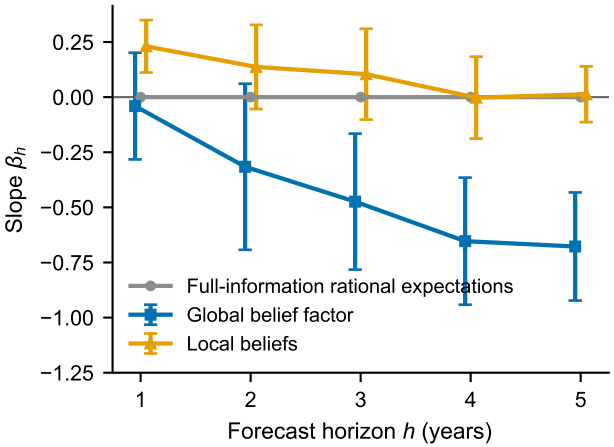
   $$L_{c,t} = y_{c,t} - a_c - \lambda_c \xi_{t|t} - \bar{u}_t, \qquad \bar{u}_t = \frac{\sum_c w_{c,t} \left(y_{c,t} - a_c - \lambda_c \xi_{t|t} \right)}{\sum_c w_{c,t}}, \qquad \sum_c w_{c,t} L_{c,t} = 0$$

Notes: $w_{c,t}$: previous-year equity market-cap share among panel countries (World Bank; OECD for Estonia and Lithuania). $\xi^{r(c)}$: factor for country c's region (six regions); it stays in local beliefs. 95 countries, 1–5 year horizons, 1995–2024. In the forecast-error regression, G_t enters in revision units ($\xi_{t|t}$ times the slope of the weighted world mean revision on it).

Forecasts over-react to the global belief factor

$$e_{c,t}(\tau) = \alpha_c + \beta_h^G \, G_t + \beta_h^L \, L_{c,t} + \varepsilon_{c,t}$$

- $e_{c,t}(\tau)$: realized minus forecast log EPS for date $\tau = t + h$, country mean
- Rational: $\beta_h^G = \beta_h^L = 0$
- **Global belief factor**: **over-reaction**, **-0.47** to **-0.68** at 3–5 years
- Local: under-reaction at 1 year (**0.23**), near zero at 4–5 years

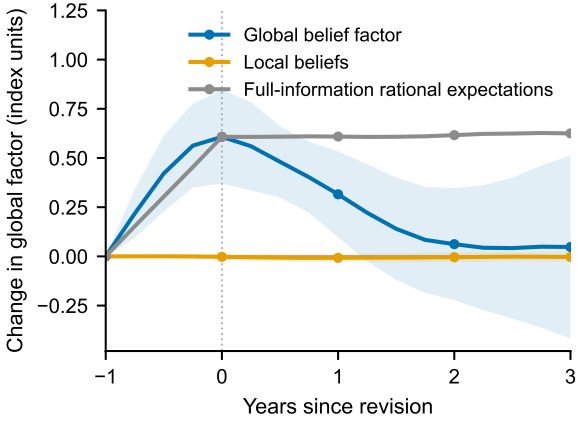


Notes: Test of Coibion and Gorodnichenko (2015). h: horizon in years. 1995Q1 onward; 4,573 country-quarters at $h = 5$. Base earnings announced at both dates of the revision. I/B/E/S median consensus, averaged over firms. Country fixed effects; previous-year equity market-cap weights. 95% confidence intervals robust to overlap and common shocks.

Global belief factor predicts a global financial cycle boom-bust

$$m_{t+k} - m_{t-4} = \alpha_c + \beta_k^G \, G_t + \beta_k^L \, L_{c,t} + \varepsilon_{c,t}$$

- m: global financial cycle factor of Miranda-Agrippino and Rey
- G_t, $L_{c,t}$: 5-year global and local beliefs (standardized)
- **Global belief factor**, one SD: m **rises 0.61**, 0.06 after 2 years
- **Local**: near zero throughout



Notes: k: quarters. Factor: 1995–2024. Country fixed effects; market-cap weights; robust 95% confidence intervals. Local beliefs are centered across countries and the outcome is common, which limits what they can predict. FIRE: model, scaled at $k = 0$.

