Does Local Government Proliferation Improve Public Service Delivery? Evidence from Indonesia,

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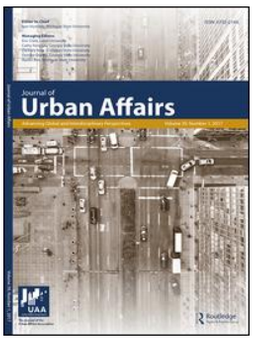

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ABSTRACT

Local government proliferation—the creation of new local governments via the splitting of administrative jurisdictions into smaller units—is a ubiquitous phenomenon in developing countries. Supporters of proliferation argue that it brings government closer to citizens and thereby helps to better match public service supply with demand. In Indonesia, the number of local governments has increased by about 80% since just prior to the initiation of the government's decentralization program in 2001 until present. This investigation exploits the plausibly exogenous timing of local government splitting to identify the causal effects of proliferation on education and infrastructure service access in Indonesia. The examination finds that the establishment of new local governments has no impact on school enrollments but that it negatively affects water and sanitation access. The study offers some preliminary evidence to imply that the poor infrastructure service performance of newly created local governments is driven by the relatively corruptible nature of the sector and the comparatively more fragile governance environments that exist in new local jurisdictions.

The decentralization of responsibility for providing and financing services from central government to local governments is a ubiquitous phenomenon in developing countries (Martinez-Vazquez & Vaillancourt, 2011; Smoke & Loffler, 2013). Decentralization is expected to result in a better match between local public service delivery and heterogeneous citizen preferences. Theoretically, the expected benefits essentially derive from the relative physical nearness of local governments to their respective constituents. Increased proximity allows local governments to more accurately discern citizen demand for services compared to central government and to tax and spend more effectively based on that knowledge (Oates, 1972). Proximity also supports the strengthening of local horizontal accountability. Because citizens are physically closer to their local governments, they are better able to insist that their demands for more and better services are met. The increased demand-side accountability reinforces independent improvements to local government service supply. The overall outcome is more efficient local public service delivery, in theory (Lewis & Smoke, 2015; Martinez-Vazquez & Vaillancourt, 2011; Oates, 1972; Smoke & Loffler, 2013; Tiebout, 1956).

Worldwide experience of developing countries that are decentralizing their public sectors suggests, however, that the theoretical benefits of decentralization may not be so easily achieved. Practice demonstrates that the increased proximity between local government decision-makers and their citizens that decentralization affords may be insufficient to engender anticipated advances in local service outcomes. A considerable body of quantitative and qualitative evidence on decentralization's service delivery effects in developing countries is decidedly mixed, ranging from strongly positive to intensely negative and essentially everything in between (Bardhan & Mookherjee, 2006;

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Boadway & Shah, 2009; Channa & Faguet, 2012; Connerley, Eaton, & Smoke, 2010; Faguet, 2014; Martinez-Vazquez &Vaillancourt, 2011; Smoke, 2001, 2015; Smoke & Loffler, 2013; United Cities and Local Governments, 2010).

The literature highlights various governance factors as leading causes for decentralization's uneven service delivery performance. A significant amount of research shows that local governments in developing countries often suffer from elite capture and/or clientelism (Bardhan & Mookherjee, 2000, 2012; Smoke, 2015). The former implies that fiscal resources are diverted away from the delivery of basic public services demanded by most citizens toward proscribed uses and/or beneficiaries, especially the rich and powerful. The latter suggests that benefits may be especially susceptible to redirection to key constituencies during election periods. In either case, service delivery outcomes suffer for most citizens.

Local government proliferation—the creation of new local governments via the splitting of administrative jurisdictions into smaller units—also brings government closer to citizens. As such, like decentralization, it may facilitate a better match between the supply of and demand for local public services. Of course, new local units created by proliferation may suffer from some of the same political economy constraints—capture and clientelism—as decentralized local governments, in general. Despite the obvious and critical connection between local government proliferation and local public service delivery, empirical research on the topic is limited.

This study examines possible service delivery consequences of local government proliferation in a single developing country, Indonesia. Indonesia—the fourth most populous country in the world—is an interesting and important case in this context. It is an extremely socially and culturally heterogeneous nation; there are more than 300 ethnic groups, each with its own language, customs, and form of social organization. Population and attendant social, political, and economic activities are dispersed across a collection of nearly 14,000 islands, spanning approximately 5,000 km.

Indonesia is a unitary country including central, provincial, and local levels of government.[1] Until 2001, the regional administration of public affairs operated through a hierarchical, multitiered, and parallel system of deconcentrated central government agencies and nominally autonomous subnational units. Throughout most of its history, Indonesia's public sector was counted among the most centralized in the world.

In 2001, however, the country began a massive effort to decentralize authority over public service delivery to subnational governments. Local governments (districts or *kabupaten/kota*) have been allocated the majority of new service obligations. They have become responsible for public services in all major sectors, including education, health, infrastructure, social protection, environment, low-income housing, security and law and order, and support for economic development, among others. Subnational government responsibility for service delivery is considerable. Subnational spending makes up over one half of total public-sector spending net of subsidies and interest payments; local government expenditure comprises about 75% of the subnational total (Lewis, 2014).

Fiscal decentralization in Indonesia has been complemented by active political developments at the local level. Prior to 1999, both subnational government executives and members of parliaments (*Dewan Perwakilan Rakyat Daerah*, DPRD) were appointed by central government. In 1999, the popular election of DPRD representatives was introduced. Starting in that year, DPRDs began to appoint subnational government executives, as central government appointed heads' terms expired. DPRD members are elected for 5-year terms. Since the first polls, parliamentary elections have been held in 2004, 2009, and 2014 (Tomsa, 2014).

Indonesia initiated direct elections of subnational government heads in 2005. Direct elections have since been implemented in a gradual manner, as indirectly elected (i.e., DPRD appointed) heads' terms expired. At the end of 2005, just less than 40% of local governments were headed by directly elected executives; by the end of 2010, direct elections had been nearly fully phased in. The transition to direct local government elections can be seen as a gradual shift from a parliamentary to presidential form government (Lewis, 2017).

This article investigates the impact of local government proliferation on education and infrastructure services. Local governments devote more than half of their expenditure budgets to service delivery in these two sectors. Local government operations in the two sectors offer an interesting comparison. Education spending is mostly routine (teacher salaries) and capital expenditure is carried out on force account. Most spending on infrastructure is on capital and projects are typically tendered out to local contractors. Both local education and infrastructure public service access have gradually improved since decentralization began, at least in the aggregate.[2] Enrollments have increased in junior and senior secondary schools and household access to protected water and sanitation has risen. Not all districts have benefited from such improvements, however, and there is some evidence to suggest that service access is becoming significantly more unequally distributed across kabupaten/kota over time (World Bank, 2012).

