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The Spread of Innovative Policies in an Imperfect Decentralisation

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Abstract

This paper aims to analyse the mechanisms of policy diffusion in the context of the decentralised education system in Indonesia. The country rapidly decentralised its government in 2000, transferring responsibilities to more than 341 districts and municipalities, bypassing the provincial governments. By 2022, the number of districts and municipalities increased to 514. The education system is a suitable platform for our analysis for two main reasons. First, local education offices are exceptionally active in implementing local-level policies. In a 2017 survey conducted by the RISE Indonesia team, we found 137 policies across 63 districts. Second, measures on outcomes related to the education system is commonly found in large-scale national surveys, allowing us to construct a comprehensive data set. It is also evident that the issues present in decentralisation also exists in the implementation of education policies in Indonesia. Local government has made little to no adjustment on the design of local curriculum contents even though the central government has fully delegated the task to local governments (Bjork, 2003).

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Introduction

A core motivation of decentralising policymaking in developing countries is to allow for a differentiated approach in development. Transferring a share of responsibilities to local government is seen as a channel to address market failures stemming from information asymmetry problems prevalent under centralised governments (Bardhan, 2002). But despite its potential, its implementation has been far from ideal. Misaligned political incentives, limitations in administrative capacity, and financial dependence are some of the most common constraints that hinders effective exercise of decentralisation (Scott, 2009). These problems are particularly pronounced in disadvantaged regions, who, as a result, often bears a disproportionate amount of the negative impact from decentralisation in developing countries (Robinson, 2007).

Given such constraints, the proliferation of local-level policies then becomes an important mechanism in supporting decentralisation efforts in developing countries. The function of local governments as policy laboratories is likely only satisfied in few select regions, ones with especially favourable conditions and competent leadership. The rest—absent of the capacity required to achieve the same—must rely on adopting innovations from elsewhere. Existing literatures commonly classify the diffusion of policies into three types: (1) learning, (2) competition, and (3) emulation. However, these channels are largely confined within the assumption that policy diffusion is a strictly technocratic process, while recent discussions have highlighted the importance of politics. Local governments may be motivated by political dynamics in their policymaking, which does not necessarily translate into the proliferation of successful policies (Gilardi and Wasserfallen, 2017). Improving our understanding of the mechanisms that govern policy diffusion is crucial in building a decentralisation system that is conducive for development.

This paper aims to analyse the mechanisms of policy diffusion in the context of the decentralised education system in Indonesia. The country rapidly decentralised its government in 2000, transferring responsibilities to more than 341 districts and municipalities, bypassing the provincial governments. By 2022, the number of districts and municipalities have increased to 514. The education system is a suitable platform for our analysis for two main reasons. First, local education offices are exceptionally active in implementing local-level policies. In a 2017 survey conducted by the RISE Indonesia team, we found 137 policies across 63 districts. Second, measures on outcomes related to the education system is commonly found in large-scale national surveys, allowing us to construct a comprehensive data set. It is also evident that the issues present in decentralisation also exists in the implementation of education policies in Indonesia. Local government has made little to no adjustment on the design of local curriculum contents even though the central government has fully delegated the task to local governments (Bjork, 2003).

Decentralization and its impact to policy implementation have been widely discussed in literature. Norway provided a good case of implementation of education policies in decentralized environment (Karlsen, 2000; Karlsen, 2010). The system provides opportunities for local government to design policies tailored to the context of their region. It also has a potential to strengthen the legitimacy of policies as there is room for citizens to be involved in formulating the policy. The Norwegian case highlights how a good decentralization system, one that enables strong public participation, accountability, and local democratic governance, is a necessary condition for the effectiveness of the policy adoption (Bardhan, 2002). Local government in Indonesia, however, lacks those qualities (Pepinsky & Wihardja, 2011). Most only assume an administrative role with limited capacity in policy planning (Nasution, 2016).

The drivers of policy adoption can be separated into internal and external factors. Residents might push for a certain welfare increasing effort from the government, which will pressure local leaders and representatives to adopt certain policies (Tommasi and Weinschelbaum, 1999). In turn, local leaders

and representatives will be motivated to gain political credits from residents, encouraging them to innovate or adopt (Karch, 2007). Supporting systems, such as initiative process, may also allow citizens to directly influence state's legislature, which provides room for populist policies (LaCombe & Boehmke, 2021).

The successes of policies are tied with local governments' capacity to plan and implement the policies (Gu, 2015). As such, they often adopt already successful policies from other regions (Volden, 2006) or policies that are more immediately relevant as a form of imitation or learning (Shipan & Volden, 2008). Local government also adopt policies motivated by competition, whether it stems from economic or political reasons (Berry & Berry, 1990; Karch, 2007; Shipan & Volden, 2008). Vertical political dynamic is also a strong motivation to adopt policies, which can come from mandates from central government or political parties (Gillardi, 2010).

Current literature has focused on case studies where policy adoption happens within a strong and mature decentralised system. In Indonesia, given the country's low political accountability, local policymaking may instead be shaped solely by local elites (Bardhan, 2002; Arif et al, 2022). Low capacity in policymaking at the regency level, along with limited means of participation for citizens, may impede the process. As such, decentralization in Indonesia has yet to show much success in improving the economy and welfare (Pepinsky & Wihardja, 2010; Nasution, 2016). Nonetheless, case studies from other developing countries have provided examples where decentralization have improved policy implementation processes, as local leaders have better knowledge of their regions' necessities (Faguet, 2001; Galasso & Ravallion, 2001; Foster and Rosenzweig, 2010).

To aid in our analysis, we studied two policies that have been extensively adopted across the country: Contract Teacher's Support and Student Financial Assistance. Policies on education have always been broadly popular amongst both the citizens and the government due to their populist nature, but these two policies have been particularly exceptional in their expansion. Furthermore, while both are populist policies, they are motivated by different political actors. Policy concerning teachers are mostly a product of influence from teacher labour unions. The current chairwoman of one of the largest teacher union in Indonesia, PGRI (*Persatuan Guru Republik Indonesia* or Indonesian Teachers Association), previously was a head in the Ministry of Education and have a direct line communication to the Yudhoyono's and Widodo's administrations. The union also had a major role in the creation of the 2005 Teachers Law, which raised teacher salaries and launched the teacher certification process. The weight of teachers on shaping the Indonesian education system is evident from the number of teacher-centric policies at the regency level. In the 2017 RISE survey, 70% of the policies are on teachers. The same cannot be said on policies concerning students. While these policies are often very popular with the masses and media, there are no organised movements or groups that specifically advocates for them.

Using both primary interviews with local government officers and data from multiple surveys—Indonesia Socioeconomic Survey (SUSENAS), Indonesia Labour Force Survey (SAKERNAS), and Village Potential data (PODES)—we constructed a panel data set consisting of detailed information about the policy as well as the region characteristics and measures, including the details on policy planning, implementation, and adoption period, policy variations (type of provision, distribution flow, and influencing actors), and characteristics of the district education office. The availability of the implementation year enables us to create a panel data using other secondary data in municipal level. We also gathered regency level socioeconomic characteristics from SUSENAS, teacher's wage from SAKERNAS, infrastructure from PODES, and district or municipality revenue and regency characteristics data from Indo Dapoer, a World Bank Database. We begin our observations from year 2000 to 2021 following the first implementation of the policy and the beginning of Indonesia's decentralization. To our knowledge, this is the first attempt to collect information on education policy adoption data in Indonesia.

Our analysis is divided into three sections. First, we begin by providing descriptive results on the spread of the policies across the country. We elaborate on our primary survey result to gain some background information on how both education policies are implemented in Indonesia. Second, we evaluate the relationship of the policies on select measures, to determine their success as a policy. This will provide us with a picture on whether the success of a policy influence the dynamics of policy diffusion. Finally, we will analyse the determinants of adoption, and the role of external factors in the mechanism. Across the three analyses, we saw a regional pattern in the spread of policies, which corroborate the case of policy diffusion. For policies on student financial assistance, we found that regional diffusion is still significant even after we have included internal factor variables, which implies the importance of policy diffusion across regions. However, for contract teacher's support, we found that regional diffusion is only significant for regions where the education office is hold by individuals from a political background—as opposed to a technocratic background. Our results highlight not only the importance of political motivation in analysing the spread of a policy, but also the relevant actors that underlies that motivation.

Our study has two main contributions. First, we complement the empirical evidence of policy adoption and diffusion in developing countries with multitude region characteristics. As our main data on policy implementation covers around 93 percent of districts in Indonesia, we have the most expansive data available to analyze policy diffusion in district level. Second, we contribute to a strand of literature in understanding the policy implementation process in a decentralized system.