Firm Cross-Section Weights and Samples

Model of the global financial cycle under diagnostic expectations

Growth $x_{c,t} = g_t + \ell_{c,t}$ with an earnings cycle in g_t and local news announced a year ahead

- **Two investor types**, global (share ω) and home, plus analysts
  - Foreign: absorb less local news, $K_N^G < K_N$ (Bae et al. 2008); rebalance gradually
  - Home: noisy world news, partly common and persistent (Lucas 1972; Lorenzoni 2009)

- **Diagnostic beliefs** about the global trend, which is truly zero (Bordalo et al. 2020):

$$b_t = b_{t-1} + \kappa\,(\bar{x}_t - b_{t-1}), \qquad \tilde{b}_t = b_t + \theta\,(b_t - \underline{b}_t), \qquad \underline{b}_t \text{ a slow reference}$$

- **Valuations** combine the belief, local news $N_{c,t}$ and the earnings cycle $\hat{C}_t$:

$$V_{c,t}^j = \chi\,\tilde{b}_{c,t}^j + K_N^j\,N_{c,t} - d_I\,\hat{C}_t, \qquad j = G, H$$

Parameters

Shared beliefs move prices; only valuation gaps create flows

Home holdings $V^H - p$; foreign holdings move a share ψ toward $V^G - p$ each quarter:

$$p_{c,t} = V^H_{c,t} + \omega\, \mathcal{D}_{c,t} - \Pi, \qquad f_{c,t} = (1-\omega)\, \Delta \mathcal{D}_{c,t}$$

$$\mathcal{D}_{c,t} = \delta\, \mathcal{D}_{c,t-1} + (1-\delta)\big(V^G_{c,t} - V^H_{c,t}\big), \qquad \delta = \frac{(1-\psi)(1-\omega)}{1-\omega+\omega\psi}$$

The valuation gap has two parts:

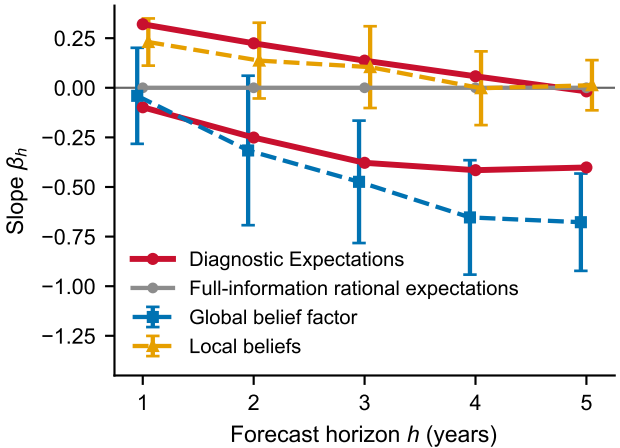
$$V^G_{c,t} - V^H_{c,t} = \underbrace{\chi\big[(1+\theta)(b^G_t - b^H_{c,t}) - \theta(\underline{b}^G_t - \underline{b}^H_{c,t})\big]}_{\text{world-news gap}} + \underbrace{(K^G_N - K_N)\, N_{c,t}}_{\text{local-news gap}}$$

- Prices average the two valuations; flows follow their smoothed difference $\mathcal{D}$
- Shared beliefs move V^G and V^H equally: **prices** move, $\mathcal{D}$ and f do not
- With rational investor beliefs $V^G = V^H$, so there are **no flows**

The model generates global over-reaction and local under-reaction

$$e_{c,t}(\tau) = \alpha_c + \beta_h^G \, G_t + \beta_h^L \, L_{c,t} + \varepsilon_{c,t}$$

- **Global beliefs**: over-reaction at long horizons (-0.40 at 5 years; data -0.68)
- **Local**: under-reaction at short horizons that fades ($+0.32$ at 1 year; data $+0.23$)

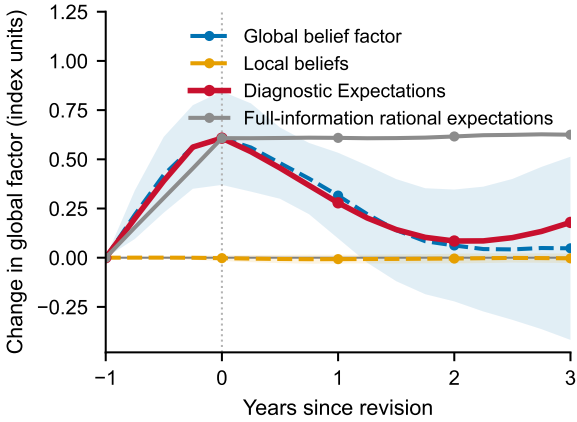


Notes: Error on revision by forecast horizon. Dashed: data, with 95% confidence intervals. Solid: model on the simulated consensus, average over three simulated panels. FIRE: slope zero. Nine of ten slopes are inside the pointwise band; the 5-year global slope is outside ($z = 2.2$).