Local government proliferation (*pemekaran*) is an especially important phenomenon in decentralizing Indonesia. Prior to 1998, Indonesian kabupaten/kota numbered 292 (excluding those in Jakarta). In the run-up to decentralization, 44 new districts were created, bringing the total to 336 at the beginning of 2001. By the end of 2010, the number of districts totaled 491. During the subsequent 5 years, an additional 38 kabupaten/kota were added, making the total number 529, an increase of more than 80% over original levels. Additional applications for the creation of new local governments are continuously being considered by central authorities.

Central and local advocates for the creation of new districts via pemekaran consistently cite the need to improve local public services as a rationale (Imansyah & Martinez-Vazquez, 2009). Taken at face value, this suggests that a desire to improve weak service delivery may inspire the district decision to split in the first instance. Moreover, the implicit argument of pemekaran enthusiasts is that district splitting will, after the fact, lead to more and better local services. Despite the central importance of the latter key question, the impact of district creation on local service delivery outcomes has not yet been comprehensively and rigorously assessed.

This study exploits the exogenous timing of district splitting to identify causal effects of new local government creation on education and infrastructure services. It finds that district splitting has no discernible impact on local junior and senior secondary school enrollments but that it does lead to declining household access to protected water and sanitation, when compared to original local government service outcomes, all else remaining equal. The study offers some preliminary evidence to suggest that the relatively poor public service performance of newly created local governments, especially as related to infrastructure provision, is driven by the comparatively more fragile governance environments that exist in new districts and the relatively corruptible nature of the infrastructure sector.

The rest of the article proceeds as follows. First, some general background on local government proliferation in developing countries is provided and the relevant academic literature is briefly reviewed. Second, district splitting processes and outcomes in Indonesia are highlighted. Third, data and methodological issues are discussed. Fourth, the impact of district splitting on service access is investigated. Fifth, some possible underlying causal mechanisms are explored. A final section of the article summarizes the main findings of the study and draws conclusions.

Proliferation in developing and transition countries

Local government proliferation is not a phenomenon that is unique to Indonesia. In fact, proliferation seems more the rule than the exception among developing and transition nations. A large and diverse collection of countries that includes Brazil, the Czech Republic, Ghana, Hungary, Nigeria, Pakistan, Uganda, and Vietnam, among others, has seen the creation of a relatively sizable number of subnational units in recent years (Grossman, Pierskalla, & Dean, 2017).

Despite the prevalence of subnational government proliferation, published research on the phenomenon is quite limited, covering just a few countries, including Indonesia. The research examines both motivations for and effects of proliferation, although more attention has been paid

to the former. Malesky (2009) maintains that the gerrymandering tactics of national reformers seeking to secure votes on the Central Committee propelled the recent creation of new provinces in Vietnam. Green (2010) argues that national politicians' search for lost regional patronage drives subnational administrative unit proliferation in Uganda. Grossman and Lewis (2014) provide empirical evidence to suggest that, on the contrary, various kinds of local political and socio-economic marginalization are the main motivating forces for proliferation in that country. Grossman et al. (2017) empirically examine the impact of the number of subnational administrative units on service delivery for an international cross section of low-income countries and find that the increasing number of units improves local service outcomes up to a point and thereafter has a negative impact on service delivery.

Specifically for Indonesia, Fitrani, Hofman, and Kaiser (2005) investigate the demographic, geographic, socioeconomic, and fiscal factors that explain local administrative unit proliferation from 2001 to 2003. They find that the probability of district splitting increases along with ethnic fragmentation, land area, and the local government wage bill and decreases with population size, central–local natural resource revenue allocations, and district development expenditures. In a more recent study, Pierskalla (2016) determines that ethnic and religious fragmentation drives district splitting to a large extent but that poor service access may also be an important contributing factor, among possible others. Kimura (2013) uses a case study approach to emphasize the importance of national–local rent-seeking coalitions in encouraging provincial-level proliferation.

Two recent studies consider the impact of district splitting in Indonesia. Burgess, Hansen, Olken, Potapov, and Sieber (2012) show that the rising number of local governments in provinces on the islands of Sumatra, Kalimantan, Sulawesi, and Papua leads to increased deforestation. Bazzi and Gudgeon (2016) find that the impact of district splitting on conflict depends on the ethnic composition of the newly established jurisdictions: The creation of more ethnically homogenous districts results in less conflict, whereas increased ethnic polarization in new local governments leads to more conflict. The present investigation builds on these two studies by considering the impact of district splitting on basic local public service delivery.

District splitting in Indonesia: Process and outcomes

The process for creating new local administrative units is quite involved. Details are specified in central government regulations, which outline a number of conditions that must be met before new districts can be established.[3] Criteria include the current number of subdistricts in a local government jurisdiction, the number of districts in the province, population size and geographic area of the district desiring to split, along with a variety of concerns related to its present fiscal, public infrastructure, economic, sociocultural, political, and security circumstances. The sitting local government and DPRD in the district that wants to split together prepare documentation that demonstrates that the many standards have been met.

After various community meetings to solicit inputs, the local government and DPRD submit their joint proposal to establish new districts to the province, where approval from both the governor and the provincial DPRD must be secured. Given the latter, the province dispatches the application to the Ministry of Home Affairs. The Ministry of Home Affairs evaluates the documentation and, once it is convinced that the local government meets the benchmarks, it drafts a law that is then forwarded to national parliament (*Dewan Perwakilan Rakyat*, DPR) by the president. Subsequently, the latter issues a law that officially creates the new local units. After it is legally created, a new district typically begins operations at the beginning of the next fiscal year. (More rarely, a period of 2 years is required before a new district is ready to begin operations.)

In practice, the central government portion of the process outlined above has been increasingly skirted by local government and DPRD applicants by taking proposals to establish new units directly to DPR (given provincial agreement). This route, though frowned upon by central government officials, is nevertheless valid because DPR promulgates all laws, including those needed to create

new districts. In this case, the DPR collects and evaluates the submitted documentation itself and, given internal agreement, drafts the required law; the draft law is then forwarded to the president for signing. The president has 60 days to offer objections to the draft law, after which time the law is promulgated, even without his or her signature.

