New Goods and Asset Prices

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Introduction

Assets: Claims to Future Goods and Services.
This paper: Love of Variety and Variety Growth
Two Margins: Groups and Brands
Variety Changes over Time and States of Nature
Group Growth and Saving
Brand/Quality Growth and Risk
Toy Model

Standard Model:

\[ u(c) = \frac{c^{1-\theta}}{1 - \theta} \]

This Model:

\[ u(c) = \frac{c_1^{1-\theta}}{1 - \theta} + \frac{c_2^{1-\theta}}{1 - \theta} + \frac{c_3^{1-\theta}}{1 - \theta} + \cdots + \frac{c_n^{1-\theta}}{1 - \theta} \]

where

\[ c_j \equiv \left( \int_0^{m_t} (A_t^\gamma c_{jj})^\alpha \, di \right)^{\frac{1}{\alpha}}. \]
Model

Product Group:

\[ c_{jt} \equiv m_t^{v+1-\frac{1}{\alpha}} \left( \int_0^{m_t} (A_t^{\gamma} c_{jit})^\alpha \, di \right)^{\frac{1}{\alpha}} \]

\[ c_{jit} \geq 0, \ \alpha \in (0, 1), \text{ and } m_t, m_t > 0. \]
Utility from Group

\[ u(c_{jt}) - u(0) = \frac{(c_{jt} + \epsilon)^{1-\theta}}{1 - \theta} - \frac{\epsilon^{1-\theta}}{1 - \theta} \geq 0, \]

\[ \theta > 1, \ \epsilon > 0, \ c_{jt} \gg \epsilon \approx 0, \ \epsilon > 0. \]
Period Utility

\[ U_t = n_t^\phi \int_0^{n_t} \frac{(c_{jt} + \epsilon)^{1-\theta}}{1 - \theta} - \frac{\epsilon^{1-\theta}}{1 - \theta} \, dj \]

\[ = n_t^\phi \int_0^{n_t} u(c_{jt}) - u(0) \, dj. \]

where \( \phi > -1 \), and \( n_t \) denotes the measure of groups actually consumed.
Lifetime Utility

\[ U \equiv E_0 \sum_{t=0}^{T} \beta^t \left( n_t^\phi \int_0^{n_t} u(c_{jt}) - u(0) \, dj - h(l_t) \right) \]
Solution

Move from One-good to Multi-good Setup:

\[ c_{jit} = \frac{C_t}{m_t n_t} \]

\[ U \equiv E_0 \sum_{t=0}^{T} \beta^t \left( \frac{n_t^\xi m_t^{\nu(1-\theta)} A_t^{\gamma(1-\theta)} C_t^{1-\theta}}{1-\theta} + \frac{n_t^\phi+1}{(\theta - 1)e^{\theta-1}} - h(l_t) \right). \]
Marginal Utility

\[ V'(C_t) = \frac{n_t^c}{C_t^\theta m_t^{\nu(\theta-1)} A_t^{\gamma(\theta-1)}}. \]

With one-good CCAPM:

\[ V'(C_t) = \frac{1}{C_t^\theta} \]
\[ c_{jt} = m_t^n A_{t}^{\gamma} \frac{C_t}{n_t}. \]

\[ U_t = n_t^{\phi} \int_0^{n_t} \frac{(c_{jt} + \epsilon)^{1-\theta}}{1-\theta} - \frac{\epsilon^{1-\theta}}{1-\theta} \, dj \]

\[ \approx n_t^{\phi} \int_0^{n_t} \frac{(m_t^n A_{t}^{\gamma} \frac{C_t}{n_t})^{1-\theta}}{1-\theta} - \frac{\epsilon^{1-\theta}}{1-\theta} \, dj \]
\[ V'(C_t) = \beta \mathbb{E}[(1 + r_{t+1})V'(C_{t+1})] \]
Notation

\( g_x \) is average growth of \( x \)

\( \sigma_x^2 \) variance of \( x \)

