Asset Prices, Local Prospects and the Geography of Housing Dynamics

Preetesh Kantak

Discussant: Andrei S. Gonçalves[1]

[1]Finance Department
The Ohio State University

April 2017

Outline

Empirical Analysis in a Nutshell...

	Stocks	Housing			
x^{global}	-0.0347*	0.0241***	0.0081**	0.0435	0.0567*
	[-1.92]	[3.77]	[2.26]	[1.39]	[1.81]
x_{msa}		0.0126***			
		[6.29]			
x_{msa}^{global}			0.0155***	0.0141***	0.0175***
			[10.42]	[8.43]	[8.73]
x_{msa}^{local}			0.0036**	0.0038**	0.0036**
			[2.21]	[2.34]	[2.24]

Empirical Analysis in a Nutshell...

	Stocks	Housing			
x^{global}	-0.0347*	0.0241***	0.0081**	0.0435	0.0567*
	[-1.92]	[3.77]	[2.26]	[1.39]	[1.81]
x_{msa}		0.0126***			
		[6.29]			
x_{msa}^{global}			0.0155***	0.0141***	0.0175***
			[10.42]	[8.43]	[8.73]
x_{msa}^{local}			0.0036**	0.0038**	0.0036**
			[2.21]	[2.34]	[2.24]

1. Measure: $\downarrow x_t = pd_t \implies \downarrow$ long-run growth
2. Finding: $\downarrow$ expected growth $\implies \downarrow$ housing risk premium
3. Implication: $\downarrow$ expected growth $\implies \uparrow$ house prices

Empirical Analysis in a Nutshell...

	Stocks	Housing			
x^{global}	-0.0347*	0.0241***	0.0081**	0.0435	0.0567*
	[-1.92]	[3.77]	[2.26]	[1.39]	[1.81]
x_{msa}		0.0126***			
		[6.29]			
x_{msa}^{global}			0.0155***	0.0141***	0.0175***
			[10.42]	[8.43]	[8.73]
x_{msa}^{local}			0.0036**	0.0038**	0.0036**
			[2.21]	[2.34]	[2.24]

1. Measure: $\downarrow x_t = pd_t \implies \downarrow$ long-run growth
2. Finding: $\downarrow$ expected growth $\implies \downarrow$ housing risk premium
3. Implication: $\downarrow$ expected growth $\implies \uparrow$ house prices

Empirical Analysis in a Nutshell...

	Stocks	Housing			
x^{global}	-0.0347*	0.0241***	0.0081**	0.0435	0.0567*
	[-1.92]	[3.77]	[2.26]	[1.39]	[1.81]
x_{msa}		0.0126***			
		[6.29]			
x_{msa}^{global}			0.0155***	0.0141***	0.0175***
			[10.42]	[8.43]	[8.73]
x_{msa}^{local}			0.0036**	0.0038**	0.0036**
			[2.21]	[2.34]	[2.24]

1. Measure: $\downarrow \; x_t = pd_t \quad \Longrightarrow \quad \downarrow$ long-run growth
2. Finding: $\downarrow$ expected growth $\Longrightarrow$ $\downarrow$ housing risk premium
3. Implication: $\downarrow$ expected growth $\Longrightarrow$ $\uparrow$ house prices

Empirical Analysis in a Nutshell...

	Stocks	Housing			
x^{global}	-0.0347*	0.0241***	0.0081**	0.0435	0.0567*
	[-1.92]	[3.77]	[2.26]	[1.39]	[1.81]
x_{msa}		0.0126***			
		[6.29]			
x_{msa}^{global}			0.0155***	0.0141***	0.0175***
			[10.42]	[8.43]	[8.73]
x_{msa}^{local}			0.0036**	0.0038**	0.0036**
			[2.21]	[2.34]	[2.24]

1. Measure: $\downarrow\ x_t = pd_t \implies \downarrow$ long-run growth
2. Finding: $\downarrow$ expected growth $\implies \downarrow$ housing risk premium
3. Implication: $\downarrow$ expected growth $\implies \uparrow$ house prices

Mechanism in a Nutshell...

$$x_{t+1} = \rho x_t + \epsilon_{x,t}$$

$$\Delta c_{t+1} = \mu_c + \phi_c \cdot x_t + \epsilon_{c,t}$$

$$\Delta s_{t+1} = \mu_s + I_{x>0} \cdot \phi_s \cdot x_t + \epsilon_{s,t}$$

Mechanism in a Nutshell...

$$x_{t+1} = \rho x_t + \epsilon_{x,t}$$

$$\Delta c_{t+1} = \mu_c + \phi_c \cdot x_t + \epsilon_{c,t}$$

$$\Delta s_{t+1} = \mu_s + I_{x>0} \cdot \phi_s \cdot x_t + \epsilon_{s,t}$$

Mechanism in a Nutshell...

