The determinants of cross-border equity flows

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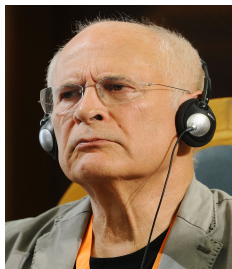Reporter
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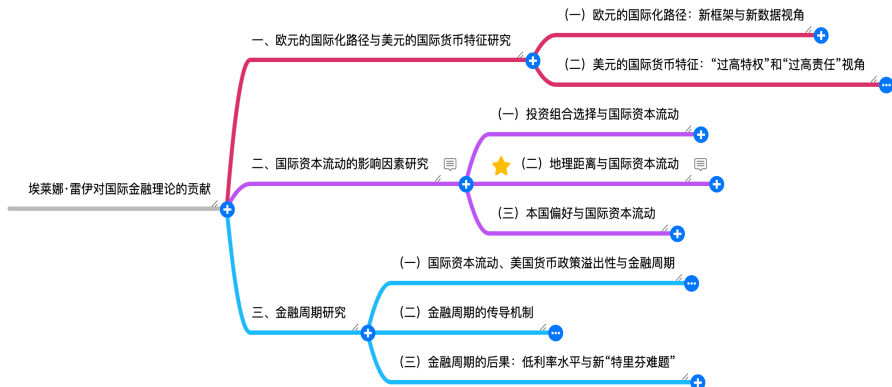

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Rey 的金融理论贡献

埃莱娜·雷伊对国际金融理论的贡献

一、欧元的国际化路径与美元的国际货币特征研究
- （一）欧元的国际化路径：新框架与新数据视角
- （二）美元的国际货币特征："过高特权"和"过高责任"视角

二、国际资本流动的影响因素研究
- （一）投资组合选择与国际资本流动
- ⭐（二）地理距离与国际资本流动
- （三）本国偏好与国际资本流动

三、金融周期研究
- （一）国际资本流动、美国货币政策溢出性与金融周期
- （二）金融周期的传导机制
- （三）金融周期的后果：低利率水平与新"特里芬难题"

Introduction
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Indroduction
Background

Very few results on international trade in assets: **especially securities.**

- data problems
- little theory behind it.

How to solve it?

A **systematic geographical pattern** in the distribution of international portfolio equity transactions.

Data: cross-border equity transaction flows.

- cross-border purchases and sales of equities.
- major equity market.(EU, US, Asia)

Indroduction
Finding

Gravity model: explaining asset trade $\succcurlyeq$ goods trade.
70% of the variance of gross cross-border equity transactions.
The most important determinants of transaction flows:

- market size
- transactions technology
- distance

Negative effect of distance: cov(informational frictions, distance)>0
Geographical distance is a barrier:

- economic agent; cultural exchange.

If diversify their portfolios, buy equities:

- cov(other business cycles, own cycle)<0
- cov(distance, asset trade) >0

Indroduction
hypothesis

The hypothesis of informational frictions

- cov(informational frictions, distance) >0.
- other variables more directly represent information flows.
    - telephone call traffic
    - the degree of overlap in trading hours
    - multinational bank branches
- the information asymmetries between domestic and foreign investors:
    - an index of the degree of insider trading.

Gross cross-border equity portfolio flows
2.1. What do we know?

There is a substantial literature on home bias in asset holdings

- Tesar and Werner (1995); Brennan and Cao (1997) ; Froot et al.(2001)

Two arguments are suggestive.

- studying asset holdings appeal to informational asymmetries that increase with distance
  - ▶ Ghosh and Wolf (1999)
- **gravity** model accounts well for FDI flows among European countries.

  - ▶ de Ménil (1999)

Few paper: determinants of international transactions in assets and their link with informational asymmetries.

Gross cross-border equity portfolio flows
2.2. Information asymmetries in the literature

The relevant information, includes knowledge of

- accounting practices
- corporate culture
- political events
- the structure of asset markets and their institutions.

The information available to market participants differs among them.

