Diversification through trade

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The general question

- What is the impact of international trade on business cycles (mainly volatility)?

The contributions

- Theory: extend Eaton Kortum set-up with stochastic country specific productivity and shows that more trade generates lower volatility

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- Quantitative: use the model to assess the impact of observed/counterfactual changes in trade on volatility
- Data: present evidence suggesting that decades/countries more trade intense are less volatile

Outline of the comments

- Thoughts on the connection between data and theory
- Additional evidence on the relation between trade and volatility
- Possible research directions

The mechanism

- Two countries, hit by a country specific productivity shock z_i
- Under autarky

$$\begin{aligned} y_i &\sim z_i \\ Var(y_i) &\sim Var(z_i) \text{ for all } i \end{aligned}$$

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- Under trade some of the good produced in country i is input of production in country j. So productivity shocks in i affect output/productivity in j and

$$\begin{aligned} y_i &\sim (1-\alpha)z_i + \alpha z_j \\ Var(y_1) &\sim (1-\alpha)^2 Var(z_1) + \alpha^2 Var(z_2) + 2cov(z_i, z_j) \end{aligned}$$

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- Predictions: Trade always increase comovement. Trade might reduce volatility (depends on variance of foreign shocks and on the covariance of foreign and domestic shocks)

Evaluating the impact of trade on volatility

Need to identify foreign and domestic shocks. Model suggests that foreign shocks can be directly measured as

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Can ask how much of $\Delta Var(y_1)$ can be explained by $\Delta \alpha^2 Var(z_2) + \Delta cov(z_i, z_j)$. Valid identification but only meaningful if model not misspecified. Also results are a bit all-over the place

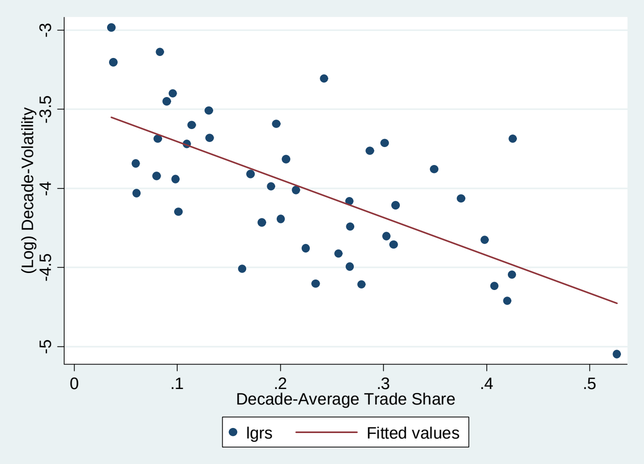
Trade and the great moderation?

Table 1. Change in Volatility from 1970-1980, for θ=0.5

Country	Percent Change in Standard Deviation (1)	Absolute Difference in Variance (2)	Absolute Difference in Var(Z) (3)	Absolute Difference in Var(dii) (4)	Absolute Difference in the Covariance (5)	Percent Share of difference (2) accounted for by (4) and (5)
Australia	45.79	4.65	4.97	-0.33	0.01	-6.89
Austria	-36.28	-8.07	-2.48	2.03	-7.61	69.22
Belgiumplus	-45.38	-13.09	-4.37	13.37	-22.10	66.64
Canada	-4.02	-1.44	12.16	2.55	-16.15	943.79
China,P.R.: Mainland	-15.43	-12.29	-9.42	1.62	-4.48	23.34
Denmark	-7.89	-1.54	-8.94	1.47	5.93	-480.04
Finland	54.87	33.69	48.85	0.43	-15.58	-44.97
Franceplus	-28.48	-7.37	-8.27	0.68	0.21	-12.18
Germany	0.69	0.18	2.16	2.97	-4.94	-1121.14
Greece	-47.92	-53.29	-57.64	0.60	3.76	-8.18
India	-18.19	-7.86	-13.60	0.45	5.29	-73.02
Ireland	64.02	27.38	30.38	11.24	-14.24	-10.93
Italy	-29.04	-7.78	1.78	-0.93	-8.64	122.86
Japan	24.11	9.24	10.36	-0.52	-0.60	-12.08
Korea	25.28	19.21	22.47	-2.84	-0.43	-17.00
Mexico	-36.98	-41.58	-26.29	3.86	-19.15	36.77
Netherlands	-21.98	-6.31	1.50	14.04	-21.84	123.75
Norway	7.35	1.54	-1.33	-1.12	3.99	186.63
Portugal	-14.96	-13.87	-22.40	0.48	8.05	-61.52
Spain	-43.41	-28.74	-27.25	-0.61	-0.88	5.18
Sweden	50.35	10.24	13.71	1.40	-4.87	-33.92
United Kingdom	-18.53	-6.17	-3.70	-0.95	-1.51	40.00
United States	-44.63	-14.39	-13.03	-0.17	-1.20	9.49

