

Discussion of Andrew K. Rose
“One Money, One Market: Common Currencies and Trade”
by
Danny Quah
CEPR and Economics Department LSE
dquah@econ.lse.ac.uk
<http://econ.lse.ac.uk/~dquah/>
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Rose has written a provocative paper that is likely to be highly cited and to generate a good number of thoughtful responses.¹

Rose’s paper—like many other good papers—addresses exactly one straightforward question. Here, that question is, What does a single currency imply for the volume of trade? There are no if’s, and’s, or but’s: A researcher, of course, needs to be careful and systematic in the answers procured. But the vision to go after is unsullied and single-minded.

The study has four main points. The first reflects on the literature: Rose asserts that, amazingly enough, no researcher has previously investigated this question rigorously. Second, the study uses the gravity model to disentangle the effects of currency integration on cross-country trade volume. Third, the dataset on pairwise trade relations is apparently extensive: It contains approximately 33,000 annual observations comprising a panel over about 190 countries between 1970 and 1990. Finally, and this is Rose’s punchline, The effects of a single currency are **HUGE**. Rose concludes from his empirical analysis that, conditioning on a range of other effects, “trade is over three times higher between common-currency countries” than between countries not sharing one money.

The reader will at this point say, Well, reducing exchange-rate volatility promotes considerably more trade than I might have at

¹ Rose has also, kindly and at very short notice, done for me the calculations that appear below. I think him, Richard Portes, and Charles Wyplosz for constructive suggestions and help.

first thought. But whatever it is from which the estimated increase in trade volume putatively derives, it is, by the author's numbers, *not* due to just a lowering of exchange-rate volatility. In the author's framework, there are two choices: A reader can believe in a massive discontinuity—reducing by a little bit exchange-rate volatility fosters trade a little, but what really helps trade massively is zeroing out volatility altogether (not leaving just a little behind, small though that residual might be). Some might find this implausible. The other possibility is that, indeed, something magical is at work when it comes to one money. However, nothing said in the paper or within ready reach of most economists at this stage of our knowledge gives us any clue what that magic might be.

The remainder of my discussion is structured as follows. In section 1, I describe why the author's use of the gravity model for cross-country trade is at odds with the paper's main intent. This, however, might be a matter of taste rather than science: The reader can decide. Section 2 digs into the guts of Rose's analysis: It points out (succinctly) where the results are robust. It asks why a reader might disbelieve the findings, and suggests where one might look next to study further the question. Section 3 briefly concludes.

1 Gravity

The gravity model of trade self-consciously takes a leaf out of the physicist's playbook. The model translates mass to national income, keeps physical distance, and seeks to explain the volume of trade the same way that physicists—very old-fashioned physicists—explain the (gravitational) force of attraction, with a simple equation relating the different quantities. Physicists do a pretty good job using their gravity model to explain and predict celestial motion.

In the current application one can ask, What does the gravity model of trade say about currencies, single or multiple? The answer is the same as what the gravity model of planetary motion says: Nothing. The gravity model of trade is entirely silent on what impact moving to a single currency might do to trade volumes. It is not just

that economic theory predicts the impact should be zero (as might happen, say, with rational expectations orthogonality tests). The theory doesn't have a place within it at all for currency integration! In terms of being guided by the economic theory, one might as well test for the impact of celestial comet showers on trade volumes across countries.

It is a little disingenuous to say that by using the gravity model—as the author does—to embed one's study of the impact of currency integration, one simply follows the dictates of economic theory and exploits theory as a way to guide the empirical analysis. One is doing no such thing. It might perhaps be better characterized as the *nuisance parameter school of empirical analysis*. There, a researcher estimates in essence the equation:

$$Y = X\beta + Z\gamma + \epsilon, \quad \text{with } \epsilon \perp (X', Z)'. \quad (1)$$

The hypothesis of interest is whether the underlying population parameter vector β lies within some subset \mathcal{A} . As in equation (1), this hypothesis informs on how X influences Y . The entries in Z are auxiliary, conditioning variables of no direct interest to the researcher; coefficients γ are then nuisance parameters.

When the researcher develops economic reasoning surrounding X and considers Z empirically relevant but economically uninteresting, an approach such as in (1) is eminently reasonable. However, distinguish it from analyses where the economic reasoning is on Z and γ —the nuisance parameters—while the hypothesis being investigated remains one targeted on $\beta \in \mathcal{A}$. Examples of the first approach might be studies of the relation between inequality and economic growth: The researcher develops an economic model relating these two (X and Y), provides a hypothesis on β , but notes that many other things (Z) potentially influence economic growth. Estimates of β are informative for the economic reasoning used.

An example of the second approach is the current study being discussed. The gravity model of trade underpins not X , but Z , the conditioning vector! The economic variable for X here is nothing that appears in the gravity model. Instead, it is the single-currency

dummy—of interest to the author and reader, but completely orthogonal to the gravity model. Whether a reader should call such an empirical study an analysis that draws on a theoretical model might well be a matter of taste. I for one would say it is not. It is an interesting empirical analysis, but no more.

