Democratization and Government Education Provision in East Asia

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Although it is commonly believed that democracy promotes public services such as education, efforts have just started to evaluate empirically how the recent trend of democratization affects education services in the developing world. This article reports on the first regionwide investigation in East Asia. By studying the effects of democracy on multiple education indicators in a time-series–cross-section dataset of eight East Asian countries/political entities, the article examines whether democratic governments increase education spending and access and which social groups are favored in the process. The statistical results, which are corroborated by findings from two case studies, show that democracy plays a progressive role in promoting education spending and school enrollment at the basic level in East Asia.

KEYWORDS: democratization, education policy, East Asia, redistribution, education spending, school enrollment, error correction model, time-series–cross-section analysis, Taiwan, Thailand

While the successful economic growth of East Asia with relative equity has often been attributed to the importance East Asian governments attach to providing basic education to their citizens,[1] little is known about how the recent trend of democratization has affected government education provision in this region. Given the more than a decade of democratic experience in some East Asian countries, we can begin to evaluate this question. In this article, I ask whether democratic governments in East Asia provide better education services to their citizens than do nondemocratic governments.

The belief that democratic governments care more about public service provision such as education can be derived from several theoretical traditions that highlight the role of electoral competition, the rationality of politicians, and the mobilization of interest groups. However, the

counterarguments to each tradition are many. Authoritarian regimes may also have incentives to improve education services, such as boosting legitimacy or facilitating economic growth.

This article contributes to a growing body of literature that explores empirically whether the transition to democracy makes an impact on government education provision. The evidence so far tilts toward a positive effect of democracy on improving total education spending,[2] education spending at the primary level,[3] and various education outcomes such as school enrollment, literacy rates, and gender equity.[4] Nevertheless, some studies identify a negative or a null relationship between democracy and various education indicators.[5]

This article makes two important contributions to the existing body of empirical research. First, it is the first regionwide investigation in East Asia[6] that, with its newly established democratic institutions, provides a hard test of the effects of democracy. Authoritarian regimes in this region have proven successful in both economic development and social service provision. Second, by studying at the same time the effects of democracy on multiple education indicators—total government education spending, spending at different levels of education, and school enrollment rates—I examine not only whether democratic governments increase education resources, but also which social groups are favored in the distribution of such resources and whether the resources are utilized more efficiently under democratic governments.

My main methodology is time-series–cross-section analysis. The dataset covers eight East Asian countries/political entities (Hong Kong before 1997, Taiwan, South Korea, Singapore, Malaysia, Indonesia, the Philippines, and Thailand) for the time period 1971–2003. My findings support the perspective that democracies promote better education services to their citizens, especially the relatively poor, as evidenced in East Asia by their higher per capita education spending, higher per student spending as percentage of GDP per capita at the secondary level, and higher gross secondary school enrollment. These statistical findings are corroborated by case study evidence from Taiwan and Thailand, where democratization is associated with greater education spending and pro-poor education expansion and redistribution.

In the following sections, I briefly review the theoretical arguments that consider the impacts of democracy on government education provision; present my research hypotheses, variables, data, and model specification; discuss the main findings; and present some country evidence that corroborates the statistical findings.

Does Democracy Promote Better Education Services?

One commonly held view is that politicians in democracies, constrained by electoral competition, would allocate more resources to social welfare to attract the support of the "median voters" when those voters have an income lower than the mean and thus would vote for social redistribution. Expanding education, especially basic-level, is one of the few effective ways to transfer resources from the rich to the poor, who constitute the majority of voters in developing countries.[7]

A similar conclusion can be reached from the perspective of public goods provision. Education, given the important role it plays in both national development and individual welfare (income, health, social mobility),[8] approximates a public good that benefits all members of the society. It is in the interest of politicians to provide more public goods under democracy, because this is a more economical way for them to secure the support of a larger number of core constituencies than providing private goods that benefit only selected members of society.[9] An economic theory of the state also implies that more public services would be provided in democracies. Given that the political market is more contestable in a democracy, the politicians are constrained from exercising their monopoly power, resulting in the provision of more public services.[10]

Theories focusing on how interest groups influence policymaking also conclude that better education services should be provided in democracies. Obtaining and disseminating information, lobbying the government, organizing, and assembling are not just easier, but the right to do so is protected by law in a democracy. All these increase the probability of generating more social redistribution. Networks of nongovernmental organizations (NGOs), for example, have been an important force in initiating education reforms and improving the quality of education worldwide.[11]

Yet, other scholars contend that there is no clear relationship between democratic regime and education provision. Michael Wallerstein and Karl Moene argue that it is simplistic for politicians to assume that the median voter necessarily prefers more social welfare, regardless of how the policy is designed. In policy areas such as basic education, in which all receive benefits regardless of their employment status, the redistribution and insurance motives of the median voter may balance out; since the median voter has to pay more to cover those without jobs, they may not prefer more spending.[12]

It is also noted that various other factors affect politicians' motives to provide social redistribution and quality public goods. Institutional factors, such as constitutional design, party systems, and partisanship, shape the scope and character of the benefits politicians must provide to build and maintain their support base.[13] In addition, various kinds of political market imperfections might distort politicians' motives to provide better public services under democracy. Examples include the lack of information among voters about politicians' performance; social fragmentation among voters, which is manifested as identity-based voting; and the lack of credibility of political promises to citizens, especially in new democracies.[14]

Counterarguments have also been made to the theories focusing on the influence of interest groups. The optimistic view on democracy assumes the same organizational capabilities of different groups and ignores collective action problems and distributional conflicts among them. Experience in Latin America has shown that education spending has often been drawn toward higher education since its lobby group, composed mainly of middle- and upper-class students and faculty members, is the most powerful.[15]

However, authoritarian regimes may invest in education to achieve other goals as well, such as boosting legitimacy, promoting economic growth, and facilitating social indoctrination. Educational expansion in Bismarck's Prussia, in Soviet Russia, and in Communist China all testify to how effective authoritarian regimes have been in expanding school enrollment. Education expansion in East Asia under authoritarian rule (South Korea, Singapore, Malaysia, Thailand, and Indonesia) provides further evidence that democracies are not the only guarantors of high enrollment rates.[16]

Research Hypotheses

Given the conflicting theoretical perspectives on the relationship between democracy and education provision, I consider three hypotheses for the East Asian case:

Hypothesis 1. Democratic governments spend more on education than nondemocratic governments.
Hypothesis 2. Democratic governments spend more on primary and secondary education than nondemocratic governments; but

there is no significant relationship between democratic govern-
ments and tertiary spending.

Hypothesis 3. Democratic governments have higher gross school
enrollments than nondemocratic governments at all levels.

I hypothesize a positive relationship between democratic regime
and total education spending (hypothesis 1) for the following reasons.
First, existing evidence from other regions is fairly strong to support a
positive relation. Second, one study in East Asia finds that democracy
has higher per capita education spending.[17] Third, there is already evi-
dence that democratization expands health care and social security in
South Korea and Taiwan.[18] I would expect similar expansion to occur
in the education sector.

Though an important indicator of government education provision,
aggregate education spending could mask very different distributions
of such spending—for example, a large bias toward the tertiary sector.
Hypothesis 2 further considers the relationship between democracy and
the distribution of education spending. It rests on the belief that demo-
cratic governments are more likely to allocate education resources to
basic education since this is an effective way to attract the support of
the poor, who compose the majority of voters in East Asian countries.
Existing empirical evidence also suggests that the effect of democracy
is significant in financing basic education in Latin America and Africa.

Hypothesis 3 tests whether democracy improves access to educa-
tion in East Asia. Existing empirical evidence has suggested a positive
relation between the expansion of suffrage and the expansion of mass
education.[19] Consistent with hypotheses 1 and 2, I expect that democ-
racy improves not only spending but also access in the East Asian case.
Enrollment at the tertiary level will also be improved due to diffusion
effect: a higher school enrollment at the secondary level provides more
population available to be educated at the tertiary level.

