Do Archipelagic Countries have Bigger Governments?*

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Abstract

This paper investigates whether geographically fragmented countries engage in higher public spending relative to contiguous countries. Using a standard OLS estimator we find that countries with archipelagic morphologies have higher levels of government spending. This result is strongly indicative of a diminished capacity to realize economies of scale in spending on public service provision and delivery across intervening bodies of water.

Keywords: Archipelago, Population Density, Public Expenditure.

JEL Classification: H50; H40; O23

*In memory of Steadroy Frederick from the Grenadine island of Bequia. Any errors in this paper are solely the responsibility of the authors.

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Introduction

Prudent fiscal and macroeconomic practice requires that countries measure their public spending relative to GDP against some benchmark to determine whether they are within acceptable and sustainable limits. It has become common place among international financial institutions to advocate uniform prudential standards for deficit to GDP and public spending to GDP ratios, as a way of encouraging countries to pursue sustainable fiscal policy. However, there is no reason to believe that there should be uniform fiscal standards across countries. Countries exhibit heterogeneity in economic, demographic, and geographic characteristics, that all contribute to different levels of spending. In this paper we seek to examine countries with archipelagic geographies and investigate whether they are likely to incur higher levels of public spending to GDP. Our search through the literature indicates that this is a novel contribution. Very little attention hitherto has been given to archipelagic countries. For the purpose of this paper we define archipelagic countries in accord with the United Nations convention on the law of the sea, section 4, article 46:

(a) "archipelagic State" means a State constituted wholly by one or more archipelagos and may include other islands;

(b) "archipelago" means a group of islands, including parts of islands, interconnecting waters and other natural features which are so closely interrelated that such islands, waters and other natural features form an intrinsic geographical, economic and political entity, or which historically have been regarded as such.

These states are also referred to as geographically fragmented countries or non-contiguous countries with intervening bodies of water. Archipelagic coun-

tries are diverse. They range in land and population size, level of development, and geographic location. Major archipelagic nations include Japan, Indonesia, Philippines, Denmark and New Zealand among others. Most archipelagic nations are found in the Asia-Pacific region, followed by the Caribbean and Africa. A list of archipelagic countries is provided in the appendix.

One can start by asking the question, is it appropriate to compare the relative public expenditure of countries that are roughly equal in size and development but distinct in this particular geographic aspect? Is it appropriate for example to compare the public spending of the Philippines and Indonesia with comparable contiguous countries? For instance, Indonesia has 17,508 islands, 6000 of which are inhabited, which means that essential services must be provided to dispersed provinces and islands. The fact that archipelagic countries are geographically fragmented therefore poses significant challenges to their development, as allocation of scarce public resources across multiple land units can be spread even thinner than they would in a contiguous country. In the presence of intervening bodies of water, governments in non-contiguous countries must provide basic infrastructure such as schools and health centres even if the threshold population does not exist to justify the service. In contiguous countries, basic services must also be provided to isolated populations. However, governments have more options in terms of "bringing the people to the service," rather than "bringing the service to the people." For instance, children can be shuttled to schools and mobile health services can visit remote settlements .Geographic fragmentation can therefore impact negatively on growth outcomes as a result of higher transportation, communication and infrastructural development costs.

The underlying premise of this research question is that the realization of economies of scale in provision of public goods and services is severely constrained across intervening bodies of water. This means that archipelagic countries have to

replicate public goods and service provision to a higher degree than do contiguous countries, across their geographical space. The most obvious example of this might be in the area of public infrastructure, for example, airports, jetties, roads, post offices, schools, and utilities such as water and electricity services. This replication we contend, can, all things considered lead to naturally higher resource requirements and by extension, higher levels of public spending relative to GDP than contiguous countries.

The empirical model adopted in this paper will not only allow us to ask our central question of whether archipelagic states have bigger governments than contiguous countries, but will allow us to address some subsidiary questions . For example, we test for the validity of Wagner's law, the assertion that as a country becomes wealthier the relative size of government increases. An important control variable used in the study is population density. Given that some archipelagic states may have low population density due to the existence of dispersed settlements, our specification will allow us to separate out density effects from geographic fragmentation and separately test whether countries with low population density have relatively larger sizes of government. Finally, we seek to determine whether more open countries have higher levels of expenditure, in view of the fact that many archipelagic states are small developing countries that are highly trade dependent.