This approach has not once met with presidential opposition, the apparent reason being that the president has had insufficient political backing in the DPR to reject the transmitted law, especially in the face of strong local aspirations surrounding the creation of new districts. The method has dominated the local government creation process in recent years, due to the relative ease of securing approvals (Imansyah & Martinez-Vazquez, 2009). The alternative process highlights the importance of national (parliamentary)–local coalitions in establishing new subnational governments, as described by Kimura (2013).

Partly in response to direct DPR approval procedures, central government issued a moratorium on the creation of new districts from 2004 to 2006. The moratorium did indeed have the desired effect of stopping the establishment of new local governments during the period. But district creation resumed anew after the moratorium expired. The main impact of the moratorium therefore seems to have been merely to delay the proliferation of local units. Government instituted a new moratorium in 2009, which lasted until 2012. This regulation appears to have been less well adhered to in practice, because at least 25 new local governments were created during the period (Ministry of Home Affairs, 2014). In any case, this moratorium has now expired as well and the creation of new districts continues at a robust rate.

Table 1 provides the basic outcomes of the district splitting process between 2001 and 2010 and the district proliferation typology used in this article. The 336 districts that existed at the beginning of decentralization in 2001 are called "original" districts. Of the original local governments, 238 did not split ("never-split" districts) and 98 did split ("split districts") at some point during the period. Split districts formed a total of 253 "new districts." The latter include both "parent" (*induk*) and "child" (*anak*) districts, where the former (98 in number) retain the previous district executive and local parliament (from the split district) but lose citizens and territory and the latter (155 in total) comprise the residual. By the end of 2010, 491 districts (238 + 253) were in existence, but a total of 589 local governments (491 + 98) had been in operation at some point during the 10-year period.[4]

Figure 1 shows never-split and newly created districts as of 2010. The figure illustrates well the broad significance of local government proliferation in Indonesia during the decade.

This study takes the fiscal year at which new districts begin operations as the date of new local government creation. As noted above, this is typically (but not always) the fiscal year that immediately follows the date of the law that formally establishes the new local governments. This definition differs from that used by previous researchers who have used the date at which new districts were established in law (Bazzi & Gudgeon, 2016; Burgess et al., 2012). Because the focus of this study is on new district public service delivery impact, it seems sensible to use a start date that coincides with the initiation of new local government operations rather than the date at which the relevant laws were promulgated. Table 2 shows the creation of new parent and child districts, by year, over the period 2001–2010. Note that no new local governments began operations between 2005 and 2007. This reflects the central government's 2004–2006 moratorium on new district establishment (i.e., with a 1-year lag).

Table 1. District splitting, 2001–2010.

Original	336
Never split	238
Split	98
New districts	253
Parent	98
Child	155
Total end of period	491
Total end of period and lapsed	589

Note. Author's own calculations based on data from the Ministry of Home Affairs.

Figure 1. Never-split and newly created districts, 2010.

Table 2. New district creation, 2001–2010.

	Parent	Child	Total
2001	0	0	0
2002	12	12	24
2003	25	37	62
2004	35	49	84
2005	0	0	0
2006	0	0	0
2007	0	0	0
2008	12	25	37
2009	9	18	27
2010	5	14	19
Total	98	155	253

Note. Author's own calculations based on data from the Ministry of Home Affairs.

Previous researchers of local government proliferation in Indonesia have argued that the timing of district splits is exogenously determined (Bazzi & Gudgeon, 2016; Burgess et al., 2012), in part because of the aforementioned central government–imposed moratorium on new district creation but also because of idiosyncratic delays in central government and national parliament administrative processes related to vetting and approving new district proposals. This study adopts the same assumption. Some empirical evidence to support the exogeneity claim is provided in the Appendix. The analysis shows that initial service access (i.e., in 2001) along with initial conditions of other relevant independent variables has no impact on the timing of the split. (See Table A2 for the specifics.) The plausibly exogenous timing of district splitting is exploited in the analysis that follows to identify the causal effects of new district creation on education and infrastructure service access.

Figure 2 illustrates some preliminary local government proliferation effects. It compares new district performance on junior and senior secondary school enrollments and household access to protected water and sanitation to that of two control groups: split and original districts. Service outcomes, treatment and control groups, and service delivery impact will be discussed in more detail in the analysis below. At this initial stage, it is perhaps useful to make three points.

First, the figures appear to indicate limited differences in education and infrastructure outcomes between new and split districts. The relatively large gaps between new and split local government performance in 2009 are largely a function the limited number of split district observations—five—in that year. Second, the differential performance between new and original local governments is considerably more apparent. Though the new–original district education gap seems to narrow for education to a certain extent, it apparently widens for infrastructure. Third, new local governments start from a much lower base of public education and infrastructure access than original districts. Average initial school enrollments and household water and

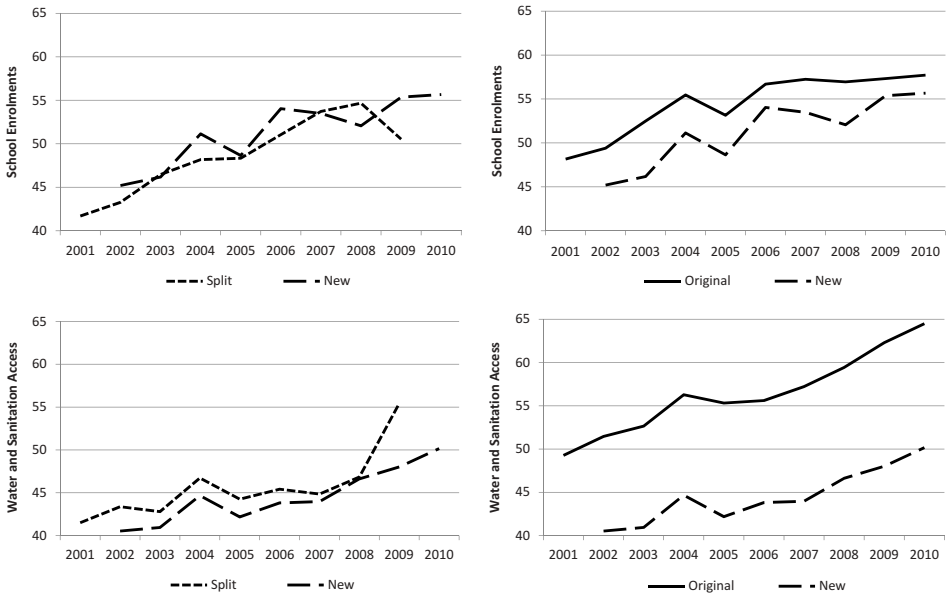

Figure 2. District splitting and education and infrastructure outcomes.

sanitation access for new local governments are 41.7 and 40.8% compared to 49.6 and 51.2% for original districts. With these facts in mind, the article turns to a more formal examination of the impact of new local government creation on public service outcomes in the education and infrastructure sectors.