The model generates the boom-bust in the global financial cycle

$$m_{t+k} - m_{t-4} = \alpha_c + \beta_k^G G_t + \beta_k^L L_{c,t} + \varepsilon_{c,t}$$

- **Boom and bust**: response 0.46 of its impact value after 1 year, 0.14 after 2 (data 0.52, 0.10)
- Rational investors (not plotted): 1.06 after 2 years, **no reversal**



Notes: Dashed: data. Solid: model. Scaled to the coefficient at $k = 0$. FIRE: announced local-news share 0.8, stochastic volatility. All 11 coefficients through 2 years are inside the band.

Cumulative Returns

The model matches return and flow comovement

	Data	Model	Rational
Return comovement	0.635	0.57	0.30
Flow comovement	0.078	0.060	no flows
Flows with returns, country	0.22	0.23	
Flows with returns, world	0.52	0.47	
Flow persistence, country	0.20	0.22	
Flow persistence, world	0.35	0.25	
Return stress ratio	5.1	1.6	

Notes: IMF BOP portfolio-equity inflows, 43 countries, 1995–2024. Rational: rational investor beliefs in the model. The flow facts are calibration targets along with the belief and price targets.

- The common part of home noise, 12% of its variance, raises flow comovement from 0.027 to 0.060
- It lowers the world flow-return correlation from 0.61 to 0.47

Conclusion

- Analyst forecasts **over-react** to the **global belief factor**
- The global belief factor predicts
  - A **reversal** of the global financial cycle
  - An earnings disappointment
- A model with **diagnostic expectations** and two investor types
  - Strong response of beliefs to global news matches the forecast errors
  - Gradual recognition of an earnings cycle accompanies the reversal
  - Return comovement far exceeds flow comovement

Appendix

Related literature

- **Global financial cycle.** Rey (2015), Miranda-Agrippino and Rey (2020), He and Krishnamurthy (2013), Bruno and Shin (2015), Acalin and Rebucci (2020) trace the common factor to U.S. monetary policy, intermediaries, and risk appetite
  - **This paper:** a belief component measured from forecasts, not inferred from prices
- **Diagnostic expectations.** Bordalo, Gennaioli, and Shleifer (2018), Bordalo et al. (2019), De la O and Myers (2021) show overreaction shapes domestic prices, credit, and returns
  - **This paper:** international, and locates the distortion in the global belief factor
- **Expectations frictions, open-economy models without rational expectations.** Coibion and Gorodnichenko (2015), Gabaix and Maggiori (2015), Na and Yoo (2025) on under-reaction to aggregate news and demand-based open economies
  - **This paper:** over-reaction to the global belief factor, under-reaction to local news

Back

Prices comove across countries, flows do not

- Correlation 0.63 for returns, 0.07 for portfolio-debt flows (absolute 0.13)
- With a common multiplier M, $r_c = Mf_c + \varepsilon_c$ implies $|\mathrm{corr}(r_c, r_{c'})| \leq |\mathrm{corr}(f_c, f_{c'})|$
- A **revaluation**, not a flow: no constant multiplier closes this gap
  - That bounds flow-driven transmission, not belief repricing

	Flow-driven (const. mult.)	Revaluation (rational)	**Diagnostic (this paper)**
Strong price comovement	Yes	Yes	**Yes**
Prices comove $\gg$ flows	No	Yes	**Yes**
Predicts earnings disappointment	No	No	**Yes**

Notes: Flows: Cerutti, Claessens, and Puy (2019), Avdjiev et al. (2022). ε_c uncorrelated across countries and flows. First PC 64% and 13%. Common return on common flow: $R^2 \approx 0.05$. The rejection is conditional on portfolio-debt inflows proxying the price-moving flow. Portfolio-equity inflows, used in the model comparison: 0.078.

Disappointment

Data details

Forecasts and revisions

Median consensus EPS: FY1–4 and quarterly

$F_{i,t}(\tau)$: log EPS for date τ, interpolated (long-term growth forecast beyond)

$\Delta F_{i,t} = F_{i,t}(t+h) - F_{i,t-4}(t+h)$, same date

Last forecast in the quarter; I/B/E/S country

Global and local components (as Miranda-Agrippino and Rey)

$y_{c,h,t} = \lambda^g_{c,h}\xi^g_t + \lambda^r_{c,h}\xi^{r(c)}_t + u_{c,h,t}$

$\xi_t = \Phi\xi_{t-1} + \eta_t, \quad \mathrm{Var}(u_{c,h,t}) = \sigma^2_{c,h}/n_{c,h,t}$

y: standardized country mean of ΔF; n firms

EM/Kalman; estimated each year on past data; filtered

$G_t = \xi^g_{t|t}$; $L_{c,t}$: country deviation net of the weighted cross-country mean (main slide)