Countries and Study Period

This study of East Asia includes eight countries/political entities: South
Korea, Taiwan, Hong Kong (before 1997), Singapore, Indonesia,
Malaysia, the Philippines, and Thailand. There are a number of reasons
for choosing this group of cases. First, since unit homogeneity is a de-
sirable quality for statistical tests, these cases were chosen to make the

degree of unit heterogeneity as small as possible. They are all listed in the "East Asia" and "Southeast Asia groupings" of the Asian Development Bank (ADB). To a large extent, they share similar developmental characteristics and are grouped together in previous studies done by the ADB.[20] However, this group of cases also shows nice variation on both democratization and government education provision.[21]

The study period 1971–2003 was chosen partly because this is the period for which data on government spending and school enrollment were available. More importantly, this period is also ideal for studying the impacts of democratization on education, because it was a period that saw drastic political and educational changes in the region.

Variables and Data

Education Spending and School Enrollment

Education spending directly measures a government's investment in education. Total central government education spending as well as disaggregated spending at different levels are investigated. By employing both the aggregate and disaggregated measures, I hope to capture the government's allocation to the education sector in general as well as its allocative priorities within the education sector.

Following Robert Kaufman and Alex Segura-Ubiergo (2001),[22] three specifications of total education spending are used in this study. Education spending as a percentage of total government spending captures budget priorities of the government; education spending as a percentage of gross domestic product (GDP) reflects allocative priorities within the national economies as a whole; and education spending per capita measures potential resources available to citizens. All three have been used in other studies, and there is no consensus on which specification is the best. Employing all three has the advantage of capturing different dimensions of spending.

Three similar specifications are used for disaggregated education spending. Primary/secondary/tertiary spending as a percentage of total government education spending captures the government's allocative priorities within the education sector; primary/secondary/tertiary spending as a percentage of GDP measures allocative priorities within the national economy as a whole; and primary/secondary/tertiary spending per student as percentage of GDP per capita reflects actual resources available to students at different levels.

The school enrollment measure summarizes to some degree the effective utilization of government education resources (the actual schooling opportunities available to citizens) as well as the distribution of such resources at different levels. Gross school enrollment ratios at all three levels of education are examined in the study. It is expressed as a ratio of the number of students enrolled at a certain level over the number of children in the country's school-age group at that level.[23]

Democracy

Democracy is probably one of the hardest concepts in social science. Surprisingly, despite their somewhat different definitions, commonly used indicators of democracy are highly correlated and thus reliable.[24] I employ a dichotomous measure of democracy to intuitively capture its possible distinct effect from nondemocracy. Scores from the Polity IV dataset are used as the base for coding.[25] The "authoritarian" score of each country is subtracted from its "democratic" score. Any country that scored above 6 is coded as democratic, otherwise it is coded as nondemocratic.[26]

Economic Controls

Globalization. Integration into the global market may affect government education provision in profound ways. On the one hand, concerns about attracting global capital may stimulate governments, particularly those of developing countries, to refrain from education expansion that might be costly and thus have negative implications for macroeconomic indicators such as real interest rates, inflation, and debt service ratio.[27] On the other hand, global competition may force governments to improve their education services, which are critical to promoting "human capital" and the competitiveness of the economy as a whole.[28] In East Asia, upgrading the skill level of the labor force through education has been accepted as a successful strategy of industrialization in the global economy.[29]

I measure globalization in two ways: trade integration and capital account liberalization. Following conventions in the literature, trade integration is measured as (import + export) / GDP. For capital account openness, I use and extend the policy index developed by Dennis Quinn. Countries are given scores from 0 (not free) to 4 (free) based on their regulations of capital payments and receipts.[30]

GDP per capita. GDP per capita controls for the effect of Wagner's law, which states that wealthy nations tend to have a larger public sector. This

positive relationship between GDP per capita and education spending has been detected in several empirical studies of developing countries.[31]

Business cycle. Government spending might be influenced by the business cycle. In the member countries of the Organization for Economic Cooperation and Development (OECD), welfare spending is usually countercyclical: government spending on social transfers goes up when the economy is bad and falls when the economy recovers; however, governments in developing countries usually lack such stabilizing policies.[32] It could be hypothesized that in developing regions, government spending on education is procyclical: when the economy is thriving, education spending expands and vice versa. Following Kaufman and Segura-Ubiergo,[33] I construct an output gap variable to control for the business cycle. A positive sign indicates procyclical spending behavior and vice versa.

Government revenue. Besides business cycle, governments in developing countries are highly constrained by their financial capability. I include government revenue as a percentage of GDP in the model, controlling for the effect that how much governments spend on education may depend on how much they have at their disposal.

Ratio of capital stock to GDP. Governments' investment in education may also depend on the skill requirement of the economy. The assumption that there should be complementarities between human and physical capital in production has been demonstrated.[34] The capital stock measure developed by Barry Bosworth and Susan Collins is used to control for the skill requirement of the economy in the model.[35]

Political Controls

The electoral cycle literature suggests that politicians might manipulate spending for electoral concerns.[36] Given that education spending, particularly at the basic level, is usually viewed as a public good that could attract the poor and minority groups, I hypothesize that it increases in election years.

To derive the electoral cycle variable, the presidential or parliamentary election, depending on the political system of a country, is coded. Considering that spending should take place before the election, the variable is coded 1 in the calendar year if the election is held in July

through December; the variable is coded 1 in the year preceding the election year if the election is held in January through June.[37]

Demographic Controls

A younger population puts more pressure on the government to allocate resources to education. Moreover, since primary and secondary education spending has redistributive consequences, a significant coefficient of this variable also reflects the government's responsiveness to poorer parents whose children benefit more from basic schooling. Controlling for this variable or similar demographic ones is already a convention in the literature.

However, youth population is highly correlated with GDP per capita in my sample.[38] This is probably because family size tends to decrease in rich countries. Consequently, following Nita Rudra and Stephan Haggard,[39] I estimate each model in three ways: (1) with GDP per capita only; (2) with the youth population control only; (3) with both controls. Model (1) is presented in detail below, and differences among the three ways of estimation are reported, if any.

Appendix 1 details variable constructions and data sources.

Model Specification

My sample contains eight countries and thirty-three years of each country. This is a time-series–cross-section (TSCS) dataset as defined by Nathaniel Beck and Jonathan Katz. Such data characteristics have important repercussions for both statistical modeling and error correction, and any modeling strategy must be sensitive to its error structure, variable stationarity, and unit heterogeneity.[40]

I pursued the following modeling strategy. First, since my data is dominant in the time dimension (that is, I have more years than countries), stationarity of the variables is checked first to build correct statistical models.[41] Tests of stationarity suggest that nonstationarity characterizes my data.[42] My model of choice is the error correction model, which is relatively robust to nonstationarity among available methodologies. Another advantage of the error correction model is that it could capture both short- and long-term impacts of the explanatory variables on the dependent variables.[43] Second, country dummies are put into the models to control for unit heterogeneity and the influence of omitted

variables such as the size of the population, political history, and geo-graphical location.[44] A decade dummy is also included in the model to distinguish the 1990s from the years before. The years before the 1990s are characterized by rapid expansion of education in this region, espe-cially the introduction of free and compulsory education; in contrast, the 1990s saw a tide of comprehensive reviews of education systems and reforms. In addition, the decade dummy helps isolate the effects of democracy, since the 1990s were also the decade of democratization in the region.[45] Finally, the model is estimated through ordinary least squares (OLS) with panel-corrected standard errors to ensure appropri-ate error structure.

