Internet Appendix for
“Competition, markups, and predictable returns”

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A Optimality conditions

In this section, we provide a detailed derivation of the optimal decisions made by households and firms and summarize the equilibrium conditions characterizing the model. Throughout the draft and the appendix, we use calligraphic letters with an overline to denote aggregate-level variables, simple calligraphic letters to denote industry-level variables, and capital letters to denote firm-level variables. In the main draft, firm and industry subscripts are suppressed to ease notational burden.

A.1 Household

The representative household maximizes utility by participating in financial markets, investing in capital and technology, and supplying labor. The household position in stocks issued in industry $j$ is denoted by $\Omega_{j,t}$, and the position in the government bond market by $\mathcal{B}_t$. The household owns an industry-specific stock of physical and intangible capital, that are rented to firms in industry $j \in [0,1]$ for a period return of $\mathcal{R}_{j,t}^k$ and $\mathcal{R}_{j,t}^z$, respectively. The real (i.e., normalized by the aggregate price index $\overline{P}_t$) budget constraint of the household is

$$\mathcal{C}_t + \int_0^1 Q_{j,t}^+ \Omega_{j,t+1} dj + \mathcal{B}_{t+1} + \mathcal{T}_t + \mathcal{S}_t = \mathcal{W}_t \mathcal{L}_t + \int_0^1 (Q_{j,t}^- + D_{j,t}) \Omega_{j,t} dj + \mathcal{R}_t^f \mathcal{B}_t + \mathcal{R}_t^k \mathcal{K}_t + \mathcal{R}_t^z \mathcal{Z}_t,$$

where $Q_{j,t}^-$ and $Q_{j,t}^+$ are vectors containing the ex-dividend stock prices of all firms in industry $j$ that are present at the beginning and at the end (i.e. including entrants) of period $t$ respectively, $D_{j,t}$ is the aggregate dividend paid by all surviving firms in industry $j$ at the beginning of time $t$, $\mathcal{R}_t^f$ is the gross risk free rate, $\mathcal{W}_t$ is the wage rate, $\mathcal{T}_t = \int_0^1 T_{j,t} dj$ is the aggregate investment in physical capital, $\mathcal{S}_t = \int_0^1 S_{j,t} dj$ is the aggregate investment in intangible capital, $\mathcal{L}_t = \int_0^1 L_{j,t} dj$ is the aggregate labor supplied by the household, and $\mathcal{R}_t^k \mathcal{K}_t = \int_0^1 R_{j,t}^k K_{j,t} dj$ and $\mathcal{R}_t^z \mathcal{Z}_t = \int_0^1 R_{j,t}^z Z_{j,t} dj$ are the aggregate revenues obtained from renting physical and intangible capital, respectively.
Setting up the household problem in Lagrangian form:

\[ \mathcal{U}_t = \max u(\mathcal{C}_t, \mathcal{Z}_t) + \beta \left( E_t \left[ \mathcal{U}_{t+1}^{1-\theta} \right] \right)^{\frac{1}{1-\theta}} \]

\[ + \Lambda^c_t \left( \mathcal{W}_t \mathcal{L}_t + \int_0^1 (\mathcal{Q}_{j,t} + \mathcal{D}_{j,t}) \Omega_{j,t} \, dj + \mathcal{K}_t \mathcal{R}_t + \mathcal{K}_t \mathcal{Z}_t - \mathcal{C}_t - \int_0^1 \mathcal{Q}_{j,t} \Omega_{j,t+1} \, dj - \mathcal{B}_{t+1} - \mathcal{I}_t - \mathcal{S}_t \right) \]

\[ + \int_0^1 \Lambda^k_{j,t} \left( (1 - \delta_k) \mathcal{K}_{j,t} + \Phi_{k,j,t} \mathcal{K}_{j,t} - \mathcal{K}_{j,t+1} \right) \, dj \]

\[ + \int_0^1 \Lambda^z_{j,t} \left( (1 - \delta_z) \mathcal{Z}_{j,t} + \Phi^z_{j,t} \mathcal{Z}_{j,t} - \mathcal{Z}_{j,t+1} \right) \, dj, \]

where \( \Lambda^c_t \) is the Lagrange multiplier on the budget constraint, and \( \Lambda^k_{j,t} \) and \( \Lambda^z_{j,t} \) are the Lagrange multipliers on the physical accumulation and intangible capital accumulation in each industry, respectively.