Motivation and Context

In 2000, Indonesia abruptly decentralised its government. The change had been part of a string of social reforms following the fall of the military-led authoritarian government in 1998. Seemingly overnight, 341 regencies (*kabupaten*) and municipalities (*kota*) acquired the power to execture responsibilities in a wide range of areas, including health, education, infrastructure, environment, and trade, bypassing the second highest administrative level, provinces[1].

However, this decision was likely not technocratically motivated, As decades of being under a highly centralised government had not allowed the governments at the level to develop the capacity necessary to assume their new role. Instead, it was likely done to address the push from the international community to dissolve the highly centralised authoritarian government while also denying power accumulation at a level where it can poses threat of separatism.

As a result, while a small set of relatively advanced regions, with a stronger talent base, was able to improve their capacity in the following years,,most regencies are still yet to be able to fully carry out their roles effectively even to this day.

A cornerstone of the decentralisation program was the immense room for innovative policymaking at the regional level. Indonesia is an incredibly vast country, with around 1,340 recognised ethnic groups spread over 10,000 islands, and development have been largely unequal. The poorest regions are comparable to extremely poor states. While the wealthiest regions, with more than 50 times the income per capita, are comparable to upper-middle income states (Hill, 2014). The tremendous differences in both culture and development level emphasised the need for differentiated policies as a development strategy, and it was the task of the regional governments to determine the policies that best suit their context.

However, the same inequality that motivates decentralisation also impedes the ability of some regions to engage in innovative policymaking. Instead of original innovations, regions often look at a select set of innovating regions and adopt the policies for their regions. In the presence of unequal

[1] Indonesia is divided into five administrative levels: (1) the Central Government; (2) Province; (3) Regencies (*Kabupaten*) and Cities; (4) Districts (*Kecamatan*); and (5) Villages.

government capacity, this innovative-adopting relationship is an important driver for the local development of Indonesia. The current decentralisation system is often deemed unideal in promoting local development, as there are misaligned incentives between the central and regency governments. Further understanding of the current dynamics that influence local policy adoption is crucial to design a system that could improve the outcomes of decentralisation.

We assess this question within the context of the Indonesian education system. The Indonesian education system is one of the largest in the world, and except for civil service recruitment (including teachers) and general knowledge curriculum, regency governments have had tremendous freedom to implement policies on the day-to-day running of the education system. The central government involved in the management of public schools and curriculum design through the Ministry of Education and Culture (MoECRT) and the support of *madrasa* (private Islamic schools) through the Ministry of Religious Affairs (MORA). Furthermore, the central government has an incentive scheme termed '*Dana Alokasi Khusus'* (DAK) or the Special Allocation Funds, that is granted to regency government to be spent on the implementation of policy innovations on a need-by-need basis. From a survey of 63 districts in Indonesia between 2017 and 2018, the RISE Indonesia team found 137 policies at the regency level. It is evident that Indonesian districts have been productive in producing policies. However, there have not been any straightforward indications that these policies are effective in raising learning outcomes. The same survey found no correlation between the presence of a performance-based policy with the region's performance in the national examination. It seems to be evident that the current system does not incentivise regencies to adopt effective policies.

The question then becomes, what drives regency government to adopt a particular policy? Classical policy adoption and diffusion mechanisms focuses on two factors: the success of the policy and its suitability for the local context. However, it hinges on the assumption of the policymakers' perfect rationality. Recent discussions have instead highlighted the importance of politics in the dynamics (Gilardi and Wasserfallen, 2019). Policymakers does not only see the impact of the policy on its targeted outcomes, but also of its popularity. Under this extended mechanism, the spread of a policy is not necessarily defined by its success, but rather by how large of a political capital it could provide to the government. There are policies that, only by existing, can provide political capital to the government due to its conceptual goodwill. Moreover, political incentives in creating education-improving policies are extended to just promises made by political candidates (Habyarimana, Ochieng' Opalo, and Schipper, 2020). While other policies may be highly effective in addressing an education issue, but is unpopular if it disadvantages a vocal group. In a highly decentralised system like Indonesia, where local governments are appointed through local elections, this political mechanism will likely play a significant role.

The spread and effectiveness of policies underpins the success of a decentralisation program. It is therefore crucial to understand the motivation and mechanism under which local government are operating, to allow us to identify the workings of the current system. To achieve this, we look at two specific policies that have widely been adopted by regencies governments. First is Contract Teacher's Support, which aims to address teacher shortages, and second is Student's Financial Assistance, which aims to alleviate financial constraints that may hinder effective school participation.

Regency-level Policies in the Indonesian Education System

Innovations vary widely depending on the region (Nihayah, Revina, and Usman, 2020). In regions already reputed for its education, most of the innovations aim to further improve the learning outcomes of the city, often directly targeting weak areas of the education system. For example, Bukittinggi, a small city known to be one of the highest academically achieving area in Indonesia, have two such policies. The first is a system of peer supervision between teachers, which aims to establish

network between schools, allowing low-performing schools to learn from high-performing schools. The second is a parental education program, which targets young mothers, to prepare their role in their child's education, such as to maintain discipline and accompany their child in studying. Both policies targets groups that are historically low-performing, and effectively acts as a capacity building mechanism to improve learning outcomes. Innovation in other regions may not be as sophisticated. In Gowa, a region with strong leadership but weak institutions, innovations target more fundamental issues within the education system. One policy targets teacher and student absenteeism through employing school guards responsible for monitoring attendance, which has effectively reduced absenteeism rate.

Despite its successes in the originating region, a policy is not necessarily readily implementable in other regions. For example, high level of parental involvement has long been regarded as playing a large role in the academic successes of Bukittinggi and Yogyakarta, inspiring other regions to pursue policies that improve parental involvement. One such widely adopted policy that originates from Yogyakarta is the '*Jam Belajar Masyarakat'* or Community Learning Hours. Between 6pm to 9pm every weekday, parents are encouraged to create a conducive environment at home (e.g., by turning off televisions, restricting access to mobile phones, requiring children to be in their own homes, etc) and accompany their child to conduct independent study. An officer from the local village office will make rounds to remind—but not enforce—households to participate in the program.

In 2020, the RISE Indonesia team conducted an RCT involving a low-touch intervention to promote higher parental involvement (Tresnatri et al, 2021). While it did not involve allocating specific hours for learning, the intervention pushed parents to be more involved in their child's education, including managing their child's learning environment and actively accompany their children in studying, similar to the activities during Community Learning Hours. The intervention successfully increased parental involvement but did not result in any significant impact on learning outcomes. Further analysis revealed that the parents lack the capability to accompany their child. For example, they were able to limit access to distractions, such as televisions or mobile phones, but were not able to guide their child on conducting independent study, making the session unproductive. This shows that policy adoption has to be conducted carefully to achieve its desired outcomes. It is important for regency governments to identify the underlying constraints within the issue before employing a policy to address them.

Contract Teachers' Support

Contract teachers plays a large role in the Indonesian education system, making up almost half (1.4 million) of the 2.9 million teachers in the country. This should not have been the case. According to the official regulations, all public-school teachers—which makes up a large portion of the total—should be recruited as civil servants. There are two issues with this process. First, teacher recruitment is determined by the state budget allocation for education, rather than by the additional number of teachers needed at schools. This also created a misallocation issue. Secondly, civil servant recruitment as a whole—which include bureaucrats—has always been a point of contention due to their large salary burden. In 2011, 60% of districts allocates more than half of their budget for civil servant salaries. To alleviate budgetary pressure, the Indonesian government often suspends all civil servant recruitments, regardless of the differing needs in the field. The misalignment between the recruitment and needs resulted in a perpetual shortage of teachers. In 2019, the Teachers Association of the Republic of Indonesia (*Persatuan Guru Republik Indonesia* or PGRI) estimated that the Indonesian education system is still short of 1.1 million teachers, highlighting a dire need for a reform in teacher recruitment.

Faced by the shortage, schools, particularly in less-developed areas, have little choice but to hire non-civil servant teachers as contract employees. But it remains a highly imperfect solution. School expenditures, including private schools who receive their funds from the central government, are highly

regulated. They have very little room to spend outside the pre-determined list set by the state, allowing only for a maximum of 15% of the funds to be used for contract teacher salaries at public schools, and 30% at private schools. Schools that require contract teachers also often lack resources, and many completely rely on state funding to operate. With insufficient capacity to spend, contract teachers' salary is mostly within the range of USD 6 to USD 20 per month. This has two implications. First, the position only attracts teachers with very low qualifications, often with only a secondary degree or below. Second, teachers often take outside jobs to obtain a living wage, making absenteeism and unpreparedness rampant among the group.

