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Small States, Small Problems?
Income, Growth, and Volatility in Small States

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Summary: Small states have attracted a large amount of research. In this paper we test whether small states are any different from other states in terms of their income, growth, and volatility outcomes. We find that, controlling for location, small states have higher per capita GDP than other states. This income advantage is largely due to a productivity advantage, constituting evidence against the idea that small states suffer from an inability to exploit increasing returns to scale. Small states also do not have different per capita growth rates than other states. Small states do have greater volatility of annual growth rates, which is in part due to their greater volatility of terms of trade shocks. This terms of trade-based volatility is in turn due to small states' greater openness. However, their greater openness on balance has a positive net payoff for growth. The one differential policy measure that might be relevant for small states is to further open up to international capital markets in order to better diversify risk, but the benefits of even that are still unresolved in the literature. We conclude that small states are no different from large states, and so should receive the same policy advice that large states do.

Keywords: The Caribbean, Pacific Islands, Growth, Volatility, Trade, Small States

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"Smallness is neither a necessary nor sufficient condition for slow economic development"
T.N. Srinivasan (1986)

"Economic storm clouds are gathering over paradise and the outlook is undeniably gloomy."
A.J. Dolman (1985)

Do small states suffer from their smallness? There are good theoretical reasons to believe that they do. The provision of public services may be subject to indivisibilities that lead to increasing returns to scale (Alesina and Spolaore (1997)), especially fiscal institutions (Easterly and Rebelo (1993)) and defense (Kuznets (1960), Harden (1985)). Many theories of economic growth suggest increasing returns to scale in the private economy as well (Romer (1986), Barro and Sala-i-Martin (1995), Aghion and Howitt (1998)), which may be difficult to realize in small states. Small economies may also be at a disadvantage because their size prevents them from diversifying into a wide range of activities, making them more vulnerable to terms of trade shocks than large states (Commonwealth Secretariat (1998), Briguglio (1995), Armstrong and Read (1998)). Many small states suffer from poor location in that they are remote and/or landlocked, and many are located in regions prone to hurricanes and volcanic activity (Srinivasan (1986)). Public officials in small states may be much more likely to be subjected to conflicting pressures (Farrugia (1993)), and it may be difficult to recruit a high-quality civil service given the limited pool of candidates in small states (Streeten (1993)). The trend towards trade multilateralism may put small states at a disadvantage because they presently benefit from many bilateral trade concessions (Armstrong and Read (1998)).

These potential difficulties facing small states have not been lost on policymakers or academics. Numerous conferences and seminars on the special difficulties of small states have been convened over the past forty years (Robinson (1960), Benedict (1967), Dobozi et. al. (1982), Commonwealth Consultative Group (1985, 1997), Small States Financial Forum (1987,1988), Kaminarides et. al. (1989)). International organizations such as the United Nations have commissioned studies on the problems confronting small states for many years (United Nations

(1971), Doumenge (1983), UNCTAD (1997)) and the United Nations has formally recognized the special difficulties of small states in a resolution to that effect (Briguglio (1995)). Titles of papers on small states (see our bibliography) frequently feature ominous terms and phrases such as "Problems", "Vulnerability", "Small is Dangerous", and even (twice) "Paradise Lost".

In this paper, we look for empirical evidence of alleged disadvantages of size by examining small states with population 1 million or less. If small size is a disadvantage, then these states must suffer with a vengeance. In particular, we would expect that small states must on average be less developed and grow less rapidly than larger states. We test this hypothesis using a large cross-country dataset including many small states. In light of the grim predictions of theory, the picture of small states which emerges from this analysis is somewhat surprising. After controlling for a range of factors, we find that small states have on average higher income and productivity levels than large states, and grow no more slowly than large states. Per capita GDP growth rates are more volatile in small states, due to their much greater exposure to international trade and fluctuations in their terms of trade. However, any growth disadvantages of this greater volatility are more than outweighed by the growth benefits of trade openness reaped by small states by virtue of their necessarily-large trade volumes. Finally, small states are well-positioned to take advantage of opportunities for international risk sharing, since the correlation of economic fluctuations in small states with the world business cycle is surprisingly low.

These results contribute evidence in support of the growing view in the literature that small size might not be a disadvantage after all. Kuznets (1960) notes that small states also have advantages: primarily that many are lucky to have good natural resources and have a small and more cohesive populations which allows them to adapt better to change. Srinivasan (1986) and Streeten (1993) argue without systematic empirical evidence that small may also be beautiful. Using a sample of 48 countries Millner and Westaway (1993) fail to find evidence that the effect of a number of growth determinants varies with country size. Armstrong et. al. (1998) uses cross-sectional regressions covering a large number of small states and independent regions to argue

that population size does not significantly affect growth, controlling for initial income and regional effects.

The remainder of this paper proceeds as follows. In the next section we document that small states are richer and have higher productivity levels than large states. In the following section we observe that small states suffer no obvious growth rate disadvantage, and attribute this to a number of offsetting advantages and disadvantages of small states. In Section 3 we document that although terms of trade volatility contributes significantly to the greater volatility of growth in small states, this is not the whole story -- a significant small state effect on volatility remains after we control for terms of trade variability. In Section 4 we note that small states are relatively well-positioned to take advantage of opportunities to diversify away their special risks since they currently are not particularly financially open and the shocks they receive are relatively uncorrelated with those experienced by the rest of the world. Section 5 offers concluding remarks.