$$x_{t+1} = \rho x_t + \epsilon_{x,t}$$

$$\Delta c_{t+1} = \mu_c + \phi_c \cdot x_t + \epsilon_{c,t}$$

$$\Delta s_{t+1} = \mu_s + I_{x>0} \cdot \phi_s \cdot x_t + \epsilon_{s,t}$$

Mechanism in a Nutshell...

$$x_{t+1} = \rho x_t + \epsilon_{x,t}$$

$$\Delta c_{t+1} = \mu_c + \phi_c \cdot x_t + \epsilon_{c,t}$$

$$\Delta s_{t+1} = \mu_s + I_{x>0} \cdot \phi_s \cdot x_t + \epsilon_{s,t}$$

Contribution

- How do prices respond to long-run growth shocks?
- Real Estate intrinsic properties ⇒ how do local growth prospects impact housing risk premia?
- The focus on long-run dynamics differs from previous literature that connects location to economic activity

Contribution

- How do prices respond to long-run growth shocks?
- Real Estate intrinsic properties $\Rightarrow$ how do local growth prospects impact housing risk premia?
- The focus on long-run dynamics differs from previous literature that connects location to economic activity

Contribution

- How do prices respond to long-run growth shocks?
- Real Estate intrinsic properties $\Rightarrow$ how do local growth prospects impact housing risk premia?
- The focus on long-run dynamics differs from previous literature that connects location to economic activity

Outline

The Paper

Major Comments

Minor Comments

Final Remarks

Is $pd = \mathbb{E}[\Delta d]$?

	Stocks	Housing			
x^{global}	-0.0347*	0.0241***	0.0081**	0.0435	0.0567*
	[-1.92]	[3.77]	[2.26]	[1.39]	[1.81]

1. Measure: $\downarrow x_t = pd_t \implies \downarrow$ long-run growth
   - Menzly, Santos, and Veronesi (2004): $\uparrow pd \Rightarrow \downarrow \mathbb{E}[r]$, but $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0$
   - Lettau and Ludvigson (2001, 2005) indirect evidence on $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0$
   - Binsbergen and Koijen (2010) maximum likelihood estimation $\Rightarrow corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0.40$
2. Finding: $\downarrow$ expected growth $\implies \downarrow$ housing risk premium
3. Implication: $\downarrow$ expected growth $\implies \uparrow$ house prices

Is $pd = \mathbb{E}[\Delta d]$?

	Stocks	Housing			
x^{global}	-0.0347*	0.0241***	0.0081**	0.0435	0.0567*
	[-1.92]	[3.77]	[2.26]	[1.39]	[1.81]

1. Measure: $\downarrow x_t = pd_t \implies \downarrow$ long-run growth
   - Menzly, Santos, and Veronesi (2004): $\uparrow pd \Rightarrow \downarrow \mathbb{E}[r]$, but $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0$
   - Lettau and Ludvigson (2001, 2005) indirect evidence on $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0$
   - Binsbergen and Koijen (2010) maximum likelihood estimation $\Rightarrow$ $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0.40$
2. Finding: $\downarrow$ expected growth $\implies$ $\downarrow$ housing risk premium
3. Implication: $\downarrow$ expected growth $\implies$ $\uparrow$ house prices

Is $pd = \mathbb{E}[\Delta d]$?

	Stocks	Housing			
x^{global}	-0.0347*	0.0241***	0.0081**	0.0435	0.0567*
	[-1.92]	[3.77]	[2.26]	[1.39]	[1.81]

1. Measure: $\downarrow x_t = pd_t \implies \downarrow$ long-run growth
   - Menzly, Santos, and Veronesi (2004): $\uparrow pd \Rightarrow \downarrow \mathbb{E}[r]$, but $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0$
   - Lettau and Ludvigson (2001, 2005) indirect evidence on $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0$
   - Binsbergen and Koijen (2010) maximum likelihood estimation $\Rightarrow$ $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0.40$
2. Finding: $\downarrow$ expected growth $\implies$ $\downarrow$ housing risk premium
3. Implication: $\downarrow$ expected growth $\implies$ $\uparrow$ house prices

Is $pd = \mathbb{E}[\Delta d]$?