Recognising the dire quality of education stemming from teacher shortage, some regencies initiated a region-wide contract teacher support scheme. Instead of relying on schools to pay the salaries, localgovernment supplemented the state funds using the regency budget. It standardised the salary and benefits that contract teachers are to receive. But inequality persists. Affluent regions, like Jakarta, can provide a minimum wage owing to their large budget. Poorer regions, faced with a small budget and numerous spending needs, such as infrastructure, struggles to provide the same level of support. Nevertheless, the policy remains popular, as teachers' welfare continues to be a point of focus for many Indonesians. This is evident from the 2017 RISE Indonesia district survey on regency policies, where they found that 70% of district-level policies targets teachers.

Student Financial Assistance

Indonesia have had a long history of increasing enrolment. The school building program in the 1970s helped the government to achieve universal primary enrolment by 1988, and in recent years, lower and upper secondary enrolment has reached 92% and 85%, respectively. A large driver to this result is the low cost of attending secondary schools. Prior to 2008, students attending public secondary schools were charged a small fee, around USD 5 per month. After 2008, with the implementation of the school grants program, all school fees up to lower secondary schools are subsidised by the government and students can attend for free. If a student does not qualify for a spot in public schools, they can attend low-quality private schools that charge around USD 1.5 per month or, in some cases, attend for free under a government subsidy program.

However, despite the seemingly low tuition, schools often have additional costs beyond tuition. This includes costs for stationaries, transportation, extracurricular activities, uniforms, school maintenance fee, and entrance fee. These costs are often large enough to exert financial pressure on poor households, and often lead to stress for the child, inflicting negative effects on their mental health and hinder learning (Yoshikawa et al, 2012; Blair and Raver, 2018). To reduce dropout rates and to improve equality among students, some regencies provide additional support for students on these complementary costs. Education have always been a popular issue among both the government and the mainstream populace, making policies on the topic prominent. Like most policies, it first received attention in several affluent regions, where the government have both the capacity and funds to execute the policy. But its attractiveness—in both the topic and target—quickly made the policy spread across regions. The peak of its popularity was when it was adopted by the governor of Jakarta, Joko Widodo, in 2012, and became a national policy when Widodo assume office as the president in 2014. Even after the national implementation of the policy, many regency governments still complement it with a similar policy specific to their region, as they deem that the national program does not sufficiently address the needs in their region.

Data

Our main data comes from two rounds of primary data collection in almost every district in Indonesia, complemented by media tracking after the data collection process to address incomplete data. We interviewed local officials, either the head of local education office or other high-ranking staff in the office, to obtain information on the policy and the characteristics of the district education office. The data collection process is summarized in table 1. We then complement this with secondary data—large scale surveys and administrative datasets—to obtain detailed information on regency characteristics and relevant outcomes.

Our first round of primary data collection managed to collect information from 349 districts, of which 251 are complete and 98 are partial. In this initial round, the interviews were completed through the phone. This poses several challenges. First, there were concerns of fraud. Particularly as we were asking for several information that could be considered as sensitive, such as the budget for a particular policy. We addressed this by requesting the Ministry of Education, Culture, Research and Technology (MoECRT) to send official letters notifying district education offices of our research. Second, some regions did not respond to our approach at all or stopped responding after the initial interview. Third, some regions expressly stated that they will only agree to an in-person interview. We address the latter two concerns through a second round of data collections.

The second round of data collection was done through in-person interviews. To address distrust, we worked with enumerators who are native to the region or who are employed in a prominent local institution in the province to conduct the survey. This was met with a much more positive response from most of the regions. We were able to complete most of the partially finished interview from round 1, and we were also able to obtain complete information for a further 66 districts. However, this round is limited by logistics. Some regions are too far, isolated, and expensive to visit. Therefore, we target mostly densely populated regions, which often has a much smaller area, and are close to each other. This round was particularly effective to obtain information on districts in Sumatra and Java, two of the most densely populated islands in Indonesia. At the end of the second round, we possess information on 415 districts, or 81% of the total.

While the number of districts were sufficient for our analysis, we realised that many of the missing information are on large and affluent regions. These are regions that may potentially play a significant role in the spread of policies and are therefore crucial to our study. Conveniently, their size and influence also mean that their policies are often put on a spotlight and are well-covered by local media. We collected the information through media tracking and was able to find information on 59 districts, bringing our total to 474 or 93% of the total districts in Indonesia. Because we mainly need the data to track adoption across time, we mainly collect information on the policy itself, as outlined by the survey instrument. Information on the office head are unavailable through media.

The media tracking was carried out in two steps. First, we manually look at different web sources and news outlets, especially local news outlet. Our selected keywords revolved around teachers' and students' welfare and benefit, teachers' wage, and scholarship such as "*tunjangan*" (support), "*kebijakan guru*" (teacher policy), "*kesejahteraan guru*" (teacher's welfare), "*gaji guru*" (teacher's wage), "*bantuan siswa*" (student assistance), "*beasiswa*" (scholarship), and "*bantuan siswa miskin*" (poor students assistance), along with the district name. Second, we verify the collected information by confirming with the local regulations in government websites. A limitation of this strategy was our inability to obtain any information for smaller districts, particularly ones that are located outside Java and Sumatera.

Table 1. Summary of primary data collection process

Steps	Data collected	Timeline
First round of survey (Phone interview)	341 out of 510 districts • 251 complete data (Most are regions in Sumatera and Kalimantan) • 98 incomplete data (Most are regions in Java – Bali, Maluku, and Papua)	November – December 2021
Second round of survey (In-person interview)	Adding 66 districts, obtaining 415 out of 510 districts • 366 complete data • 49 incomplete data (Regions in Banten, West Java, East Java, North Sumatera)	February – March 2022
Media tracking	Adding 59 districts, obtaining 474 out of 510 districts • 20 incomplete data (Mostly remote regions)	May – June 2022

We collected information on education attainment of local office heads and their previous position. We use previous position or employment to identify whether the office head has any political affiliation or whether they are more connected to bureaucrats or civil society. Then, on the policy implementation of both teacher assistance and student assistance, we gathered information on when the policy is planned and implemented, who influenced the policy adoption, the occupation and affiliation of the influencer, and the policy's characteristics, such as the amount provided for the incentive and aid, the delivery mechanism of the policy, types of incentive (cash, in-kind, or voucher), and the distribution flow.

We also utilize various secondary data sources, starting from Indonesia national household socioeconomic survey (Survei Sosial Ekonomi Nasional / Susenas), Indonesia national labour force survey (Survei Angkatan Kerja Nasional / Sakernas), Village Potential (Potensi Desa / Podes), and various resources from Statistics Indonesia (BPS), Ministry of Education and Culture (MoEC), and Ministry of Finance (MoF) for district and municipal level GDP, district and municipal government income and expenditure, and national exam scores. We also utilize a compiled dataset from World Bank's Indo Dapoer (Indonesia Database for Policy and Economic Research) website. This website contains district, municipal, and provincial level dataset gathered from various sources of Indonesia's database, from Statistics Indonesia to several databases owned by ministries.

Susenas is published semi-annually on February-March and July with a sampling scope of around 200.000-300.000 households from each district and municipality in Indonesia. The data is therefore representative at the district and municipality level and weighted to match the population numbers. The survey collects socioeconomic information of individuals, such as family relationships, education, health, crime rate, internet access, social assistance, and maternal health, and household-related questions, such as water and sanitation access, house qualities, and asset ownership. In addition, the survey also asked household consumption details in a separated consumption module, which allows us to obtain non-food related consumption. We gathered information on the number of poor households, poverty rate, students live under poor households, household head/parent's highest education level, and out of pocket (OOP) school expenditures. All data is in municipal level. We use the March data from 2000 to 2021, except for the OOP school expenditures data, since the consumption module only began in 2002. Susenas 2012 and 2013 also lacked municipality identification, thus we extrapolate all data between these years using existing information from all the years before and after the period.

Similar to Susenas, Sakernas is also published semi-annually on every February and August, with two months of data collection. Sakernas collects around 75.000 household data within 7.500 census block, mainly asking individuals in working age, and weighted according to population. The questions

revolve around employment indicators, such as employment status, occupational codes, economic sectors, formality, social assistance, and other related indicators. For consistency, we utilize Sakernas to obtain the number of teachers and average yearly income of teachers. However, the detail on occupation status is only captured in 1-digit International Standard Classification of Occupations (ISCO) code, making it impossible to distinguish between teachers and other professional jobs. Due to this limitation, we opted to use 2000 to 2017 data for teacher's salary and the number of teachers.

PODES is an administrative dataset collected from each district and municipality government. It contains information on regency assets and infrastructure such as road's length, hospitals, schools, religious buildings, tourism sites, and local government buildings. As PODES is collected once every three years, except in later periods, we use 2000, 2003, 2005, 2008, 2014, and 2018 to 2020 data to collect number of schools in regions. As for other datasets, local government budget, income, and expenditure is obtained from local government budget management information system (Sistem Informasi Pengelolaan Keuangan Daerah / SIPKD), which is collected by the World Bank through Indo Dapoer. As there is a gap between periods, we extrapolate the data using linear projections as the data are very unlikely to have a spike in their trends.