- Such as, US bias investments towards companies whose headquarters are located nearby earn more returns.
  - ▸ Coval and Moskowitz (2001)
- distance is a significant determinant of stock holdings and trades.
  - ▸ Grinblatt and Keloharju (2001)
- and so on...

Gross cross-border equity portfolio flows
2.3. An empirical model of asset trade

The log of transactions in equities T_{ij} (sum of purchases and sales) from country i to country j:

$$\log T_{ij} = k_1 \log (M_i M_j) + k_2 \log (\tau_{ij}) + k_3 \tag{1}$$

where M_{ij} are measures of the economic masses, τ_{ij} represents the trading cost and $k_1 > 0$, $k_2 < 0$ and k_3 are constants to be estimated.

Very intuitive and similar to the standard '**gravity**' equations.

- the trading cost = information cost + the efficiency of the transaction technology.
- information cost.
  - ▶ longer distances↑→ cultural differences↑→ business links↓
  - ▶ data：distance; information transimission(tele; bank; overlap trading hours).
- transaction technology.
  - ▶ sophistication of financial markets: credit/GDP.

Gross cross-border equity portfolio flows
2.3. An empirical model of asset trade

To summarize:

$$\log\left(T_{ij,t}\right) = \alpha_1 \log\left(mktcap_{i,t}\right) + \alpha_2 \log\left(mktcap_{j,t}\right) + \alpha_3 \log\left(\text{distance}_{ij}\right)$$
$$+ \alpha_4 \text{ information varibales} + \alpha_5 \text{ transaction technology variables}$$
$$+ \text{ time dummies} + \text{contant} + \varepsilon_{ij,t}$$

(2)

Suggests that $\alpha_1 = \alpha_2 = 1, \alpha_3 < 0$ and $\alpha_4 > 0, \alpha_5 > 0$.
Normalized form:

$$\log\left(T_{ij,t} / \left(mktcap_{i,t} \times mktcap_{j,t}\right)\right)$$
$$= \beta_1 \log\left(\text{distance}_{ij}\right) + \beta_2 \text{ information variables}$$
$$+ \beta_3 \text{ transaction technology variables } + \text{ time dummies}$$
$$+ \text{ constant } + v_{ij,t}$$

(3)

Data

data:

- panel: 1989-1996; annual;
- biateral flows: 14 source; 1456 observation(8*13*14);
- transactions data: $purchas_{ij}$ and sal_{ij};

Countries:

- North America: US, CA.
- East Asia: JP, HK, SG.
- EU Eurpe: UK, GE, FR, NL, SP, IT, SV(Scandinavia).
- Non-EU: SW, AU.

Data

Table 1
Summary statistics

(a) Source country total purchases, sales, gross flows, net flows, 1989–1996 (US$ billions)

	Purchases mean	Sales mean	Transaction flows			Net flows means
			mean	min	max	
US	21.235	17.995	39.230	2.180	419.006	3.240
Japan	3.473	3.212	6.681	0	71.603	0.265
UK	19.001	18.260	37.258	0	319.84	0.743
Germany	2.541	2.305	4.846	0	27.515	0.236
France	2.223	2.140	4.363	0	21.833	0.083
Switzerland	6.142	5.962	12.101	0	84.536	0.183
Netherlands	2.023	1.754	3.776	0	33.502	0.268
Spain	0.159	0.137	0.296	0	2.937	0.022
Italy	0.974	0.925	1.895	0	22.329	0.050
Scandinavia	0.684	0.534	1.214	0	14.000	0.153
Canada	3.146	2.866	6.010	0	103.081	0.282
Australia	0.560	0.512	1.071	0	7.917	0.049
Hong Kong	1.884	1.730	3.614	0	26.040	0.155
Singapore	1.324	1.078	2.401	0	23.972	0.247

(b)

Non-US transactions in percentage of total transactions	42%	
Intra-European transactions in percentage of total transactions	24%	
Distance (km)	mean	7039
	min	235
	max	17,700
Telephone volume (millions of minutes)	mean	99
	min	0.7
	max	3462
Market capitalization (US$ millions)	mean	752
	min	28
	max	6680

Data

Information flows and transactions costs, as well as equity market returns, and their covariances.