Taking the first order conditions with respect to \( \mathcal{I}_{j,t}, \mathcal{S}_{j,t}, \mathcal{K}_{j,t+1}, \mathcal{Z}_{j,t+1} \), and \( \Omega_{j,t+1} \) yields a set of three intertemporal Euler equations in each industry \( j \in [0, 1] \):

\[ 1 = E_t \left[ \frac{\mathcal{R}^k_{j,t+1} + \Lambda^k_{j,t+1} \left( 1 - \delta_k - \Phi^k_{j,t+1} \frac{\mathcal{I}_{j,t}}{\mathcal{K}_{j,t}} + \Phi^k_{j,t+1} \right)}{\Lambda^k_{j,t}} \right], \]

\[ 1 = E_t \left[ \frac{\mathcal{R}^z_{j,t+1} + \Lambda^z_{j,t+1} \left( 1 - \delta_z - \Phi^z_{j,t+1} \frac{\mathcal{S}_{j,t}}{\mathcal{Z}_{j,t}} + \Phi^z_{j,t+1} \right)}{\Lambda^z_{j,t}} \right], \]

\[ 1 = E_t \left[ \frac{\mathcal{D}_{j,t+1} + \mathcal{Q}^-_{j,t+1}}{\mathcal{Q}^+_{j,t}} \right]. \]

where \( \Phi^m_{j,t} = \frac{\partial \Phi^m_{j,t} (x)}{\partial x}, \Lambda^m_{j,t} = \frac{1}{\Phi^m_{j,t}} \) for \( m = k, z \), and \( \mathcal{M}_{t,t+1} \) is the one-period stochastic discount factor:

\[ \mathcal{M}_{t,t+1} = \beta \left( \frac{\mathcal{U}_{t+1}}{E_t(\mathcal{U}_{t+1})^{\frac{1-\theta}{\theta}}} \right)^{-\frac{1}{\theta}} \left( \frac{\mathcal{C}_{t+1}}{\mathcal{C}_t} \right)^{-\frac{1}{\phi}}. \]

Additionally, the first order conditions with respect to \( \mathcal{B}_{t+1} \) and \( \mathcal{L}_{j,t+1} \) yield an Euler equation defining the equilibrium risk-free rate and an intratemporal labor supply condition that is independent
of the industry $j$ because the representative household works indifferently in all industries:

$$1 = E_t \left[ \mathcal{M}_{t,t+1} \mathcal{R}_{j,t+1} \right] ,$$

$$\mathcal{W}_t = \frac{\chi_0 (1 - \bar{\mathcal{E}}) \psi Z_t^{1 - 1/\psi}}{\mathcal{C}_t^{1/\psi}} .$$

Note that the value of an individual firm is obtained after imposing the symmetry condition across firms within an industry $j$ and using the evolution of the number of firms, we have that $Q_{j,t}^- = N_{j,t} Q_{j,t}$, and $Q_{j,t}^+ = (N_{j,t} + N_{j,t}^E) Q_{j,t}$. Thus, the cum-dividend value of a firm in industry $j$ simplifies to:

$$V_{j,t} = D_{j,t} + (1 - \delta_n) E_t \left[ \mathcal{M}_{t,t+1} V_{j,t+1} \right] .$$

### A.2 Final goods sector

The final goods firm’s problem consists of choosing the optimal bundle of products $\{ X_{ij,t} \}_{i \in [0,1], j \in [0,N_{j,t}]}$ in order to maximize the firm’s profit. The production function is:

$$\mathcal{Y}_t = \left( \int_0^{1/N_{j,t}} \frac{\nu_{1-1}}{\nu_{1-1}} \left( \int_0^{\frac{1}{N_{j,t}}} d_i \right)^{\frac{\nu_{1-1}}{\nu_{1-1}}} \right)$$

$$\mathcal{V}_{j,t} = \left( \int_0^{N_{j,t}} X_{ij,t}^{\frac{\nu_{2-1}}{\nu_{2-1}}} d_i \right)^{\frac{\nu_{2-1}}{\nu_{2-1}}}$$