	Stocks	Housing			
x^{global}	-0.0347*	0.0241***	0.0081**	0.0435	0.0567*
	[-1.92]	[3.77]	[2.26]	[1.39]	[1.81]

1. Measure: $\downarrow x_t = pd_t \implies \downarrow$ long-run growth
   - Menzly, Santos, and Veronesi (2004): $\uparrow pd \Rightarrow \downarrow \mathbb{E}[r]$, but $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0$
   - Lettau and Ludvigson (2001, 2005) indirect evidence on $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0$
   - Binsbergen and Koijen (2010) maximum likelihood estimation $\Rightarrow$ $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0.40$
2. Finding: $\downarrow$ expected growth $\implies$ $\downarrow$ housing risk premium
3. Implication: $\downarrow$ expected growth $\implies$ $\uparrow$ house prices

Is $pd = \mathbb{E}[\Delta d]$?

	Stocks	Housing			
x^{global}	-0.0347*	0.0241***	0.0081**	0.0435	0.0567*
	[-1.92]	[3.77]	[2.26]	[1.39]	[1.81]

1. Measure: $\downarrow x_t = pd_t \implies \downarrow$ long-run growth
   - Menzly, Santos, and Veronesi (2004): $\uparrow pd \Rightarrow \downarrow \mathbb{E}[r]$, but $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0$
   - Lettau and Ludvigson (2001, 2005) indirect evidence on $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0$
   - Binsbergen and Koijen (2010) maximum likelihood estimation $\Rightarrow$ $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0.40$
2. Finding: $\downarrow$ expected growth $\implies \downarrow$ housing risk premium
3. Implication: $\downarrow$ expected growth $\implies \uparrow$ house prices

Is $pd = \mathbb{E}[\Delta d]$?

	Stocks	Housing			
x^{global}	-0.0347*	0.0241***	0.0081**	0.0435	0.0567*
	[-1.92]	[3.77]	[2.26]	[1.39]	[1.81]

1. Measure: $\downarrow x_t = pd_t \implies \downarrow$ long-run growth
   - Menzly, Santos, and Veronesi (2004): $\uparrow pd \Rightarrow \downarrow \mathbb{E}[r]$, but $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0$
   - Lettau and Ludvigson (2001, 2005) indirect evidence on $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0$
   - Binsbergen and Koijen (2010) maximum likelihood estimation $\Rightarrow$ $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0.40$
2. Finding: $\uparrow$ equity premium $\implies \downarrow$ housing risk premium
3. Implication: $\downarrow$ expected growth $\implies \uparrow$ house prices

Is $pd = \mathbb{E}[\Delta d]$?

	Stocks	Housing			
x^{global}	-0.0347*	0.0241***	0.0081**	0.0435	0.0567*
	[-1.92]	[3.77]	[2.26]	[1.39]	[1.81]

1. Measure: $\downarrow x_t = pd_t \implies \downarrow$ long-run growth
   - Menzly, Santos, and Veronesi (2004): $\uparrow pd \Rightarrow \downarrow \mathbb{E}[r]$, but $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0$
   - Lettau and Ludvigson (2001, 2005) indirect evidence on $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0$
   - Binsbergen and Koijen (2010) maximum likelihood estimation $\Rightarrow$ $corr(\mathbb{E}[r], \mathbb{E}[\Delta d]) > 0.40$
2. Finding: $\uparrow$ equity premium $\implies \downarrow$ housing risk premium
3. Implication: $\uparrow$ equity premium $\implies \uparrow$ house prices

Data Generating Process

- All variables are demeaned (r_f is constant):

$$pd_t = \sum_{j=0}^{\infty} \rho_e^j \left(\mathbb{E}_t \left[\Delta d_{t+1+j} \right] - \mathbb{E}_t \left[r_{t+1+j}^e \right] \right)$$

$$ps_t = \sum_{j=0}^{\infty} \rho_h^j \left(\mathbb{E}_t \left[\Delta s_{t+1+j} \right] - \mathbb{E}_t \left[r_{t+1+j}^h \right] \right)$$

Data Generating Process

- All variables are demeaned (r_f is constant):

$$pd_t = \sum_{j=0}^{\infty} \rho_e^j \left(\mathbb{E}_t \left[\Delta d_{t+1+j} \right] - \mathbb{E}_t \left[r^e_{t+1+j} \right] \right)$$

$$ps_t = \sum_{j=0}^{\infty} \rho_h^j \left(\mathbb{E}_t \left[\Delta s_{t+1+j} \right] - \mathbb{E}_t \left[r^h_{t+1+j} \right] \right)$$

Data Generating Process

- All variables are demeaned (r_f is constant):

$$pd_t = \sum_{j=0}^{\infty} \rho_e^j \left(\mathbb{E}_t \left[\Delta d_{t+1+j} \right] - \mathbb{E}_t \left[r^e_{t+1+j} \right] \right)$$

$$ps_t = \sum_{j=0}^{\infty} \rho_h^j \left(\mathbb{E}_t \left[\Delta s_{t+1+j} \right] - \mathbb{E}_t \left[r^h_{t+1+j} \right] \right)$$