Data and methods

Data

The dependent variables of interest to this study are education and infrastructure access. Education access is defined as the average of district junior and senior secondary school net enrollment rates. Infrastructure access is the percentage of households in the district with access to protected water and protected sanitation, where, again, the average is used to define the relevant variable.[5] Data on the four variables come from the Central Bureau of Statistics (BPS [Badan Pusat Statistik]) annual household survey (SUSENAS [Survei Sosial Ekonomi Nasional]).

Control variables used in the analysis include total local government spending per capita, population size, percentage of households with access to electricity, percentage of population that is poor, Gini coefficient for personal consumption per capita, and personal consumption per capita. Some research indicates that both per capita spending (Lewis, 2016) and population (Alesina, Baqir, & Hoxby, 2004) may have quadratic effects on service outcomes. Preliminary analysis suggested, however, that using spending squared and/or population squared had no impact on the results, so squared values of these variables are not used in the examination. Data are unfortunately unavailable on other potential determinants of local public service access such as district personnel competencies and related variables.

Data on local government spending have been accessed through Ministry of Finance and data on all other variables come from BPS/SUSENAS. Summary statistics for all variables employed in the empirical analyses in this study organized by original, split, and new districts can be found in Table A1 in the Appendix.

Methods

The main objective of this investigation is to test the (null) hypothesis that district splitting leads to improved education and infrastructure service access. For analytical purposes, new districts are collapsed into their 2001 boundaries. This facilitates a proper comparison between newly created local governments (the treatment group) and split and original districts (the control groups) over time. Table 3 provides a breakdown of the number of districts by type over the study period.

Two empirical models are used to examine the impact of local government splitting on education and infrastructure access. The first specification is a (static) generalized difference-in-differences model.

$$s_{it} = \alpha + n_{it}\beta_1 + n_{it-1}\beta_2 + z_{it}^{'}\beta_3 + \theta_t + w_i + w_i t + \varepsilon_{it}. \quad (1)$$

In Equation 1, subscripts i and t represent individual districts, respectively; s is education or infrastructure service access; n is a dummy variable denoting newly created districts, which takes on the value of one for all years after a split becomes effective, else zero; z includes exogenous control variables, detailed below; θ are time fixed effects, which accommodate any period shocks, such as those related to macroeconomic conditions that might have affected service delivery across all districts[6]; w are district fixed effects, which control for time-invariant impacts on service access across districts; $w * t$ are district-specific time trends, which control for the secular increases in service access during the period; ε is the error term; and α, β_1, β_2, and β_3 are the parameters to be estimated. In view of the stated objectives of the study, the examination focuses on $\hat{\beta}_1$ and $\hat{\beta}_2$.

Control variables include log total district spending per capita, log population, percentage of households with access to electricity, percentage of households that are poor, Gini coefficient for personal consumption per capita, and log personal consumption per capita. The model in Equation 1 is estimated by standard fixed effects methods.

The second model is a dynamic version of the first.

$$s_{it} = \alpha + s_{it-1}^{'}\gamma + n_{it}\beta_1 + n_{it-1}\beta_2 + z_{it}^{'}\beta_3 + \theta_t + w_i + \varepsilon_{it} \quad (2)$$

All notation and variables in Equation 2 have been previously defined. The main difference between Equation 1 and Equation 2 is that the latter specifies the lagged value of the dependent variable as a determinant (which renders the model dynamic). The inclusion of the lagged dependent variable on the right-hand side controls for possible independent effects of initial district service conditions, as Figure 2 suggests may be important to do, especially for the comparison between new and original districts. Finally, note also that the district-specific time trends have been dropped from the specification because the model cannot be estimated with those trends included.

Equation 2 is estimated by difference-generalized method of moment (GMM) techniques (Arellano & Bond, 1991).[7] Difference-GMM estimation proceeds by taking first differences of Equation 2 to purge the unobserved effects. In Equation 2, lagged service access is predetermined

Table 3. Number of districts, by type.

	Original	Never split	Split	New	Total
2001	336	238	98	0	336
2002	324	238	86	12	336
2003	299	238	61	37	336
2004	264	238	26	72	336
2005	264	238	26	72	336
2006	264	238	26	72	336
2007	264	238	26	72	336
2008	252	238	14	84	336
2009	243	238	5	93	336
2010	238	238	0	98	336

Note. Author's own calculations based on data from the Ministry of Home Affairs.

and moment conditions imply that second lags of service access (i.e., $s_{i,t-2}$) and beyond can serve as instruments for $\Delta s_{i,t-1}$ in the differenced equation. Differenced exogenous variables (i.e., n, its lagged value, the controls, and fixed time effects) serve as instruments for themselves. In order to avoid problems related to overinstrumentation, estimation in this study employs only the second to fourth lags to construct instruments for lagged service access and collapses those instruments to reduce their number further (Roodman, 2009).[8]

Impact of district splitting on service access

Equation 1 is estimated for both education and infrastructure service access for each of two different control groups: split districts and original districts. As already noted, estimation is by fixed effects methods. Standard errors are clustered at the district level to account for arbitrary serial correlation over time within groups. All regressions include control variables as previously specified, fixed time and district effects, and district-specific time trends (and a constant). Table 4 supplies the output, where only the results of main interest are shown.

The output suggests that the establishment of new districts has no apparent contemporaneous or lagged impact on either education or infrastructure service access when the comparator group is split districts, all else remaining the same. The creation of new local governments has no significant contemporaneous or lagged effect on access to education when compared to original districts either. However, the evidence implies that new district establishment negatively affects infrastructure access vis-à-vis original local governments, at least in the second year of operations. The specific result suggests that the creation of new districts leads to about a 1% decline in household access to protected water and sanitation in year 2 relative to original districts. The incorporation of additional lags into the specification—not shown in the table—demonstrates no statistically significant effects.

Table 5 provides the analogous estimation results for Equation 2. In this case, estimation is by two-step difference-GMM procedures where standard errors are again clustered at the district level. As before, only the results of main interest are supplied. The output shows that the coefficient of lagged service access is statistically significant in each of the four models. This suggests that the dynamic specification may indeed be appropriate in this context. The estimated coefficient is less than one in each case, implying that service access is conditionally converging across all districts taken together. As before, the output implies that the establishment of new local governments does not affect education or infrastructure access vis-à-vis access provided by split districts.