The problem is solved in two steps. First, we derive the optimal demand for products $X_{ij,t}$ within industry $j$ to maximize industry output $\mathcal{V}_{j,t}$ for any given expenditure level $\xi_{j,t}$:

$$\int_0^{N_{j,t}} P_{ij,t} X_{ij,t} d_i = \xi_{j,t} (1)$$

The Lagrangian of the problem is:

$$\mathcal{L}_{\xi,j,t} = \max_{\{ X_{ij,t} \}_{i \in [0,N_{j,t}]} \in [0,1], j \in [0,N_{j,t}]} \left( \int_0^{N_{j,t}} X_{ij,t}^{\frac{\nu_{2-1}}{\nu_{2-1}}} d_i \right)^{\frac{\nu_{2-1}}{\nu_{2-1}}} + \Lambda_{\xi,j,t} \left( \xi_{j,t} - \int_0^{N_{j,t}} P_{ij,t} X_{ij,t} d_i \right)$$

where $\Lambda_{\xi,j,t}$ is the associated Lagrange multiplier. The first order necessary conditions are:

$$\left( \int_0^{N_{j,t}} X_{ij,t}^{\frac{\nu_{2-1}}{\nu_{2-1}}} d_i \right)^{\frac{\nu_{2-1}}{\nu_{2-1}}} \frac{1}{\nu_{2-1}} X_{ij,t}^{\frac{1}{\nu_{2-1}}} = \Lambda_{\xi,j,t} P_{ij,t}, \quad \text{for} \ i \in [0,N_{j,t}]$$
Using the expression above, for any two products $i$, and $k$,

$$X_{ij,t} = X_{kj,t} \left( \frac{P_{ij,t}}{P_{kj,t}} \right)^{-\frac{1}{\nu_2}}$$ (2)

Now, raising both sides of the equation to the power of $\frac{\nu_2 - 1}{\nu_2}$, integrating over $i$ and raising both sides to the power of $\frac{1}{\nu_2}$, we get

$$\left( \int_0^{N_{j,t}} X_{ij,t} \frac{1}{\nu_2} \frac{\nu_2 - 1}{\nu_2} \right)^{\frac{\nu_2 - 1}{\nu_2}} = X_{kj,t} \left( \int_0^{N_{j,t}} P_{ij,t}^{1 - \frac{1}{\nu_2}} \frac{1}{\nu_2} \right)^{\frac{\nu_2 - 1}{\nu_2}}$$

Substituting for the industry production function in the left-hand side and rearranging terms,

$$\frac{Y_{j,t} P_{kj,t}^{-\frac{1}{\nu_2}}}{X_{kj,t}} = \left( \int_0^{N_{j,t}} P_{ij,t}^{1 - \frac{1}{\nu_2}} di \right)^{-\frac{1}{\nu_2}} \quad (3)$$

The industry $j$ price index is the price $P_{j,t}$ such that $P_{j,t} Y_{j,t} = \xi_{j,t}$. Using the expenditure function, Eq. 1, along with Eq. 2, we get

$$\frac{X_{kj,t}}{P_{kj,t}^{-\frac{1}{\nu_2}}} \int_0^{N_{j,t}} P_{ij,t}^{1 - \frac{1}{\nu_2}} di = \xi_{j,t} = P_{j,t} Y_{j,t}$$ (4)

Putting Eq. 3 together with Eq. 4, we obtain the expression for the industry price index $P_{j,t}$:

$$P_{j,t} = \left( \int_0^{N_{j,t}} P_{ij,t}^{1 - \frac{1}{\nu_2}} di \right)^{\frac{1}{\nu_2}}$$

