

Why Are Exchange Rates So Smooth? A Segmented Asset Markets Explanation

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What is the question of the paper? Why should we care about it?

There is no link between prices and quantities in international finance. From the data on the real exchange rate and asset prices, the authors see the volatility of the real exchange rate is much smaller than that of the stochastic discount factor (pricing kernel). That implies the stochastic discount factor is highly correlated across countries. But the quantity data show the different picture. By the standard representative agent models, the correlation of pricing kernels is equal to the correlation of aggregate consumption growth. Empirically, the correlation of aggregate consumption growth is less than 50% for most industrialized country pairs. The authors try to build the connection between prices and quantities.

What is the author's answer?

1. The author calibrate the model to evaluate the extent to which the model can account for the international correlation in pricing kernels, the volatility of the pricing kernel and the volatility of the RER seen in the data.
2. The model shows the high cross-country correlation in the pricing kernel is not necessarily the evidence of the high degree of international risk sharing as the latter is determined by a small group of sophisticated investors who frequently trade domestic and foreign equities. Their portfolio adjustments even drive the volatility of the real exchange rate and generate a positive correlation between the real exchange rate and relative consumption growth. Hence, the author has not solved the Backus-Smith puzzle which documents a negative correlation between the real exchange rate and relative consumption growth.
3. The main contribution to the literature is the integration of the micro evidence on household portfolio choices into a general equilibrium model to solve the exchange rate smoothness puzzle first articulated by Brandt, Cochrane, and Santa-Clara (2006).
4. Aggregate risk is concentrated among a small fraction of households that also share aggregate risk with a small fraction of foreign households. The risk distribution is driven by heterogeneous portfolio choices which are strongly supported by the empirical evidence.
5. The study contributes to the emerging literature that integrates international portfolio choice into international macroeconomics. Specifically, the authors demonstrate the importance of household portfolio heterogeneity in open economies, whereas the majority of open-economy macroeconomic models rely on a representative agent framework.
6. International macroeconomic models assume either incomplete markets with only one asset or a complete market environment without heterogeneity in trading technologies. But a complete menu of assets is traded in the model we allowing for heterogeneity in household trading technologies. Because it is strongly supported by the data, the model creates a role for the heterogeneity in trading technologies that we observe in the data. Therefore, the model provides a laboratory for studying the consequences of the cross-sectional heterogeneity in portfolio choices on exchange

rates.

How did the author get there?

1. The author use a general equilibrium model with asset trading restrictions and consumption home bias to demonstrate that real exchange rate volatility is related to frictions in both goods and financial markets. The asset trading restrictions imposed in the model are in line with the empirical evidence in the household finance literature.
2. With a realistic assumption that most investors do not actively participate in the domestic and foreign equity markets, the author reconcile highly correlated and volatile pricing kernels with low correlation in consumption growth.
3. Instead of assuming that aggregate risk has been distributed efficiently across households, the authors focus on the sophisticated investors who bear their share of aggregate risk. The mechanism in the model relies on the skewness of the cross-sectional distribution of aggregate risk. Thus, the marginal investor's consumption growth is highly correlated across countries. This mechanism can quantitatively account for the excess smoothness of the real exchange rate in the presence of stochastic discount factors that satisfy the Hansen-Jagannathan bounds.

Example

This example is come up for the authors' realistic assumption that most investors do not actively participate in the domestic and foreign equity markets. The following tables are excerpted from Guiso, L., and P. Sodini (2012).