\( \sigma_{x,y} \) correlation of \( x \) and \( y \).
Risk-Free Rate

\[ r_f = \underbrace{\rho + \theta g_c - \nu (1 - \theta) g_m - \gamma (1 - \theta) g_A - \zeta g_n - \frac{1}{2} (\theta (\theta + 1) \sigma_{g_c}^2)} + \nu (1 - \theta)(\nu (1 - \theta) - 1) \sigma_{g_m}^2 + \zeta (\zeta - 1) \sigma_{g_n}^2 + \]
\[ + \gamma (1 - \theta)(\gamma (1 - \theta) - 1) \sigma_{g_A}^2 \] + \nu \theta (1 - \theta) \sigma_{g_m,g_c}
\[ + \theta \gamma (1 - \theta) \sigma_{g_A,g_c} + \theta \zeta \sigma_{g_n,g_c} \]
\[ - \nu \gamma (1 - \theta)^2 \sigma_{g_A,g_m} - \nu (1 - \theta) \zeta \sigma_{g_m,g_n} - \gamma (1 - \theta) \zeta \sigma_{g_A,g_n} \]
\[ E(r - r_f) = \theta \sigma_r \sigma_{g_c} \rho_{r,g_c} + \nu (\theta - 1) \sigma_r \sigma_{g_m} \rho_{r,g_m} + \gamma (\theta - 1) \sigma_r \sigma_{g_A} \rho_{r,g_A} \]

\[ -\zeta \sigma_r \sigma_{g_n} \rho_{r,g_n}. \]
Data

Trends over Time

Cyclical Trends

Love of Variety and Welfare
Long-Run Trends

\[ w_t V'(C_t) = h'(l_t). \]
Stable Labor Hours

\[ gV'(C) = -\theta g_c + \nu (1 - \theta) g_m + \gamma (1 - \theta) g_A + \zeta g_n = -g_w \]
Risk-Free Rate

\[
rf = \rho + \theta gc - v(1 - \theta)gm - \gamma(1 - \theta)gA - \zeta gn - \frac{1}{2} \left( \theta(\theta + 1)\sigma_g^2 \right)
\]

\[
= gw + v(1 - \theta)(v(1 - \theta) - 1)\sigma_{gm}^2 + \zeta(\zeta - 1)\sigma_{gn}^2 +
\]

\[
\gamma(1 - \theta)(\gamma(1 - \theta) - 1)\sigma_{gA}^2 + v\theta(1 - \theta)\sigma_{gm,gc} +
\]

\[
+ \theta\gamma(1 - \theta)\sigma_{gA,gc} + \theta\zeta\sigma_{gn,gc} - v\gamma(1 - \theta)^2\sigma_{gA,gm} - v(1 - \theta)\zeta\sigma_{gm,gn} - \gamma(1 - \theta)\zeta\sigma_{gA,gn}
\]
Short-Run Trends

Is variety growth procyclical?

Brands, Quality, Groups?

How much does variety matter for welfare?
Broda and Weinstein (2007):

“in a typical year, forty percent of household expenditures are in goods that were created in the last four years.”

“net product creation is strongly procyclical.”

“substantial quality upgrading.”
Adweek, April 2009:

“The recession is driving down the rate of new product development, with the launch of new foods and drinks declining 51 percent in the first quarter compared to the year earlier period, according to new data from Mintel’s Global New Products Database.”

% Deviation From Trend


New Trademarks

Consumption

[Graph showing the deviation from trend of consumption and new trademark registration]
Hausman (1997):

“I find that consumers highly value new goods, which provide significant consumer surplus despite the existence of other brands which compete closely with the new brand.”

Other Evidence: Trade, Cities, Supermarkets.
## Baseline Parameters for Calibration

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Calibration of Expected Returns when Risk Aversion, $\theta = 5$, and Time Preference, $\rho = 3\%$

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Conclusion

Group Growth Raises Savings

Volatility in Brand/Quality Growth Raises Consumption Risk.

Multi-Good Setup Works Against Both Puzzles

Complements any Consumption-Based Solution

Incorporating “Love of Variety” Has Been Successful in Other Fields