Data Generating Process

- All variables are demeaned (r_f is constant):

$$pd_t = \sum_{j=0}^{\infty} \rho_e^j \left(\mathbb{E}_t \left[g_{t+j}^d \right] - \mathbb{E}_t \left[\mu_{t+j}^e \right] \right)$$

$$ps_t = \sum_{j=0}^{\infty} \rho_h^j \left(\mathbb{E}_t \left[g_{t+j}^s \right] - \mathbb{E}_t \left[\mu_{t+j}^h \right] \right)$$

Data Generating Process

- All variables are demeaned (r_f is constant):

$$pd_t = \sum_{j=0}^{\infty} \rho_e^j \left(\mathbb{E}_t \left[g_{t+j}^d \right] - \mathbb{E}_t \left[\mu_{t+j}^e \right] \right)$$

$$ps_t = \sum_{j=0}^{\infty} \rho_h^j \left(\mathbb{E}_t \left[g_{t+j}^s \right] - \mathbb{E}_t \left[\mu_{t+j}^h \right] \right)$$

- g and μ processes similar to Binsbergen and Koijen (2010):

Data Generating Process

- All variables are demeaned (r_f is constant):

$$pd_t = \sum_{j=0}^{\infty} \rho_e^j \left(\mathbb{E}_t \left[g_{t+j}^d \right] - \mathbb{E}_t \left[\mu_{t+j}^e \right] \right)$$

$$ps_t = \sum_{j=0}^{\infty} \rho_h^j \left(\mathbb{E}_t \left[g_{t+j}^s \right] - \mathbb{E}_t \left[\mu_{t+j}^h \right] \right)$$

- g and μ processes similar to Binsbergen and Koijen (2010):

$$\mu_{t+1}^e = \phi_e \cdot \mu_t^e + \sigma_e \cdot \epsilon_{t+1}^e$$

Data Generating Process

- All variables are demeaned (r_f is constant):

$$pd_t = \sum_{j=0}^{\infty} \rho_e^j \left(\mathbb{E}_t \left[g_{t+j}^d \right] - \mathbb{E}_t \left[\mu_{t+j}^e \right] \right)$$

$$ps_t = \sum_{j=0}^{\infty} \rho_h^j \left(\mathbb{E}_t \left[g_{t+j}^s \right] - \mathbb{E}_t \left[\mu_{t+j}^h \right] \right)$$

- g and μ processes similar to Binsbergen and Koijen (2010):

$$\mu_{t+1}^e = 0.932 \cdot \mu_t^e + 0.016 \cdot \epsilon_{t+1}^e$$

Data Generating Process

- All variables are demeaned (r_f is constant):

$$pd_t = \sum_{j=0}^{\infty} \rho_e^j \left(\mathbb{E}_t \left[g_{t+j}^d \right] - \mathbb{E}_t \left[\mu_{t+j}^e \right] \right)$$

$$ps_t = \sum_{j=0}^{\infty} \rho_h^j \left(\mathbb{E}_t \left[g_{t+j}^s \right] - \mathbb{E}_t \left[\mu_{t+j}^h \right] \right)$$

- g and μ processes similar to Binsbergen and Koijen (2010):

$$\mu_{t+1}^e = 0.932 \cdot \mu_t^e + 0.016 \cdot \epsilon_{t+1}^e$$
$$\mu_{t+1}^h = \phi_h \cdot \mu_t^h + \sigma_h \cdot \epsilon_{t+1}^h$$

Data Generating Process

- All variables are demeaned (r_f is constant):

$$pd_t = \sum_{j=0}^{\infty} \rho_e^j \left(\mathbb{E}_t \left[g_{t+j}^d \right] - \mathbb{E}_t \left[\mu_{t+j}^e \right] \right)$$

$$ps_t = \sum_{j=0}^{\infty} \rho_h^j \left(\mathbb{E}_t \left[g_{t+j}^s \right] - \mathbb{E}_t \left[\mu_{t+j}^h \right] \right)$$

- g and μ processes similar to Binsbergen and Koijen (2010):

$$\mu_{t+1}^e = 0.932 \cdot \mu_t^e + 0.016 \cdot \epsilon_{t+1}^e$$

$$\mu_{t+1}^h = 0.932 \cdot \mu_t^h + 0.016 \cdot \epsilon_{t+1}^h$$

Data Generating Process

- All variables are demeaned (r_f is constant):

$$pd_t = \sum_{j=0}^{\infty} \rho_e^j \left(\mathbb{E}_t\left[g_{t+j}^d\right] - \mathbb{E}_t\left[\mu_{t+j}^e\right]\right)$$

$$ps_t = \sum_{j=0}^{\infty} \rho_h^j \left(\mathbb{E}_t\left[g_{t+j}^s\right] - \mathbb{E}_t\left[\mu_{t+j}^h\right]\right)$$