Table 2. Summary of secondary data used in the paper

Data	Source	Years used	Variables
SUSENAS	BPS Survey	2000 – 2021	Number of poor households, poverty rate, students live under poor households, household head/parent's highest education level, and out of pocket (OOP) school expenditures
SAKERNAS	BPS Survey	2000 – 2017	Number of teachers, average yearly income of teachers, employment composition
PODES	Administrative Data	2000, 2003, 2005, 2008, 2014, 2018, 2019, 2020	Road's length, schools, and local government buildings
Indo Dapoer	The World Bank, Administrative Data	2000 – 2021	Local government budget, local government revenue
Regency GDP Publication	BPS	2000 – 2021	Regency GDP
Nat. Exam Scores	Dapodik (MoECRT Administrative Dataset)	2005 – 2019	National exam scores
World Bank Data	The World Bank	2000 – 2021	Gini ratio

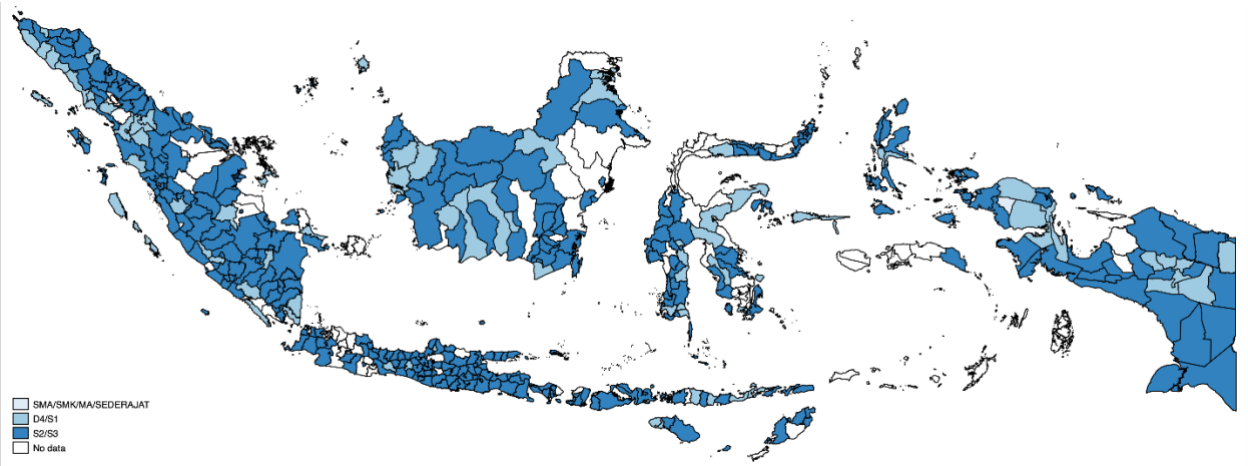
Descriptive results

The background of local government's head of education office

We begin the discussion by observing the capacity of local government education office head using highest education and previous position as proxies. Our initial hypothesis is that higher education department head's capacity will increase the effectiveness of the innovating or adoption process.

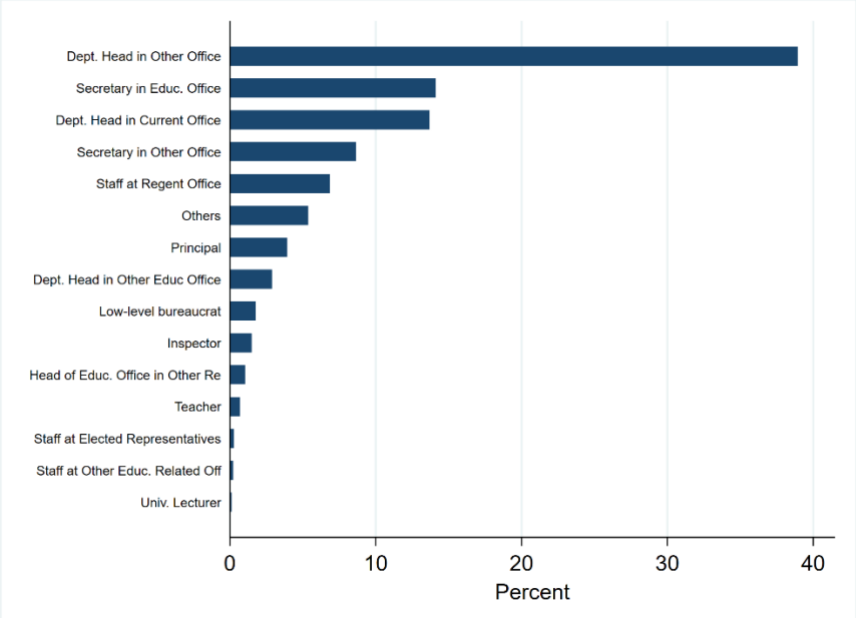
From figure 1, it is apparent that most education office heads have master's or doctorate degree (323 districts/municipalities), while heads in 86 districts/municipalities have diploma or bachelor's degree. Only 1 district, Maybrat in West Papua, has an office head with a senior high education. The high share of master's or doctorate degree is heavily linked to the promotion process for government officials, where educational attainment is a strict requirement. However, the spread of education level is also distinct in each island, where less developed regions, such as Papua, Sulawesi, and Kalimantan have higher share of office head only with a diploma or bachelor's degree.

Figure 1. Highest level of education completed by the head of the district education office



Most education office head was selected from the bureaucracy. Figure 2 shows that around 75 percent of office heads were either a lead or coordinator at the education office or its related teams. However, around 10 percent of them have politically related background, such as special staffs of governors, members of the parliament, or other government officials. There is also around 8 percent of staffs who have professional background in education related field, such as headmasters or teachers.

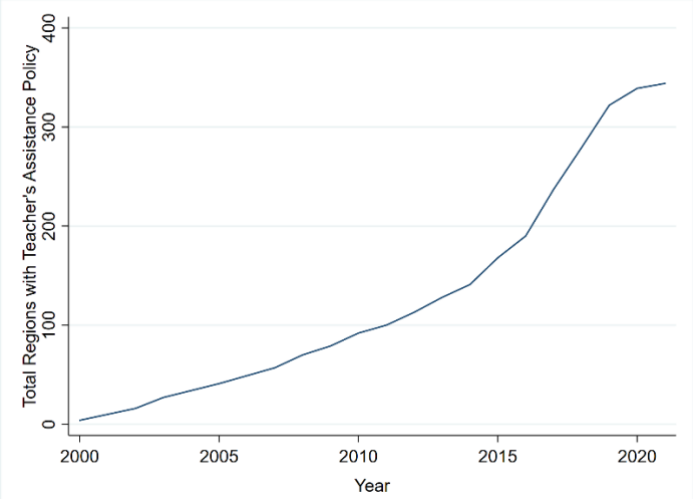
Figure 2. Previous position of education department head



Teacher's incentives policies

Teacher's incentives policies are popular. Based on Figure 3, in 2021, the policies have been adopted by 344 districts / municipalities. The pace of adoption increased exponentially after 2012, with an average addition of 24 districts / municipalities every year, significantly higher relative to the 9 districts / municipalities average before 2012. There are several factors that can explain the marked growth. First, Indonesia's economic growth was at its peak during this period, averaging at 6 to 7 percent of the GDP each year. However, teacher's salary was relatively stagnant despite the higher rate of inflation. A push to improve welfare from teachers might contribute towards the higher rate of adoption. Second, the implementation of Kartu Jakarta Pintar (KJP) in 2012 may explain the increase in adoption, as it brought education related issues to the national spotlight. Adoption rate decreased significantly in 2021 due to Covid-19 pandemic-related budget reallocation.