- $dist_{ij}$ (-): distance between country i and country j.
- $teleph_{ij}$ (+): volume of telephone call traffic in minutes.
- $bank_{ij}$ (+): number of branches(banks headquartered).
- $overlap_{ij}$ (+): number of trading hours overlap.
- $insiders_{ij}$ (-): degree of insider trading.
  - (World Competitiveness Report, 1996, 1998, 2000).
- $soph_{ij}$ (+): sophistication of financial markets.
  - (World Competitiveness Report, 1996, 1998, 2000).
- $covar_{ij}$ (-): covariances of stock market returns.

4.1. Further robustness checks

Table 2
Bilateral equity flows 1989–1996 (1–3); normalised flows (4–8); full set of country dummies (7); control for goods trade (8)

	(1) equity$_{ij}$	(2) equity$_{ij}$	(3) equity$_{ij}^a$	(4) equitynor$_{ij}$	(5) equitynor$_{ij}$	(6) equitynor$_{ij}^a$	(7) equitynor$_{ij}^b$	(8) equitynor$_{ij}$
mktcap$_i$	0.987	0.993	1.006	–	–	–	–	–
	(0.037)	(0.030)	(0.058)					
mktcap$_j$	1.055	1.061	1.077	–	–	–	–	–
	(0.035)	(0.032)	(0.058)					
soph$_i$	0.456	0.610	0.627	0.609	0.434	0.451	0.169	0.441
	(0.038)	(0.034)	(0.055)	(0.034)	(0.039)	(0.066)	(0.124)	(0.038)
soph$_j$	0.094	0.248	0.265	0.258	0.080	0.119	−0.202	0.065
	(0.037)	(0.030)	(0.055)	(0.029)	(0.042)	(0.077)	(0.127)	(0.041)
dist$_{ij}$	–	−0.881	−0.890	−0.881	−0.673	−0.684	−0.646	−0.529
		(0.031)	(0.063)	(0.031)	(0.040)	(0.056)	(0.056)	(0.042)
telephnor$_{ij}$	–	–	–	–	0.174	0.171	0.078	0.155
					(0.027)	(0.045)	(0.032)	(0.027)
banknor$_{ij}$	–	–	–	–	0.148	0.136	0.236	0.174
					(0.034)	(0.068)	(0.057)	(0.034)
insiders$_j$	–	–	–	–	−0.001	0.045	−0.209	0.026
					(0.044)	(0.083)	(0.105)	(0.044)
trade$_{ij}$	–	–	–	–		–		0.224
								(0.031)
N	1456	1456	182	1456	1456	182	1455	1456
$F(K, N\text{-}K\text{-}1)$	206.71	352.58	189.74[c]	62.97	99.17	53.59[d]	66.19[e]	99.00
R^2	0.555	0.693	0.844[f]	0.322	0.445	0.648[f]	0.562	0.463

(handwritten annotations: dist — 变小; telephnor — 正; insiders — 不稳定; robust; 解释力变大，70%)

- All our estimates include time dummies.
- [a]: Between regression on group means.
- [b]: There is a full set of dummy variables for both source and recipient countries.

New York, London and Tokyo are the world's major financial centers, and even after allowing for their market sizes and sophistication, we might expect them to enter **disproportionately** in the data.