The paper is organized in the following manner; Section 2 presents a synopsis of the literature on the factors which influence government size while section 3 describes the data and indicates the data sources. In section 4 we present the econometric methodology and the empirical model. Finally results are discussed in section 5 with a brief conclusion in section 6.

2 Literature Review

A review of the literature on archipelagic countries reveals that limited research has been conducted on the link between the specific economic and geographic circumstances of these countries. Consequently, this section will be based on existing empirical work which investigates factors that determine the size or real size of government. The theoretical and empirical literature on the determinants of government size reveals that there a two broad classes of models utilized to explain government size; Economic/apolitical models and institutional/political models. This section will provide a brief description these models.

2.1 Economic/Apolitical Models

These models tend to explain government size as a function of factors such as income, openness to trade, the price of government services and other relevant economic factors. Borcherding et al. (1985) provided a two way examination of whether the size of government increases with income (Wagner's law) or whether government size is a constraint to economic growth. Wagner's Law states that the development of an industrial economy will be accompanied by an increase in the share of public expenditure to GDP. Thus, the law implies that more developed economies have bigger governments than developing countries.

The Borcherding (1985) analysis concludes that the real size government is influenced by the proportion of dependent older persons, population size, the price of government services and the degree of openness of an economy. They found that the average value for income elasticity of demand for government services from the various formulations were significantly less than one (.400) and therefore inconsistent with the prediction of income elasticity greater than 1 for Wagner's law. The Borcherding (1985) study also highlighted that real government size

measured by the share of government consumption in GDP is negatively related to real output growth.

Rodrik (1998) also presents an analysis of how the degree of a country's openness to trade is related to the size of its government. Rodrik argues that government expenditure is utilized to provide insurance against external risks. Using data from the Penn World Tables, World Bank World Data 1995 and the United Nations Educational, Scientific and Cultural Organization (UNESCO), Rodrik demonstrated that there is a robust and positive relationship between the size of government and the degree of openness of an economy.

Shelton (2007) sought to test several leading hypotheses and explain certain puzzles on the size and composition of government expenditure including Wagner's law and Rodrik's explanation regarding openness and insurance against external risks. Shelton found that an increase in openness resulted in higher public sector expenditure. However, he noted that a significant share of the increase in government expenditure associated with higher openness especially for less developed countries did not occur in social insurance categories. Instead, for less developed countries he noted greater openness is associated with higher spending on transportation and education. With respect to Wagner's law, the study concluded that after controlling for the fraction of the population over age 65, richer countries tend to have smaller governments. Once the control for demographics was removed income was positively related to the size of government providing some support for Wagner's law. High population dependency (persons over 65), income inequality and political rights were all positively related to the size of government.

Other researchers have sought to explain government size starting from the premise that the ability of a government to achieve economies of scale in the production of government services will undoubtedly influence government size. Alesina and Wacziarg (1997) posit that given the existence of fixed costs and

economies of scale linked to partial, complete or non-rivalry in the supply of public goods, smaller countries may have a larger share of Government in GDP. They assert that there are fixed costs in establishing a set of institutions such as legal, monetary and fiscal systems. Given that public goods are characterized by non rivalry in consumption, increasing returns to scale occurs because where populations are larger; the financing costs for public goods are spread over a larger pool of tax payers in large countries compared to their smaller counterparts.

The authors of this paper contend that the Alesina and Wacziarg (1997) returns to scale argument can be extended to explain the size of government in the context of archipelagic countries. In archipelagic states the population is often spread across islands with intervening bodies of water. This therefore means that many public sector goods and services must be replicated in order to service the population, even in cases where critical population mass does not exist to justify certain public outlay. In cases where services are not replicated the public sector often has to intervene to ensure access to services on the mainland. The need to replicate services therefore militates against the achievement of economies of scale in the provision of public services, resulting in higher government expenditure.

2.2 Institutional/Political Models

The Institutional/Political models evolved out of the research on the public sector in the 1950's and the resulting school of public choice. This includes the work of Mueller (1987). The essential argument is that the public sector institutions impact to a large measure on public sector outcomes. It should be noted that institutions encompass the procedures which obtain and the people who work within the institutions. Institutional/political models recognize that temporal government expenditure may be influenced by the occurrence of elections, the political cycle as well as the degree of ethnic, religious and language fractionalization

which exists among the electorate.