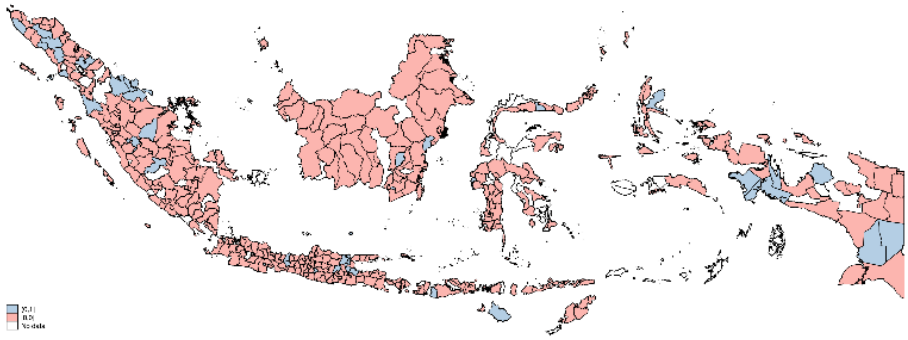
Figure 3. Adoption trend of teacher's incentive policy



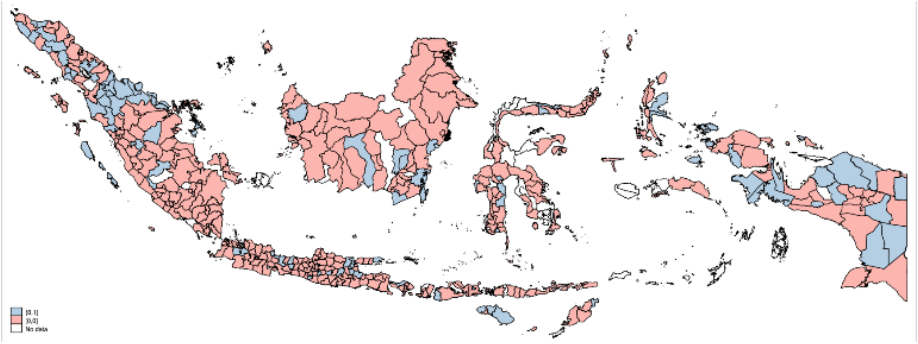
The distribution pattern might indicate the presence of spillovers. From figure 4, we observe that teacher's incentives policy began in less developed regions, notably Aceh, Papua, West Papua, Nusa Tenggara, Kalimantan, Gorontalo, and Jambi, although several regions in Java, such as Yogyakarta, Gresik, Lamongan, have also adopted the policy. We can see a relatively clear pattern that the adoption happened in clusters. The cluster developed and grew larger in 2010, where the adoption was mainly seen in other Papua regions such as Raja Ampat, Kaimana, Puncak, and Mappi, also in Aceh regions and North Sumatera. By 2015, the adoption has spread substantially in Java, Kalimantan, and Sulawesi regions. The clustered adoption pattern is still observed even in 2020.

Figure 4. Distribution of teacher's incentives policies over time

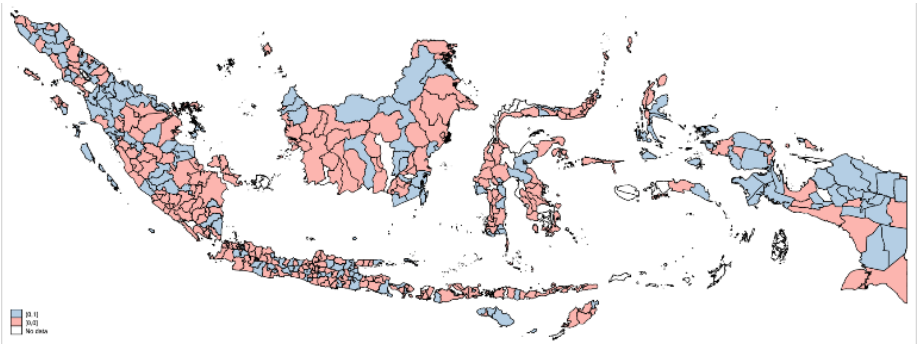
2005



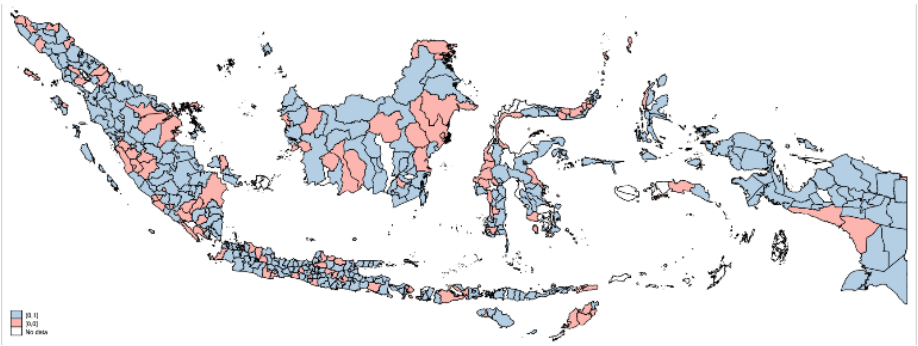
2010



2015



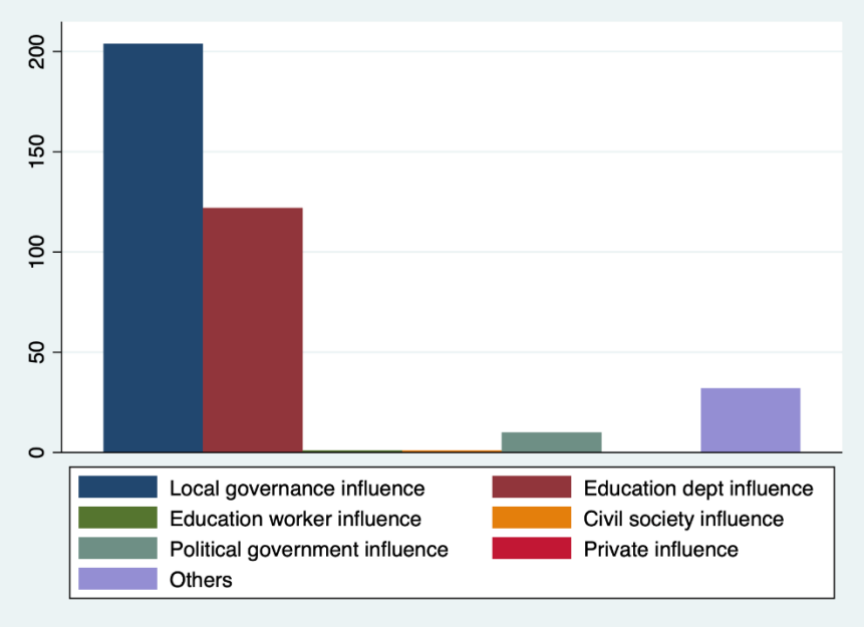
2020



Note: Blue is where the policy has been implemented

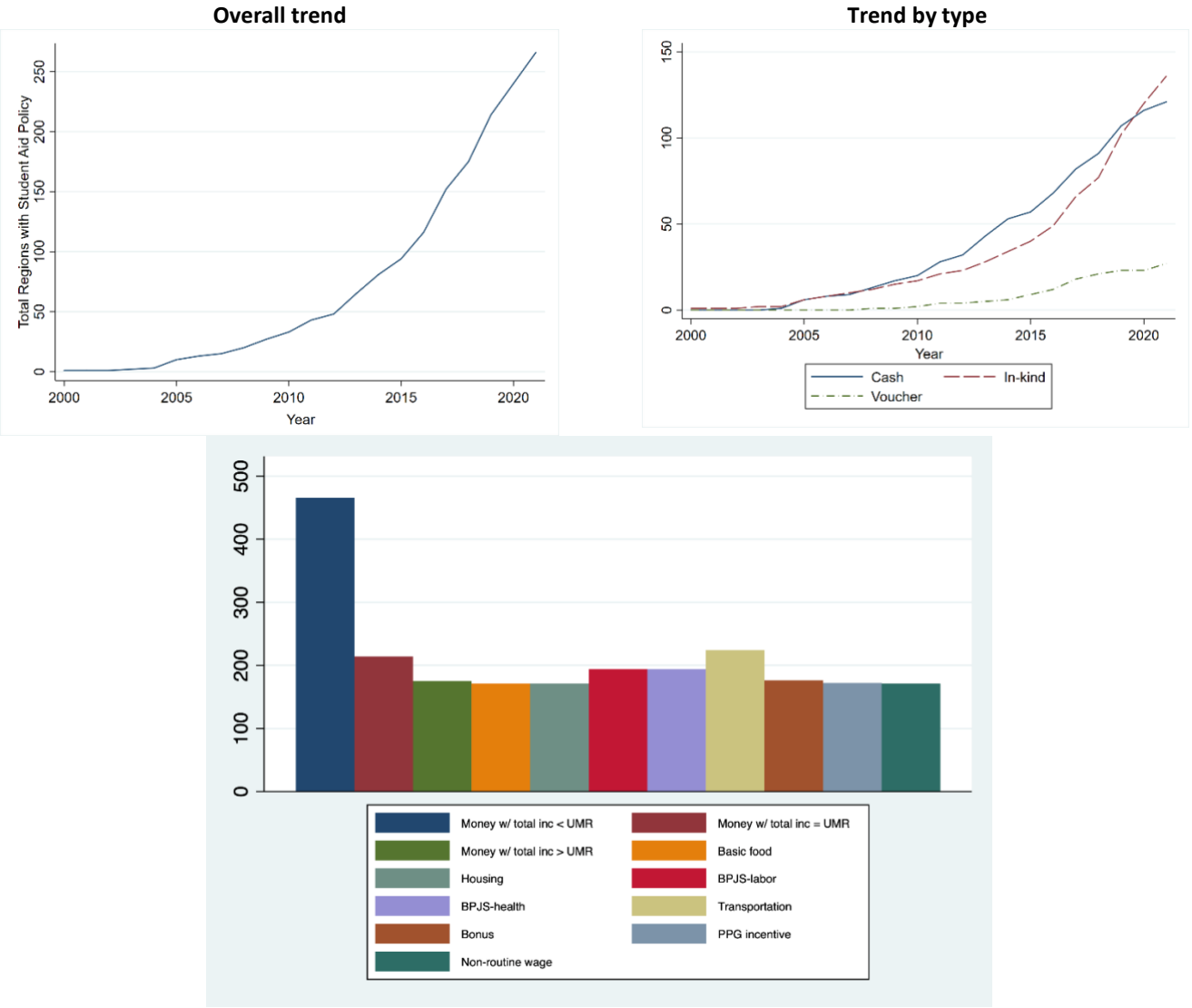
Figure 5 describes who the influence of policy adoption or innovation. Most regions claimed that the idea of policy implementation came within the local government, either from the education office head or larger governing bodies in municipalities/districts. Local governors might influence the policy adoption directly due to political reasons. In addition, other related governing bodies might influence adoption, albeit in a smaller role. Interestingly, education workers did not seem to influence any of the policy adoption in any region in Indonesia, implying their limited role in the policymaking process. However, it could also signify education workers convey their will through local education department or local government. Political actors also play a role in teacher's incentives adoption through local parliaments or politically placed officials within the local government. The result can indicate relatively strong influence of political aspects in teacher's incentives policy adoption.