More direct evidence in the paper

Figure 1: Volatility and Trade-to-Output Shares.



Each dot is a decade, Largest world countries, 1970-2007, annual

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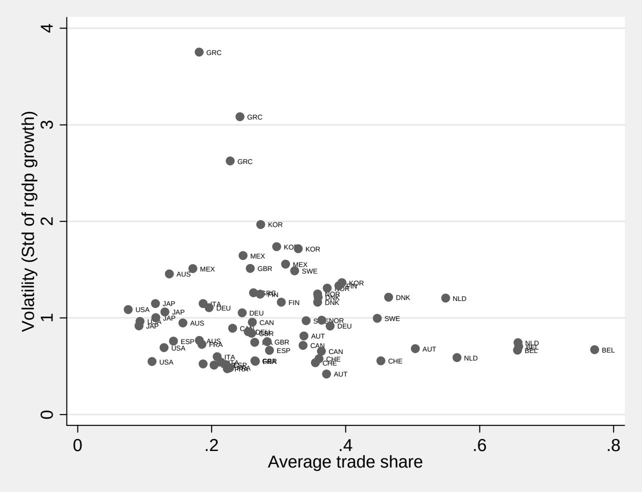
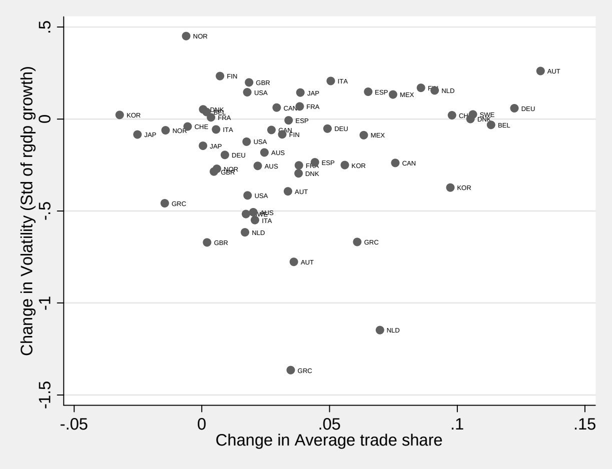


Each dot is a decade, OECD countries, 1970-2009, quarterly

How about controlling for country/time fixed effects



Each dot is change between decades, OECD countries, 1970-2009

Some numbers

Dependent variable is Std of GDP growth:

	1970-2009			1970-2000		
	Level	Level + FE	FD	Level	Level+FE	FD
Coeff of Trade	-0.42	-0.51	0.92	-0.28	-4.12	-3.90
	(0.52)	(2.09)	(0.85)	(0.69)	(3.97)	(2.24)
Obs	76	56	56	56	56	36

Standard errors clustered at the country level are in parentheses

Summarizing

- Some evidence of large negative relation between trade and volatility, but not very robust to change in sample, methodology etc. ("ambiguous at best")

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- Some evidence of large negative relation between trade and volatility, but not very robust to change in sample, methodology etc. ("ambiguous at best")
- This does not mean that the mechanism highlighted in the paper is not a valid one
- It suggests though that unconditional volatility in a decade strongly affected by events orthogonal to trade (i.e. Asian crises, oil shocks, financial crisis)

Trade and comovement

- Frenkel and Rose have documented strong relation between trade and comovement of output and TFP
- Kose and Yi have shown that this relation hard to replicate quantitatively in standard business cycle model, in particular hard to obtain that trade leads to more TFP comovement
- This model suggests that stochastic EKAL might help explain the pattern (also see Burstein, Kurz and Tesar)

Conclusions

- Very nice paper
- Main contribution in my view is that it proposes an extension of the EKAL model for business cycle analysis
- Could be a very useful to study shocks propagation and interaction between trade and intertemporal markets