Nordhaus (1975) put forward a political business cycle model which included several assumptions. The main argument of this political business cycle model is that opportunistic politicians/policymakers will stimulate the economy immediately before an election (assuming that voters are nave and myopic) in an effort to remain in office. This theory is based on the following assumptions; (i) the economy is characterized by an expectation augmented Phillips curve, (ii) inflation expectations are adaptive (iii) politicians are identical and prefer to remain in office rather than be out of office (iv) only two candidates face off in every election (v) voters like growth and dislike inflation and unemployment (vi) policymakers control policy instruments that are deterministically related to aggregate demand and (vii) the timing of elections is exogenously fixed.

The political business cycle model can be related to the Median Voter Theorem. Borcherding (1985) conceptualizes the demand function for government services as an outcome of the demand for public goods by the median voter. The Median Voter Theory suggests that if there are more voters at a particular point of an ideological spectrum, politicians who seek to win an election will appeal to those issues that best represent the largest section of voters. Thus, the characteristics of the median voter lead to the specification of a demand for public goods as a function of income, prices, population and other variables. Borcherding (2001) also examined the impact of political control variables on the real size of government. This included an examination of fractions of the population who are dependent on the government and therefore benefit from larger government size, the size of the workforce (as government grows so does its workforce) and the influence of organized groups such as trade unions and lobbies.

In similar vein, Easterly and Levine (1997) examine the impact of heterogeneous preferences as reflected in a high degree of religious and ethnic fractionaliza-

tion. They argue that the presence of heterogeneous preferences that are driven my ethnicity may stimulate interest group activity and encourage log-rolling which will lead to increased demand for public goods and services. However, higher demand for public goods or services may not result in increased government expenditure due to the fact that ethically fragmented economies may have difficulty in reaching consensus on public policy choices and the provision of public goods. Alesina et al. (2003) contend that heterogeneous preferences reflected through high ethnic and linguistic fractionalization can be associated with negative outcomes in terms of quality of government. In contrast, they posit that high religious fractionalization is often present in more democratic and tolerant societies. Thus, high religious fractionalization suggests that public expenditure may increase as the political decision making process seeks to cater to the needs of the various religious groups.

3 Data

The data are obtained from the 6.2 version of the Penn World Tables and the World Development indicators database. The Political Rights variable was obtained from Freedom House and ranges from 1 to 7, with 1 representing the best regime with the most political freedoms and 7 representing the worst regime with limited political freedoms. The fractionalization variables were obtained from Alesina et al. (2003) and can range from 0 which would represent a perfectly homogenous country to 1 which would represent a perfectly fractionalized country. The data is collected for years 1995 to 2003 for 188 countries and is summarized in table 1. Of the sample of 188 countries, 32 (or 17 %) are archipelagic. It is important to note that some very large economies such as Japan, New Zealand, Indonesia, and the Philippines are among the group of archipelagic countries, as well

as some extremely small countries which comprise the majority of the group. In table 2, the variables are summarized for the archipelagic countries alone whereas table 3 attempts to provide an indication of the degree of fragmentation of these countries by listing the number of islands, islets, cays and rocks for each territory. Table 5 in the appendix provides a list of all the countries in the sample.

The key limitations of our study are twofold; first the definition of an archipelagic country can be somewhat subjective and makes the selection of an archipelagic country difficult on the margin. In some cases where peninsular land masses are involved if the majority of the land space and population of that country are on the peninsular then this may approximate a contiguous state. Nonetheless, the overwhelming majority of archipelagic countries in our sample are unambiguously fragmented, and self identify themselves as archipelagos. What we do is, first we define our universe of countries as the countries listed in the Penn World Tables, then based on the definition presented earlier we determine which countries constitute archipelagic nations. Some nations have archipelagos as part of their geography but are not considered archipelagic because this is not a significant component of their geography. The second limitation involves the use of aggregated public expenditure data. Although we are primarily interested in overall government outlay, there would likely be significant inferences we could obtain from using more disaggregated data.

3.1 Data Properties

As a precursor to the empirical investigation we examine the summary statistics for the measures of the dependent variable for the entire sample of countries and for archipelagic countries as a group. We explore whether the average share of government spending in GDP and government spending per capita is larger for archipelagic states than the average for the full sample. Tables 1 and 2 below

present the summary statistics for the full sample of countries and the sample of archipelagic states.