95 countries, 1–5 year horizons; **1995–2024**

Realized outcome

Log realized EPS at τ, interpolated between fiscal years

SEs robust to overlap and common shocks

Prices and flows

Global financial cycle factor: Miranda-Agrippino and Rey

Total returns, USD: iShares MSCI country funds; SPY for the United States;

42 countries, **1995–2024**

Motivation: gross portfolio-debt inflows, Avdjiev et al. (2022)

Model comparison: portfolio-equity inflows, IMF BOP,

43 countries, **1995–2024**

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Adding flow dynamics to the baseline

	Static, i.i.d. noise	Rebalancing, i.i.d. noise	Baseline	Dat
Rebalancing speed ψ	1	0.65	0.65	
Persistence of common noise	0	0	0.50	
25-target criterion	18.7	19.2	19.1	
Largest $\|z\|$, 25 targets	2.19	2.19	2.19	
Largest $\|z\|$, seven dynamic flow moments	14.8	3.3	1.7	
Return comovement	0.57	0.57	0.57	0.63
Flow comovement	0.071	0.065	0.060	0.07
Flows with returns, within country	0.24	0.22	0.23	0.22
Flows with returns, world	0.45	0.45	0.47	0.52
Flow persistence, world	−0.15	0.09	0.25	0.35
Flow persistence, country	−0.06	0.20	0.22	0.20

Notes: Other parameters at baseline values.

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The baseline and learning alone ($\theta = 0$)

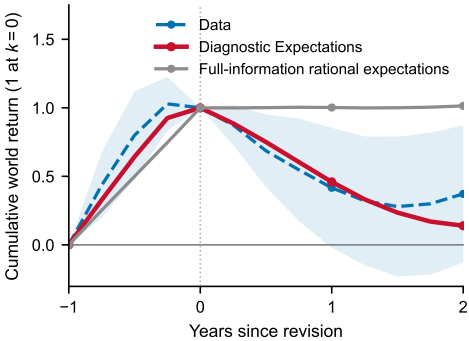
	Baseline	Learning only, baseline gain	Learning only, matched impact	Learning only, calibrated
θ	0.87	0	0	0
κ	0.20	0.20	0.37	0.36
Objective	32.1	91.4	34.0	34.3
25-target criterion	19.1	37.0	18.8	21.2
Largest $\lvert z \rvert$ among the 25 targets	2.19	2.36	2.19	2.16
Flow autocorrelation term	2.7	15.8	3.8	4.1

Notes: Objective: sum of squared standardized deviations from the 25 targets plus terms for the return response, flow moments, third-year factor path, and flow autocorrelations. Matched impact: gain 0.37 keeps $(1 + \theta)\kappa$ at its baseline value. Calibrated: $\theta = 0$ with the other parameters calibrated to the same objective. Each entry averages three independent sets of simulations.

◂ Back

The model and cumulative world returns

- Cumulative return 0.46 after 1 year, 0.14 after 2 (data 0.42, 0.37)
- FIRE: no reversal



Notes: Cumulative world return from $t - 3$ to $t + k$ on the 4-quarter change of the common 5-year forecast, 1 at $k = 0$. Dashed: data, with 95% band. Solid: model. FIRE uses an announced share of local news of 0.8 (1.0 in the model) and has stochastic volatility. The model is inside the pointwise band. With the rolling 5-year forecast as regressor the data are 0.26 and 0.16 and the model 0.45 and 0.11.

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Model parameters

Parameter	Value	Parameter	Value
Global variance parameter σ_g^2	0.355	Global trend gain κ	0.20
Persistence ρ, persistent share s_z	0.8, 0.035	Diagnostic θ, reference gain $\underline{\kappa}$	0.87, 0.50
Cycle: share, persistence, correction	0.25, 0.92, 0.09	Common share of home noise c_H	0.12
Cycle gain κ_C, weight d_I	0.42, 1.69	News absorbed, K_N, K_N^G	0.30, 0.23
Loading χ, premium Π	1.0, 0.1	Announced local share s_N	1.0
Global investors' share ω	0.3	Home noise, world news n_H	0.26
Analysts' local, stale, delayed shares	0.88, 0.26, 0.5	Countries	42
Foreign rebalancing speed ψ	0.65	Persistence of common noise	0.50

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Cross-section: firms with optimistic forecasts have lower subsequent price changes