The final model I estimate is the following:

$$\Delta Y_{it} = \alpha - \phi Y_{i,t-1} + \beta_k \, (\Delta Democracy_{i,t-1} + \Delta Intrade_{i,t-1} + \Delta CapitalAccount_{i,t-1} +$$
$$\Delta GDPpercapita_{i,t-1} + \Delta CapitalIntensity_{i,t-1} + \Delta Government \ Revenue_{it} + \Delta BusinessCycle_{it})$$
$$+ \beta_j(Democracy_{i,t-2} + Intrade_{i,t-2} + CapitalAccount_{i,t-2} + GDPpercapita_{i,t-2}$$
$$+ CapitalIntensity_{i,t-2} + Government \ Revenue_{i,t-1} + BusinessCycle_{i,t-1})$$
$$+ \Delta election_{it} + \chi U + \delta T + \varepsilon_{it}$$

Y_{it} represents education spending/school enrollment for country i at time t; Δ is the first difference operator. The explanatory variables de-mocracy, globalization, GDP per capita and capital intensity of the econ-omy are lagged one year to increase confidence that the causality occurs from these exogenous variables to the dependent variable. Government revenue and business cycle are not lagged since they capture shock of the same year. The differenced election dummy is $\Delta election_{it}$;[46] U is a vector of country dummies; T is the decade dummy; ε_{it} is a random error. Six highly skewed variables—trade, GDP per capita, education spending per capita, tertiary spending as percentage of GDP, tertiary spending per student as percentage of GDP per capita, and tertiary school enrollment—have been logged to achieve normality.[47] In the model, β_k measures the short-term impact of ΔX_t on ΔY_t whereas $\gamma = \beta_j/\phi$ measures the long-run equilibrium relationship between X and Y. ϕ is the yearly adjust rate.[48]

Main Findings

The model results show three main findings that are robust. First, democracies have a higher per capita education spending than non-democracies, supporting hypothesis 1. Second, democracies have dif-ferent allocative priorities; although democracies do not significantly

increase primary spending, they make more resources available to students at the secondary level while devoting a smaller proportion of their budget to tertiary education. This suggests the main beneficiaries of education expansion under democracy are the poor rather than the rich, as speculated in hypothesis 2. Third, democracies have a higher gross secondary school enrollment ratio than nondemocracies, partly confirming hypothesis 3 that democracies would have higher school enrollment at all levels. This result is not surprising given that primary school enrollment already reached universal in 1980 in all East Asian countries regardless of regime type. It is also consistent with the finding that democracies devote more resources to secondary education but less to tertiary education, and it further suggests that democracies also use those resources more efficiently.

Results from Aggregate Spending Models

Table 1 shows the results from total government education spending models. The D line refers to the differenced term of the explanatory variable, and the L line refers to the lagged term. In brackets are panel-corrected standard errors. For clarity of presentation, the coefficients for country dummies are not shown. In general, the models explain about 27 percent to 36 percent of total variance in education spending. The fits are reasonable overall. The signs of the control variables are mostly consistent with theoretical expectations. Trade integration seems to increase government education spending, whereas capital account openness does not have any significant effects. Richer countries have more resources available to their students, as argued by Wagner's law. East Asian governments are also constrained by their fiscal ability to spend, and these governments have a procyclical spending pattern. The relationship between capital intensity of the economy and education spending is positive, showing the complementarities between physical and human capital.

As we can see from Table 1, democracy does not have a significant impact on education spending as a percentage of total government spending. But for both education spending as percentage of GDP and education spending per capita models, the impacts of democracy are positive and significant in both the short and long term. Democracies would increase education spending by about .3 percent of GDP the next year immediately following democratization; then they would increase education spending more by about .5 percent gradually. Overall, democracies spend about 1 percent more of GDP on education than

Table 1 Total Government Education Spending Model Results

Model		(1) Education Spending as % of Government Spending	(2) Education Spending as % of GDP	(3) Education Spending Per Capita (log)
Democracy $_{t-1}$	D	.54	.27*	.1**
		(.74)	(.15)	(.05)
	L	−.25	.21**	.08**
		(.47)	(.11)	(.03)
Trade (log) $_{t-1}$	D	−.4	.37	.14
		(1.4)	(.29)	(.09)
	L	1.4*	.27*	.11***
		(.74)	(.15)	(.04)
Capital account openness $_{t-1}$	D	−.4	−.03	−.02
		(.42)	(.11)	(.03)
	L	−.04	−.03	−.01
		(.29)	(.06)	(.02)
GDP per capita (log) $_{t-1}$	D	−11	−2.3	−.08
		(7.2)	(1.5)	(.39)
	L	−1.1*	−.47***	.19***
		(.67)	(.17)	(.07)
Revenue as % of GDP $_t$	D	−.09	.05***	.01**
		(.07)	(.01)	(.004)
	L	−.001	.04***	.01***
		(.06)	(.01)	(.003)
Output gap $_t$	D	−.02	−.02**	.01**
		(.04)	(.01)	(.003)
	L	.01	.02*	.001
		(.04)	(.01)	(.003)
Capital stock as % of GDP $_{t-1}$	D	−.02	.0002	.0003
		(.03)	(.005)	(.001)
	L	.01	.004***	.001**
		(.01)	(.001)	(.0005)
Election $_t$	D	−.14	.04	.01
		(.18)	(.04)	(.01)
Lagged dependent variable		−.3***	−.4***	−.36***
		(.06)	(.07)	(.06)
Decade		.92**	−.14	−.03
		(.45)	(.1)	(.03)
Constant		8.1	2*	−.89**
		(5.3)	(1.2)	(.42)
R^2		.27	.36	.36
N		159	159	159

Notes: All models are estimated through OLS with panel-corrected standard errors. D refers to a differenced term of the explanatory variable, and L refers to a lagged term. In brackets are panel-corrected standard errors. Country dummies are not shown for clarity of presentation. F-tests indicate country dummies are significant in all the models except (1).

*significant at .1 level; **significant at .05 level; ***significant at .01 level.

nondemocracies in approximately six years.[49] Given that the average education spending is about 3 percent of GDP in the region, this is about a 33 percent increase in educational resources. Democratization would also improve the log of education spending per capita by a total of .32. For a country such as Malaysia, with an average education spending per capita of $319 during the study period, this means education spending per capita would rise to $439 (a 38 percent increase) in approximately eight years as democratization takes place. This is a fairly large effect.

Results from Disaggregated Spending Models

The results from disaggregated spending models are shown in Table 2. Reduced data availability and the problem of missing data[50] mean that there are fewer cases in these models than in the aggregate spending models. Thus, explanatory variables that do not have a significant contribution to the models are left out to increase the efficiency of estimation. The explanatory variables could account for 27 percent to 50 percent of the variations in these models. The fits are reasonable. Similar to the aggregate spending models, the signs of the control variables are generally consistent with theoretical expectations.

The results show that East Asian democracies have more education resources available to students at the primary and secondary levels. Democracy has a significant positive effect on per student spending at the primary level: in approximately nine years, democracies spend 3 percent more of their GDP per capita on primary education per student than nondemocracies. Given that the regional average per student primary spending is about 11 percent of GDP per capita, democracy could increase per student primary spending by about 27 percent.

The evidence for the positive role of democracy is even stronger for secondary spending. In two of the three specifications (as percentage of GDP and per student spending as percentage of GDP per capita), democracy has a significant positive effect. The models show that a transition to democracy in East Asia would increase secondary spending by about .5 percent relative to GDP and improve per student secondary spending by 5 percent relative to GDP per capita in about eight years. The regional averages of secondary spending are 1 percent of GDP and 14 percent of GDP per capita; the increases under democracy—by almost 50 percent and 35 percent respectively—are quite remarkable.

However, democracies in East Asia seem to allocate fewer resources to tertiary education. The models show that democracy is negatively

Table 2 Disaggregated Education Spending Model Results

		Primary Spending			Secondary Spending			Tertiary Spending		
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable		As % of Education Spending	As % of GDP	Per Student as % of GDP per Capita	As % of Education Spending	As % of GDP	Per Student as % of GDP per Capita	As % of Education Spending	As % of GDP (log)	Per Student as % of GDP per Capita (log)
Democracy $_{t-1}$	D	-2.8	.1	-.05	-4.8	.12	1.2	-3.1**	.01	.14
		(4.6)	(.16)	(1.2)	(3.6)	(.15)	(2.1)	(1.5)	(.12)	(.19)
	L	-2.6	.02	1.4**	2.5	.2**	2.1**	-5.3***	-.15	.07
		(2.0)	(.12)	(.56)	(2.5)	(.1)	(.86)	(1.6)	(.11)	(.15)
Trade (log) $_{t-1}$	D	5.5	-.21	1.9	-9.2	-.25	.76	-2.4	.16	.37
		(5.1)	(.29)	(1.8)	(5.8)	(.24)	(3.9)	(4.6)	(.29)	(.47)
	L	2.8	-.19	-.57	-4.2	-.38**	-3.5	-3.6	.07	.1
		(2.8)	(.17)	(.93)	(3.1)	(.16)	(2.2)	(2.6)	(.17)	(.24)
Capital account openness $_{t-1}$	D	1.4	.03	.8	2.6	.12	2.7**	-.59	-.03	-.09
		(1.2)	(.11)	(.83)	(2.0)	(.11)	(1.3)	(1.7)	(.1)	(.16)
	L	1.8	.03	-.76	3.4*	.08	-.28	1.7	-.02	.03
		(1.4)	(.11)	(.53)	(2.1)	(.1)	(1.0)	(1.5)	(.09)	(.13)
GDP per capita (log) $_{t-1}$	D	-24**	-1.3	-6.4	98***	2.2**	-13	-20*	-2***	-1.1
		(10)	(.87)	(5.3)	(19)	(.89)	(10)	(11)	(.74)	(.65)
	L	-9.6***	-.6***	-1.9**	4.3	-.45***	-3.6***	7.9***	.27**	-.3*
		(3)	(.2)	(.81)	(3.2)	(.17)	(1.2)	(2.3)	(.13)	(.17)
Revenue as % of GDP $_t$	D	.06***	.26***		.06***	.33***		.01		
		(.01)	(.08)		(.01)	(.14)		(.02)		
	L	.03***	.13*		.05***	.19		.01		
		(.01)	(.07)		(.01)	(.13)		(.02)		