A. Direct Stockholding							B. Direct and Indirect Stockholding						
	Quartile I	Quartile II	Quartile III	Quartile IV	Top 5 %	Average		Quartile I	Quartile II	Quartile III	Quartile IV	Top 5 %	Average
US	1.4	6.9	20.6	47.9	70.1	19.2	US	4.4	38.3	66	86.7	93.7	48.9
UK	0	4.4	28.3	53.6	67.9	21.6	UK	4.9	11.9	37.8	71.1	83.9	31.5
Netherlands	1.5	7.4	20	40.3	60.2	17.2	Netherlands	1.7	11	31.3	52.8	72	24.1
Germany	0.6	4.1	16.1	36.1	50.5	14	Germany	1.5	11.8	28.7	51.4	61.2	22.9
Italy	0	0.8	3.1	12.8	30.8	4	Italy	0	0.8	5.2	27.5	64.8	8.2
Austria	0	1.7	2.8	15.6	25.7	5	Austria	0	1.9	8.1	25.5	33.8	8.8
Sweden	12.9	30.7	46.9	72.8	80.6	40.8	Sweden	25.8	63.4	82.7	92.9	95.8	66.2
Spain	0	0.3	1.8	13.2	14.4	3.5	Spain	0	1.1	3	19.1	24.6	5.4
France	0.7	9.9	14.6	33.3	44.2	14.4	France	1.1	17.6	29.9	57.6	67.3	26.2
Denmark	6.3	25.9	36.4	55.6	68.4	31	Denmark	6.6	30.8	44.8	65.7	75.4	37
Greece	0	0.7	3.2	17.3	23.5	4.9	Greece	0	0.7	4	22.2	32.9	6.3
Switzerland	2.8	12.2	30.3	54.2	63.2	24.9	Switzerland	2.8	20	38.2	63.7	65.8	31.4

Source: Guiso, L., and P. Sodini (2012): "Household Finance: An Emerging Field," CEPR Discussion Papers.

It's hard to convince me of the fixed participation. Among the top 5% wealthiest investors, 28% have no stocks in the Netherlands, 39% in Germany, and 75% in Spain.

A quick look at the model

1. The country-specific endowment in period t :

$$\ln Y_t = t \ln \bar{g} + \ln m_t, \quad \ln Y_t^* = t \ln \bar{g} + \ln m_t^*, \text{ where}$$

m_t, m_t^* : the percentage deviation of endowment from the growth trend.

\bar{g} : the average growth rate of endowment of both countries.

2. Preferences:

$$\sum_{t=1}^{\infty} \beta^t \sum_{(z^t, \eta^t)} \frac{c(z^t, \eta^t)^{1-\gamma}}{1-\gamma} \pi(z^t, \eta^t), \text{ where}$$

γ : the coefficient of relative risk aversion. $c(z^t, \eta^t)$: the consumption basket.

3. Correlation of consumption growth: $C(z^t) = Y_n(z^t)^\theta Y_x^*(z^t)^{1-\theta}$.

4. Leverage and assets supply: with a constant leverage ratio, the total supply is

$$\bar{B}_t(z^t) = \phi[W_t(z^t) - \bar{B}_t(z^t)], \text{ where}$$

$W_t(z^t)$: a claim to home country's aggregate diversifiable income in period t.

5. Heterogeneity in trading technologies: trading of mertonian investors' financial wealth in period t

$$a_t(z^t, \eta^{t-1}) = a_{ht}(z^t, \eta^{t-1}) + \frac{a_{ft}(z^t, \eta^{t-1})}{e_t(z^t)}, \text{ where}$$

a_{ht} : the payoff of state – contingent claims in the home country in terms of the home consumption basket.

a_{ft} : the payoff of state – contingent claims in the foreign state in terms of the foreign consumption basket.

e_t : the RER.

Trading of non-mertonian investors' financial wealth in period t

$$\hat{a}_t(z^t, \eta^t) + c(z^t, \eta^t) \leq R_{t,t-1}^p(z^t) \widehat{a}_{t-1}(z^{t-1}, \eta^{t-1}) + \alpha[q_n(z^t)Y_n(z^t) + \frac{R_x^*(z^t)}{e_t(z^t)}Y_x(z^t)]\eta_t, \text{ where}$$

$\widehat{a}_{t-1}(z^{t-1}, \eta^{t-1})$: total asset holding at the beginning of period t, is given by their asset position at the end of the previous period.