1. Small states and per capita income level*s*

In this paper, we consider a large cross section of 157 countries for which at least 10 years of annual data on per capita GDP adjusted for differences in purchasing power parity is available. Of these, 33 are small states defined as having an average population over the period 1960-1995 of less than one million. These countries are listed in Table 1, and range in size from tiny St. Kitts and Nevis with population of 42,000 to Mauritius with 912,000. The income range is similarly wide, from very poor African countries such as Guineau-Bissau and Comoros with real PPP-adjusted per capita GDPs around $600 to wealthy oil-exporting countries such as Qatar with per capita GDP of over $18,000. Although our sample is quite large, it is worth noting that it is not comprehensive but rather is constrained by data availability. Of the 212 states and territories listed in the World Bank's databases, 55 have populations less than one million, but we

have only have internationally-comparable per capita GDP data for 33 of these small states. While it is not clear a priori what biases this might introduce (both rich small states such as Liechtenstein and poor small states such as Equatorial Guinea are excluded from our sample), we do note that some caution is in order before generalizing our results to all small states. In subsequent regressions the sample is even smaller, reflecting the non-availability of variables other than per capita incomes in these regressions. Details on variable definitions and data availability are provided in the Appendix.

If small states suffer from the disadvantages of smallness, they should be poorer on average than larger states. What do we actually find? In Figure 1, we show that, without controlling for any other characteristic, small states have the same range of per capita incomes as the rest of the countries in the world. Moreover, if we control for the location by continent of all countries, whether they are oil producers, and whether they belong to the OECD, then small states are actually significantly *richer* than other states. We show this in the first column of Table 2, where we regress the logarithm of real per capita GDP at PPP on these dummy variables, as well as a dummy variable for small states. The significant coefficient on the small states dummy indicates that they are on average 50 percent (=exp(.403)-1) richer than their regional neighbours. We note that this result does not reflect the obvious outliers in the sample, since the oil exporting countries Qatar and Bahrain are picked up by the oil exporter dummy, and Luxembourg and Iceland are picked up by the OECD member dummy. Even if we exclude two other particularly wealthy small states not captured by these dummy variables (Bermuda and Bahamas), we still find that small states are nearly 40 percent richer than other states.

These results do not appear to be sensitive to the population threshold at which we divide countries into small and large states. Figure 2 plots the residuals from this regression (excluding the small states variable) by quintile of population, and we see the very strong income effect in the bottom two population quintiles.[1] We also note that the favourable performance of small

states carries over to other quality of life indicators. For example, if we in turn use under-five infant mortality and life expectancy at birth as the dependent variable in the above regression, we find that infant mortality is significantly lower in small states by 22 per thousand, while life expectancy is about four years higher (columns 2 and 3 of Table 2). Although this analysis does not tell us why small states are so much richer than their regional neighbors and have better human development indicators, it does cast doubt on the often-heard arguments that small states suffer from a development *dis*advantage.

We next ask whether small states are richer than large states because they save more or because they have higher productivity levels. Following Mankiw, Romer and Weil (1992), we consider the prediction of the neoclassical Solow growth model that the steady-state level of output per person is given by:

$$(1)\quad Y/L = A\,(s/(x+\delta+n))^{\alpha/(1-\alpha)}$$

where Y/L is output per person, A is the level of labor-augmenting productivity, s is the investment to GDP ratio, x is the rate of labor-augmenting productivity growth, δ is depreciation, n is population growth, and α is the share of capital income in GDP. We assume a productivity growth of 2 percent and a depreciation rate of 7 percent. We take logs of both sides and regress the log of output per person on the same dummies as above (capturing continental and other productivity differences) and the log of the second multiplicative term in (1):

$$(2)\quad \ln(Y/L) = \ln A + \alpha/(1-\alpha)\,[\ln s - \ln(x+\delta+n)]$$

We call this second term MRW, and report the results of this specification in the first column of Table 3. Comparing the coefficient on the small states dummy with that in the first column of

Table 2, we find that small states' productivity advantage accounts for about two-thirds of their income per capita advantage (i.e. 0.267/0.403). This evidence is inconsistent with the commonly-held idea that small states suffer from productivity disadvantages due to their inability to exploit increasing returns to scale. We also note that our specification differs from Mankiw, Romer and Weil (1992) in that we allow the average level of productivity to vary across regions, and these differences are statistically significant (remember that the regressions include a full set of regional dummies). Once we allow the productivity level to vary, the coefficient on MRW implies a capital share of .28 -- which is in line with most estimates from national income accounting.

It is interesting to decompose the MRW into its numerator and denominator from Equation (1). We do this in the second and third columns of Table 3, where we regress the log investment rate and the population growth rate on the same set of dummy variables as before. We find that that small states have significantly higher investment rates but not significantly lower population growth rates. This suggests that some portion of the previously-unexplained income differential between small states and large states can be explained by the former's higher investment rates.