The creation of new districts has no discernable impact on education access relative to original districts either but negatively affects access to water and sanitation infrastructure, with a lag of 1 year. More specifically, in the short run, lagged new district formation reduces household access to protected water and sanitation by about 1.35% in the second year of operations. As before, adding deeper lags of the new district variable has no effect on infrastructure access. In the dynamic model setup, long-run effects are given by $\beta/(1 - \gamma)$. In the present case, this implies that new district

Table 4. Explaining education and infrastructure service access, static model.

	Split vs. new				Original vs. new			
	Education		Infrastructure		Education		Infrastructure	
Independent variables	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
New district	0.148	0.867	−0.162	0.920	0.391	0.573	−0.027	0.649
Lagged new district	−0.795	0.649	−0.923	0.726	−0.260	0.543	−0.987	0.579*
Number of groups	98		98		336		336	
Number of observations	750		750		2,714		2,714	
R^2 (within)	0.624		0.612		0.542		0.605	

Note. Dependent variables are listed across the second top row. All regressions include control variables as specified in the text, fixed time effects, fixed district effects, and district specific time trends. Standard errors are clustered at the district level.
* indicates statistical significance at the .10 level.

Table 5. Explaining education and infrastructure service access, dynamic model.

	Split vs. new				Original vs. new			
	Education		Infrastructure		Education		Infrastructure	
Independent variables	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Lagged service access	0.394	0.124**	0.382	0.147**	0.502	0.046***	0.227	0.069***
New district	0.038	0.902	0.024	0.953	0.080	0.725	0.104	0.593
Lagged new district	0.319	0.735	−0.690	0.769	−0.275	0.606	−1.351	0.584**
Number of groups	98		98		336		336	
Number of observations	725		733		2,677		2,693	
Number of instruments	20		20		20		20	
	Stat	*p*	Stat	*p*	Stat	*p*	Stat	*p*
Arellano-Bond test for AR(2) in first differences	1.49	.135	0.09	.926	1.65	.099	1.49	.135
Hansen test of overriding restrictions	1.65	.439	1.78	.411	13.21	.001	1.65	.439

Note. Dependent variables are listed across the second top row. All regressions include control variables as specified in the text, fixed time effects, and fixed district effects. Standard errors are clustered at the district level.
*** and ** indicate statistical significance at the .01 and .05 levels, respectively.

creation leads to an approximately 1.75% reduction (= −1.35/(1 − 0.23)) in household access to water and sanitation in the long term. (The *p* value is .023.)

Finally, the Arellano-Bond and Hansen test statistics provided at the bottom of the table in general do not indicate any problems with second-degree autocorrelation or the overidentifying restrictions, respectively.[9] The exception to the rule concerns the education equation for which original districts make up the control group. In this case, the hypotheses of no second-degree autocorrelation and instrument exogeneity are rejected at the .10 and .00 levels, respectively. These problems can be overcome by reducing the number of lags used to create the instruments (by starting with the third lag instead of the second), but the insignificant impact of new district creation on school enrollments persists. An additional issue concerns the strength of the instruments for lagged service access. The Appendix provides and discusses evidence suggesting that the instruments used for lagged infrastructure access are sufficiently strong, whereas those for lagged education access are perhaps somewhat less so. See Table A3 for the specifics.

The empirical analysis concludes with a simple falsification test of the estimation results regarding the impact of new district creation on infrastructure access. The test is implemented by adding first and second leads of the new district dummy variable to both the static and dynamic infrastructure specifications where the control group includes original districts. This examination can be seen as a partial test of the parallel trends assumption intrinsic to difference-in-differences models and analysis. Table 6 provides the output. As the table shows, neither the first nor second leads of the new district dummy has a statistically significant impact on infrastructure access in either of the models. None of the other estimation output changes much. The output provides support for the view that the initial results for the infrastructure equation are robust.

Underlying causal mechanisms

The foregoing analysis raises the obvious question: Why do newly created districts provide less access to water and sanitation services than original districts, all else being equal? A plausible answer to the question is a function of the general governance environment in both the infrastructure sector and among new districts. First, it is well established in Indonesia that the infrastructure sector is relatively amenable to corrupt practices. Public works projects are tendered out to private contractors and the tendering process is highly susceptible to fraud—bid rigging and kickbacks, among others (Aspinall, 2013; Sacks, Rahman, Turkewitz, Buehler, & Saleh, 2014).

Second, it seems plausible to argue that newly created districts may be generally less well governed than original districts as well. If local elites drive the proliferation process in the first instance, as some research suggests is the case (Kimura, 2013; Pierskalla, 2016), then those same elites may be

Table 6. Explaining infrastructure service access, falsification tests.

	Static		Dynamic	
Independent variables	Coefficient	SE	Coefficient	SE
Lagged service access	—	—	0.226	0.067***
Second lead new district	−0.686	0.920	−1.051	0.800
First lead new district	−0.605	0.632	0.163	0.678
New district	0.006	0.623	0.107	0.606
Lagged new district	−1.002	0.570*	−1.296	0.596**
Number of groups	336		336	
Number of observations	2,714		2,693	
Number of instruments	—		22	
			Stat	*p*
Arellano-Bond test for AR(2) in first differences	—	—	1.46	.144
Hansen test of overriding restrictions	—	—	1.68	.432
R^2 (within)	0.605		—	

Note. Dependent variable is infrastructure access. All regressions include control variables as specified in the text, fixed time effects, and fixed district effects. The static model also includes district specific time trends. Standard errors are clustered at the district level.
***, **, and * indicate statistical significance at the .01, .05, and .10 levels, respectively.

able to capture the political process, along with the attendant fiscal and economic spoils, after splitting occurs. The corruptible nature of the infrastructure sector and heightened elite capture in newly formed districts might be expected to result in weaker access to infrastructure services for the majority of citizens in those places.

To properly test this hypothesis, one would need to rigorously assess and compare various dimensions of the governance environment in newly created and original districts, respectively. Unfortunately, data with which to directly and comprehensively measure local governance conditions do not yet exist in Indonesia. The examination in this section of the article uses two indirect and partial indicators of governance: political fragmentation in district DPRDs and financial audit opinions of local governments.[10] Due to the nature of the data, the analysis here is perhaps best considered as exploratory and suggestive.

Political fragmentation within parliaments concerns the dispersion of decision-making authority across political parties. Aspinall (2013) has argued that local political fragmentation in Indonesia is a direct function of rent-seeking and patronage distribution.[11] As local rent-seeking opportunities increase, competition for DPRD seats intensifies and political fragmentation rises. Political fragmentation is often measured by either the absolute or effective number of political parties that hold seats in a parliament, where the latter weights each political party in a parliament by its share of votes or seats. The effective number of political parties is used in this analysis.[12] It is posited that as the effective number of parties represented in DPRDs increases, governance conditions generally weaken.