- *(see Mason and Warnock, 2001).*

Table 3

	Excluding US	Excluding US and UK	Flows within Europe			Without intra-European flows
	(1) $equitynor_{ij}$	(2) $equitynor_{ij}$	(3) $equitynor_{ij}$	(4) $equitynor_{ij}$	(5) $equitynor_{ij}$[a]	(6) $equitynor_{ij}$
$soph_i$	0.521	0.519	0.566	0.495	0.510	0.445
	(0.040)	(0.043)	(0.061)	(0.070)	(0.125)	(0.561)
$soph_j$	0.0733	0.123	0.007	−0.302	−0.291	0.190
	(0.046)	(0.050)	(0.055)	(0.100)	(0.213)	(0.056)
$dist_{ij}$	−0.721	−0.856	−0.756	−0.727	−0.719	−0.632
	(0.047)	(0.056)	(0.126)	(0.139)	(0.269)	(0.087)
$telephnor_{ij}$	0.156	0.141	–	0.084	0.081	0.182
	(0.030)	(0.032)		(0.057)	(0.087)	(0.033)
$banknor_{ij}$	0.151	0.118	–	0.020	0.025	0.192
	(0.047)	(0.055)		(0.073)	(0.165)	(0.039)
$insiders_j$	0.021	0.026	–	−0.398	−0.374	0.027
	(0.048)	(0.0511)		(0.117)	(0.251)	(0.195)
N	1248	1056	448	448	56	1008
$F(K,N-K-1)$	95.26	79.74	31.04	26.03	12.82[b]	57.86
R^2	0.457	0.450	0.408	0.429	0.611[c]	0.404

[a] 'Between' regression on group means.

4. The determinants of portfolio equity investment flows
4.2. Further robustness checks

We found the intra-European results very striking.

- Even **integrated** economic, significant informational segmentation.
- To document this effect further, we studied the geographical coverage of some of the main European newspapers.

Table 4
National information sets

Geographical coverage of *Le Monde*, *The Guardian*, *Frankfurter Allgemeine Zeitung*, *La Stampa* (1996–1998)								
Le Monde	UK	France	Germany	Netherlands	Switzerland	Spain	Italy	Scandinavia
(%)	17	27	8	7	15	17	9	
The Guardian	UK	France	Germany	Netherlands	Switzerland	Spain	Italy	Scandinavia
(%)	46	15	6	5	9	13	6	
Frankfurter	UK	France	Germany	Netherlands	Switzerland	Spain	Italy	Scandinavia
(%)	17	29	5	12	13	15	9	
La Stampa	UK	France	Germany	Netherlands	Switzerland	Spain	Italy	Scandinavia
(%)	22	30	22	4	6	11	5	

Geographical coverage of the *Financial Times*, *Les Echos* and *Il Sole 24 Ore* (1993–1998)								
Financial Times	UK	France	Germany	Netherlands	Switzerland	Spain	Italy	Scandinavia
(%)	30	25	7	6	9	12	11	
Les Echos	UK	France	Germany	Netherlands	Switzerland	Spain	Italy	Scandinavia
(%)	29	29	5	6	10	13	7	
Il Sole 24 Ore	UK	France	Germany	Netherlands	Switzerland	Spain	Italy	Scandinavia
(%)	22	31	27	3	6	7	4	

世界报，法国 卫报，英国 法兰克福汇报 德国 新闻报 意大利 金融时报 英国 回声报 法国 太阳报 意大利

- general interest newspaper: cov(number of articles, the distance) = -0.23.
- the financial newspapers: cov(number of articles, the distance) = -0.33.

4. The determinants of portfolio equity investment flows
4.3. Portfolio diversification

When we control for diversification motives, the results are quite interesting.

- We define net purchases: $purcha_{ij}$ - $sales_{ij}$.
- risk diversification: $covar_{ij}$
  - the stock market indices; gdp growthrate; consumption growth rate.
- If diversification motive, covariance $\rightarrow (-)$
  - the greater the **comovements** between financial assets of two countries, **the lower the benefit of diversification**.
  - empirically: cov(correlations of different countries' assets, distance) < 0;
  - further: cov(distance, business cycles) < 0;
- If diversification motive were powerful:
  - French people should invest a lot in Australian equities.
    - since cov(FR stock, AU stock) $= 0$
  - But if French people know very little about Australia, they may not want to invest there much anyway.