Table 2 Continued

Model		Primary Spending			Secondary Spending			Tertiary Spending		
		(1) As % of Education Spending	(2) As % of GDP	(3) Per Student as % of GDP per Capita	(4) As % of Education Spending	(5) As % of GDP	(6) Per Student as % of GDP per Capita	(7) As % of Education Spending	(8) As % of GDP (log)	(9) Per Student as % of GDP per Capita (log)
Dependent variable										
Output gap$_t$	D		.004 (.003)	-.01 (.02)	-.06 (.17)			.13 (.13)	-.002 (.01)	
	L		.003** (.001)	.02*** (.01)	-.33** (.16)			.32*** (.11)	.01** (.01)	
Capital stock as % of GDP$_{t-l}$	D				.18** (.07)	.01** (.004)	-.1*** (.03)			
	L				.01 (.03)	.003*** (.001)	.03*** (.01)			
Lagged dependent variable		-.63*** (.15)	-.67*** (.13)	-.44*** (.08)	-.74*** (.15)	-.4*** (.14)	-.43*** (.13)	-.53*** (.11)	-.37*** (.09)	-.4*** (.14)
Decade					-3.3** (1.5)					
Constant		88*** (25)	5.6*** (1.6)	15*** (5.7)	-11 (26)	3.7*** (1.1)	48*** (16)	-41*** (10)	-2.8*** (.85)	3.3* (1.8)
R^2		.42	.5	.41	.46	.46	.3	.36	.33	.27
N		72	70	77	72	70	69	80	80	67

Notes: All models are estimated through OLS with panel-corrected standard errors. D refers to a differenced term of the explanatory variable, and L refers to a lagged term. In brackets are panel-corrected standard errors. Country dummies are not shown for clarity of presentation. F-tests indicate country dummies are significant in all the models.

*significant at .1 level; **significant at .05 level; ***significant at .01 level.

associated with two specifications of tertiary spending (as percentage of government spending and as percentage of GDP). The first negative association is significant at the .05 level: democracies devote a total of 13 percent less of their education spending to the tertiary level in about seven years. The regional average on tertiary spending is 18 percent of total education spending, which means democracy would lead to a 72 percent decrease. Such reduction is again very impressive.

Results from School Enrollment Models

Table 3 shows the results for school enrollment models. The R^2s range from .2 to .36, which are reasonable fits. Again, the control variables are mostly consistent with theoretical expectations. Richer countries have a higher school enrollment rate at the secondary and tertiary levels; so do countries that are more urbanized. However, the globalization variables do not have significant impacts on school enrollment rates.

As can be seen from Table 3, among the three enrollment models, democracy has a positive long-term impact only on gross secondary school enrollment. A transition to democracy has no immediate effect on gross secondary enrollment the next year; however, it gradually increases secondary school enrollment by 14 percent in approximately fourteen years. Considering that the regional average secondary school enrollment during the study period is 63 percent, this effect of democracy means that democratization would increase gross secondary school enrollment by about 20 percent. Such effects are again large.

Robustness Issues

I consider a number of potential problems that might affect my statistical results, as summarized in Table 4. First of all, are the significant findings on democracy sensitive to its specification? I rerun the models using four different indicators of democracy.[51] The findings on spending remain mostly consistent across different specifications. The positive effect of democracy on secondary school enrollment also remains significant for democracy indicators that emphasize institutional constraints.[52]

Youth population was not included in the initial round of model estimation due to its high collinearity with GDP per capita. Democracy no longer has a significant effect on total education spending as percentage of GDP and secondary spending as percentage of GDP when the demographic control is introduced (together with GDP per capita or separately). Other substantive findings on democracy remain significant.

Table 3 Gross School Enrollment Model Results

Model		Gross School Enrollment		
Dependent variable		(1) Primary Level	(2) Secondary Level	(3) Tertiary Level (log)
Democracy $_{t-1}$	D	.92	1.2	−.08
		(1.6)	(1.2)	(.06)
	L	.58	4***	−.07
		(1.1)	(.79)	(.05)
Trade (log) $_{t-1}$	D	3.3	−1.4	−.07
		(3.7)	(2.5)	(.11)
	L	2.7	.2	−.05
		(1.7)	(1.5)	(.07)
Capital account openness $_{t-1}$	D	.39	1	.02
		(1.0)	(.79)	(.03)
	L	.8	.98	.02
		(.88)	(.65)	(.03)
GDP per capita (log) $_{t-1}$	D	19	1.8	−.37
		(16)	(13)	(.51)
	L	−.15	8.1***	.22**
		(2.4)	(2.0)	(.10)
Urbanization $_{t-1}$	D	.56	3.3***	.08**
		(1.1)	(.91)	(.04)
	L	−.05	−.14*	.003
		(.10)	(.08)	(.003)
Capital stock as % of GDP $_{t-1}$	D	.08	.02	−.0004
		(.05)	(.04)	(.002)
	L	.01	−.003	.0004
		(.02)	(.02)	(.001)
Lagged dependent variable		−.23***	−.28***	−.14**
		(.05)	(.05)	(.06)
Decade		−2.2*	−1.6*	−.03
		(1.4)	(.92)	(.03)
Constant		8.6	−61***	−1.7*
		(17)	(13)	(1.0)
R^2		.23	.36	.2
N		157	152	121

Notes: D refers to a differenced term of the explanatory variable and L refers to a lagged term. The models are estimated using OLS with PCSE.

*significant at .1 level; **significant at .05 level; ***significant at .01 level.

The proportion of resources that governments could devote to education may depend very much on the total resources governments have at their disposal. Similarly, the resources they could devote to each level of education may also rely on total education resources available, and school enrollment might be a function of fiscal resources available. Nevertheless, entering the spending controls directly in the model has the potential problem of endogeneity.[53] A better modeling

Table 4 Summary of Robustness Checks

	Total Education Spending		Primary Spending		Secondary Spending	Tertiary Spending	School Enrollment
	% of GDP	Per Capita	Per Student as % of GDP per Capita	% of GDP	Per Student as % of GDP per Capita	% of Education Spending	Secondary Level
Effects of democracy	+	+	+	+	+	–	+
Model results sensitive to?							
Different indicators of democracy	no	no	no	no	no	no	no[a]
Youth population control	yes	no	no	yes	no	no	no
Spending control	yes	no	no	yes	no	no	no
Other controls	no	no	no	no	no	no	no
Sample variation (Taiwan, HK)	no	no	yes	no	no	no	no
Taking potentially problematic countries out (e.g., Singapore)	no	no	no	no	no	no	no

Note: a. Model results are not sensitive to indicators of democracy that emphasize institutional constraints.

strategy would be an instrumental variable approach, but good instruments are hard to find. As a rough check of the findings, I rerun the models, including corresponding spending controls directly. The substantive findings remain pretty much the same except that democracy no longer has a significant effect on total education spending as percentage of GDP and secondary education as percentage of GDP.

I considered a number of other specifications for the aggregate spending models: the interaction between GDP per capita and democracy,[54] the 1997 financial crisis, trends, inequality, and alternative measures of the business cycle. None of the substantive findings on democracy change. Interaction terms are not considered for the disaggregated spending models due to limited data availability. Dropping urbanization,[55] which is highly correlated with GDP per capita, from the school enrollment models also does not change the basic findings.