District-executed budgets are audited by the Supreme Audit Agency (BPK [Badan Pemeriksa Keuangan]) on an annual basis. BPK financial audits examine the adequacy of internal controls; compliance with laws and regulations; and the clarity and accuracy of information contained in official cash budgets, operating statements, and balance sheets. BPK offers four main types of opinions with respect to its investigations: disclaimers, adverse, qualified, and unqualified. Poor performance on local audits is in many cases due to corrupt budget practices, particularly as related to tendering of public works projects (Lewis, 2016). It is hypothesized here that as audit outcomes move along the scale from disclaimers to unqualified opinions, governance conditions improve.

Between December 2007 and March 2008, the Indonesian nongovernmental organization Regional Autonomy Watch (KPPOD [Komite Pemantauan Pelaksanaan Otonomi Daerah]) conducted a survey in 15 Indonesian provinces, eliciting the perceptions of business people on a wide range of important district governance issues, including as related to land access, business licensing, interaction with local governments and parliaments, business development programs, capacity and integrity of district administrations, local taxes and transaction costs, local public infrastructure, security and conflict resolution, and local government regulations. KPPOD uses

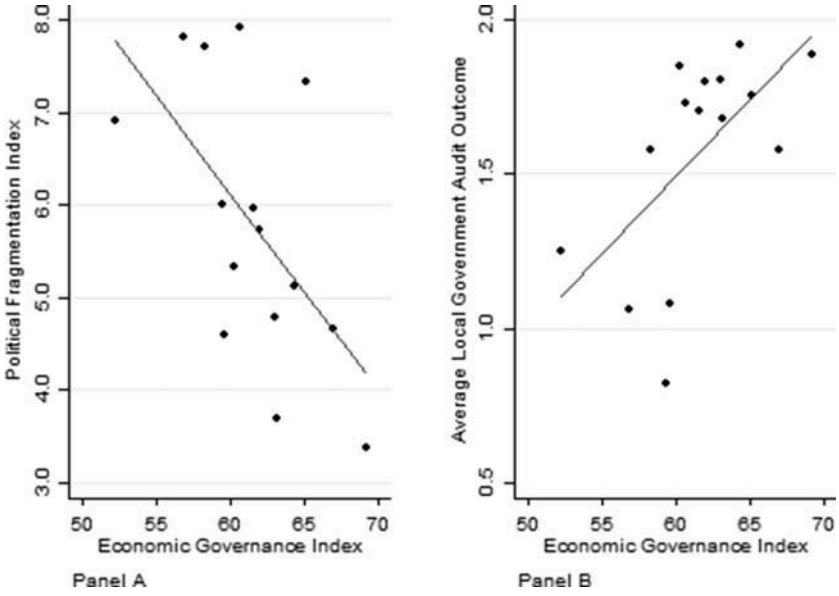

Figure 3. Governance, political fragmentation, and audit outcomes.

Table 7. Governance conditions of original and new districts.

	Original	New
Political fragmentation	5.77	6.67***
Audit opinions	1.74	1.31***

Note. Political fragmentation is the average effective number of political parties in district parliaments. Audit opinions are district averages, where disclaimers and adverse, qualified, and unqualified opinions are set equal to 0, 1, 2, and 3, respectively.
*** indicates that differences are statistically significant at the .01 level.

the survey results to create an economic governance index (EGI; KPPOD, 2008). The KPPOD EGI is a widely used indicator of governance conditions and corruption among applied analysts working on subnational issues in Indonesia.

Figure 3 illustrates the relationship between local governance conditions, as proxied by KPPOD's EGI, and political fragmentation (panel A) and local government audit outcomes (panel B). Increasing values of the EGI imply improved governance conditions. Political fragmentation is measured by the effective number of political parties within DPRDs, where rising numbers indicate increased fragmentation. Audit outcomes are defined as disclaimers (= 0), adverse (= 1), qualified (= 2), and unqualified (= 3) opinions, where higher values suggest improved performance. All data have been averaged at the provincial level. The figure suggests that governance conditions are negatively associated with political fragmentation and positively correlated with local government audit outcomes, as hypothesized above. A simple correlation test implies that the relationship in both cases is statistically significant at the .02 level.

Table 7 shows average political fragmentation and audit opinions for original and newly created districts. Political fragmentation and audit outcomes are defined as above. As can be seen in the table, newly created districts have higher average political fragmentation and lower average audit opinions relative to original districts.[13] Given the above discussion, this arguably implies that new districts may be less well governed than more established local governments. This proposition provides a plausible rationale for generally weaker infrastructure service outcomes for newly formed districts.

Summary and conclusions

The proliferation of local governments in decentralizing developing countries is a significant worldwide phenomenon. Despite the potentially important relationship between the creation of new local governments and the quantity and quality of local public services they provide, the issue has not received much attention in the literature. This study provides a first rigorous attempt to examine the effects of proliferation on public service delivery in a single large and important developing country—Indonesia. Local government proliferation is an especially significant phenomenon in Indonesia. The number of districts has increased by about 80% since just before the government's decentralization program was initiated in 2001.

The evidence in this study suggests that newly created districts perform no better or no worse in providing service access than the split districts from which they derive. Neither school enrollments nor water and sanitation service access differs in any significant manner between newly established and split local governments. New districts do not perform substantially worse than original districts either, at least in terms of education access. However, new districts do provide reduced access to infrastructure services compared to original local governments.

Newly created districts start at a comparative disadvantage vis-à-vis original local governments. Initial school enrollments and household access to water and sanitation in new districts are on average 8 and 10% lower than those of original local governments, respectively. New districts are unable to close the service delivery gap in enrollments, and they fall further behind in providing access to water and sanitation services. The infrastructure access gap widens by just less than 2% over the 10-year period, all else remaining the same. These results clearly contradict the claims of local government proliferation supporters.

The study provides some suggestive evidence that the relatively poor service performance of newly created districts thus far, especially as related to infrastructure, is driven by the comparatively more fragile governance environments that exist in new districts and the relatively corruptible nature of the sector. The essential underlying argument is that political rent-seeking is a strong motive in district splitting in the first instance and that its persistence significantly constrains infrastructure service delivery after new districts are formed. To the extent that local government proliferation is driven by a search for political rents and infrastructure is relatively corruptible in other developing countries, the results of this study may also be somewhat generalizable. This would appear to offer a rich area for future research.

