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An Estimate of the Effect of Currency Unions on Trade and Growth

Many countries are, for the first time, considering the possibility of abandoning independent currencies and adopting rigid institutional commitments, including currency boards (Argentina and Estonia), dollarization (El Salvador and Ecuador), or full currency union (the members of the European Monetary Union). Proponents tout such currency arrangements as the ultimate credible commitment to nonexpansionary monetary policy. The idea is that when the central bank ties its hands so it could not in the future expand the money supply even if it wanted to, workers expect lower inflation. As a result, the country achieves lower inflation for any given level of output. Indeed, in the long run, the enhanced monetary stability promotes higher real economic growth. One study, for example, finds that currency boards raise long-term growth by as much as 1.8 percent per year.

We find that currency unions are indeed good for the performance of the economy in the long run, as indicated by a statistical association with economic growth. The channel, however, runs via a substantial stimulus to trade among the members, rather than via

macroeconomic influences. In theory, as well as according to statistical evidence, trade is good for growth, and this is as true of trade that is stimulated by currency unions as of other sources of trade. This paper investigates both stages: the influence of currency unions on trade and the influence of trade on growth.

Currency unions go beyond reducing the variability of bilateral exchange rates. They eliminate altogether the risk of future changes in the exchange rate, as well as the transactions costs incurred from converting one currency into another. Thus they facilitate imports and exports. Past studies have not been able to find major effects over time of exchange-rate variability on trade. But by focusing on a cross-section of country pairs, we are able to find a large effect of currency unions. We estimate that when one country adopts the currency of another, trade between them eventually triples in magnitude.

We arrive at this estimate by studying trade between pairs of countries. We use the gravity model, so-called because it says that trade between two countries is inversely related to the distance between them and proportionate to the product of their sizes, much as the gravitational attraction between two heavenly bodies is inversely related to the distance between them and proportionate to the product of their masses. The model has been successful at predicting trade patterns. Measures of distance that are relevant for trade between a pair of countries include physical distance, measures related to adjacency and whether they are landlocked, and linguistic differences. Each has strong negative effects on trade. Measures of country size that are relevant are GDP, population, and land area.

After holding constant for all these important determinates, we can discern the independent effect on bilateral trade that comes when the two partners share a common currency. We also hold constant for past colonial history and ongoing political unions. Like the other gravity variables, these influences are significant statisti-

cally, but the independent effect of the currency union remains as well.

Our data to study bilateral trade include 41,678 bilateral trade observations—drawn from pairs among 186 countries, including in this definition of *country* dependencies, territories, overseas departments, and colonies. The data set spans six different years between 1970 and 1995. (Our growth equation uses a data set of annual observations for 210 countries.)

The threefold effect of currency unions on trade that we find sounds very large, and indeed it is. But it becomes plausible when one recalls findings that Canadian provinces are twelve to twenty times more inclined to trade with each other than with U.S. states, after holding constant for distance and size. Something has to explain such findings of "home country bias." The currency difference is as good a candidate as any other explanation. Our results show that among components of home bias, the currency union variable ranks in explanatory power roughly equal with the role of free trade areas, behind the colonial relationship, and ahead of linguistic links and the residual political boundary variable.

We checked whether the stimulus to trade between members of a currency union might come at the expense of trade with non-members. Such a diversion of trade away from nonmembers would imply less overall stimulus to total trade and less likelihood of positive effects on real income. We found no evidence whatsoever of trade diversion from currency unions. Indeed, we found that countries that belong to currency unions have higher overall openness, as measured by the ratio of trade to GDP, by 14 percent, as compared to countries that do not. (This estimate again holds constant for domestic size and income, along with overall remoteness from trading partners, and dummy variables such as landlockedness.) The foregoing estimate, however, does not take into account whether the country in question shares the currency of a large trading partner or a small one.

The next stage in our analysis is to investigate the effect of trade on growth. The proposition that trade has a positive effect on real income is almost as old as economic theory itself. It derives from the principle of comparative advantage. More recently, trade theorists have studied how an increase in trade might potentially have more than a onetime effect on the level of real income; it might raise the rate of economic growth on a long-term basis. Intensive economic interaction with the rest of the world speeds innovation and the adoption of new ideas, adding to growth in technological and managerial know-how and productivity.

Many empirical studies have confirmed a statistical relationship across countries between openness and the level or growth rate of real income. This is true even after holding constant for such other important determinants of growth as investment in physical capital (plant and equipment), investment in human capital (schooling), and initial income (the convergence phenomenon, whereby countries that start further behind have the potential to catch up).