Another potential problem that might affect the robustness of the findings is sample variation. Even though I have collected data for all eight countries in the study, the model results presented previously are actually based on an estimation sample that, because of missing data, does not include Taiwan and Hong Kong.[56] To get some rough idea as to whether my findings could be generalized to Taiwan and Hong Kong, I reestimated the models, including the two in the estimation sample, by slightly changing model specifications.[57] Changes like this have the danger of confounding sample changes with that of variable effects, but a consistent finding will increase the confidence of its validity. Given this caveat, it is comforting to see that the findings on democracy remain almost the same. However, the positive effect of democracy on primary spending per student as percentage of GDP per capita is no longer significant when Taiwan and Hong Kong are added to the estimation sample.

In addition, since Singapore has a trade volume two times higher than the regional average and thus might have a big influence on the findings, models excluding Singapore are estimated. Substantive findings do not change. Also, for the disaggregated spending models, countries such as Indonesia and the Philippines have only a few data points. This causes a potential problem for the error correction model, which should not include countries with such a short time span. To address this problem, I reestimate each disaggregated spending model, excluding countries of limited data points for that model. It is comforting to see that the findings do not change.

The various robustness checks conducted in this section cast caution on the findings that democracy has a significant positive effect on

total education spending as percentage of GDP, secondary spending as percentage of GDP, and primary spending per student as percentage of GDP per capita. However, the findings that democracies have a higher per capita education spending, a higher secondary per student spending as percentage of GDP per capita, a lower government budget devoted to tertiary spending, and a higher gross secondary school enrollment are robust.

Cases

Statistical studies are usually (and rightly) criticized for their lack of specificity. In contrast, case studies analyze the research question in specific historical and national contexts.[58] In this section, I further test my hypotheses in two case studies. Both the Taiwan and Thailand cases show that democracy is associated with greater education spending and pro–basic education financing, supporting hypotheses 1 and 2. In Thailand, democracy is also associated with higher gross school enrollment at the primary and secondary levels, partly supporting hypothesis 3.

Case Selection and Method

Among cases in my statistical sample, Taiwan and Thailand are two ideal candidates to study the apparent effects of democratization. Both of them went through democratic transition in the late 1980s. With more than a decade of democratic experience available, the effects of democracy can start to be identified by comparing government education provision in the predemocratic period with the democratic period. Second, the two cases have nice contrasts in terms of economic development and education achievements. Taiwan already had a relatively high income and a strong reputation with respect to education provision at the time of democratic transition. Thailand, however, had a much lower income and school enrollment ratios. Thus, these two cases represent well other democratizing cases in the sample.[59]

Taiwan

The Chinese Nationalist Party (KMT) ruled Taiwan with martial law between 1949 and 1986. The late 1980s saw the start of democratic transition in Taiwan. In 1986, the KMT regime accepted the formation of an oppostition party, the Democratic Progressive Party (DPP), and

martial law was lifted in 1987. The Civic Organization Law, which set the rules for the formation of new parties, was promulgated in 1989, and a more democratic period in Taiwan's history began in 1992. For the first time, all the legislators were elected directly from Taiwan in the second legislative election. The first direct presidential election was conducted in 1996, and Lee Teng-hui became Taiwan's first popularly elected president. The 2000 presidential election marked the end of the KMT one-party rule in Taiwan; the election was won by the opposition candidate Chen Shui-bian from the DPP, who was reelected in 2004.

Democratization in Taiwan is associated with profound changes in government education provision. Despite high educational achievements in a comparative context, the Taiwanese education system was highly controlled by the state, and education spending also favored the elites during the authoritarian period.[60] As the political environment gradually liberalized, various civil groups were mobilized and formed a social movement demanding fundamental education reforms.[61] The increasing popularity of the reform movement forced the government to respond by initiating education reforms in 1994.

Although it might still be too early to evaluate the reform measures, the Taiwanese education system is very different today from what it was during the predemocratization period, which I detail elsewhere.[62] Relevant to this article, democratization is associated with greater central government education expenditure and new legislation to protect education spending and basic education financing, which supports hypotheses 1 and 2. Even though the Taiwanese constitution long stipulated a minimum spending on education, science, and culture for all levels of government,[63] the central government has never reached its spending minimal of 15 percent.[64] In 1989, in a more relaxed general political environment, the legislators in the opposition party[65] strongly opposed such low central government spending on education. In response, the central government, for the first time, increased spending on education, science, and culture to the amount set by the constitution in 1990. As a result, education spending increased from only 5.6 percent of total central government spending in 1987 to about 10 percent in 1993; it has stabilized around that level since then.

Second, new legislation was successfully pushed through by reform groups and sympathetic legislators to protect education spending in the late 1990s, because the constitutional provision that guarantees a minimum education spending had been abolished.[66] Two laws, the Education Fundamental Act and the Compilation and Administration of Education Expenditures Act, were passed to ensure the priority of education

spending and basic education financing in the government budget. As Table 5 shows, the ratio of per student spending at the university level versus spending at the primary and junior high levels is much smaller in the democratic period as compared with the predemocratic period, partly reflecting the preference for basic education financing in the democratic period.[67]

Thailand

Two democratic openings can be identified in the recent history of Thailand. The 1973 student uprising against the military government, backed up by an alliance of the king, farmers, laborers, and the Bangkok middle class, ushered in the most democratic period in Thai history. But the success of the student rebellion was quickly hijacked by a center-right regime that was taken over by the military again in 1976.[68] However, after the democratic opening, the returned military regime could not oppress as before and ruled with a more moderate hand. It tried to even meet the needs of the citizens, who were ignored before the 1973 rebellion. In 1988, Chatichai Choonhavan became the first member of parliament to be elected prime minister in Thai history, and military power was subordinated under his rule. When, in 1991, his moderate government was overthrown by the military generals, who in 1992 formed a coalition government composed mainly of military leaders, a mass demonstration against the military leaders erupted in Bangkok. By the end of 1992, Thailand had elected a civilian government and had met the criteria for democracy in citizen participation, electoral competition, and civil liberties.[69] Then, in 2006, the military initiated another coup and toppled the Thaksin government.

Table 5 Taiwan: Education Spending per Student at Different Levels (1950s–2005, NT$1,000)

	1970s	1980–1987	1988–1997	1998–2005
Primary	4.4	12.4	42.8	88.1
Junior high	6.3	18.2	51.8	93.0
Senior high	19.9	44.5	115.1	151.4
Senior vocational	11.7	26.4	63.6	95.9
Junior college	18.4	44.8	75.4	35.3
University	34.7	97.2	197.4	213.9
Ratio (university/primary)	7.9	7.9	4.6	2.4
Ratio (university/junior high)	5.5	5.3	3.8	2.3

Source: Author's own calculation based on data from Ministry of Education, Taiwan, 2006.

Evidence suggests that both democratic periods in Thai history are associated with pro-poor education expansion and resource distribution, supporting hypotheses 1 and 2 and partly supporting hypothesis 3. Education policy, and social policy in general, were incorporated into the national development plan for the first time under the democratic government between 1973 and 1976.[70] The democratic government initiated the first major education reform since 1960.[71] Emphasis was placed on a more equitable allocation of education resources; better implementation of six-year compulsory education, especially in the rural areas; the development of a curriculum more practical and more relevant to community life; and the decentralization of the administrative structure. Despite poor implementation, given the short life of the democratic government, primary school enrollment increased to almost universal, and secondary school enrollment also increased significantly but was concentrated in Bangkok. In contrast, tertiary school, which served the rich more than the poor,[72] expanded significantly due to the establishment of two open universities in 1971 and 1978, the predemocratic and postdemocratic period ruled by the military.

The democratic government of Chuan Leekpai, who was elected to power as the candidate of the Democratic Party in 1992, was also associated with pro-poor education policies. The Chuan government faced a particularly low secondary school enrollment and unequal regional distribution of education resources in a comparative context. To address these problems, the Chuan government extended compulsory education from six to nine years; specific measures such as a student loan scheme and a tuition waiver program were set up to help poor students and reduce disparities in education.[73] Total education spending increased by about 2 percent of total government budget under Chuan's government; spending on secondary school increased by about 2 percent of total education spending; and gross secondary enrollment also increased dramatically, from 37 percent to 54 percent. Compared with the stagnation of government education provision in the 1980s under the moderate military regime, this achievement of the democratic government was remarkable. The promulgation of the most democratic constitution in Thai history, in 1997, was also associated with pro-poor education expansion and, more remarkably, with a fundamental reform of the education system in Thailand. The constitution stipulates that twelve years of free basic education would be provided to all citizens. The 1999 New Education Act, based on the spirit of the constitution, started a fundamental reform of the Thai education system in areas such as access, learning mode, administrative structure, and quality control. The democratic

government also implemented several strategies to ensure that poor students would not be deprived of education opportunities after the 1997 financial crisis. Even though the implementation of these policies is still to be evaluated, the direction of policy change showed the progressive role of democracy in improving basic education services.