Within country and quarter, **21,058** firms in **32** countries, **1981–2024** (only U.S. and Canada before 2007):

$$r_{i,\,t\to t+2\mathrm{y}} = \alpha_{c,t} + \beta\, O_{i,t} + \varepsilon_{i,t}$$

r: two-year log price change; $\alpha_{c,t}$: country×quarter FE; $O_{i,t}$: standardized long-run growth forecast

A one-SD more optimistic forecast: two-year log price change -6.3 log points
Size control, matched sample: -6.2 without, -5.8 with
Excluding U.S. firms: -1.3

Country-quarter FE absorb every common shock; identified within country-quarter from cross-firm variation

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Beliefs vs. risk: the predictable disappointment

A common discount-rate factor looks the same whether it is **rational risk compensation** or a **correlated belief distortion**: prices alone cannot separate them

- Forecast revisions predict **subsequent earnings errors** (over-extrapolation), which a rational forecast cannot produce
- Firms with over-extrapolated forecasts **underperform**, the international analog of Bordalo et al. (2019)
- A rational discount-rate factor forecasts **no predictable earnings shortfall**

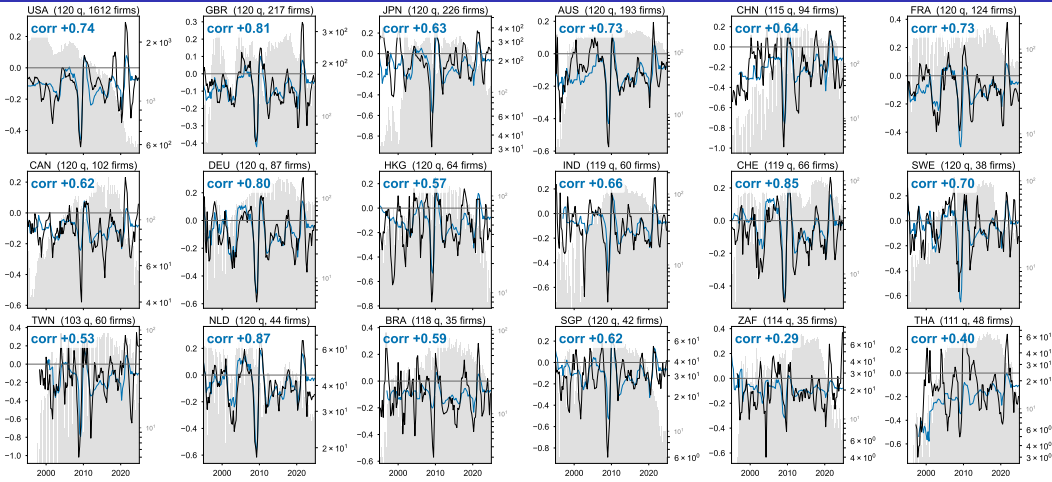
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Main results under other weights and samples

	Forecast errors: global β_h^G			Boom-bust: global
	3 years	4 years	5 years	$\beta_0^G \to \beta_8^G$
Market cap (baseline)	−0.47 (−3.0)	−0.65 (−4.4)	−0.68 (−5.4)	0.61 → 0.06
Market cap, no U.S.	−0.37 (−2.0)	−0.53 (−4.0)	−0.55 (−4.5)	0.63 → 0.08
GDP share	−0.43 (−2.5)	−0.61 (−3.7)	−0.59 (−3.9)	0.61 → 0.07
Firms in cell	−0.51 (−3.4)	−0.63 (−4.7)	−0.66 (−5.9)	0.62 → 0.08
Equal	−0.33 (−1.2)	−0.37 (−1.7)	−0.35 (−1.5)	0.63 → 0.07
Log market cap	−0.31 (−1.3)	−0.37 (−1.8)	−0.35 (−1.7)	0.63 → 0.08

Notes: t-statistics in parentheses, robust to overlap and common shocks. Country level, country FE; $G_t = \xi_{t|t}$ and $L_{c,t}$ as in slide 5, with $L_{c,t}$ re-centered under each row's weights. The boom-bust barely changes across weights because G_t is common to all countries. Equal and log weights give small economies with few firms the weight of large ones; their country means are noisy. Factor model estimated each year on past data.

Inputs to the global belief factor: 5-year revisions by country



Notes: Black: country mean of firms' revisions of the 5-year forecast for the same date (as in the main results), ≥ 3 firms; blue: the factor model's real-time global part for the country; grey bars: firms per quarter (log scale, right axis); corr: correlation of the country series with the global component. Countries ordered by firm-quarters. Across the 52 countries with at least 20 quarters of cells with three or more firms since 1995, the median correlation is 0.58 and 48 of 52 are positive. Quarters with fewer than three firms are filled from past data and the current global component.

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