- g and μ processes similar to Binsbergen and Koijen (2010):

$$\mu_{t+1}^e = 0.932 \cdot \mu_t^e + 0.016 \cdot \epsilon_{t+1}^e$$

$$\mu_{t+1}^h = 0.932 \cdot \mu_t^h + 0.016 \cdot \epsilon_{t+1}^h$$

$$g_{t+1} = \phi_g \cdot g_t + \sigma_g \cdot \epsilon_{t+1}^g$$

Data Generating Process

- All variables are demeaned (r_f is constant):

$$pd_t = \sum_{j=0}^{\infty} \rho_e^j \left(\mathbb{E}_t \left[g_{t+j}^d \right] - \mathbb{E}_t \left[\mu_{t+j}^e \right] \right)$$

$$ps_t = \sum_{j=0}^{\infty} \rho_h^j \left(\mathbb{E}_t \left[g_{t+j}^s \right] - \mathbb{E}_t \left[\mu_{t+j}^h \right] \right)$$

- g and μ processes similar to Binsbergen and Koijen (2010):

$$\mu_{t+1}^e = 0.932 \cdot \mu_t^e + 0.016 \cdot \epsilon_{t+1}^e$$

$$\mu_{t+1}^h = 0.932 \cdot \mu_t^h + 0.016 \cdot \epsilon_{t+1}^h$$

$$g_{t+1} = 0.775 \cdot g_t + 0.179 \cdot 0.048 \cdot \epsilon_{t+1}^g$$

Data Generating Process

- All variables are demeaned (r_f is constant):

$$pd_t = \sum_{j=0}^{\infty} \rho_e^j \left(\mathbb{E}_t \left[g_{t+j}^d \right] - \mathbb{E}_t \left[\mu_{t+j}^e \right] \right)$$

$$ps_t = \sum_{j=0}^{\infty} \rho_h^j \left(\mathbb{E}_t \left[g_{t+j}^s \right] - \mathbb{E}_t \left[\mu_{t+j}^h \right] \right)$$

- g and μ processes similar to Binsbergen and Koijen (2010):

$$\mu_{t+1}^e = 0.932 \cdot \mu_t^e + 0.016 \cdot \epsilon_{t+1}^e$$

$$\mu_{t+1}^h = 0.932 \cdot \mu_t^h + 0.016 \cdot \epsilon_{t+1}^h$$

$$g_{t+1} = 0.775 \cdot g_t + 0.009 \cdot \epsilon_{t+1}^g$$

Data Generating Process

- All variables are demeaned (r_f is constant):

$$pd_t = \sum_{j=0}^{\infty} \rho_e^j \left(\mathbb{E}_t\left[g_{t+j}^d\right] - \mathbb{E}_t\left[\mu_{t+j}^e\right]\right)$$

$$ps_t = \sum_{j=0}^{\infty} \rho_h^j \left(\mathbb{E}_t\left[g_{t+j}^s\right] - \mathbb{E}_t\left[\mu_{t+j}^h\right]\right)$$

- g and μ processes similar to Binsbergen and Koijen (2010):

$$\mu_{t+1}^e = 0.932 \cdot \mu_t^e + 0.016 \cdot \epsilon_{t+1}^e$$

$$\mu_{t+1}^h = 0.932 \cdot \mu_t^h + 0.016 \cdot \epsilon_{t+1}^h$$

$$g_{t+1} = 0.775 \cdot g_t + 0.009 \cdot \epsilon_{t+1}^g$$

$$g_t^d = 4.9 \cdot g_t$$

$$g_t^s = 5 \cdot g_t$$

Data Generating Process

- All variables are demeaned (r_f is constant):

$$pd_t = \frac{1}{1 - \rho_e \cdot \phi_g} \cdot g_t^d - \frac{1}{1 - \rho_e \cdot \phi_e} \cdot \mu_t^e$$

$$ps_t = \frac{1}{1 - \rho_h \cdot \phi_g} \cdot g_t^s - \frac{1}{1 - \rho_h \cdot \phi_h} \cdot \mu_t^h$$

- g and μ processes similar to Binsbergen and Koijen (2010):

$$\mu_{t+1}^e = 0.932 \cdot \mu_t^e + 0.016 \cdot \epsilon_{t+1}^e$$

$$\mu_{t+1}^h = 0.932 \cdot \mu_t^h + 0.016 \cdot \epsilon_{t+1}^h$$

$$g_{t+1} = 0.775 \cdot g_t + 0.009 \cdot \epsilon_{t+1}^g$$

$$g_t^d = 4.9 \cdot g_t$$

$$g_t^s = 5 \cdot g_t$$

What would the Econometrician see?