Conclusion

Table 6 summarizes the robust findings in this article. As can be seen from the table, democracies in East Asia do provide better education services to their citizens, particularly those who are relatively poor. They have a higher per capita education spending, a higher per student spending as percentage of GDP per capita at the secondary level, a smaller proportion of government budget devoted to tertiary education, and a higher gross secondary school enrollment rate. These effects of democracy are significant after controlling for factors such as wealth, government fiscal constraints, and the skill intensity of the economy. Compared with regional averages, the magnitudes of these effects are pretty remarkable. The statistical findings on the progressive role of democracy in education provision are further corroborated by country evidence from Taiwan and Thailand, where democratization is associated with greater government education spending, pro-poor education expansion, and redistribution.

My findings add strong empirical evidence to the theory that democracy provides better basic education services. The East Asian case is a rather hard test for the effects of democracy, since authoritarian regimes in this region have proven to be successful in both promoting

Table 6   Effects of Democracy in East Asia

	Regional Average[a]	Democracy[b]
Total education spending (per capita)	$243[c]	+ $91[c]
Secondary spending (per student as % of GDP per capita)	14%	+5%
Tertiary spending (as % of total education spending)	18%	−13%
Gross school enrollment (secondary level)	63%	+14%

Notes: a. Data refer to the average of all countries in the sample during the period 1971–2003.

b. Depending on the adjustment rate of model, these effects of democracy are realized in approximately eight to sixteen years.

c. Data are based on Penn World Tables 6.1, constant international dollar, 1996 as the baseline.

economic development and improving the education level of their citizens. Consistent with findings in Latin America, Africa, developing countries in general, and global samples, my study shows that democracy also has a progressive role in promoting better education services, particularly at the basic level, in East Asia.

However, my study still leaves a number of questions worth exploring in future research studies. First, even though my statistical study is carefully designed, it could be improved by better data and a better modeling strategy. Missing from Taiwan and Hong Kong are data on several key independent variables. The dependent variables are also second best. The total education spending data come only from the central government. For most countries in my sample, this is not a big problem since central government spending composes the majority of the spending. Nevertheless, in a case like Taiwan, where central government spending accounts for only about one-third of total education spending, the data represent a rough approximation, even though the trends of central government spending and general government spending are similar. The disaggregated spending data for all cases except Taiwan contain only current expenditure; also, the data cover only until 1997, which seriously limits the number of cases available for estimation. Education participation would be better measured by net school enrollment rather than gross school enrollment. The statistical results might also be improved if good instruments could be found for controls such as youth population and spending constraints.

Second, my study leaves unanswered the following question: What are the causal processes that have produced these effects of democracy? My model results do show that the effects of democracy require a number of years to be realized, suggesting a long-term causal process. My preliminary country studies elsewhere show that in Taiwan, interest groups played a major role in producing the educational changes associated with democratization by, for example, initiating societywide discussions and protests and gaining the sympathy of legislators, whereas electoral incentives of the politicians also prevented them from taking any unpopular education measures; in Thailand, the democratic elites and NGOs might be the major forces of change, whereas electoral competition played almost no role. Nevertheless, the causal stories and the politics of education associated with democratization, particularly those related to social redistribution and structural reform, need to be investigated more closely and in more country and comparative case studies. An even further question is whether democracy and better basic education provision would reinforce each other in East Asia.

Appendix 1   List of Variables

Variable	Definition	Source
e_gov	Education spending as % of total government spending	Data for Hong Kong, Malaysia, the Philippines, Singapore, and Taiwan are from the Asian Development Bank (ADB), *Key Indicator Series*. Data for Korea and Indonesia are from IMF *Government Finance Statistics* (GFS), 2004 CD-ROM. Data for Thailand are from ADB (1971–1994) and GFS (1995–2003). The consistency of different data sources is checked and validated.
e_gdp	Education spending as % of GDP	GDP data are from World Bank, *World Development Indicators* (WDI), 2005, online at http://devdata.worldbank.org/dataonline/old-default.htm.
e_pc	Education spending per capita (PPP measure)	Constructed based on PPP measure from Penn World Tables 6.1. Population data are from WDI. Formula: e_pc (ppp measure) = (education spending per capita in local price) * real GDP per capita (constant price: Laspeyres) / GDP per capita (local price).
trade	Trade intensity	Trade = (import + export) / GDP * 100. Data are from WDI 2005 online. Taiwan data are from Penn World Tables 6.1.
opencap	Capital account openness coded as 0–4 (0 = not free, 4 = free)	Annual data. Author's coding based on Quinn's coding rules. IMF, *Annual Report on Exchange Restrictions* (1972–2003).
polity2	Degree of openness of political institutions, Scale: –10–10 (–10 = high autocracy, 10 = high democracy)	Polity IV.
democracy	Regime type (polity), coded as 0, 1 (0 = autocracy, 1 = democracy)	Author's coding based on polity2 from Polity IV. Countries scoring 6 or more points are coded as democracy.
ACLP2	Regime type (ACLP), coded as 0, 1 (0 = autocracy, 1 = democracy)	Alvarez, Cheibub, Limongi, and Przeworski's coding of regime type (1996) combined with the democracy coding above for years after 1990. Mike Alvarez, José Antonio Cheibub, Fernando Limongi, and Adam Przeworski, "Classifying Political Regimes," *Studies in Comparative International Development* 31 (Summer 1996): 3–36.
polyarchy	Polyarchy, 0–100	Tatu Vanhanen, "A New Dataset for Measuring Democracy, 1810–1998," *Journal of Peace Research* 37, no. 2 (2000): 251–265.
liberty	Liberty score, 1–7 (1 = not free, 7 = most free)	Freedom House (2005 online at www.freedomhouse.org/uploads/fiw/FIWAllScores.xls); Scores of HK were provided to the author by the publisher. The liberty score is an average between political rights and civil liberty scores.

continues

Appendix 1 Continued

Variable	Definition	Source
election	Election year, coded as 0, 1 (0 = election year, 1 = nonelection year)	Author's coding. For Taiwan, Indonesia, Korea, Singapore, and the Philippines, presidential elections are coded; for Malaysia and Thailand, parliamentary elections are coded. Source: Aurthur S. Banks, Thomas C. Muller, and William R. Overstreet, eds., *Political Handbook of the World,* various editions (Washington, DC: CQ Press).
rev_gdp	Revenue as % of GDP	Source for revenue data is the same as that for spending data.
lngdp_pc	ln real GDP per capita (constant price, Laspeyres)	Penn World Tables 6.1.
outputga2	Real GDP per capita (constant price, Laspeyres) output gap	outputgap = (Real GDP per capita – Hondrick Prescott Filtered Real GDP per capita) / Hondrick Prescott Filtered Real GDP per capita * 100. HP filtered real GDP per capita is calculated using excel added in by Kurt Annen (downloadable at www.web-reg.de/hp_addin.html, accessed April 13, 2006). An λ of 6.25 is chosen.
urban	Urban population as % of total population	Penn World Tables 6.1.
pop014	Age 0–14 as % of total population	WDI 2005 online; Taiwan data are from Taiwan National Bureau of Statistics (TNS).
ks_gdp	Capital stock as % of GDP	Barry Bosworth and Susan M. Collins, "The Empirics of Growth: An Update," Working Paper, Brookings Institution, September 2003.
prim_edu	Primary school spending as % of total education spending	UNESCO Yearbook, various years; data indicate only current expenditure; data for Taiwan are from Taiwan Statistical Yearbook.
sec_edu	Secondary school spending as % of total education spending	UNESCO Yearbook; Taiwan Statistical Yearbook.
ter_edu	Tertiary school spending as % of total education spending	UNESCO Yearbook; Taiwan Statistical Yearbook.
prim_gdp	Primary school spending as % of GDP	UNESCO Yearbook; WDI 2005 online.
sec_gdp	Secondary school spending as % of GDP	UNESCO Yearbook; WDI 2005 online.
ter_gdp	Tertiary school spending as % of GDP	UNESCO Yearbook; WDI 2005 online.
primps	Primary school spending per student as % of GDP per capita	UNESCO Yearbook; WDI 2005 online.
secps	Secondary school spending per student as % of GDP per capita	UNESCO Yearbook; WDI 2005 online.
terps	Tertiary school spending per student as % of GDP per capita	UNESCO Yearbook; WDI 2005 online.
gelprim	Gross primary school enrollment	UNESCO Yearbook, various years; data for Taiwan are from Taiwan Statistical Yearbook.
gelsec	Gross secondary school enrollment	UNESCO Yearbook, various years; data for Taiwan are from Taiwan Statistical Yearbook.
gelter	Gross tertiary school enrollment	UNESCO Yearbook, various years; data for Taiwan are from Taiwan Statistical Yearbook.