We conclude with two important caveats regarding these results on the productivity and investment advantages of small states. First, the regressions in Table 3 do not control for differences across countries in human capital, since it is difficult to adequately measure saving in the form of human capital. As a result, the productivity advantage of small states to some extent reflects their human capital differences from the rest of the world. This is consistent with the strand of the literature that argues that small states need to rely on imported technology and high quality human capital to compensate for their lack of natural resources (Bhaduri et al. (1982) suggest human capital-intensive exported services as a way to escape "smallness"; Briguglio (1995) suggests the importance of regional technical cooperation; Milner and Westaway (1993) find that small states have a weak disadvantage in agricultural technological catch-up but a weak

advantage in non-agricultural technological catch-up; and Armstrong and Read (1998) suggest that advances in transport and communications technology have helped offset "smallness" and "remoteness").

Second, we should take with more than a grain of salt the result that investment accounts for some of the income advantage of small states. The significance of the MRW term in Table 3 may reflect reverse causality – richer states can afford to invest more and are usually thought to choose lower population growth than poor states. Or it may reflect an omitted third factor, like incentive policies that affect both investment and income. It is difficult to adequately control for these possibilities. Instead, we simply note that they are likely to result in an overstatement of the contribution of investment to the income advantage of small states.

2. Micro States and Macro Growth

Even if small states do not have a disadvantage in terms of their income levels, they might grow more slowly over time for various reasons. Several endogenous growth theories predict that growth rates will be positively correlated with size due to scale effects. As we discuss below, small states exhibit greater output volatility, which has been shown empirically to have adverse effects on growth (Ramey and Ramey (1995)). What do the data say? In Figure 3 we show that small states have the same range of growth experiences as other states, suggesting that there is no obvious scale effect for growth rates that is related to population size. There is also no growth difference for small states after controlling for continental location, oil, and OECD dummies, as shown in the first column of Table 4 where we regress growth on these dummies and the small states dummy.

Why do small states not suffer any apparent growth disadvantages due to their small size? To answer this question, we consider a parsimonious cross-country growth regression which captures two of the factors prominent in the small states debate: openness to international trade

(measured as the share of imports and exports in GDP), and volatility (measured as the standard deviation of annual growth rates within each country). We also include initial income to capture convergence effects, and secondary school enrollment rates. The results are shown in the second column of Table 4. All of the variables are significant of the expected sign. The negative coefficient on initial income shows that there is conditional convergence, secondary enrollment rates and trade openness are positively correlated with growth, and growth rate volatility has a negative effect on growth.

This regression framework provides some useful clues as to why the small state dummy is not significant in the basic regression in the first column of Table 4. In particular, we can see from this regression that small states will have several offsetting advantages and disadvantages. We have already seen that they are richer than other countries (relative to regional averages) and hence will have slower growth than average by the conditional convergence effect. They have slightly higher secondary enrollment rates, which would give them higher growth. Most important, as we document below, small states tend to have much higher trade shares (which is good for growth), offset by much higher volatility of growth rates (which is bad for growth).[2] As a result, the insignificance of the small state dummy in the growth regression suggests that the negative effects of high initial income and high volatility are roughly offset by the positive effects of trade openness and better educational attainment.

In order to document the magnitude of these offsetting effects, we first need to know how different small states are from non-small states in terms of their growth determinants. We document the well-known fact that small states typically have much higher trade ratios than larger states in the first column of Table 5, where we regress this variable on the same set of dummy variables as before, as well as the small states dummy. The consequences for openness of being a small state are truly remarkable. Small states have a ratio of trade to GDP that is 54 percentage points (1.2 standard deviations) higher than the average economy controlling for continent dummies! Second, real per capita GDP growth rates tend to be much more volatile in small

states. The second column of Table 5 shows that the standard deviation of annual real per capita GDP growth is 1.4 percentage points higher in small states than in non-small states.[3] Finally for completeness we show that while secondary school enrollment rates are modestly higher in small states, this difference is only marginally statistically significant.

These results suggest that the absence of a clear growth advantage of small states is due to three main offsetting effects: (i) they are significantly richer, and hence grow more slowly due to the conditional convergence effect; (ii) they are significantly more open to international trade, which is good for growth, and (iii) they suffer from significantly greater growth rate volatility, which is bad for growth. Interestingly, the positive growth effect of openness in Table 5 (0.012x0.54=0.65 percent) is 2.5 times larger than the negative growth effect (-1.79x0.014=-0.25 percent) of small states' greater output volatility. This suggests that even if output volatility is one of the consequences of openness (as we discuss in more detail below), small states' greater openness is still on balance a positive factor for small states' growth. This finding is of particular interest, given the widely held view that small states suffer from their openness.[4] Of course, any source of growth volatility that is not related to openness might still be detrimental to small states' growth performance.

Finally, it is interesting to note that one often-heard benefit of small states does not appear to be empirically very important. It is often argued that one of the advantages of small states is that they tend to be ethnically very homogeneous, which may make it easier for such states to forge the political consensus required to adjust to a changing environment (for example, Kuznets (1960)). Easterly and Levine (1997) and Alesina, Baqir, and Easterly (1999) find that measures of ethnic fractionalization are associated with a lower level of public goods provision and lower growth. However, the mean value of an ethnolinguistic indicator of diversity among those small states for which data is available is insignificantly different from that among non-small states, suggesting that the benefits of homogeneity may not be especially pronounced for small states.[5]

3. Openness and Volatility

In the previous section we saw that small states reap growth benefits from their openness to international trade, but suffer growth costs due to the greater volatility of their growth rates. In this section we consider in more detail the relationship between trade openness and volatility in small states. A significant portion of the growth rate volatility experienced by small states can be attributed to volatility in their terms of trade, but this is not the entire story. Even after controlling for terms of trade volatility, growth rates in small states are significantly more volatile than in non-small states.