Therefore the demand for intermediate firm $(i, j)$ output is:

$$X_{ij,t} = Y_{j,t} \left( \frac{P_{ij,t}}{P_{j,t}} \right)^{-\frac{1}{\nu_2}}$$ (5)

In the second step, we derive the optimal demand for each industry good $Y_{j,t}$ in order to maximize the final goods firm profit, that is

$$\max_{\{Y_{j,t}\}_{i \in [0,1]}} \bar{P}_t \left( \int_0^1 Y_{j,t}^{\frac{\nu_2 - 1}{\nu_2}} dj \right)^{\frac{\nu_2}{\nu_2 - 1}} - \int_0^1 P_{j,t} Y_{j,t} dj$$

where $\bar{P}_t$ is the price of the final good (taken as given), $Y_{j,t}$ is the amount of industry good
purchased from industry $j$ and $\mathcal{P}_{j,t}$ is the price of that good $j \in [0, 1]$. The first-order condition with respect to $\mathcal{Y}_{j,t}$ is

$$
\mathcal{P}_t \left( \int_0^1 \mathcal{Y}_{j,t}^{\frac{\nu_j-1}{\nu_j}} \, dj \right)^{\frac{\nu_j-1}{\nu_j-1}} \mathcal{Y}_{j,t}^{\frac{1}{\nu_j}} - \mathcal{P}_{j,t} = 0
$$

which can be rewritten as

$$
\mathcal{Y}_{j,t} = \mathcal{Y}_t \left( \frac{\mathcal{P}_{j,t}}{\mathcal{P}_t} \right)^{-\nu_j} \tag{6}
$$

Using the expression above, for any two industry goods $j, k \in [0, 1]$,

$$
\mathcal{Y}_{j,t} = \mathcal{Y}_{k,t} \left( \frac{\mathcal{P}_{j,t}}{\mathcal{P}_{k,t}} \right)^{-\nu_j} \tag{7}
$$

Since markets are perfectly competitive in the final goods sector, the zero profit condition must hold:

$$
\mathcal{P}_t \mathcal{Y}_t = \int_0^1 \mathcal{P}_{j,t} \mathcal{Y}_{j,t} \, dj \tag{8}
$$

Substituting (7) into (8) gives

$$
\mathcal{Y}_{j,t} = \frac{\mathcal{P}_{j,t}}{\mathcal{P}_t \mathcal{Y}_t} \left( \int_0^1 \mathcal{P}_{j,t}^{1-\nu_j} \, dj \right)^{-\nu_j} \tag{9}
$$

Substitute (6) into (9) to obtain the price index

$$
\mathcal{P}_t = \left( \int_0^1 \mathcal{P}_{j,t}^{1-\nu_j} \, dj \right)^{\frac{1}{1-\nu_j}}
$$

In the following, we choose $\mathcal{P}_t = 1$ as our numeraire.
A.3 Intermediate firms

Using the demand faced by a firm $i$ in sector $j$ (Eq. 5), and the demand faced by industry $j$ (Eq. 6), the demand faced by firm $(i,j)$ can be expressed as

$$X_{ij,t} = \mathcal{Y}_t \left( \frac{P_{ij,t}}{P_{j,t}} \right)^{-\nu_2} \left( \frac{P_{j,t}}{P_t} \right)^{-\nu_1}$$

$$= \mathcal{Y}_t P_{ij,t}^{-\nu_2} P_{j,t}^{\nu_2-\nu_1}.$$

The (real) source of funds constraint is

$$D_{ij,t} = P_{ij,t} X_{ij,t} - \mathcal{W}_t L_{ij,t} - R^k_{j,t} K_{ij,t} - R^z_{j,t} Z_{ij,t} - f_{j,t}$$

Taking the input prices, $f_{j,t}$, the pricing decisions of other firms in the industry, and the pricing kernel as given, firm $(i,j)$’s problem is to maximize shareholder’s wealth subject to the firm’s demand:

$$V_{ij,t} = \max_{\{L_{ij,t}, K_{ij,t}, Z_{ij,t}, P_{ij,t}\} \geq 0} \mathbb{E}_t \left[ \sum_{s=0}^{\infty} \mathcal{M}_{t,t+s} (1 - \delta_n)^s D_{ij,t+s} \right]$$

s.t. $X_{ij,t} = \mathcal{Y}_t P_{ij,t}^{-\nu_2} P_{j,t}^{\nu_2-\nu_1}$

where $\mathcal{M}_{t,t+s}$ is the marginal rate of substitution between time $t$ and time $t + s$.