Table 1: Summary Statistics for Full Sample

	Obs.	Mean	St. Dev.	Min	Max
Population (in thousands)	1692	31,766.15	119,630.4	17.04	1,286,976
Land Area (in square kilometers)	1692	707,701.5	1,937,007	25	1.71e+07
GDP per Capita (in U.S$)	1692	8,665.42	8,860.03	157.48	51,154.67
Government Spending (in % of GDP)	1692	23.83	11.12	2.12	98.27
Openness	1692	87.60	49.95	1.98	392.64
Population Density	1683	271.75	1,285.8	1.45	16,357.8
Age Dependency Ratio	1683	1.50	6.52	0.28	63
% under 15 years old	1692	32.38	10.23	14.08	51.16
% Over 65 years old	1692	6.85	4.51	1.08	19.2
Government Spending per Capita (in U.S$)	1692	177,665.6	167,471.20	2018.39	1,117,198
Ethnic Fractionalization	1629	0.44	0.26	0.00	0.93
Language Fractionalization	1593	0.39	0.28	0.0021	0.92
Religious Fractionalization	1674	0.44	0.23	0.0023	0.86
Political Rights	1639	3.50	2.21	1	7

The average share of government expenditure in GDP for the sample of archipelagic countries is 26.3 percent compared to a mean of 23.8 percent for the full sample which includes both archipelagic and non archipelagic countries. Similarly, average government spending per capita is substantially higher for the sample of archipelagic countries relative to per capita government expenditure for the full sample. It is interesting to note that for both measures of government size, there is more variation in terms of government expenditure for archipelagic countries when compared to the standard deviation for the full sample.

Table 3 below presents statistics on the geography of the archipelagic states included in the study. Close examination of table reveals that these islands vary in terms of land size, number of peninsulas, islands, islets and cays. Indonesia is the largest archipelagic country in terms of land size (1,919,440 km^2), number of islands (17,508) and population (238 million). In contrast Saint Kitts and Nevis ranks the smallest with land size (261 km^2), two islands and a population of

Table 2: Summary Statistics for Archipelagic Countries

	Obs.	Mean	St. Dev.	Min	Max
Population (in thousands)	288	14,372.05	44,941.79	17.04	234,893.5
Land Area (in square kilometers)	288	112,996.3	348,387.1	25	1,933,658
GDP per Capita (in U.S$)	288	9,976.93	9,229.04	1,177.75	32,161.52
Government Spending (in % of GDP)	288	26.30	14.51	6.61	75.04
Openness	288	104.46	61.59	16.8	392.64
Population Density	288	846.87	2,818.95	10.4	16,357.8
Age Dependency Ratio	288	3.69	12.05	0.35	63
% Under 15 years old	288	29.50	11.83	17.36	46.42
% Over 65 years old	288	6.31	4.26	2.15	18.73
Government Spending per Capita (in U.S$)	288	239,461	216,458.8	26,652.48	1,117,198
Ethnic Fractionalization	234	0.27	0.21	0.00	0.74
Language Fractionalization	243	0.26	0.25	0.01	0.84
Religious Fractionalization	279	0.48	0.26	0.01	0.81
Political Rights	252	2.21	1.72	1	7

39,000 persons.

4 Methodology

The model specified in this study conforms largely to the economic or apolitical class of models which aim to explain issues related to the size of government. In an effort to test the hypothesis that archipelagic countries have bigger governments, we employ an OLS estimator with robust standard errors to the following empirical model[2]:

$$\begin{aligned} g_{it} &= \alpha + \beta_1 POP_{it} + \beta_2 GDPPC_{it} + \delta POPDENSE_{it} + \chi FRAC15_{it} + \psi FRAC65_{it} \\ &\quad + \phi OPEN_{it} + \theta ARCHIPELAGIC_i + \gamma ETHNICFRAC_{it} + \varepsilon_{it} \end{aligned} \tag{1}$$

where the dependent variable represents the central government spending to GDP ratio and in alternative specifications government spending per capita, both

[2]Instrumental variable regressions were also performed using latitude as an instrument for per capita income with no discernible difference from the OLS results

Table 3: Geographic Description of Archipelagic Countries[1]