We first document that the volatility of terms of trade shocks experienced by small states is much greater than for larger states. We define terms of trade shocks as the growth in the local currency price of exports times the share of exports in GDP less the growth in the local currency price of imports less the share of imports in GDP, which captures both the magnitude of price fluctuations (changes in export and import prices) and their importance for the domestic economy (weighted by the shares of exports and imports in GDP). We then regress the standard deviation of this measure of terms of trade shocks on the same set of regional dummies as before, dummy variables to capture oil exporters and commodity exporters who are more likely to suffer extreme fluctuations in their terms of trade, and the small state dummy. The results are shown in the first column of Table 6. We find that there is a highly-significant small state effect, with the standard deviation of terms of trade shocks larger by 0.013 (or about one-third of one standard deviation of the dependent variable) in small states.

This terms of trade volatility might be due to two factors. First, we have already seen that the share of trade in GDP is especially large in small states, and this may contribute to the magnitude of our measure of terms of trade shocks (since it weights changes in import and export prices by the shares of imports and exports in GDP). Second, small states' exports are likely to

be more specialized than those of large states, both in terms of products exported and in terms of export markets (Kuznets (1960), Armstrong and Read (1998)). As a result, the average prices of their exports and imports might be more volatile than in countries with more diversified trade patterns. The distinction between these two factors is important because there is little that small states can do about their overall trade volumes – autarky is simply not an option for small states that produce a much narrower range of goods and services than they consume, and moreover we have already documented the substantial growth benefits accruing to small states due to their openness. If in contrast the greater volatility of growth is due to excessive reliance on a few export products and a few export markets, then policies designed to help diversify exports may help to dampen economic fluctuations.[6]

We can get a rough idea of the relative importance of these two factors by redefining the terms of trade shock as the *unweighted* difference between the growth in export prices and the growth in import prices. When we use this alternative measure of terms of trade shocks as the dependent variable in the second column of Table 6, we find that the small states dummy is negative and insignificant. That is, the volatility of changes in the price of exports relative to imports is if anything *lower* in small states relative to larger states. Although this is not conclusive evidence, it does cast doubt on the notion that small states are especially vulnerable to external shocks simply because their international trade is more specialized. Rather, the greater volatility of terms of trade shocks in small states is primarily due to their unavoidably large trade shares.

Finally, it is worth noting that greater volatility of growth in small states is not solely due to their greater susceptibility to terms of trade shocks. To illustrate this point, we re-estimate the growth rate volatility regression in the second column of Table 4, adding the volatility of the terms of trade as an explanatory variable. The results are shown in the last column of Table 6. We find that the small state dummy remains significant even after controlling for the effect of greater terms of trade volatility on the volatility of overall growth. This indicates that a

significant portion of the volatility of output in small states is unrelated to their exposure to international trade. This additional volatility may be due to several factors. Many of the small states in our sample are located in areas prone to natural disasters such as hurricanes, and the higher growth volatility in small states may simply reflect the devastating effect of these natural forces. However, it is also possible that some of this observed volatility reflects difficulties in measuring per capita incomes, which may be particularly acute in small states where statistical institutions may be weaker than average.

4. Opportunities for Diversification

In the previous section we have seen that small states experience much more volatile growth rates than non-small states. This in part reflects their greater vulnerability to terms of trade shocks, and perhaps also the tendency of many small states to suffer heavily from natural disasters. In this section we briefly consider the potential of small states to mitigate the adverse effects of this largely-unavoidable volatility by sharing risks with the rest of the world.

One of the potential benefits of financial openness is that it allows countries to share risks with the rest of the world, by holding claims on assets located outside their borders whose returns are not perfectly correlated with returns to domestic assets. The magnitude of these benefits depends on how volatile are shocks to the domestic economy, and the extent to which they are uncorrelated with shocks abroad. Small states are particularly well-situated to benefit from such risk sharing arrangements, for two reasons. First, small states suffer large shocks, as documented in Section 3. Second, in contrast to the often-heard view that small states are particularly susceptible to cyclical fluctuations abroad, we find that the shocks experienced by small states are not unusually correlated with the world business cycle. We illustrate this point in the first column of Table 7, where we regresses the correlation of per capita GDP growth in a country with OECD average real per capita GDP growth on the same set of dummies as before, as well as the

logarithm of average per capita GDP (to capture the stylized fact documented by Kraay and Ventura (1998) that business cycles in poorer countries tend to be less correlated with the world average cycle), and a small state dummy. The small state dummy is insignificant, suggesting that small states are in fact not unusually correlated with the OECD cycle. However, it is important to note that growth rates in neighbouring small states may be highly correlated, especially to the extent that their growth rate volatility reflects natural disasters such as hurricanes. This suggests that regional arrangements to share risk among small states will be much less valuable than pooling risks with a wider range of countries.