	ϵ^e	ϵ^h	ϵ^g	Empirical Results	Implications
ϵ^e	1				
ϵ^h	0.5	1			
ϵ^g	0.42	0.42	1		

What would the Econometrician see?

	ϵ^e	ϵ^h	ϵ^g	Empirical Results		Implications
ϵ^e	1			$\rho(pd, g) =$	0.27	
ϵ^h	0.5	1		$\rho(pd, \mu^e) =$	-0.81	
ϵ^g	0.42	0.42	1	$\rho\left(pd, \mu^h\right) =$	-0.30	
				$\rho(pd, ps) =$	0.49	

What would the Econometrician see?

	ϵ^e	ϵ^h	ϵ^g	Empirical Results		Implications	
ϵ^e	1			$\rho(pd, g) =$	0.27	$\rho\left(g, \mu^h\right) =$	0.35
ϵ^h	0.5	1		$\rho(pd, \mu^e) =$	-0.81	$\rho(g, ps) =$	0.36
ϵ^g	0.42	0.42	1	$\rho\left(pd, \mu^h\right) =$	-0.30		
				$\rho(pd, ps) =$	0.49		

What would the Econometrician see?

	ϵ^e	ϵ^h	ϵ^g	Empirical Results		Implications	
ϵ^e	1			$\rho(pd, g) =$	0.27	$\rho\left(g, \mu^h\right) =$	0.35
ϵ^h	0.5	1		$\rho(pd, \mu^e) =$	-0.81	$\rho(g, ps) =$	0.36
ϵ^g	0.42	0.42	1	$\rho\left(pd, \mu^h\right) =$	-0.30		
				$\rho(pd, ps) =$	0.49		
ϵ^e	1						
ϵ^h	-0.5	1					
ϵ^g	0.42	0.42	1				

What would the Econometrician see?

	ϵ^e	ϵ^h	ϵ^g	Empirical Results		Implications	
ϵ^e	1			$\rho(pd, g) =$	0.27	$\rho(g, \mu^h) =$	0.35
ϵ^h	0.5	1		$\rho(pd, \mu^e) =$	-0.81	$\rho(g, ps) =$	0.36
ϵ^g	0.42	0.42	1	$\rho(pd, \mu^h) =$	-0.30		
				$\rho(pd, ps) =$	0.49		
ϵ^e	1			$\rho(pd, g) =$	0.27		
ϵ^h	-0.5	1		$\rho(pd, \mu^e) =$	-0.81		
ϵ^g	0.42	0.42	1	$\rho(pd, \mu^h) =$	0.74		
				$\rho(pd, ps) =$	-0.54		

What would the Econometrician see?

	ϵ^e	ϵ^h	ϵ^g	Empirical Results		Implications	
ϵ^e	1			$\rho(pd, g) =$	0.27	$\rho\left(g, \mu^h\right) =$	0.35
ϵ^h	0.5	1		$\rho(pd, \mu^e) =$	-0.81	$\rho(g, ps) =$	0.36
ϵ^g	0.42	0.42	1	$\rho\left(pd, \mu^h\right) =$	-0.30		
				$\rho(pd, ps) =$	0.49		
ϵ^e	1			$\rho(pd, g) =$	0.27	$\rho\left(g, \mu^h\right) =$	0.36
ϵ^h	-0.5	1		$\rho(pd, \mu^e) =$	-0.81	$\rho(g, ps) =$	0.35
ϵ^g	0.42	0.42	1	$\rho\left(pd, \mu^h\right) =$	0.74		
				$\rho(pd, ps) =$	-0.54		

What would the Econometrician see?

	ϵ^e	ϵ^h	ϵ^g	Empirical Results		Implications	
ϵ^e	1			$\rho(pd, g) =$	0.27	$\rho(g, \mu^h) =$	0.35
ϵ^h	0.5	1		$\rho(pd, \mu^e) =$	-0.81	$\rho(g, ps) =$	0.36
ϵ^g	0.42	0.42	1	$\rho(pd, \mu^h) =$	-0.30		
				$\rho(pd, ps) =$	0.49		
ϵ^e	1			$\rho(pd, g) =$	0.27	$\rho(g, \mu^h) =$	0.36
ϵ^h	-0.5	1		$\rho(pd, \mu^e) =$	-0.81	$\rho(g, ps) =$	0.35
ϵ^g	0.42	0.42	1	$\rho(pd, \mu^h) =$	0.74		
				$\rho(pd, ps) =$	-0.54		
ϵ^e	1						
ϵ^h	-0.5	1					
ϵ^g	0.42	-0.42	1				

What would the Econometrician see?