The Lagrangian of the problem is

$$\mathcal{L}_{v,ij,t} = P_{ij,t} K_{ij,t}^{\alpha} \left( \mathcal{A}_t Z_{ij,t}^{\eta} \mathcal{Y}_t^{1-\eta} L_{ij,t} \right)^{1-\alpha} - \mathcal{W}_t L_{ij,t} - R^k_{j,t} K_{ij,t} - R^z_{j,t} Z_{ij,t} - f_{j,t}$$

$$+ \Lambda^d_{ij,t} \left( K_{ij,t}^{\alpha} \left( \mathcal{A}_t Z_{ij,t}^{\eta} \mathcal{Y}_t^{1-\eta} L_{ij,t} \right)^{1-\alpha} - \mathcal{Y}_t P_{ij,t}^{-\nu_2} P_{j,t}^{\nu_2-\nu_1} \right)$$

The corresponding first order necessary conditions are

$$R^k_{j,t} = \alpha \frac{X_{ij,t}}{K_{ij,t}} (P_{ij,t} + \Lambda^d_{ij,t})$$

$$R^z_{j,t} = \eta (1 - \alpha) \frac{X_{ij,t}}{Z_{ij,t}} (P_{ij,t} + \Lambda^d_{ij,t})$$

$$\mathcal{W}_t = (1 - \alpha) \frac{X_{ij,t}}{L_{ij,t}} (P_{ij,t} + \Lambda^d_{ij,t})$$

$$X_{ij,t} = \Lambda^d_{ij,t} \mathcal{Y}_t \left[ -\nu_2 P_{ij,t}^{-\nu_2-1} P_{j,t}^\nu_2 - \nu_1 + (\nu_2 - \nu_1) P_{ij,t}^{-\nu_2} P_{j,t}^{\nu_2-\nu_1-1} \frac{\partial P_{j,t}}{\partial P_{ij,t}} \right]$$
where $\Lambda_{ij,t}^d$ is the Lagrange multiplier on the inverse demand function.

Using the definition of the industry price index and using the fact that the firm is relatively large in the industry,

$$\frac{\partial P_{j,t}}{\partial P_{ij,t}} = \left( \frac{P_{ij,t}}{P_{j,t}} \right)^{-\nu_2}$$

Imposing the symmetry condition across firms within an industry implies that $P_{j,t} = N_{j,t}^{1/\nu_2} P_{ij,t}$ and thus, $X_{ij,t} = \sum_t P_{ij,t}^{-\nu_2} N_{j,t}^{-\nu_1/\nu_2}$. Using this expression and defining the price markup as the price charged by the firm over the marginal cost of production, i.e. $\varphi_{ij,t} = \left(1 + \Lambda_{ij,t}^d / P_{ij,t}\right)^{-1}$, our set of equilibrium conditions simplifies to:

$$R_{j,t}^k = \frac{\alpha}{\varphi_{j,t}} \frac{P_{j,t} X_{j,t}}{K_{j,t}}$$

$$R_{j,t}^z = \frac{\eta(1 - \alpha)}{\varphi_{j,t}} \frac{P_{j,t} X_{j,t}}{Z_{j,t}}$$

$$\overline{W}_t = \frac{(1 - \alpha)}{\varphi_{j,t}} \frac{P_{j,t} X_{ij,t}}{L_{j,t}}$$

$$\varphi_{j,t} = \frac{-\nu_2 N_{j,t} + (\nu_2 - \nu_1)}{-\nu_2 - \nu_1}$$

where we dropped the $i$-subscript because of the symmetry within each industry.