Despite the potential benefits of risk sharing through participation in international financial markets, small states do not appear to be especially open financially. We illustrate this point in the last two columns of Table 7, where we regress two alternative measures of financial openess on a set of regional dummies as well as the logarithm of average per capita income. The first is the fraction of years for which data is available in which the IMF reports restrictions on capital account transactions in that country.[7] The coefficient on the small state dummy is positive, although insignificantly so. This suggests that small states are not particularly open to financial flows, as measured by legal impediments to such flows. Combining this observation with the empirical results of Lewis (1995), who finds that consumption risks are less diversified in countries with this measure of capital controls, this suggests that small states are not taking full advantage of the opportunities for risk diversification afforded by international capital markets. The second outcome measure of financial openness (capital inflows plus capital outflows as a share of GDP) paints a somewhat more favorable picture, as the small state dummy is positive and statistically significant at conventional levels. This suggests that the volume of capital flows is slightly larger for small states than for non-small states, although the magnitude of this effect is small – only about 2-3 percentage points of GDP. Overall, this evidence suggests that small states are not as financially open as they might be given the high volatility they face, and hence are not fully exploiting opportunities for international risk diversification.

We conclude this section with the observation that although greater financial openness may help small states insure against the large shocks they receive, financial openness is itself no panacea. Grilli and Milesi-Ferretti (1995) and Rodrik (1998) both note that there is no evidence that financially-open economies grow faster or enjoy higher investment rates. On the other hand, there is also no systematic evidence in favor of the popular view that by opening up financially, countries expose themselves to greater volatility due to the vagaries of international financial markets (Kraay (1998)). In summary, although financial openness may provide a valuable means for small states to diversify some of the large risks they face, existing evidence does not support the view that there will be a large growth payoff from such policies.

5. Conclusions

Our analysis suggests that small states have perhaps received excessive attention from the literature – notwithstanding our own addition to the literature!--as special cases calling for special policy measures. We find that small states have, if anything, significantly *higher* per capita income than others in their region. There is no significant difference in growth performance between large and small states. It is true that growth volatility and volatility of terms of trade shocks as percent of GDP is higher in small states, but this is largely due to their greater trade openness – and the net benefits of openness on growth are positive. The one missing piece in the current situation of small states is that they are not fully exploiting the potential to diversify their risks by opening up to international capital movements. But even the payoff to filling in this last missing piece is unclear from evidence in the literature.

This is not to say that small states are free of economic problems! Many small states are still poor, and promoting growth as a means to alleviate poverty is as important in small poor states as it is in other poor countries. The good news is that the lessons of growth experience

from all countries seem to be applicable to small states, so they can benefit from the large amount of cross-country evidence on the determinants of long-run growth.

Appendix: Variable Definitions and Data Sources

This appendix documents the definitions of all variables and the data sources from which they were constructed. Variables are listed in the order in which they appear in the tables in the table below. The sample consists of all countries for which at least ten years of data on real per capita GDP adjusted for purchasing power parity is available, as documented below. Since a number of very small states do not report national accounts data and/or are not included in the United Nations/World Bank Income Comparison Project, real per capita GDP data is not available for these states. As discussed in the text, it is not clear a priori what sorts of biases this might introduce. Nevertheless, some caution is in order before extending the results to the universe of small states.

All of the cross-sectional regressions are based on averages over all available years of the relevant variables. As a result, the time period covered for each country varies with the length of the time series available for that country. Due to unavailability of additional explanatory variables, the sample of countries covered in the regressions varies, ranging from the maximum possible of 157 to a minimum of 114.

Appendix Table 1: Variable Definitions and Data Sources

Variable Name	Comments	Source
Small State	Indicator variable for average population over all available years 1960-95 less than 1 million	World Bank World Tables
OECD Member	Indicator variable for 24 members of OECD before recent expansions	
Oil Exporter	Fuel (SITC3) exports account for more than 50% of total exports	World Bank World Development Report 1996
Real GDP Per Capita	Primary source is the Summers and Heston Penn World Table, Version 5.6, measured in 1985 international dollars. Missing observations in the PWT are filled in where possible using PPP-adjusted GDP estimates reported by the World Bank.	Summers and Heston, World Bank World Tables
Infant Mortality	Infant mortality per thousand live births.	World Bank World Tables
Life Expectancy	Life expectancy at birth, measured in years	World Bank World Tables
Investment/GDP	Ratio of investment to GDP adjusted for purchasing power parity. Available only for countries appearing in Summers and Heston since World Bank does not report PPP GDP by expenditure components	Summers and Heston
Initial Real Per Capita GDP	Real per capita GDP in the first available year for that country	Summers and Heston, World Bank World Tables
Secondary School Enrollment Rates	Gross secondary school enrollment rates, percent	World Bank World Tables
Share of trade in GDP	Exports plus imports as a share of GDP, both measured in constant-price local currency units	World Bank World Tables
Terms of Trade Growth	Growth rate of local currency export deflator multiplied by share of exports in GDP, less growth rate of local currency import deflator multiplied by share of imports in GDP	World Bank World Tables
Unweighted Terms of Trade Growth	Growth rate of local currency export deflator less growth rate of local currency import deflator	World Bank World Tables
OECD Average Growth	Population-weighted average of real per capita GDP growth rates of 24 OECD member countries before recent expansions	Summers and Heston, World Bank World Tables
Capital Controls	Average over all available years of indicator variable for presence of restrictions on capital account transactions	International Monetary Fund Annual Report on Exchange Arrangements and Exchange Controls
Capital Inflows and Outflows as Share of GDP	Sum of credit items plus –1 times debit items in the financial account of the balance of payments, expressed as a share of GDP in current dollars at market exchange rates.	International Monetary Fund Balance of Payments Statistics Yearbook Revision 5

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[1] All of the results reported in the paper are qualitatively similar if we use the logarithm of population rather than an indicator variable for small states.