This criticism should not be taken as harsh. There is nothing *wrong* or necessarily objectionable with the (not based on theory) regressions estimated in the paper. I am arguing here only that they be recognized as exploratory empirical analyses, in common with many other interesting studies.

And a reader does learn a lot from the regressions in the paper.

2 Guts

The paper relies on 33,903 bilateral trade observations over (pairs of) countries and for different years across time. Two groups partition this set of observations.

First is the subset of country-pairs and years where the pair of countries do not share a single currency. The second group is where there is a single currency. How many observations are there in the two different groups? The second group contains exactly 320 observations: This is 0.94% of the sample; it is a very small subgroup.

Note that membership in this second group depends not on everyone there sharing a unique single currency, only that for that year, there is some other country using the same currency as oneself. It will be useful to call this group the “single-currency” group, although, as just explained, this is something of a misnomer and should not be taken to mean that only one currency circulated everywhere in the group.

The differing behaviour across the two groups—the 99.06% majority and the interesting, innovative, experimental 0.94%—is what allows Rose to conclude “countries with the same currency trade over three times as much with each other as countries with different currencies!” [exclamation in the original].

How does this conclusion come about? What is so different across

	Mean (std. dev.)	
	99.06% free	0.94% single
Bilateral trade	9.1 (3.3)	8.8 (3.0)
Output, pair-product	34.4 (2.7)	28.8 (4.0)
Output per capita, pair-product	16.2 (1.4)	15.2 (1.6)
Pairwise distance	8.2 (0.8)	6.6 (1.5)
Contiguity	0.02 (0.15)	0.09 (0.29)

Table 1: Comparing country pairs in and out

the two subgroups, aside from one not having shared currencies at all, the other having currencies so? Table 1 shows means and standard deviations within each of the groups. Glancing down the main columns, the two groups seem surprisingly alike. Bilateral trade is not only roughly the same on average—9.1 for the first group, 8.8 for the second—but also surprisingly similar in its fluctuations (standard deviation 3.3 in the first group, 3.0 in the second). This first row of the table does not contradict Rose’s conclusion that *conditional on other variables Z*, the single-currency group trades more than the other group: Table 1 simply shows unconditional averages.

Looking further down the table, output and output per capita, in pairwise products, do not dramatically differ, although the single-currency group obviously has smaller overall output with mean value of 28.8 compared to 34.4 in the other group. The group standard deviation is also considerably larger for the single-currency countries—one’s hunch is there are many very small country-pairings here, with one or two very large ones then to bring up the average. The disparity in output per capita product-pairs between the two groups is much smaller, both in mean—16.2 in the first compared to 15.2 in the second—and standard deviations, although the directional differences are the same as for output overall.

We can get a little more insight by looking directly at who it is in this single-currency subgroup. Naming names, we have:

Anguilla, Antigua/Barbuda, **Australia**, Bahamas, Bar-

bados, Belize, Benin, Bhutan, Brit. Virgin Islands, Burkina Faso, Cameroon, Central Afr. Rep., Chad, Comoros, Congo, Cook Islands, Cote D'Ivoire, **Denmark**, Dominica, Falkland Is., Fr. So. Ant. Tr., Fr. Guiana, **France**, Gabon, Gibraltar, Greenland, Grenada, Guadeloupe, Guinea-Bissau, **India**, **Ireland**, Kiribati, Liberia, Mali, Montserrat, Nauru, New Caledonia, **New Zealand**, Niger, Nieu, Panama, Reunion, Senegal, St. Kitts & Nevis, St. Helena, St. Lucia, St. Pierre & Miquelon, St. Vincent & the Grenadines, Togo, Turks & Caicos Isl., Tuvalu, **UK**, **USA**, US. Virgin Islands.

Most of the countries that appear in the “single-currency” group are, indeed, quite small—with some notable exceptions. In bold, I have indicated those members that are atypical relative to the rest of the group. This list gives one an uneasy feeling that for most of the observations in this very small second group, too many special factors are at work to allow one to generalise potential policy conclusions for other countries.

3 Conclusions

As I said when I began this discussion, Rose has provided an interesting and provocative analysis—one that, I suspect, will engender lively debate and spirited response from the research community.

The author used the gravity model of trade to motivate the empirical analysis. The results indicate a staggeringly large impact on increasing trade from the move to a single currency.

In this discussion, I have raised four objections:

1. Even within the empirical framework used in Rose’s paper, the size of the trade-improving effect is puzzling. It does not arise, for instance, from simply reducing, continuously, the variability of exchange rates.
2. Saying that the empirical analysis is justified on a theoretical level by the gravity model of trade is misleading. The gravity

model is, properly, just a nuisance parameter in Rose's empirical framework.

3. The partition between subgroups, first not having single-currency characteristics and the second having so, is frighteningly skewed: Less than 1% of the total sample is in the single-currency group. Researchers have discarded subsamples larger than that in the pursuit of statistical robustness. Yet, it is what provides the author with the strong results that he has.
4. The single-currency subsample is small in more than one way. Even granting that the less-than-1% size is appropriate, most of the observations that appear in this group are, for one reason or another, unrepresentative of most of the real-world economies out there contemplating moves towards currency unification.