4. The determinants of portfolio equity investment flows
4.3. Portfolio diversification

Table 5
Estimates with trading hour overlap (1); benchmark regression with purchases; impact of risk diversification on purchases (3–6)

	(1) equitynor$_{ij}$	(2) purnor$_{ij}$	(3) purnor$_{ij}$	(4) purnor$_{ij}$ (other definition of covar$_{ij}$)	(5) purnor$_{ij}$	(6) purnor$_{ij}$
soph$_i$	0.464	0.504	0.505	0.524	0.507	0.532
	(0.042)	(0.058)	(0.058)	(0.061)	(0.058)	(0.058)
soph$_j$	0.107	−0.015	−0.016	−0.002	−0.015	0.050
	(0.044)	(0.069)	(0.813)	(0.071)	(0.069)	(0.044)
dist$_{ij}$	−0.532	−0.699	−0.715	−0.709	−0.745	−
	(0.080)	(0.051)	(0.051)	(0.053)	(0.053)	not control
telephnor$_{ij}$	0.165	0.206	0.217	0.222	0.217	
	(0.028)	(0.036)	(0.036)	(0.036)	(0.036)	
banknor$_{ij}$	0.136	0.129	0.121	0.121	0.120	
	(0.034)	(0.039)	(0.038)	(0.039)	(0.038)	
insider$_j$	−0.011	0.085	0.092	0.100	0.093	−
	(0.044)	(0.074)	(0.074)	(0.075)	(0.074)	
overla$_{ij}$	0.057	−	−	−	−	−
	(0.033)					
covar$_{ij}$	−	−	0.325	−0.303	−	0.346
			(0.112)	(0.185)		(0.136)
			time-variant	time-invariant		
covar$_{ij}$/dist$_{ij}$	−	−	−	−	2.915	−
					(0.948)	
N	1448	1456	1456	1456	1456	1456
$F(K, N-K-1)$	98.19	71.84	69.72	67.05	69.42	19.09
R^2	0.451	0.335	0.338	0.336	0.339	0.123

- covar$_{ij}$:(1) the monthly returns on the stock market indices; (2) GDP growth rates (3) consumption growth rate.
- the diversification motive is **overwhelmed** by the friction.

international equity transactions are very **asymmetric**:

Table 6
Bilateral manufactures trade and equities trade, 1989–1996

trade_{ij}	(1)	(2)	equity_{ij}	(3)	(4)	(5) within Europe
$\text{gdp}_i \times \text{gdp}_j$	0.512	0.580	$\text{mktcap}_i \times \text{mktcap}_j$	1.057	0.862	0.711
	(0.013)	(0.013)		(0.022)	(0.036)	(0.010)
$\text{gdppc}_i \times \text{gdppc}_j$	0.147	0.180	trade_{ij}	–	0.364	0.485
	(0.064)	(0.059)			(0.048)	(0.102)
dist_{ij}	−0.547 减少	−0.279	dist_{ij}	−0.666	−0.455	−0.451
	(0.048)	(0.052)		(0.040)	(0.046)	(0.163)
telephnor_{ij}	–	0.123	telephnor_{ij}	0.179	0.131	0.038
		(0.010)		(0.027)	(0.027)	(0.055)
banknor_{ij}	–	0.141	banknor_{ij}	0.162	0.157	0.101
		(0.019)		(0.035)	(0.034)	(0.074)
NorthAm	1.461	1.398	soph_i	0.417	0.486	0.669
	(0.114)	(0.104)		(0.040)	(0.041)	(0.083)
EU	0.020	0.472	soph_j	0.055	0.116	−0.074
	(0.117)	(0.119)		(0.044)	(0.043)	(0.112)
EastAsia	1.484	1.440	insider_j	0.019	−0.003	0.303
	(0.131)	(0.127)		(0.045)	(0.044)	(0.122)
N	1456	1456	N	1456	1456	448
$F(K, N-K-1)$	495.82	539.14	$F(K, N-K-11)$	315.95	299.76	57.85
R^2	0.702	0.747	R^2	0.707	0.720	0.692

All the regressions include a full set of time dummies. We use the product of market capitalizations on the right-hand side of the equity equation to offer the closest parallel with the standard trade in goods specification.