Correlation does not necessarily imply causality, however. Trade may be correlated with growth because richer countries trade more, rather than the other way around. This is the problem of simultaneity: growth causes trade, while simultaneously trade causes growth. For example, countries tend to reduce tariffs as they become more developed. If a country engages in a lot of trade because it has low tariffs, the observed correlation with growth could be attributable to an effect of growth on tariffs and thereby on trade. Our statistical method for getting around this problem isolates that variation in trade that is specifically attributable to the exogenous influences captured by the gravity model. The influence of trade on growth turns out to be as strong or stronger when this technique is used, which we believe is free from the simultaneity problem. If a country engages in a lot of trade because it is located close to other large countries, the observed correlation with growth cannot be

attributed to an effect of growth on location and trade. It must be because higher trade leads to growth.

We seek to explain 1990 income per capita across countries. We begin by holding constant only for country size (as measured by population). We estimate an apparent correlation whereby each increase in the trade/GDP ratio (which we are calling openness) of 1 percentage point is associated with an increase in per capita income of 0.7 percent. But the openness variable may in part be standing in for a host of other variables. So we hold constant for 1970 income per capita, investment, two measures of schooling, and population growth. Controlling for these influences brings the coefficient on trade down to 0.25, which says that, holding constant for 1970 income, income in 1990 was 0.25 percent higher for every 1.0 percentage point increase in the trade/GDP ratio.

The equation also implies a process of partial convergence of income levels over twenty years, estimated at a speed equal to one-quarter of the total distance from the 1970 starting point to the long-run equilibrium. It follows that in the truly long run, the effect of a currency union on income is four times as large as the 1990 effect.

This estimate is still subject to the critique that it might reflect reverse causation, of income on trade. Our preferred way of addressing the simultaneity problem is to focus on a measure of trade that is built up from the bilateral predictions of the gravity model. When the trade coefficient is estimated with this technique, as already noted, it is at least as strong as when it is estimated without it. Every 1 percentage-point increase in openness is estimated to raise the level of income by an estimated 0.33 percent, over the twenty-year period. In the truly long run, the effect on income is again four times as large: 1.3 percent for every 1 percentage point of trade/GDP.

Finally, we combine our estimated effect of currency unions on trade with our estimated effect of trade on growth to derive a combined prediction of the effect of currency unions on growth. Our

predictions are based on the estimate that currency unions triple trade among the members. But the question of the ultimate effect should depend on who is adopting what currency. For example, our statistics imply generally that dollarization should raise an average country's income by roughly 4 percent over twenty years. But the answer varies according to whether or not the country in question is a natural trading partner of the United States.

El Salvador and Ecuador trade a lot with the United States, relative to their GDPs. The reasons are that they are small, the United States is large, and the distance is not great. As a consequence, our estimate is that dollarization should have a sufficiently large effect on the overall trade undertaken by El Salvador or Ecuador that it could raise their incomes by as much as 20 percent over the subsequent twenty-year period. But these countries trade much less with Europe, so that adopting the euro would have less effect on their overall trade and would thus be of less benefit to them. Conversely, Poland trades a lot with Western Europe, so that adopting the euro would subsequently raise income an estimated 20 percent, while dollarizing would have much less benefit. (In each of these three examples, trade with the regional hegemon is about half of the country's total trade. This implies that tripling the trade with the hegemon doubles the country's total trade.)

It is possible that our results, which we attribute to the bilateral trade channel, are in part due to other economic interactions that run along geographic lines that are similar to trade—investment, communication, migration. But we do offer evidence against the conventional belief that the long-term growth effects of currency unions come through macroeconomic influences. This follows from a demonstration of support for the hypothesis that the effects depend on the members being natural trading partners. We find no sign that simply belonging to a currency union in itself has any effect on a country's growth, beyond the effect achieved when the link is to major trading partners. Thus, it seems that the growth benefits do

not come through the central bank credibility route but rather through the trade route.

An implication for policy of the usual hypothesis—that the benefits come via monetary stability—would be that it does not much matter to what country one pegs one's currency, as long as it is to a country with a currency that is strong and stable in value. A conclusion from our analysis, however, is that geography belongs in the decision to whom one should link. Countries tend naturally to trade more with large neighbors; thus, the benefits to adopting the currency of a large neighbor, other things equal, will exceed the benefits to adopting the currency of a country that is smaller or more distant.

The analysis is subject to many qualifications. For one thing, our sample of currency union members tends to consist of small dependencies. We cannot be confident that the results generalize to large countries like the members of the European Monetary Union. (Indeed, the spirit of the paper is that countries that are too small to achieve economies of scale domestically are particularly dependent on the benefits of economic interaction through currency unions and trade.) For another thing, although we have held constant for many influences, there may be others that we have not yet captured. Finally, we do not know if the beneficial effects of currency unions on trade come quickly or might appear only with very long lags.