[2] The model of Alesina and Spolaore (1997) mentioned earlier has the prediction that openness reduces the costs of forming small states, since countries will not need to produce domestically the entire basket of goods they wish to consume.

[3] An interesting historical footnote is that the greater volatility of small states has not always been accepted. Tarshis (1960) finds little evidence of a relationship between the coefficient of variation of per capita income and size across US states, and poses this as a puzzle.

[4] This view of small states dates back at least to Scitovsky (1960). Dolman (1985) goes so far as to suggest that many small island states would be better off reverting to autarkic subsistence economies.

[5] One characteristic of small states that we do not examine is geographical isolation. It is difficult to test the effect of this, because some of the literature indicates that being geographically isolated because you are landlocked is harmful to growth, while other strands of the literature stress "islandness". Since virtually all small states are either islands or landlocked, it would be hard to separate out the effects of geographical isolation, however measured.

[6] Of course, to the extent that scale economies are important at the industry level, the potential for such diversification might be limited in small states.

[7] As reported in the International Monetary Fund's Annual Report on Exchange Arrangements and Exchange Restrictions. The disadvantages of this measure are well-known. First, it captures only the presence, and not the intensity of controls. Second, it captures only controls on residents, and not on non-residents, although there is some presumption that these two types of controls are correlated across countries.

Table 1 – Small States

		Population (Thousands)	Average Per Capita GDP, 1985 PPP-Adjusted Dollars
ATG	Antigua and Barbuda	63	5329
BHR	Bahrain	419	10342
BHS	Bahamas, The	237	11136
BLZ	Belize	178	3548
BMU	Bermuda	58	15356
BRB	Barbados	247	5341
BWA	Botswana	880	1516
COM	Comoros	340	632
CPV	Cape Verde	295	746
CYP	Cyprus	638	5084
DJI	Djibouti	344	1479
FJI	Fiji	602	3149
GAB	Gabon	777	3853
GMB	Gambia, The	628	803
GNB	Guinea-Bissau	739	644
GRD	Grenada	92	2632
GUY	Guyana	719	1630
ISL	Iceland	223	9689
KNA	St. Kitts and Nevis	42	4399
LCA	St. Lucia	148	3264
LUX	Luxembourg	358	11934
MDV	Maldives	201	1908
MLT	Malta	341	4049
MUS	Mauritius	916	4092
QAT	Qatar	384	18278
REU	Reunion	496	2253
SLB	Solomon Islands	299	1845
SUR	Suriname	378	2877
SWZ	Swaziland	556	2358
SYC	Seychelles	59	2214
VCT	St. Vincent and the Grenac	107	3312
VUT	Vanuatu	145	1633
WSM	Samoa	160	1844

Table 2: Development Advantages of Small States

Dependent Variable	Log Real Per Capita GDP, Average 1960-95	Under-5 Infant Mortality per 1000 Live Births	Life Expectancy at Birth,Years
OECD Member	1.169	-28.415	7.736
	(0.148)	(5.723)	(1.018)
Oil Exporter	0.815	0.896	0.893
	(0.178)	(12.488)	(1.513)
Small State	0.403	-22.887	4.143
	(0.108)	(9.548)	(1.383)
R-squared	0.709	0.634	0.719
Number of observations	157	152	153

Note: All regressions include a full set of regional dummies (Sub-Saharan Africa, Asia, Europe and Central Asia, Middle East and North Africa, and the Americas). Standard errors are White-corrected for heteroscedasticity.

Table 3: Productivity Advantages of Small States

Dependent Variable	Log Real Per Capita GDP, Average 1960-95	Log Investment as a Share of GDP	Average Annual Population Growth, 1960-95
OECD Member	1.122	0.199	-0.411
	(0.114)	(0.098)	(0.129)
Oil Exporter	0.692	0.138	0.166
	(0.151)	(0.160)	(0.092)
Small State	0.267	0.381	-0.241
	(0.132)	(0.107)	(0.146)
MRW	0.389		
	(0.102)		
R-squared	0.761	0.440	0.701
Number of observations	139	139	139

Note: All regressions include a full set of regional dummies (Sub-Saharan Africa, Asia, Europe and Central Asia, Middle East and North Africa, and the Americas). Standard errors are White-corrected for heteroscedasticity.