6. Relation between transaction flows and asset holdings

- So far, focused on the determinants of financial asset transactions.
- different: the determinants of asset holdings.
- link: asset transactions and holdings.

We find a very strong positive correlation between the transactions data and the asset holding data:

$$\log(\text{ US transactions }) = \underset{(0.053)}{1.05} \log(\text{ US holdings }) + \underset{(0.127)}{6.66}; \quad R^2 = 0.87$$

$$\log(\text{ US holdings }) = \underset{(0.082)}{0.47} \log(mktcap) + \underset{(0.098)}{0.24} \text{soph}_i - \underset{(0.262)}{0.71} \log(\text{distance})$$
$$+2.05; R^2 = 0.63$$

$\rightarrow$ the same informational friction shapes the pattern of international asset **transactions** and **holdings**

7. Conclusion

- very important **geographical** component in international asset flows.
- **gravity** model explains transactions in financial assets at least as well as trade in goods.
- accounts for almost **70**% of the variance of the transaction flows.
- distance as a **proxy** for information asymmetries
  - ▶ telephone traffic, number of bank branches, index of insider trading.
- We found **weak** evidence of a diversification motive.
  - ▶ The covariance variable enters with the sign predicted by (-) only control information friction.
- market capitalization, market sophistication, and distance give a good explanation for holdings.

附录 1

自 20 世纪 90 年代中期以来，跨境资产和负债的国际资本流动规模已经从世界 GDP 的 60% 上升到 2015 年的大约 200% 左右。从美国的数据来看，1975 年的债券和股票跨境交易总额相当于 GDP 的 4%，这一比例在 20 世纪 90 年代初和 2000 年分别上升到 100% 和 245%。这些大规模资产的回报和损失情况将对各国的外部资产头寸产生显著影响，不同资产的投资组合是影响外部资产头寸短期供求平衡的重要影响因素，这些问题都引起了雷伊及其合作者的广泛关注，其关于国际资本流动决定因素讨论的创新体现在：

- 一是从微观与宏观相结合的视角来讨论国际资本流动的决定因素，**创新性地将"引力模型"纳入分析框架**；
- 二是利用最新的经验数据来验证关于国际资本流动影响因素的创新观点。

附录 2
地理距离与国际资本流动

　　地理距离与商品贸易密切相关，引力模型将距离和经济总量纳入国际贸易交易量分析中发现，**两国之间的双边贸易规模与经济总量成正比，与距离成反比**。引力模型在国际贸易领域得到了广泛应用，但雷伊等（2001）创新性地使用引力模型讨论了地理距离与国际资本流动之间的关系，并利用美国和 40 个市场（包括发达市场和新兴市场）的双边资本流动数据（包括公司股票、公司债券和政府债券）进行研究发现，作为交易成本较低且名义上与地理特征无关的金融资产，在存在信息摩擦的情况下，无论投资者基于何种动机（例如投资多元化或者投机性等），**当选择距离作为信息不对称的代理变量时，与贸易引力模型一样得到了距离与金融交易流量负相关的结论。**

　　进一步的研究还发现，距离所代理的信息不对称可能来自会计实务、企业文化等商业条件，也可能来自金融市场的流动情况等金融条件。因此，不同金融资产的信息含量差异将会影响金融资产的交易流量，其中公司股票和公司债券的信息含量较高，受信息不对称（信息摩擦）影响大。

　　此外，雷伊等（2005）将商品贸易和股票交易都纳入引力模型中发现，总交易量取决于来源国和目的地国的市场规模以及交易成本，而信息对市场规模和交易成本有重要影响。研究发现，**信息含量能够明显提高商品贸易交易量，传统国际贸易理论下交易成本的作用被夸大。在控制商品交易的前提下，信息含量对股票交易量也会产生重要影响。**雷伊等（2001；2005）前后均得出一致结论认为，信息含量是投资组合股票、公司债券交易的决定性因素，而对国债等的影响则不显著。

感谢大家的聆听！