Figure 5. Influencing actors of teacher's incentives adoption



Most regions provided various and multiple incentives to teachers. From Figure 6, we can observe most regions provided additional income, although the amount given made their income still less than the regency minimum wage. Several regions provided additional income to make teacher's total income same as the regency minimum wage. Many regions also provided basic social security assistance (BPJS) and transportation allowance.

Figure 6. Type of incentive



Student's aid policies

Figure 7. Student's aid policy adoption trends

As seen in Figure 7, adoption of the student's aid policies saw a marked increase after 2012. A significant factor is the implementation of Kartu Jakarta Pintar (KJP), a student voucher program initiated in the capital city DKI Jakarta in 2012, which brought a huge wave of adoption. On average, there are 23 regions each year that have adopted this policy after 2012, while only 4 regions each year that adopted the policies before that. Despite its rapid adoption, student's aid policy is relatively less popular than teacher's incentive as only 266 regions have adopted this policy relative to teacher's incentives that have been adopted in 344 regions by 2021.

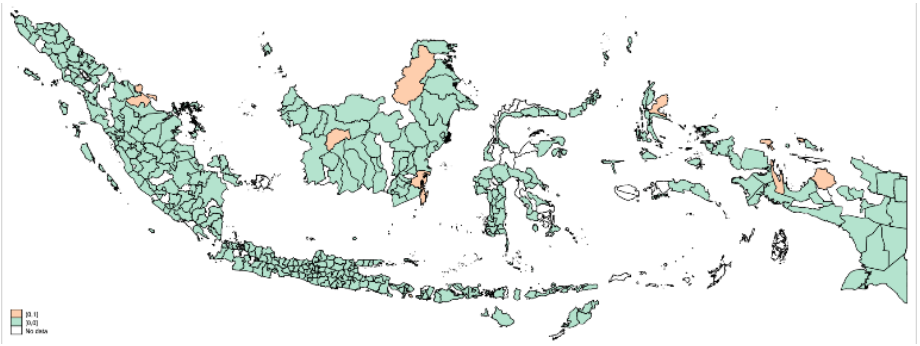
Figure 7 also described the adoption trend by type of policies. Initially cash-based incentives are the most popular type of incentives to be adopted. Between 2013 and 2019, there are around 10

regions in average each year that have adopted cash based student's aid policies. The rate declined to the average of 7 regions each year in 2020 and 2021. Meanwhile, in-kind based student's aid policies were gaining traction since 2017 with around 17 adopting regions in average each year in 2017 and above after the average of 4 regions each year from 2005 to 2016. On the other hand, voucher based incentive is relatively low although still gaining popularity after 2015. The losing popularity of cash based policies might be driven by the already plenty of other cash based policies, such as various direct cash transfers. In addition, cash based incentive fell out of favor as a consequence of multitude cash based subsidies. Another explanation might be because of the implementation of Kartu Indonesia Pintar (KIP) in 2014 as a universal cash based student's aid incentives reduced the necessities of local government to provide additional cash. Therefore, local government might opt to adopt more in-kind based policies to complement Kartu Indonesia Pintar.

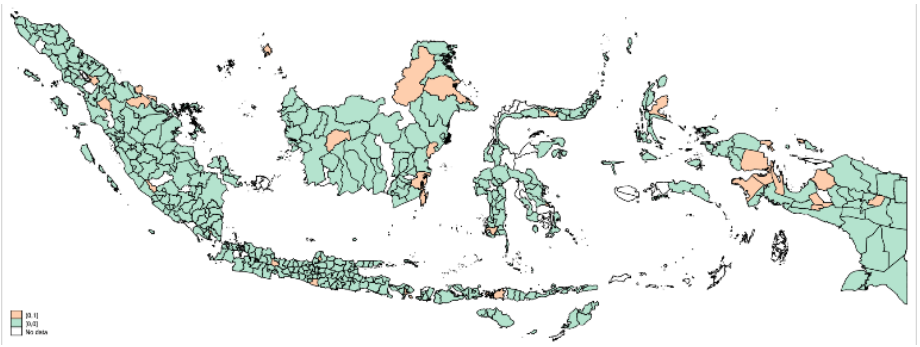
Similar to teacher's incentive policies, the distribution of student's aid policies adoption also seemed to be clustered in several regions. From Figure 8, starting in 2005, only several regions in Papua, Kalimantan, and Riau that have implemented the policy. The adoption has slightly increased in 2010 in neighboring regions within Papua, Kalimantan, and Sumatera. Using Papua to illustrate, the first adoption existed in Kotabaru, Waropen, and Manokwari, then it expanded in 2010 to Deiyai, Fakfak, Yalimo, and other neighboring regions. In 2015, the adoption significantly increased in regions within Java following the adoption of KJP. In 2020, we can observe a rapid adoption rate of the policies within regions in Indonesia, especially in Java, Sumatera, and Kalimantan.