Table 4: Growth in Small States

Dependent Variable	Average Annual Real Per Capita GDP Growth 1960-95	Average Annual Real Per Capita GDP Growth 1960-95
OECD Member	0.007	0.009
	(0.004)	(0.006)
Oil Exporter	-0.014	-0.0004
	(0.007)	(0.005)
Small State	0.002	
	(0.005)	
Log of Real Per Capita GDP in First Available Year		-0.017
		(0.004)
Average Secondary School Enrollment Rate, 1960-95		0.0003
		(0.0001)
Average Share of trade in GDP, 1960-95		0.012
		(0.003)
Standard Deviation of Annual GDP Growth, 1960-95		-0.179
		(0.082)
R-squared	0.195	0.535
Number of observations	154	130

Table 5: Growth Advantages and Disadvantages of Small States

Dependent Variable	Share of Trade in GDP, Average 1960-95	Standard Deviation of Annual GDP Growth, 1960-95	Secondary School Enrollment Rate Average 1960-95, Percent
OECD Member	-0.179	-0.026	27.705
	(0.078)	(0.004)	(5.844)
Oil Exporter	0.145	0.016	6.587
	(0.095)	(0.005)	(5.821)
Small State	0.539	0.014	8.344
	(0.071)	(0.003)	(4.440)
R-squared	0.286	0.468	0.717
Number of observations	158	154	136

Note: All regressions include a full set of regional dummies (Sub-Saharan Africa, Asia, Europe and Central Asia, Middle East and North Africa, and the Americas). Standard errors are White-corrected for heteroscedasticity.

Table 6: Volatility in Small States

Dependent Variable	Standard Deviation of Annual Terms of Trade Growth, 1960-95	Standard Deviation of Unweighted Annual Terms of Trade Growth, 1960-95	Standard Deviation of Annual Per Capita Real GDP Growth, 1960-95
Commodity Exporter	0.007	0.023	0.007
	(0.005)	(0.013)	(0.004)
Oil Exporter	0.023	0.074	0.012
	(0.005)	(0.024)	(0.006)
Small State	0.013	-0.011	0.021
	(0.005)	(0.011)	(0.005)
Terms of Trade Volatility			0.250
			(0.105)
R-squared	0.490	0.474	0.535
Number of observations	114	114	114

Table 7: Risk Sharing in Small States

Dependent Variable	Correlation of Real Per Capita GDP Growth with OECD Average Real Per Capita GDP Growth, 1960-95	Fraction of Years over 1960-95 during which capital controls were in place	Average Capital Inflows plus Capital Outflows as a fraction of GDP, 1960-95
OECD Member	0.082	-0.149	0.016
	(0.069)	(0.100)	(0.029)
Oil Exporter	-0.077	-0.097	-0.027
	(0.065)	(0.116)	(0.016)
Small State	0.013	0.026	0.027
	(0.054)	(0.080)	(0.013)
Log real GDP per capita, Average 1960-95	0.119	-0.170	0.024
	(0.029)	(0.050)	(0.013)
Commodity Exporter	0.026	0.005	-0.014
	(0.058)	(0.063)	(0.011)
R-squared	0.345	0.278	0.260
Number of observations	155	139	132