### A.4 Aggregate resource constraint

The aggregate resource constraint is obtained after imposing market clearing in financial markets (i.e. $\Omega_{j,t} = 1$ and $\overline{E}_t = 0$), goods markets and production input markets as well as using the symmetric nature of each industry. We obtain,

$$\overline{C}_t + \int_0^1 N_{j,t}^{E} Q_{j,t} \, dj + \overline{I}_t + \overline{S}_t = \overline{W}_t \overline{L}_t + \int_0^1 N_{j,t} D_{j,t} \, dj + \overline{R}_t^k \overline{K}_t + \overline{R}_t^z \overline{Z}_t$$

which after replacing for $D_{j,t}$, and using the free entry condition (i.e. $Q_{j,t} = F_{j,t}^{E}$), simplifies to:

$$\overline{C}_t + \overline{F}_t + \overline{I}_t + \overline{S}_t + \overline{f}_t = \overline{J}_t$$

where $\overline{J}_t = \int_0^1 N_{j,t}^{E} F_{j,t}^{E} \, dj$ and $\overline{f}_t = \int_0^1 f_{j,t} \, dj$. 

8
B Data sources

This section provides additional details on the sources and definitions of the data series used in the paper. We start with the aggregate data series:

- **Output**: gross domestic product, available quarterly from the BEA.
- **Consumption**: consumption of nondurable goods plus consumption of services, available quarterly from the BEA.
- **Physical investment**: total private nonresidential fixed investment minus nonresidential intellectual property products investments, available quarterly from the BEA.
- **R&D investment**: research and development, available quarterly from the BEA.
- **Physical capital stock**: net stock of private, nonresidential fixed assets, available annually from the BEA.
- **R&D capital stock**: net stock of private, intellectual property products, available annually from the BEA.
- **Labor share**: labor share for the nonfarm business sector, available quarterly from the BLS.
- **Hours**: average weekly hours for the nonfarm business sector, available quarterly from the BLS.
- **CPI**: consumer price index for all urban consumers: all items, available monthly from the BLS and converted to a quarterly frequency by averaging over the quarter.
- **r^f**: 3-month T-Bill yield minus expected inflation, where expected inflation is approximated using 4 lags of realized log-inflation. The T-Bill series is obtained from the board of governors of the federal reserve system and is available quarterly.
- **pd**: the price-dividend ratio is obtained from Robert Shiller website and is available monthly. We use the end-of-quarter observation as our quarterly measure.
- **rd**: return on a value-weighted portfolio of all CRSP firms incorporated in the US and listed on the NYSE, AMEX, or NASDAQ that have a CRSP share code of 10 or 11 at the beginning of month t, good shares and price data at the beginning of t. The data is obtained from Ken French website and is available monthly. It is converted to a quarterly frequency by compounding the return over the quarter.
- **NBF**: the index of net business formation is published by the department of commerce. It is available for the period 1948:Jan-1995:Oct, after which it was discontinued. The data is available monthly and is converted to a quarterly frequency by averaging values over the quarter. The historical data for the period 1948:Jan-1993:Dec can be downloaded from historical editions of the Citibase database (now called the Basic Economics Database), distributed by Global Insight. The remaining data, i.e. 1994:Jan-1995:Oct, is hand-collected from table B-92 of the 1996 Economic Report of the President available on the following link: https://fraser.stlouisfed.org/title/45.
- **NEB**: total number of establishment births in the US private sector. The data is available quarterly for the 1992:III-2016IV period. It is obtained from the Business Employment Dynamics database published by the BLS.

- **Population**: total population in the US includes resident population plus armed forces overseas. The data is available quarterly from the BEA.

The industry-level series are defined as:

- **Labor share**: is defined as real payroll divided by real value added. The real payroll is obtained by dividing total industry payroll by the consumer price index. The real value added is obtained by deflating the total value added by the deflator for the total value of shipments. The data is available annually at the 4-digit SIC code level and is obtained from NBER-CES Manufacturing Industry Database.

- **Average hours**: is defined as total industry production worker hours divided by total production workers. The data is available annually at the 4-digit SIC code level and is obtained from NBER-CES Manufacturing Industry Database.