	ϵ^e	ϵ^h	ϵ^g	Empirical Results		Implications	
ϵ^e	1			$\rho(pd, g) =$	0.27	$\rho(g, \mu^h) =$	0.35
ϵ^h	0.5	1		$\rho(pd, \mu^e) =$	-0.81	$\rho(g, ps) =$	0.36
ϵ^g	0.42	0.42	1	$\rho(pd, \mu^h) =$	-0.30		
				$\rho(pd, ps) =$	0.49		
ϵ^e	1			$\rho(pd, g) =$	0.27	$\rho(g, \mu^h) =$	0.36
ϵ^h	-0.5	1		$\rho(pd, \mu^e) =$	-0.81	$\rho(g, ps) =$	0.35
ϵ^g	0.42	0.42	1	$\rho(pd, \mu^h) =$	0.74		
				$\rho(pd, ps) =$	-0.54		
ϵ^e	1			$\rho(pd, g) =$	0.27		
ϵ^h	-0.5	1		$\rho(pd, \mu^e) =$	-0.81		
ϵ^g	0.42	-0.42	1	$\rho(pd, \mu^h) =$	0.31		
				$\rho(pd, ps) =$	-0.09		

What would the Econometrician see?

	ϵ^e	ϵ^h	ϵ^g	Empirical Results		Implications	
ϵ^e	1			$\rho(pd, g) =$	0.27	$\rho\left(g, \mu^h\right) =$	0.35
ϵ^h	0.5	1		$\rho(pd, \mu^e) =$	-0.81	$\rho(g, ps) =$	0.36
ϵ^g	0.42	0.42	1	$\rho\left(pd, \mu^h\right) =$	-0.30		
				$\rho(pd, ps) =$	0.49		
ϵ^e	1			$\rho(pd, g) =$	0.27	$\rho\left(g, \mu^h\right) =$	0.36
ϵ^h	-0.5	1		$\rho(pd, \mu^e) =$	-0.81	$\rho(g, ps) =$	0.35
ϵ^g	0.42	0.42	1	$\rho\left(pd, \mu^h\right) =$	0.74		
				$\rho(pd, ps) =$	-0.54		
ϵ^e	1			$\rho(pd, g) =$	0.27	$\rho\left(g, \mu^h\right) =$	-0.33
ϵ^h	-0.5	1		$\rho(pd, \mu^e) =$	-0.81	$\rho(g, ps) =$	0.74
ϵ^g	0.42	-0.42	1	$\rho\left(pd, \mu^h\right) =$	0.31		
				$\rho(pd, ps) =$	-0.09		

Outline

Some Comments on the Empirical Analysis

- Repeat-sales method. predictability for $r_{t+1 \to t+2}$
- Campbell-Shiller valuation identity requires either dividends or net payout (not total payout)
- Confusing notation: x_t in equation 1, but $x_t = pd_t$ after
- Table 3: Lack of predictability in roughly 50% of the industries
- A version of x_t^{cf} should be central to analysis
- Tables 5 and 7 use different clustering methods
- Some of the control variables (such as business cycle βs) are estimated. System GMM for standard errors.

Some Comments on the Empirical Analysis

- Repeat-sales method. predictability for $r_{t+1 \rightarrow t+2}$
- Campbell-Shiller valuation identity requires either dividends or net payout (not total payout)
- Confusing notation: x_t in equation 1, but $x_t = pd_t$ after
- Table 3: Lack of predictability in roughly 50% of the industries
- A version of x_t^{cf} should be central to analysis
- Tables 5 and 7 use different clustering methods
- Some of the control variables (such as business cycle βs) are estimated. System GMM for standard errors.

Some Comments on the Empirical Analysis

- Repeat-sales method. predictability for $r_{t+1 \to t+2}$
- Campbell-Shiller valuation identity requires either dividends or net payout (not total payout)
- Confusing notation: x_t in equation 1, but $x_t = pd_t$ after
- Table 3: Lack of predictability in roughly 50% of the industries
- A version of x_t^{cf} should be central to analysis
- Tables 5 and 7 use different clustering methods
- Some of the control variables (such as business cycle βs) are estimated. System GMM for standard errors.

Some Comments on the Empirical Analysis

- Repeat-sales method. predictability for $r_{t+1 \rightarrow t+2}$
- Campbell-Shiller valuation identity requires either dividends or net payout (not total payout)
- Confusing notation: x_t in equation 1, but $x_t = pd_t$ after
- Table 3: Lack of predictability in roughly 50% of the industries
- A version of x_t^{cf} should be central to analysis
- Tables 5 and 7 use different clustering methods
- Some of the control variables (such as business cycle βs) are estimated. System GMM for standard errors.