Country	Peninsulas	Islands	Islets/Cays
Antigua & Barbuda		2	
Bahamas		29	661
Bermuda		138	
Cape Verde		10	8
Comoros		4	
Denmark	1	443	1,419
Fiji		322	522
Greece	2	1,400	
Grenada		7	
Indonesia		17,508	
Japan		6,852	
Kiribati		33	
Macao	1	2	
Malaysia	2		
Maldives			1,192
Micronesia		607	
Netherlands Ant		5	
New Zealand		2	
Palau		10	
Papua New G.	1	600	
Philippines		17,107	
Puerto Rico		5	2
Samoa		2	8
Sao Tome Pr.		2	
Seychelles		115	
Singapore		63	
Solomon Is.		1000	
St. Kitts Nevis		2	
St.Vincent Gr.		17	6
Tonga		169	
Trinidad Tob.		2	
Vanuatu		82	

measure the relative size of government, GDPPC is gross domestic product per capita and measures the average income level in the country, POP is the size of the population and is an indicator of country size[3] , POPDENSE is the population density and measures the number of people per square kilometer, OPEN is the sum of exports and imports divided by GDP and measures the degree of openness to trade, FRAC15 is the percentage of the population below the age of 15 whereas FRAC65 is the percentage of the population above the age of 65. ETHNICFRAC measures the degree of ethnic fractionalization and it ranges from 0 to 1 with 0 being the highest degree of homogeneity. Finally, the key variable is ARCHIPELAGIC and it is defined as follows:

$$ARCHIPELAGIC = \begin{cases} 0 & \text{if country is archipelagic;} \\ 1 & \text{otherwise.} \end{cases}$$

In some additional specifications we include RELFRAC, LANGFRAC, and POLRIGHT which are measures of religious fractionalization, language fractionalization, and the degree of political freedom in a country. The first two are measured in the same way as the ETHNICFRAC variable where as the POLRIGHT variable ranges from 1 to 7 where 7 is represents the lowest level of political freedoms and 1 is the highest.

5 Results

Table 4 below presents the results for estimation of the empirical model outlined above using the dependent variable government expenditure to GDP (GOVGDP) and the log of government expenditure per capita in equations I and III respectively. Equations II and IV present an alternative specification which includes

[3]We also use land area as a measure of country size and found no discernible difference between regressions that use land area and the regression results we present here use population size

measures of ethnic fractionalization, religious fractionalization and the degree of political freedom.

Table 4: Estimation Results

	I	II	III	IV
	GOVGDP	GOVGDP	LGOVPC	LGOVPC
Population	-1.411**	-1.075**	-0.051**	-0.042**
	(0.166)	(0.163)	(0.007)	(0.008)
Density	-0.004**	-0.005**	0.0003**	0.0003**
	(0.0003)	(0.0004)	(0.00001)	(0.00002)
FRAC15	-0.243**	-0.12*	-0.014**	-0.01**
	(0.060)	(0.060)	(0.003)	(0.003)
FRAC65	0.075	0.335**	-0.002	0.006
	(-0.094)	(0.107)	(-0.004)	(-0.005)
GDP per Capita	-4.47**	-3.982**	0.806**	0.82**
	(0.393)	(0.389)	(0.016)	(0.017)
Openness	0.048**	0.054**	0.002**	0.002**
	(0.007)	(0.007)	(0.0003)	(0.0003)
ARCHIPELAGIC	2.613**	3.073**	0.116**	0.123**
	(0.704)	(0.718)	(0.026)	(0.028)
ETHNICFRAC	-3.382**	-1.521	-0.233**	0.15**
	(1.015)	(-1.309)	(0.049)	(0.054)
RELFRAC		4.616**		0.114*
		(1.034)		(0.049)
LANGFRAC		-4.321**		-0.172**
		(1.352)		(0.055)
POLRIGHT		0.698**		0.022**
		(0.155)		(0.007)
Constant	78.984**	61.839**	5.597**	5.082**
	(5.727)	(5.568)	(0.243)	(0.253)
Observations	1620	1530	1620	1530
R^2	0.24	0.24	0.88	0.88

Robust standard errors in parentheses

significant at 5 %; ** significant at 1 %

In all the specifications, the logged population variable is significant and negatively related to government expenditure. Similarly, the population density variable is also significant and negatively related to both measures of government size. These results suggest that countries can benefit from economies of scale in supplying public goods or services as the population or population density increases. The dependency variable FRAC15 is significant in all specifications and carries a negative coefficient. This differs from the results of Shelton (2007) who obtained

a positive but insignificant result when examining the size of central government. This can likely be explained by the fact that societies with high proportions of children, also have higher proportions of working age people which may not necessarily imply higher public expenditures. The dependency variable FRAC65 which is intended to capture the impact of persons over 65 on the government expenditure is significant and positively related to government expenditure in equation II, indicating that as the number or proportion of persons aged 65 and above increases, the ratio of government expenditure to GDP will increase. This is consistent with the payment of social security benefits as persons leave the workforce. The coefficients for this variable are not significant in the other specifications but in an alternative specification that we run using the total age dependency ratio, we obtain highly significant and positive estimates[4]. Together these results seem to imply some nonlinear effects on public finance across age cohorts.