- **Herfindahl-Hirschman Index**: the data is collected for the 1992, 1997, 2002, 2007, 2012 Census years and are available at the 4-digit SIC code level for 1992 and 6-digit NAICS level thereafter. We convert the HHI measure from 1997 onwards to 4-digit SIC levels using the same methodology as Ali, Klasa, and Yeung (2009) and use the concordance tables available on the U.S. Census website to link NAICS to SIC codes.

- Individual firm returns and stock market valuation are from CRSP. In our sample, we consider all firms that are incorporated in the US and listed on the NYSE, AMEX, or NASDAQ that have a CRSP share code of 10 or 11 at the beginning of month t, good shares and price data at the beginning of t. An industry is defined at the 4-digit SIC industry classification. The data is obtained from CRSP.

- Accounting variables are collected from compustat: Total Asset (AT), Income Before Extraordinary Items (IB), Total Long-Term Debt (DLTT), Cost of Goods Sold (COGS), Selling, General and Administrative Expenses (XSGA), Total Sales (SALE), and Book Equity (CEQ). The accounting measures are obtained as follows: book-to-market ratio = CEQ/ME, asset growth = AT\_t/AT\_t-1, profitability = IB/AT, financial leverage = DLTT/AT, asset utilization = SALE/AT, and operating leverage = (COGS+XSGA)/AT, where ME is the market value of the firm’s equity obtained from CRSP.
C Additional tables & figures

This section presents a set of additional tables and figures that complement the main results of the paper. Table 1 reports stock return predictive regressions using our two empirical measures of markups where we correct for a series of potential biases (Kendall (1954), Stambaugh (1986), and small sample bias). Overall, the estimation bias is generally small and the bootstrapped p-values confirm the statistical significance of markup as a predictor of returns.

Table 1: Stock Return Predictability - Robustness

<table>
<thead>
<tr>
<th>Horizon (in years)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td>Panel A. Markup - $\varphi^s$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\beta^{(n)}$</td>
<td>1.610</td>
<td>2.604</td>
<td>3.570</td>
<td>5.005</td>
<td>5.841</td>
</tr>
<tr>
<td>S.E.</td>
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<td>1.432</td>
<td>1.789</td>
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<tr>
<td>$b^{(n)}$</td>
<td>1.558</td>
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<td>3.306</td>
<td>4.260</td>
<td>5.293</td>
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<td>p-value</td>
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<td>0.018</td>
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<td>0.014</td>
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<tr>
<td>$R^2$</td>
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<td>0.074</td>
<td>0.107</td>
<td>0.176</td>
<td>0.182</td>
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<tr>
<td>Panel B. Markup - $\varphi^d$</td>
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<tr>
<td>$\beta^{(n)}$</td>
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<td>5.143</td>
<td>6.528</td>
<td>8.591</td>
<td>9.417</td>
</tr>
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<td>S.E.</td>
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<td>1.879</td>
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<td>3.281</td>
<td>4.266</td>
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<td>6.279</td>
<td>7.123</td>
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<td>p-value</td>
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<td>0.020</td>
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<td>0.043</td>
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<td>0.079</td>
<td>0.112</td>
<td>0.102</td>
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</tbody>
</table>

This table reports excess stock return forecasts for horizons of one to five years, i.e. $r^{x}_{t,t+n} - y^{(n)}_t = \alpha + \beta x_t + \epsilon_{t+1}$, where $x_t$ is a proxy for the price markup. We consider two empirical proxies for the price markup $\varphi^s$ (Panel A) and $\varphi^d$ (Panel B). The price markup proxies are linearly detrended and averaged over the preceding four quarters. The forecasting regressions use overlapping quarterly observations. $\beta^{(n)}$ is the coefficient estimate obtained via OLS. S.E. is the standard error, corrected for heteroscedasticity using Newey-West with $k + 1$ lags. $b^{(n)}$ is the regression coefficient corrected for estimation bias (Kendall (1954), Stambaugh (1986) and small sample bias). p-value is the two-sided p-value which is obtained by block-bootstrapping with replacement over 10,000 samples and computing the empirical probability of obtaining, under the null, an absolute value for the coefficient that is as large as the absolute value of the data estimate. The data sample period is 1948:Q1-2016:Q4. Model moments are averaged across 100 simulations that are equivalent in length to the data sample.