Some Comments on the Empirical Analysis

- Repeat-sales method. predictability for $r_{t+1 \to t+2}$
- Campbell-Shiller valuation identity requires either dividends or net payout (not total payout)
- Confusing notation: x_t in equation 1, but $x_t = pd_t$ after
- Table 3: Lack of predictability in roughly 50% of the industries
- A version of x_t^{cf} should be central to analysis
  - ICAPM vs CAPM
  - Weak relation between $\mathbb{E}[r]$ and σ (see Campbell et al (2017))
- Tables 5 and 7 use different clustering methods
- Some of the control variables (such as business cycle βs) are estimated. System GMM for standard errors.

Some Comments on the Empirical Analysis

- Repeat-sales method. predictability for $r_{t+1 \to t+2}$
- Campbell-Shiller valuation identity requires either dividends or net payout (not total payout)
- Confusing notation: x_t in equation 1, but $x_t = pd_t$ after
- Table 3: Lack of predictability in roughly 50% of the industries
- A version of x_t^{cf} should be central to analysis
  - ICAPM vs CAPM
  - Weak relation between $\mathbb{E}[r]$ and σ (see Campbell et al (2017))
- Tables 5 and 7 use different clustering methods
- Some of the control variables (such as business cycle βs) are estimated. System GMM for standard errors.

Some Comments on the Empirical Analysis

- Repeat-sales method. predictability for $r_{t+1 \to t+2}$
- Campbell-Shiller valuation identity requires either dividends or net payout (not total payout)
- Confusing notation: x_t in equation 1, but $x_t = pd_t$ after
- Table 3: Lack of predictability in roughly 50% of the industries
- A version of x_t^{cf} should be central to analysis
  - ICAPM vs CAPM
  - Weak relation between $\mathbb{E}[r]$ and σ (see Campbell et al (2017))
- Tables 5 and 7 use different clustering methods
- Some of the control variables (such as business cycle βs) are estimated. System GMM for standard errors.

Some Comments on the Empirical Analysis

- Repeat-sales method. predictability for $r_{t+1\to t+2}$
- Campbell-Shiller valuation identity requires either dividends or net payout (not total payout)
- Confusing notation: x_t in equation 1, but $x_t = pd_t$ after
- Table 3: Lack of predictability in roughly 50% of the industries
- A version of x_t^{cf} should be central to analysis
  - ICAPM vs CAPM
  - Weak relation between $\mathbb{E}[r]$ and σ (see Campbell et al (2017))
- Tables 5 and 7 use different clustering methods
- Some of the control variables (such as business cycle βs) are estimated. System GMM for standard errors.

Some Comments on the Empirical Analysis

- Repeat-sales method. predictability for $r_{t+1\to t+2}$
- Campbell-Shiller valuation identity requires either dividends or net payout (not total payout)
- Confusing notation: x_t in equation 1, but $x_t = pd_t$ after
- Table 3: Lack of predictability in roughly 50% of the industries
- A version of x_t^{cf} should be central to analysis
  - ICAPM vs CAPM
  - Weak relation between $\mathbb{E}[r]$ and σ (see Campbell et al (2017))
- Tables 5 and 7 use different clustering methods
- Some of the control variables (such as business cycle βs) are estimated. System GMM for standard errors.

Some Comments on the Model

- i.i.d shocks = Business Cycle Shocks?

- Can you generalize the Δs process to have non-zero ϕ in bad times? Identification (equation 12) seems to depend heavily on this assumption

- What is the role of MSA specific non-housing goods?

Some Comments on the Model

- i.i.d shocks = Business Cycle Shocks?
- Can you generalize the Δs process to have non-zero ϕ in bad times? Identification (equation 12) seems to depend heavily on this assumption
- What is the role of MSA specific non-housing goods?

Some Comments on the Model

- i.i.d shocks = Business Cycle Shocks?
- Can you generalize the Δs process to have non-zero ϕ in bad times? Identification (equation 12) seems to depend heavily on this assumption
- What is the role of MSA specific non-housing goods?

Outline

The Paper

Major Comments

Minor Comments

Final Remarks

Final Remarks

- Paper is very interesting: important question!
- Needs to better disentangle the difference between expected growth and expected returns
- Good luck!

Final Remarks

- Paper is very interesting: important question!
- Needs to better disentangle the difference between expected growth and expected returns
- Good luck!

Final Remarks

- Paper is very interesting: important question!
- Needs to better disentangle the difference between expected growth and expected returns
- Good luck!