Figure 1: Per capita income and population size, averages 1960-95

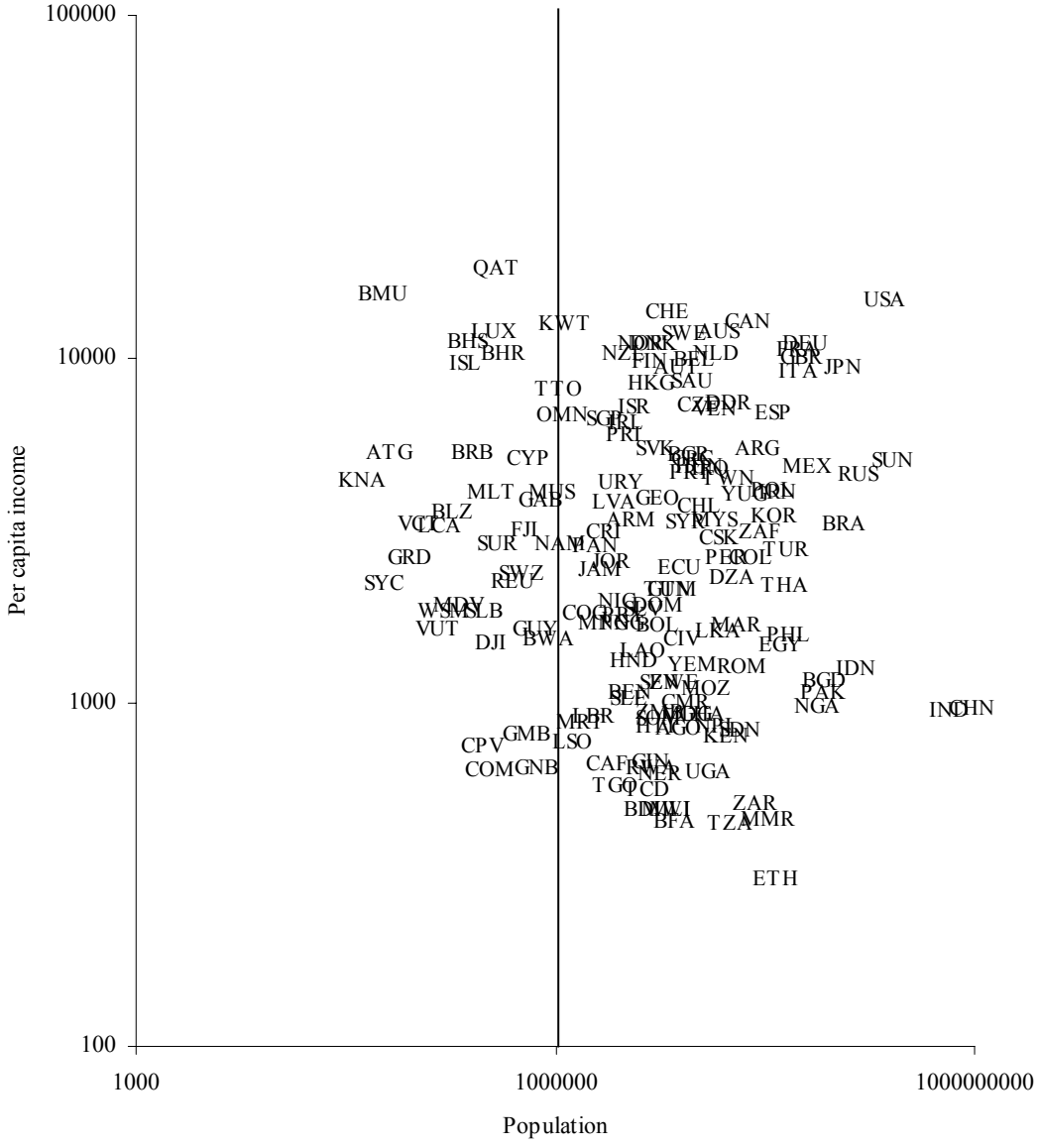

Figure 2: Unexplained income level and population size

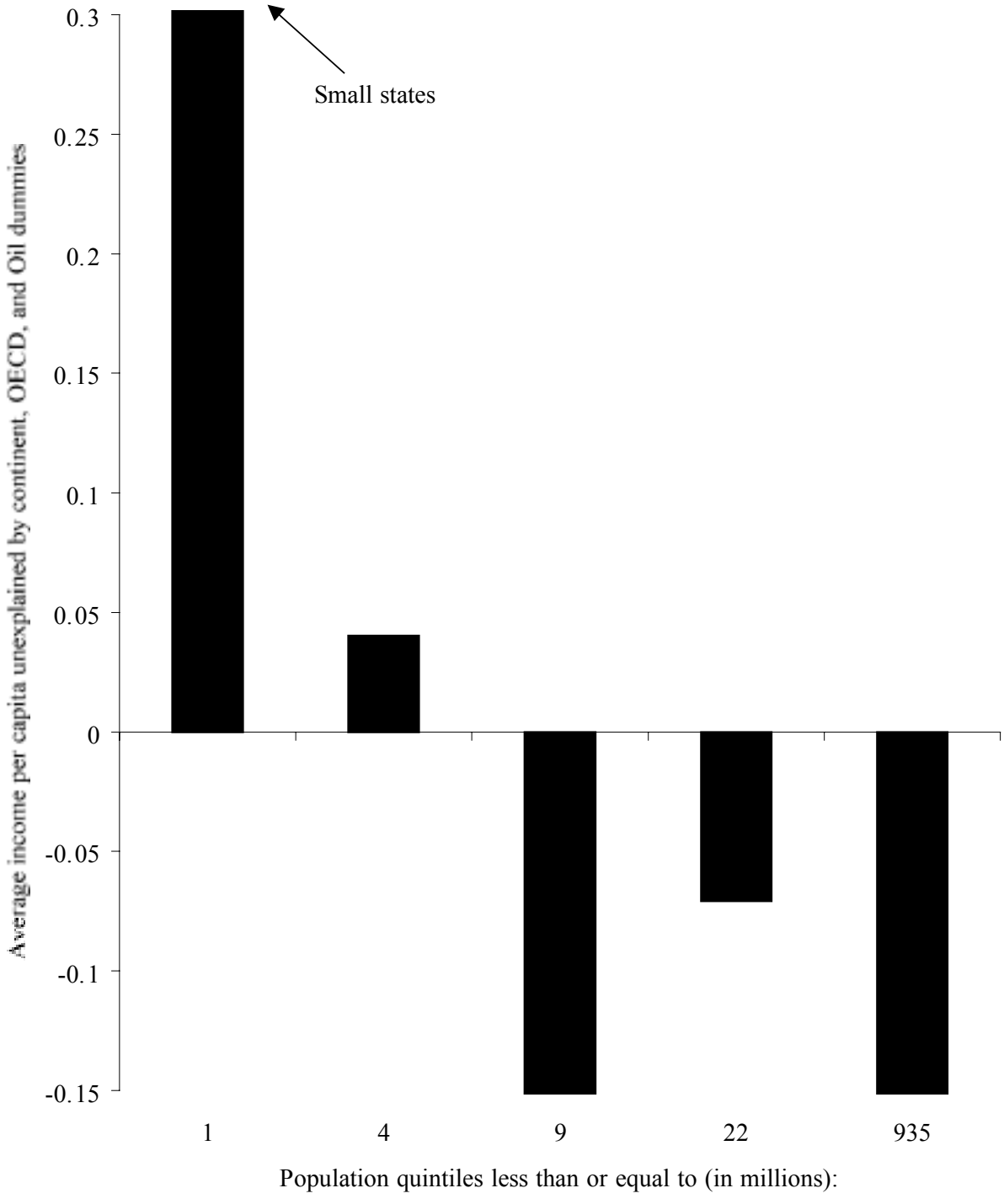

Figure 3: Average per capita growth and population size 1960-95