The degree of trade openness of a country is significant in all four and positively related to the proxy for government size. This implies that countries which are more open tend to have bigger governments. This result is consistent with the findings of Rodrik (1997) who found a positive relationship between openness and government size. This result is explained by the fact that highly open countries are more vulnerable to external trade shocks and therefore governments will likely invest in measures to stabilize the economy following the occurrence of such shocks.

The logged GDP per capita variable is positive and significant for equations III and IV where the dependent variable is government expenditure per capita. This provides some evidence for Wagner's law that more industrial countries will have a greater share of public expenditure in GDP. However, in specifications I and

[4]This specification is the same as the one we present except for the fact that we use a combined measure of age dependency. All other results from this specification were remarkably similar.

II where the dependent variable is the ratio of government expenditure to GDP, the elasticity coefficient associated with the GDP per capita variable is large, negative and statistically significant which does not lend support to Wagner's law. This finding is similar to the conclusion from Shelton (2007) that total government spending excluding social security payments declines as per capita income increases[5].

The coefficient of the dummy variable for religious fractionalization is positive and significant in the two specifications where it is included, implying that the greater the level of religious fractionalization the higher the level of government expenditure as government tries to meet political economy objectives. Countries with high degrees of religious fractionalization are more likely to allow for free expression of religious and political opinions. Thus, governments are therefore more likely to seek to cater to the needs of various religious groups. This argument regarding religious fractionalization is consistent with some findings presented by Hill et al. (2008) on the economic geography of Indonesia. Hill et al. (2008) found that some provinces which were religiously mixed exhibited low levels of conflict, while others with high majority religion shares exhibited serious conflict. However, he argues that there was no clear relationship between religious diversity and incidence of conflict across provinces. We find that the political rights variable is positive and significantly related to the size of government. This suggests that the more empowered the median voter, the greater his or her ability to influence political allocative decisions will be, which could potentially increase government expenditure.

[5]It should be noted that this study utilizes total expenditure, inclusive of social Security payments. However, most of the countries within the sample are developing countries and as such their demographics do not suggest significant expenditure on social security payments.

In contrast, the coefficient on the language and ethnic fractionalization variables are negatively related to both measures of government size, suggesting as the fractionalization according to language and ethnicity increases the size of government falls. High levels of ethnic diversity may be reflected at the decision making levels where policy makers find it difficult to achieve consensus regarding public policy choices thus resulting in low level of public sector investment. This result is consistent with the findings of Easterly and Levine (1997) and Alesina et al (2002). Easterly and Levine found that ethnic fragmentation in Africa was positively correlated with infrastructure measures such as electrical system losses and the number of unpaved roads. Similarly, Alesina (2002) in a paper providing a new measure of ethnic fragmentation conclude that high levels of ethnic and linguistic fragmentation can be associated with a lower quality of government, and a smaller share of government transfers in GDP.

Finally, we asked a question about whether or not a country's archipelagic geography would affect its public finances. Specifically, we seek to establish whether countries with archipelagic geographies have larger public outlays relative to contiguous countries after controlling for the standard determinants of public spending? Our results show that the coefficient associated with the dummy variable for the archipelagic states is positive and highly significant in all specifications. In regressions I and II, the coefficients are 2.613 and 3.073 respectively and this implies that after taking into account all variation in the control variables, countries with archipelagic geographies have public spending in percent of GDP roughly 3 percent larger than comparative contiguous countries. The raw difference in means between archipelagic countries and the full sample shown in tables 1 and 2 is 2.5 percent. Some of the difference in these means is explained by the fact that most archipelagic states are small and highly open to international trade but a substantial proportion of the difference we find is attributable to the geographic

morphology of these countries.