What can be done to constrain district proliferation in Indonesia? The unfortunate answer, at least in the short run, is probably not much. Reasonably adequate central government regulations are in place to assess proposals for the creation of new local governments and sensibly limit their numbers. But new district supporters can easily avoid government regulations by taking applications directly to national parliament, which has proved more than amenable to passing laws in favor of new local government formation. Government could issue yet another moratorium on new district creation, but this approach has not worked well in the past, at least in part because central authorities have not managed to hold such moratoria in place for any length of time. In any case, the inability of central government to constrain continuing district proliferation, in the face of local interest group initiatives and national parliamentary support, suggests that nationwide improvements to local service outcomes, especially in infrastructure, will remain constrained for the near future.

A final caveat concerns the temporal dimensions of improvements to service delivery. That is, the local public service effects of decentralization, in general, and local government proliferation, in particular, are likely to be felt only in the quite long run. As such, it must be admitted that the 10-year period of this study may be too short to discern the impact of district splitting on service outcomes with any great accuracy and certainty. This suggests that the investigation of such effects should form an integral part of a longer-term research agenda.

Notes

1. There are currently 34 provinces and 529 districts (not including Jakarta), including 430 (mostly) rural districts (*kabupaten*) and 99 municipalities (*kota*). Provinces and districts are autonomous, nonoverlapping units of government, and both are directly accountable to the central government. Districts are not formally accountable to the provinces within which they are located, although the latter play a coordinating role among districts within their borders.
2. This study focuses on service access and not service quality, due to a lack of comprehensive data on the latter.
3. Government Regulation (GR) 129/2000 was in force from 2000 until 2007, at which time it was replaced by GR 78/2007.
4. The data indicate that five parent districts themselves split during the period, creating an additional six child districts. This study associates those newly created districts with the original split districts. An alternative would be to drop those districts from the analysis. This alternate strategy was also implemented and there were no qualitative changes to the derived conclusions.
5. Protected water as defined by BPS includes piped water, communal tap water, rainwater, spring water, and covered wells. Protected sanitation facilities include flush toilet, piped sewer system, flush/pour flush pit latrine, and ventilated pit latrine.
6. In fact, economic conditions during the period of study were quite stable. By 2001, recovery from the Asian financial crisis was well underway, and growth between 2001 and 2004 held consistently around 4.5% per year. In 2005, growth increased to around 5.0% per annum and remained relatively stable through 2010. See Tabor (2015) for the evidence and some discussion.
7. An alternative to difference-GMM is systems-GMM (Blundell & Bond, 1998). The latter augments difference-GMM by simultaneously estimating the levels equation (i.e., Equation 2), whereby moment conditions imply that lagged changes in the dependent variable can serve as instruments for the level of the lagged dependent variable. As usual, exogenous variables function as instruments for themselves. The additional instruments used in systems-GMM may result in more efficient parameter estimates, but the increased efficiency comes at the cost of an additional assumption: deviations from the long-run mean of the dependent variable, conditional upon any exogenous variables, must be unrelated to the individual-specific unobserved effect. Preliminary analysis in this study suggested that difference-GMM is the preferred model and so it is used in the empirical examinations here.
8. Overinstrumentation can result in two main problems. First, use of too many instruments may overfit the endogenous variables, thus inadequately expunging the endogeneity and biasing coefficient estimates in the process. Second, the employment of an excessive number of instruments may also create problems for the Hansen test of instrument exogeneity; that is, if the number of instruments becomes too large, the test is invalidated. See Roodman (2009) for elaboration.
9. The test of overidentifying restrictions can be seen as a test of the null hypothesis that the set of instruments is exogenous. If the null is not rejected, the test provides support for the claim that the instruments can be taken as exogenous. See Roodman (2007) for a discussion.
10. Data on DPRD political fragmentation have been provided by the General Elections Commission (KPU [Komisi Pemilihan Umum]) and on local government audit opinions have been supplied by the Supreme Audit Agency (BPK).
11. Patronage politics are common throughout the developing world. See Gordin (2002) and Arriola (2009) for reviews of the phenomenon for Latin America and Africa, respectively.
12. Political fragmentation (PFG) is defined as follows: $PFG_i = \frac{1}{\sum_j v_{ij}^2}$, where the subscripts i and j refer to individual districts and political parties, respectively, and v is a political party's share of total votes in the district. See Laakso and Taagepera (1979) for the initial development of the index.
13. The expected (i.e., predicted) values of political fragmentation and audit outcomes conditional on the exogenous control variables used in this study are 5.8 and 1.8 for original districts and 6.5 and 1.4 for new districts. Differences across new and original districts are statistically significant at the .01 level.

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Appendix—Summary statistics

Table A1. Summary statistics.

Variable	Number of observations	Mean	Standard deviation	Minimum	Maximum
Original districts					
Education access	2,450	54.25	12.89	7.33	88.29
Infrastructure access	2,450	56.23	15.50	7.31	96.15
District total expenditure per capita	2,450	1,844,605	1,878,512	118,157	23,900,000
Population	2,450	666,000	608,042	29,098	4,946,438
Percentage of households with electricity access	2,450	86.72	18.35	0.78	100.00
Percentage of population that is poor	2,450	17.21	10.26	1.24	81.85
Gini for personal consumption per capita (×100)	2,450	26.89	4.25	15.59	44.41
Personal consumption per capita ('000)	2,450	480,190	175,787	196,159	1,453,038
Sumatra	2,450	0.25	0.43	0.00	1.00
Kalimantan	2,450	0.10	0.30	0.00	1.00
Sulawesi	2,450	0.13	0.33	0.00	1.00
Eastern	2,450	0.11	0.32	0.00	1.00
Papua	2,450	0.02	0.12	0.00	1.00
Java/Bali	2,450	0.39	0.49	0.00	1.00
Effective number of political parties in DPRD	1,303	5.77	1.71	2.14	11.79
Local government audit opinions	1,724	1.74	0.73	0.00	3.00
Split districts					
Education access	287	46.07	13.74	7.33	88.29
Infrastructure access	287	44.08	12.72	7.31	70.95
District total expenditure per capita	287	2,038,362	1,973,052	415,519	10,400,000
Population	287	649,380	666,987	78,610	4,300,000
Percentage of households with electricity access	287	66.56	22.18	0.78	99.52
Percentage of population that is poor	287	25.47	14.66	2.82	81.85
Gini for personal consumption per capita (×100)	287	25.29	4.24	16.30	39.67
Personal consumption per capita ('000)	287	397,757	107,381	196,159	883,460
Sumatra	287	0.40	0.49	0.00	1.00
Kalimantan	287	0.14	0.35	0.00	1.00
Sulawesi	287	0.16	0.37	0.00	1.00
Eastern	287	0.15	0.36	0.00	1.00
Papua	287	0.07	0.26	0.00	1.00
Java/Bali	287	0.07	0.26	0.00	1.00
Effective number of political parties in DPRD	113	7.07	1.77	3.33	11.79
Local government audit opinions	91	1.44	0.96	0.00	3.00
New district					
Education access	539	52.92	11.84	13.29	86.10
Infrastructure access	539	46.16	11.86	8.59	80.67
District total expenditure per capita	539	3,371,419	3,072,414	560,221	26,200,000
Population	539	586,048	599,980	60,596	5,241,177
Percentage of households with electricity access	539	75.38	19.11	3.37	99.80
Percentage of population that is poor	539	20.90	11.62	2.44	73.80
Gini for personal consumption per capita (×100)	539	26.87	3.78	17.25	42.83
Personal consumption per capita ('000)	539	452,276	106,387	220,315	857,706
Sumatra	539	0.38	0.49	0.00	1.00
Kalimantan	539	0.17	0.37	0.00	1.00
Sulawesi	539	0.18	0.39	0.00	1.00
Eastern	539	0.13	0.33	0.00	1.00
Papua	539	0.10	0.30	0.00	1.00
Java/Bali	539	0.05	0.21	0.00	1.00
Effective number of political parties in DPRD	848	6.67	1.92	2.49	11.11
Local government audit opinions	1,375	1.31	0.98	0.00	3.00