Appendix 2   The Derivation of the Error Correction Model

The error correction model is given by

$$\Delta Y_{it} = \alpha + \beta_k \Delta X_{it} - \phi(Y_{i,t-1} - \gamma X_{i,t-1}) + \varepsilon_{it} \tag{1}$$
$$(i = 1, \ldots, N; t = 2, \ldots, T.)$$

where Y_{it} represents in this study education spending/school enrollment for country i at time t; Δ is the first difference operator; X is a vector of independent variables to be estimated; ε_{it} is a random error.

As can be seen from equation 1, any impact of X on Y is composed of two parts: first, any short-term change of X, ΔX_t will have a contemporaneous impact on Y and the impact ΔY_t is determined by the coefficient β_k; then, if the short-term changes disrupt the long equilibrium relationship between and X and Y, Y will continue to change to adjust back to the equilibrium relationship with X at a yearly rate of ϕ.

After rearranging terms, equation 1 can be rewritten as

$$\Delta Y_{it} = \alpha - \phi Y_{i,t-1} + \beta_k \Delta X_{it} + \phi\gamma X_{i,t-1} + \varepsilon_{it} \tag{2}$$

Let $\beta_j = \phi\gamma$, then

$$\Delta Y_{it} = \alpha - \phi Y_{i,t-1} + \beta_k \Delta X_{it} + \beta_j X_{i,t-1} + \varepsilon_{it} \tag{3}$$

Equation 2.3 can then be estimated through OLS. The interpretation of coefficients is as follows:
β_k measures the short term impact of ΔX_t on ΔY_t; γ ($\gamma = \beta/\phi$) measures the long-run equilibrium relationship between X and Y; ϕ is the yearly adjust rate (e.g. in the second year, the effect is $\gamma\phi$; the third year, $(\gamma - \gamma\phi)\phi$ until all the effects go away).

The total impact of ΔX_t on ΔY_t is $\beta_k + \gamma = \beta_k + \beta/\phi$.   (4)

Jing Chen recently received her PhD in political science from Rutgers, State University of New Jersey, where she also earned a masters degree in statistics. Her dissertation studies the impacts of globalization and democratization on government education provision in East Asia. Her research interests are comparative social policy with a regional focus on East Asia. She has a BA in international studies and economics from Beijing University.

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17. Chan, "Democracy and Inequality."

18. Huck-ju Kwon, "Transforming the Developmental Welfare State in East Asia," *Development and Change* 36, no. 3 (2005): 477–497; Joseph Wong, *Healthy Democracies, Welfare Politics in Taiwan and South Korea* (Ithaca: Cornell University Press, 2004); Christian Aspalter, *Democratization and Welfare State Development in Taiwan* (Burlington, VT: Ashgate, 2002).

19. Stanley L. Engerman, Elisa V. Mariscal, and Kenneth L Sokoloff, "The Evolution of Schooling Institutions in the Americas, 1800–1925," Working Paper (Los Angeles: University of California, 1998); Peter Lindert, *Growing Public: Social Spending and Economic Growth Since the Eighteenth Century* (Cambridge: Cambridge University Press, 2004). Also see note 4 for other literature on the positive relation between democracy and school enrollment.

20. K. M. Lewin, "Access to Education in Emerging Asia: Trends, Challenges and Policy Options," research monograph for the Asian Development Bank, *Emerging Asia Development Review*, 1996.

21. Based on the standard Polity score, South Korea, Taiwan, the Philippines, and Thailand experienced democratic transition in the late 1980s and Indonesia in the late 1990s, whereas Singapore and Malaysia remained authoritarian throughout the study period. In terms of education provision, Hong Kong, South Korea, Taiwan, and Singapore are relatively higher education achievers than Malaysia, Indonesia, the Philippines, and Thailand.

22. Kaufman and Segura-Ubiergo, "Globalization, Domestic Politics."

23. A more accurate measure for participation is net school enrollment ratio, which excludes children enrolled at a certain level but above the official school age. However, this measure suffers a serious missing data problem for countries in my sample.

24. Gerardo Munck and Jay Verkuilen, "Conceptualizing and Measuring Democracy, Evaluating Alternative Indices," *Comparative Political Studies* 35 (February 2002): 5–34.

25. Monty Marshall, Keith Jaggers, and Ted Robert Gurr, Polity IV Project*, 2003. The project website is www.cidcm.umd.edu/polity.

26. The democratic years in the dataset are Indonesia (1999–2002), South Korea (1988–2002), the Philippines (1987–2002), Thailand (1992–2002), and Taiwan (1992–2002).

27. Geoffrey Garrett, "Globalization and Government Spending Around the World," *Studies in Comparative International Development* 35, no. 4 (2001): 3–29; Layna Mosley, "Room to Move: International Financial Markets and National Welfare States," *International Organization* 54 (Autumn 2000): 737–773.

28. Kaufman and Segura-Ubiergo, "Globalization, Domestic Politics."

29. Don Adams, "Education and National Development: Priorities, Policies, and Planning," *Education in Developing Asia Series,* Asian Development Bank, 2002; Alain Mingat, "The Strategy Used by High-performing Asian Economies in Education: Some Lessons for Developing Countries," *World Development* 26 (April 1998): 695–715; Jandhyala B. G. Tilak, "Effects of Adjustment on Education: A Review of Asian Experience," *Prospects* 27, no. 1 (1997): 85–107.

30. Dennis Quinn, "The Correlates of Change in International Financial Regulation," *American Political Science Review* 91 (September 1997): 531–551. For countries included in this study, Quinn provides data for 1973, 1982, 1988, and 1997 only. I extend his coding to annual data.

31. Kaufman and Segura-Ubiergo, "Globalization, Domestic Politics"; Rudra and Haggard, "Globalization, Democracy"; Stasavage, "Democracy and Education Spending."

32. Rudra and Haggard, "Globalization, Democracy"; Kaufman and Segura-Ubiergo, "Globalization, Domestic Politics."

33. Kaufman and Segura-Ubiergo, "Globalization, Domestic Politics."

34. R. Benabou, "Equity and Efficiency in Human Capital Investment: The Local Connection," *Review of Economic Studies* 63 (1996): 237–264; Daniele Checchi, "Inequality in Incomes and Access to Education: A Cross-Country Analysis (1960–95)," *Labor* 17 (June 2003): 153–201.

35. Barry Bosworth and Susan M. Collins, "The Empirics of Growth: An Update," Working Paper, Brookings Institution, September 2003. Their measure of capital stock has taken into particular consideration issues such as stock vs. investment and domestic vs. international prices.

36. Joan M. Nelson, *Economic Crisis and Policy Choice, the Politics of Adjustment in the Third World* (Princeton: Princeton University Press, 1990); Chae-Han Kim, "Political Business Cycle in Korea," in Jongryn Mo and Moon

Chung-In, eds., *Democracy and Korean Economy* (Stanford: Hoover Institution Press, 1999).

37. Moritz Kraemer, "Electoral Budget Cycles in Latin America and the Caribbean: Incidence, Causes, and Political Futility," Working Paper Series No. 354, Office of the Chief Economist, Inter-American Development Bank, 1997.

38. The simple Pearson correlation between these two variables is -.9.

39. Rudra and Haggard, "Globalization, Democracy."

40. Nathaniel Beck and Jonathan Katz, "What to Do (and Not to Do) with Time-Series Cross-Section Data," *American Political Science Review* 89 (September 1995): 634–647; Nathaniel Beck and Jonathan Katz, "Nuisance vs. Substance: Specifying and Estimating Time-Series–Cross-Section Models," *Political Analysis* 6 (1996): 1–36; Nathaniel Beck, "Time-Series–Cross-Section Data: What Have We Learned in the Past Few Years?" *Annual Review of Political Science* 4 (2001): 271–293. Nathaniel Beck and Jonathan Katz, "Time-Series–Cross-Section Issues: Dynamics," Working Paper, New York University, 2004; William H. Greene, *Econometric Analysis* (New York: Macmillan, 2003).