Figure 8. Distribution of student's aid policies over time

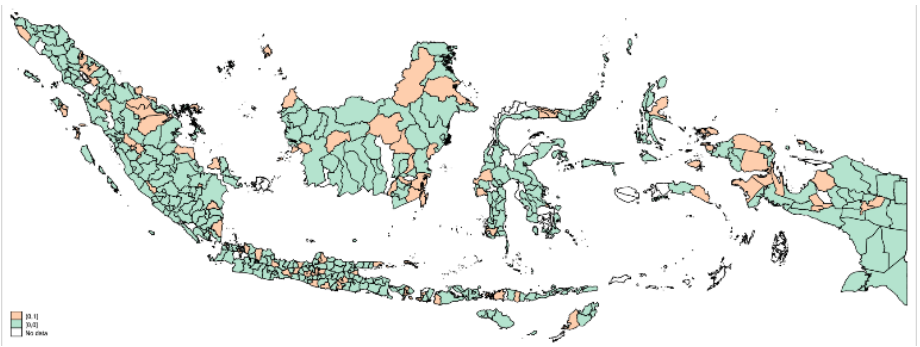
2005



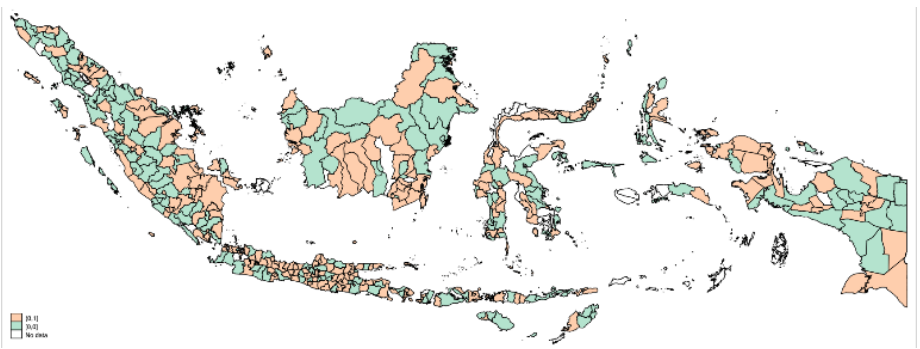
2010



2015



2020

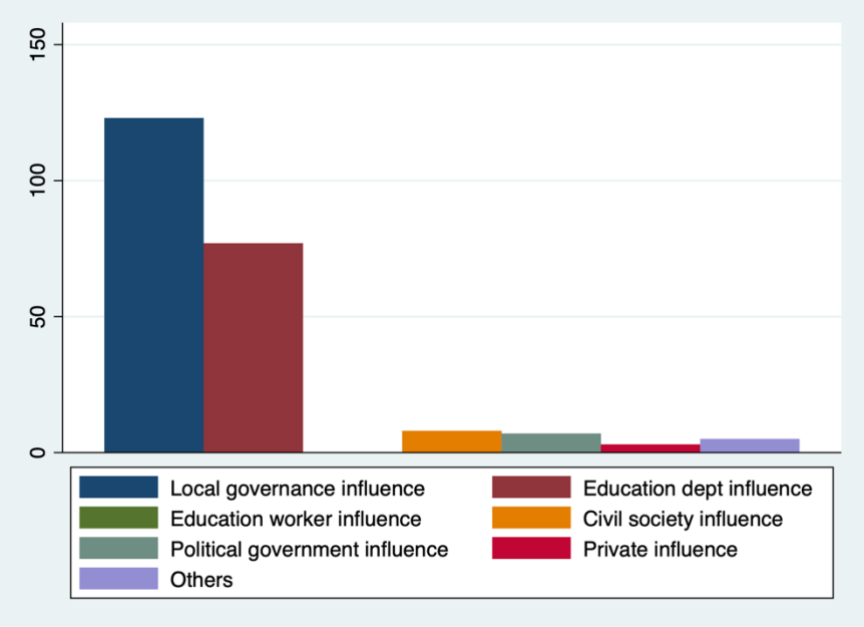


Note: Orange zone is where the policy has been implemented

Both teacher's incentives and student's aid bear a similar adoption pattern. First, they started in least developed regions, such as Papua, Aceh, and Maluku regions. This pattern may indicate a strong internal push factor in policy innovation or adoption. In this case, regions with lower capacity, either from per capita GDP, poverty rate, or inequality, might have higher need to adopt these types of policies, thus initiating a policy innovation. The motivation may vary as it can be politically driven to secure more votes or purely out of welfare increasing motives. Meanwhile, both policies also indicated a strong spillover effect through adoption in regions' neighbors, adoption in central or popular regions, or adoption within regions on national level.

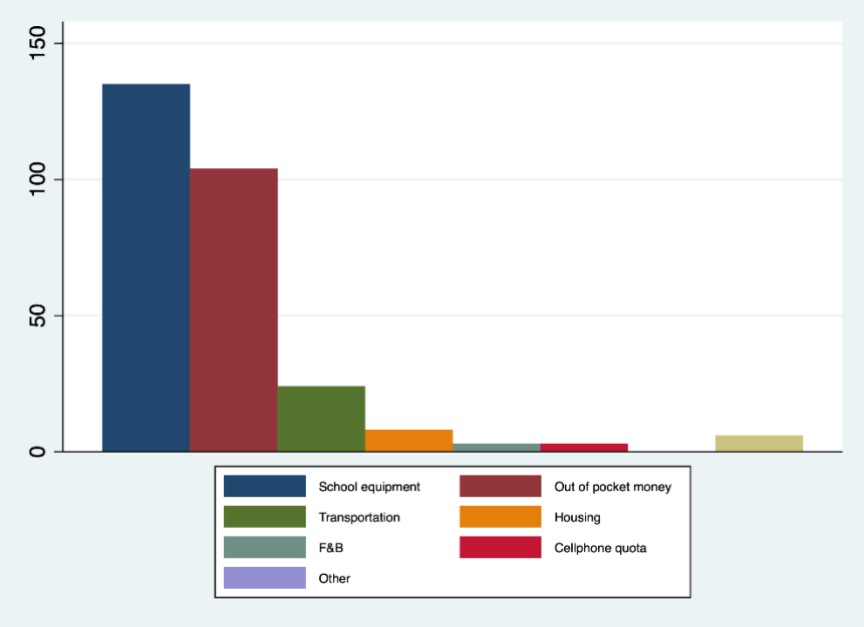
Influence within internal local government bodies is still the most relevant factor. From Figure 9, however, we can also see some variations of influence from civil society, political government, and also private influence. The variation may suggest that the adoption of students' aid policy might be less politically driven and more welfare-increasing driven as other external factors contribute relatively stronger in pushing out the policies. It is still important to note that political will might still also contributed significantly to the policy adoption as political government influence and governors still play a strong role.

Figure 9. Influencing actors of students' aid adoption



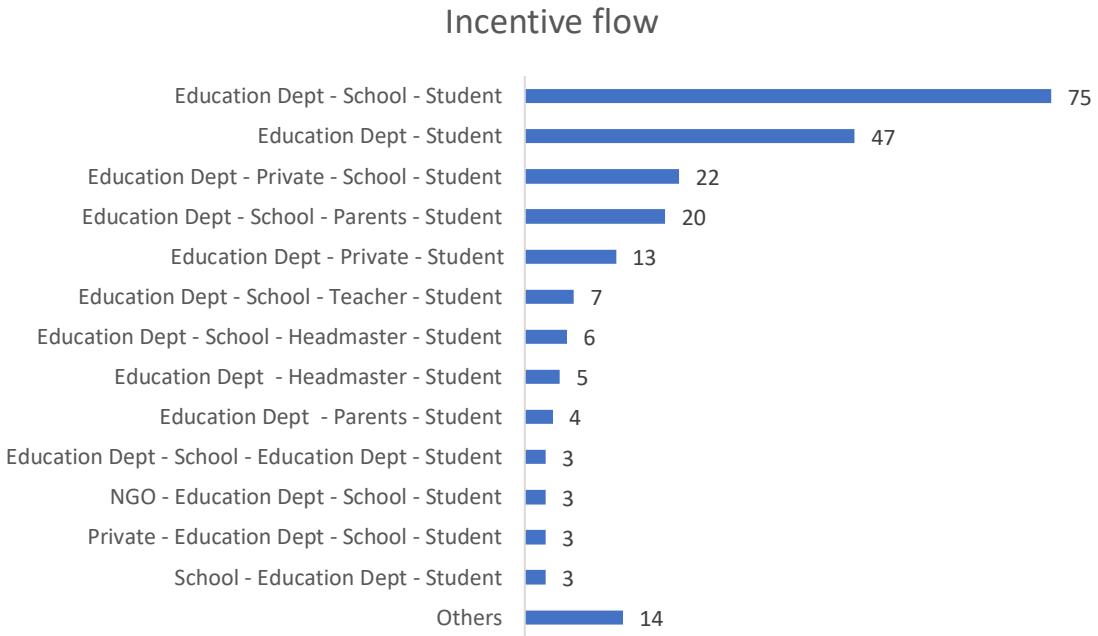
In line with the increasing popularity of in-kind based incentives, providing school equipment (books, clothes, shoes, basic learning tools, etc.) is the most favorite type of incentive to implement. From Figure 10, around 130 provinces provided school equipment as incentives. Meanwhile, around 100 provinces provided cash as incentives. Other than that, local government also provided transportation, accommodation, food and beverage, and cellphone quota as incentives.

Figure 10. Type of incentive



Most of the incentive flows utilized schools (either administration, teachers, or headmasters) or parents as a catalyst. 75 of implementing regions distribute the subsidies to school first and let school to distribute them to students. 47 of regions directly distribute the subsidies to students. Meanwhile, for in-kind subsidies, private sector played larger role as a distributor, whether directly to student or as an intermediary before distributing to schools. In addition, 20 of implementing regions require schools to distribute the subsidy through parents first and let them provide education needs to their children.