Note. All economic and fiscal variables are measured in rupiah in constant 2010 terms. See text for further information.

Exogenous timing of district splitting

The identifying assumption regarding the causal impact of new district creation on service access is that the timing of district splitting is exogenously determined. One method that could be used to test this assumption is explained and implemented below.

Consider the following equation:

$$tts_i = s'_{i,-t}\chi + z'_{i,-t}\delta + \varepsilon_i \tag{A1}$$

where *tts* is the time to the district split as measured by the number of years after 2001 before the split occurs; *s* represents service outcomes—that is, either education or infrastructure service access, where the subscript $-t$ refers to the initial (i.e., 2001) level of the variable; *z* is a set of exogenous controls, defined further below, that are also measured at their initial levels; ε is the standard error term; and γ and δ are the coefficients to be estimated.

If the estimated coefficients are statistically insignificant, it can be concluded that initial service access along with other relevant variables of interest do not help explain the timing of the split; that is, it can be argued that the timing of district splitting is plausibly exogenous.

To test this hypothesis, Equation A1 is estimated for all districts that split between 2001 and 2010 for which required data are available. The education and infrastructure service access variables are as defined in the text and *z* includes log of district spending per capita, log of population, percentage of the population that is poor, Gini coefficient of personal consumption, log of personal consumption per capita, and dummies for island location (Sumatra, Kalimantan, Sulawesi, Eastern Indonesia [Maluku, West Nusa Tenggara, East Nusa Tenggara], and Papua and West Papua, where Java/Bali is the base case). The continuous variables in *z* are the same controls used in the main econometric analyses in the article.

Because *tts* is a count variable, negative binominal regression techniques are used and standard errors have been clustered at the district level. (Results do not change if Poisson or ordinary least squares methods are employed.) Table A2 supplies the estimation results.

Table A2. Exogeneity test for timing of district splits, 2001–2010.

	Education		Infrastructure	
Independent variables	Coefficient	SE	Coefficient	SE
Average service access	0.004	0.009	0.013	0.009
Log district spending per capita	0.255	0.279	0.143	0.287
Log population	0.173	0.236	0.073	0.244
Percentage of households with access to electricity	−0.007	0.007	−0.006	0.006
Percentage population that is poor	−0.012	0.009	−0.008	0.009
Gini coefficient for personal consumption	0.020	0.031	0.019	0.031
Log of personal consumption per capita	−0.169	0.653	−0.204	0.643
Sumatra	0.004	0.465	−0.033	0.442
Kalimantan	−0.272	0.507	−0.282	0.501
Sulawesi	−0.368	0.514	−0.422	0.504
Eastern	0.243	0.542	0.122	0.541
Papua	−0.397	0.697	−0.371	0.684
Constant	−2.424	9.402	0.436	9.500
Number of districts/observations	92		92	
Psuedo R^2	0.022		0.027	

Note. Dependent variable is the number of years after 2001 until the split occurs. Independent variables are initial values in 2001, where the relevant service access variable is listed across the top second row. Fiscal and economic variables are measured in constant 2010 terms. Estimation is by negative binomial regression where standard errors are clustered at the district level. None of the coefficients is statistically significant at the .10 level.

As the output demonstrates, none of the estimated coefficients for any of the determinants is statistically significant at even the 10% level. Overall, these results provide support for the assumption that the timing of district splitting is exogenous.

Instrument strength

Table A3 provides the results of weak instrument tests for the dynamic models related to education and infrastructure access. CLR is a conditional likelihood ratio test and *K* is a Lagrange multiplier test. Both tests assume that instruments are exogenous; that is, that the overidentifying restrictions are satisfied. The null hypothesis in both cases is that the estimated coefficient of endogenous lagged service access is zero, given the instruments employed. Rejection of the null supports the argument that the instruments are adequately strong.

The output implies that instruments for both infrastructure access equations are sufficiently strong. The test statistics safely reject the null at standard levels of significance. For the new versus split education specification, the null hypothesis is only rejected at the 10% (CLR test) and 13% (*K* test) levels, indicating at least some weakness in the instruments. For the new versus original specification, the instruments appear very strong. Both tests reject that null at the .01 level. However, results for the Hansen's test of overidentifying restrictions for this specification, as reported in the text, cast doubt on the underlying assumption of the weak instrument test that instruments are exogenous and suggest that any conclusions regarding the strength of instruments in this case should be taken under advisement.

Table A3. Weak instrument test for dynamic specifications.

	CLR		*K*	
	Stat	*p* Value	Stat	*p* Value
Split vs. new equation				
Education access	2.80	.104	2.32	.127
Infrastructure access	5.75	.021	5.16	.023
Original vs. new equation				
Education access	38.70	.000	26.02	.000
Infrastructure access	11.11	.001	10.86	.001

Note. CLR and *K* are weak instrument tests. CLR is a conditional likelihood ratio test and *K* is a Lagrange multiplier test. Both tests assume that instruments are exogenous. The null hypothesis in both cases is that the estimated coefficient of the endogenous variable (in this case lagged service access) is zero. Rejection of the null supports the argument that the instruments are strong.