Part of the reason for including population density in the empirical model as a control was to distinguish between the phenomenon of remoteness and geographic separation by water. Large vast countries often have numerous remote and sparsely populated communities. Indeed remote and sparsely populated communities are also common in archipelagic countries but we argue that archipelagic countries have additional constraints. If standard principles of project evaluation were applied without regard to political and social realities, we might expect little difference in public outlay. However with voting communities distributed across multiple land units, in most cases each with strong attachments to that island and demands for public services, combined with an even greater need for infrastructure and services that increase social cohesion, public services and public infrastructure is likely it incur a higher incidence of duplication. This therefore means that public services such as schools, hospitals, public services, and airports must often be provided across intervening bodies of water whether or not the threshold population exists to justify the costs associated with provision of those services. Public expenditure will therefore increase due to the "need" to replicate services and infrastructure across islands, thus militating against the achievement of economies of scale.

6 Conclusion

This paper sought to examine the hypothesis that geographically fragmented countries engage in higher public spending relative to contiguous countries. Using a standard OLS estimator we find that countries with archipelagic morphologies have higher levels of government spending. This result is strongly indicative of a diminished capacity to realize economies of scale in spending on public service

provision and delivery across intervening bodies of water.

The results also confirm that public expenditure for countries varies directly with the level of trade openness and the dependent population aged 65 and above. We find some support for Wagner's Law as GDP per capita is positively related to our proxy for the size of government. Measures of ethnic and linguistic fragmentation suggest that public expenditure falls as fragmentation increase. We therefore conclude that difficulties in building consensus in highly fragmented (ethnic and language) countries impact negatively on public investment and policy outcomes.

This paper provides an exploratory analysis of the impact of certain geographic characteristics on public finances and by extension development. It begins to highlight an important stylized fact that geographically fragmented countries incur higher public expenditures relative to contiguous countries. Further research would entail determining what particular categories of spending are most affected by this and constructing models that provide additional insights into this phenomenon.

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APPENDIX

Table 5: Countries in the Sample

Contiguous Countries					Archipelagic Countries
Afghanistan	Croatia	Jordan	Paraguay	US	Antigua & Barbuda
Albania	Cuba	Kazakhstan	Peru	Uruguay	Bahamas
Algeria	Cyprus	Kenya	Poland	Uzbekistan	Bermuda
Angola	Czech Rep.	Korea, North	Portugal	Venezuela	Cape Verde
Argentina	Djibouti	Korea	Qatar	Vietnam	Comoros
Armenia	Dominica	Kuwait	Romania	Yemen	Denmark
Australia	Dominican Rep.	Kyrgyzstan	Russia	Zambia	Fiji
Austria	Ecuador	Laos	Rwanda	Zimbabwe	Greece
Azerbaijan	Egypt	Latvia	Saudi Arabia		Grenada
Bahrain	El Salvador	Lebanon	Senegal		Indonesia
Bangladesh	Equat. Guinea	Lesotho	Serbia Mont.		Japan
Barbados	Eritrea	Liberia	Sierra Leone		Kiribati
Belarus	Estonia	Libya	Slovak Rep.		Macao
Belgium	Ethiopia	Lithuania	Slovenia		Malaysia
Belize	Finland	Luxembourg	Somalia		Maldives
Benin	France	Macedonia	South Africa		Micronesia
Bhutan	Gabon	Madagascar	Spain		Netherlands Ant.
Bolivia	Gambia	Malawi	Sri Lanka		New Zealand
Bosnia Herzeg.	Georgia	Mali	St. Lucia		Palau
Botswana	Germany	Malta	Sudan		Papua New G.
Brazil	Ghana	Mauritania	Suriname		Philippines
Brunei	Guatemala	Mauritius	Swaziland		Puerto Rico
Bulgaria	Guinea	Mexico	Sweden		Samoa
Burkina Faso	Guinea-Bissau	Moldova	Switzerland		Sao Tome Pr.
Burundi	Guyana	Mongolia	Syria		Seychelles
Cambodia	Haiti	Morocco	Taiwan		Singapore
Cameroon	Honduras	Mozambique	Tajikistan		Solomon Is.
Canada	Hong Kong	Namibia	Tanzania		St. Kitts Nevis
Central African Rep.	Hungary	Nepal	Thailand		St.Vincent Gr.
Chad	Iceland	Netherlands	Togo		Tonga
Chile	India	Nicaragua	Tunisia		Trinidad & Tob.
China	Iran	Niger	Turkey		Vanuatu
Colombia	Iraq	Nigeria	Turkmenistan		
Congo, D Rep.	Ireland	Norway	Uganda		
Congo, Rep.	Israel	Oman	Ukraine		
Costa Rica	Italy	Pakistan	UAE		
Cote d'Ivoire	Jamaica	Panama	UK		