Table 2 runs a horse race of our supply- and demand-based markup measures with the labor-share for predicting excess returns at a one-year horizon. We find that, even at a higher frequency, our two measures of markup contain additional information about future returns not captured by
the labor share.

Table 2: Horse Race - One-Year Horizon

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$s_L$</td>
<td>-1.41</td>
<td>-0.69</td>
<td>-0.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.75)</td>
<td>(0.72)</td>
<td>(0.79)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\varphi^s$</td>
<td>1.61</td>
<td>1.33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.70)</td>
<td>(0.74)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\varphi^d$</td>
<td>3.54</td>
<td>3.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.39)</td>
<td>(1.38)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.029</td>
<td>0.051</td>
<td>0.055</td>
<td>0.056</td>
<td>0.066</td>
</tr>
</tbody>
</table>

This table compares the one-year excess stock return forecasts for different predictors. Each column corresponds to a different set of predicting variables. The predicting variables are the log-labor share $s_L$, and the two measures of price markup $\varphi^s$ and $\varphi^d$. All measures are linearly detrended and averaged over the preceding four quarters. The forecasting regressions use overlapping quarterly observations. Standard errors are corrected for heteroscedasticity using Newey-West with $k+1$ lags and are reported below each coefficient estimate in parentheses. The data sample period is 1948:Q1-2016:Q4.

Table 3 investigates the proportion of the return spread between high- and low-markup industries that is due to operating leverage. To do so, we compute the stock return on a firm with the same cash-flows as the firm in the benchmark model but without fixed cost of production. The levered returns are reported in the second column and the unlevered returns in the third column. As expected the spread drops once returns are unlevered. However, we find that the markup channel still contributes to about 75% if the total spread, which highlights that the markup channel is the main driver of the cross-sectional return spread in the model.

Figure 1 plots the time-series of the low- and high-markup portfolios over the sample period for our $\varphi^s$ measure. Panel A plots the log-cumulative abnormal return for the two series. Panel B plots the realized abnormal returns. The abnormal returns are obtained by adjusting realized returns for a series of firm characteristics: size, book-to-market, momentum, asset growth, profitability, financial leverage, asset utilization, and operating leverage.
Table 3: Unlevered Cross-Sectional Return Spread

<table>
<thead>
<tr>
<th></th>
<th>Benchmark</th>
<th>No operating leverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>$r_H$</td>
<td>11.01%</td>
<td>9.82%</td>
</tr>
<tr>
<td></td>
<td>(0.70%)</td>
<td>(0.51%)</td>
</tr>
<tr>
<td>$r_L$</td>
<td>7.38%</td>
<td>7.55%</td>
</tr>
<tr>
<td></td>
<td>(0.44%)</td>
<td>(0.39%)</td>
</tr>
<tr>
<td>$r_H - r_L$</td>
<td>3.63%</td>
<td>2.27%</td>
</tr>
<tr>
<td></td>
<td>(0.30%)</td>
<td>(0.11%)</td>
</tr>
</tbody>
</table>

This table presents the average returns of portfolios sorted on industry price markup. The first column reports portfolio returns obtained from the benchmark model. The second column computes the unlevered return and is obtained by computing the stock return on a firm with the same cash-flows as the firm in the bechmark model but without fixed cost of production. $r_H$ ($r_L$) is the return on a portfolio formed of firms in high (low) markup industries. $r_H - r_L$ is the return on the zero investment portfolio that is long $r_H$ and short $r_L$. Newey-West standard errors are reported below in parentheses.
Figure 1: Returns on the long and short markup portfolio - $\varphi^*$

This figure plots the log cumulative (Panel A) and quarterly (Panel B) characteristic-adjusted returns for the portfolio of stocks with the highest industry markups (thick blue line) and the portfolio of stocks with the lowest industry markups (dashed red line).