41. Nathaniel Beck and Jonathan Katz, "Throwing Out the Baby with the Bath Water: A Comment on Green, Kim, and Yoon," *International Organization* 55 (Spring 2001): 487–495; Bernhard Kittel and Hannes Winner, "How Reliable Is Pooled Analysis in Political Economy? The Globalization-Welfare State Nexus Revisited," *European Journal of Political Research* 44 (March 2005): 269–293.

42. Given the methodological limitations on testing stationarity for TSCS data, both the Im-Pesaran-Shin panel unit root test and Dicky-Fuller tests for individual time series in each country are performed. Details of the tests are not shown here due to space limitations.

43. Nathaniel Beck, "Time Series–Cross Section Data"; Anindya Banerjee, ed., *Co-integration, Error Correction and Econometric Analysis of Nonstationary Data* (New York: Oxford University Press, 1993).

44. Kaufman and Segura-Ubiergo, "Globalization, Domestic Politics."

45. Objections have been made that including country and decade dummies might absorb cross-section and cross-time variance; thus, scholars need to be careful about using them by balancing their advantages and disadvantages. Thomas Plumper, Vera E. Troeger, and Philip Manow, "Panel Data Analysis in Comparative Politics: Linking Method to Theory," *European Journal of Political Research* 44 (March 2005): 327–354; Beck and Katz, "Time Series–Cross Section Issues." In response to these concerns, an F-test has been conducted in the study to assess whether country effects are required; some countries have also been added or dropped from the model one at a time to see whether the results would differ. In terms of using the decade dummy of the 1990s, given that my data (eight countries, thirty-three years each) are dominant in the time dimension, I am less worried that one decade dummy would badly absorb the variation.

46. Since I do not theoretically expect a long-run impact of election cycle on education spending, I have only included a differencing term for it.

47. John Fox, *Applied Regression Analysis, Linear Models, and Related Methods* (Thousand Oaks, CA: Sage Publications, 1997).

48. For a detailed derivation of the error correction model and the interpretation of the coefficients, see Appendix 2.

49. For formulas to interpret the coefficients, see Appendix 2.

50. Data for disaggregated spending are available only for the period 1971–1997, while data for aggregate spending covers 1971 to 2003. What compounds less data availability for disaggregated spending models is the problem of missing data in countries such as Indonesia.

51. The four measures are (1) another dichotomous measure of democracy that highlights its contestation and participation nature (Mike Alvarez, José Antonio Cheibub, Fernando Limongi, and Adam Przeworski, "Classifying Political Regimes," *Studies in Comparative International Development* 31 [Summer 1996]: 3–36); (2) a continuous measure of the Polity score, (3) the liberty score published by Freedom House focusing on a list of political and civil rights that citizens should enjoy in a democracy (Raymond Duncan Gastil, "The Comparative Survey of Freedom: Experiences and Suggestions," *Studies in Comparative International Development* 25 [Spring 1990]: 25–50); and (4) a democracy score (polyarchy) constructed by Tatu Vanhanen, "A New Dataset for Measuring Democracy, 1810–1998," *Journal of Peace Research* 37, no. 2 (2000): 251–265, relying mainly on election results.

52. The positive impacts of democracy on secondary school enrollment are no longer significant when I use indicators that do not emphasize the institutional constraint dimension of democracy (Freedom House liberty score and Vanhanen's polyarchy index; see note 51).

53. For example, the explanatory variables already in the model (except capital stock as percent of GDP) can explain 35 percent of total government spending.

54. Two studies have identified different effects of democracy on education achievement for rich and poor countries: Brown, "Reading, Writing, and Regime Type"; and Baum and Lake, "Political Economy of Growth."

55. Urbanization is included in the school enrollment models due to its high explanatory power.

56. Taiwan does not have data on capital account openness; Hong Kong lacks data on capital stock, polity score, and election.

57. I was able to include Taiwan in the estimation sample by dropping the explanatory variable of capital account openness; similarly, by dropping capital account openness, capital stock, election, and the changing of democracy specification from polity scores to Freedom House liberty scores, I was able to include both Taiwan and Hong Kong in the estimation sample.

58. Another advantage of case study is to help identify the underlying causal process, which is beyond the scope of this article.

59. Among other democratizing cases in the sample, South Korea, which democratized in the late 1980s and has a relatively high income, is well represented by Taiwan. The Philippines, with lower income and democratization in the late 1980s, is well represented by Thailand. Indonesia, which democratized

in the late 1990s, is a less ideal candidate to study the effects of democratization, which may take some time to realize.

60. Three kinds of proelite spending inequalities have been identified by the Taiwanese education movement organizations: (1) the government devoted more resources to university education than to compulsory education; (2) investment in academic education was favored by the government over vocational education; (3) private education received few subsidies from the government compared with public education. Given the strict government control of enrollment in public universities and senior high academic schools, it is students coming from rich families that are more likely to go to the better-funded academic schools, public schools, and universities, as they can better afford extra exam tutoring and fees and have less need to make money. Xiaohua Xue, *Civil Education Reform Movement in Taiwan* (in Chinese) (Taipei: Qianwei Publishing, 1996).

61. Xue, *Civil Education Reform Movement in Taiwan*.

62. Jing Chen, "Globalization, Democratization and Government Education Provision in East Asia" (PhD diss., Rutgers, State University of New Jersey, 2007).

63. Article 164 of the Taiwanese constitution stipulated that "expenditures of educational programs, scientific studies and cultural service shall be, in respect of the central government, no less than 15 percent of the total national budget; in respect of each province, no less than 25 percent of the total provincial budget; and in respect of each municipality or *hsien*, no less than 35 percent of the total municipal or *hsien* budget."

64. Some authors argue that this is because the central government devoted most resources to defense spending. Jingyi Zhu and Jiahui Ye, "Private Education in Taiwan: Examination of Current Status and Policy Recommendations" (in Chinese), paper presented at the National Civil Education Reform Conference, January 8, 1994.

65. Due to the limitation of my research, I have no information on the names of these legislators or the bills they proposed.

66. Article 164 was abolished upon recommendation by officials in the executive branch, such as the Ministry of Finance and the Directorate-General of Budget, Accounting, and Statistics, and the Executive Yuan, for reasons of inefficiency and waste. Lizhu Chen, "The Crisis and Turning Point of Education Finance in Taiwan" (in Chinese), proceedings of the Taiwan Education Fundamental Act Conference, 2000); Shixin Huang and Zhiquan Ding, "A Study on Education Revenues and Expenditures: Reasons for Freezing Article 164 of the Constitution and Responses" (in Chinese), Taiwan: Ministry of Education, June 1999.

67. Another reason for the decreasing ratio is the smaller youth population at the primary and the secondary levels.

68. Pasuk Phongpaichit and Chris Baker, *Thailand: Economy and Politics*, 2nd ed. (New York: Oxford University Press, 2002).

69. Clark Neher, "Democratization in Thailand," *Asian Affairs* 21 (Winter 1995): 195–209.

70. Waranya Teokul, "Social Development in Thailand," *ASEAN Economic Bulletin* 16, no. 3 (1999): 360–372.

71. Silaporn Nakornthap, *Educational Policy and Politics in Thailand: A Case Study of Education Reform, 1973–77* (Tallahassee: Florida State University, 1986).

72. In the mid-1980s, of the students who passed the university entrance exams, 46 percent were Bangkok residents and 74 percent were children of proprietors or government officials. Furthermore, the subsidies provided by the government for the tertiary level far outweigh those provided for the primary and secondary levels. Erik M. Kuhonta, "The Political Economy of Equitable Development in Thailand," *American Asian Review* 21 (Winter 2003): 69–108.

73. David Murray, "The 1995 National Elections in Thailand: A Step Backward for Democracy?" *Asian Survey* 36 (April 1996): 361–375; World Bank, *Thailand: Secondary Education for Employment,* vol. 1: *A Policy Note* (Washington, DC: World Bank, 2001).