Figure 11. Incentive distribution flow

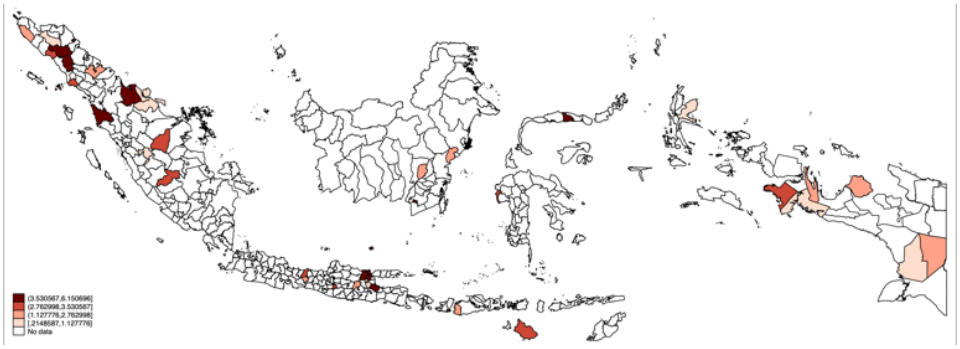


Similarity of policy types

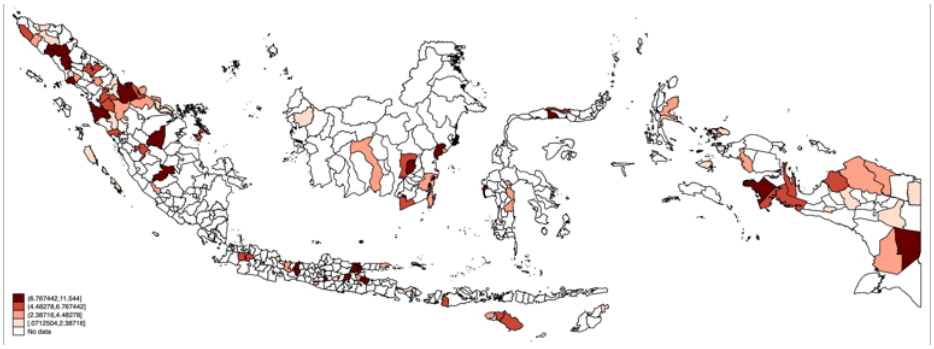
To better understand the connection of policy adoption between regions, we construct a similarity index, an indicator to compare the similarity in policy types applied between regions. For teacher's incentive policy, we use influencing characters in policy making process, reason of policy adoption, type of incentives, and reason to keep the policy as the attributes of teacher's incentive policy type. As for student's aid policy type, we use influencing characters in policy making process, reason of policy adoption, reason of choosing comparative implementing regions, type of incentives, steps of administration process, number of parties involved, and variety of involved parties in the aid distribution. The similarity index is computed using Jaccard similarity method that captures the difference between asymmetric binary variables. The index captures the similarity between two municipalities as a paired data with a score from 0 to 100 where the higher the score means stronger similarity in policy types between two regions. In Figure 12, 13, and 14, however, we provide the descriptive analysis through the average number of similarity index of the region to roughly describe how similar or how much influence does a region has over other policies in different regions. The methodological details are left in the appendix.

Figure 12. Average similarity index of teacher's incentive policy

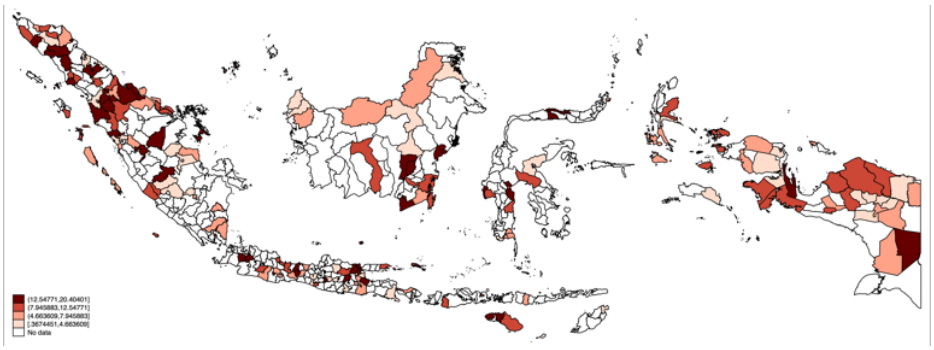
2005



2010



2015



2020

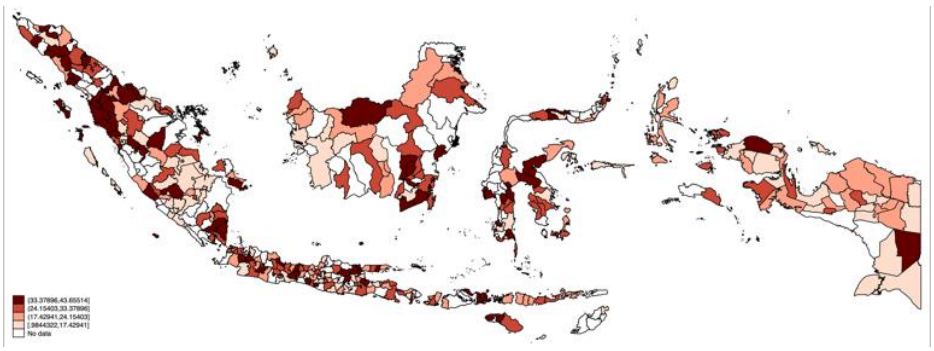
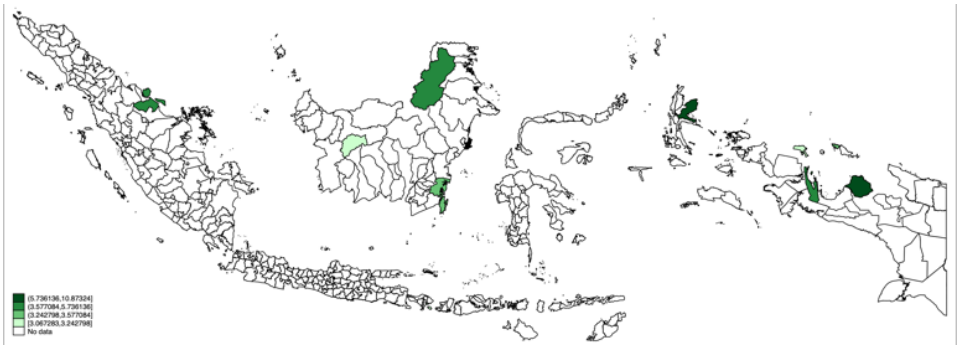
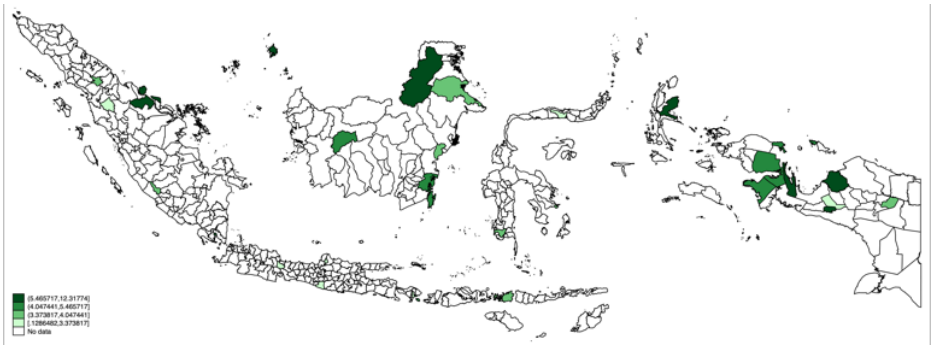


Figure 13. Average similarity index of student's aid policy

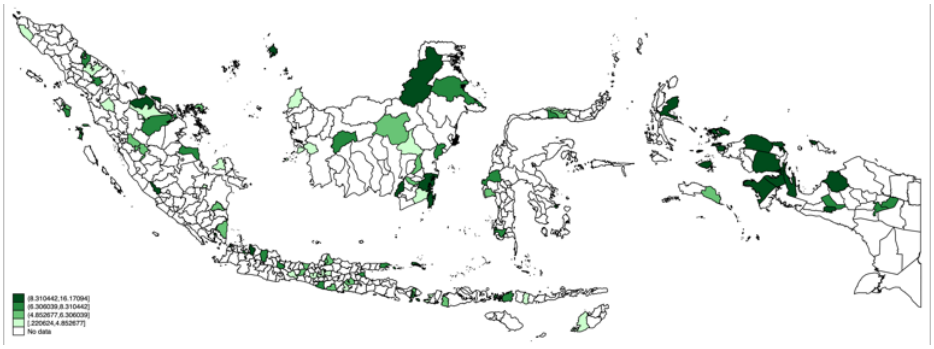
2005



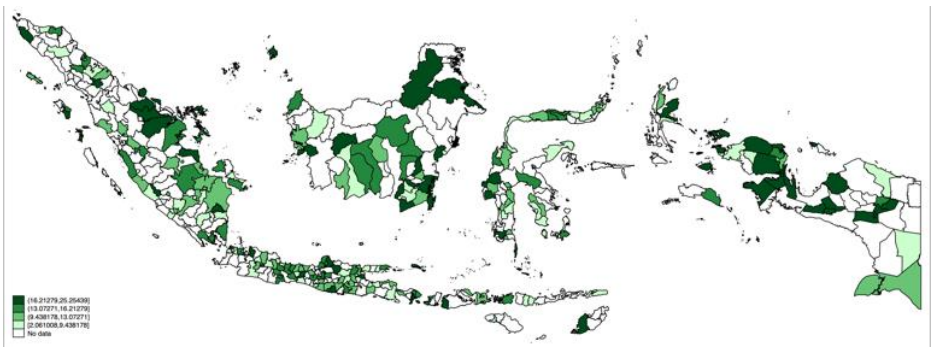
2010



2015



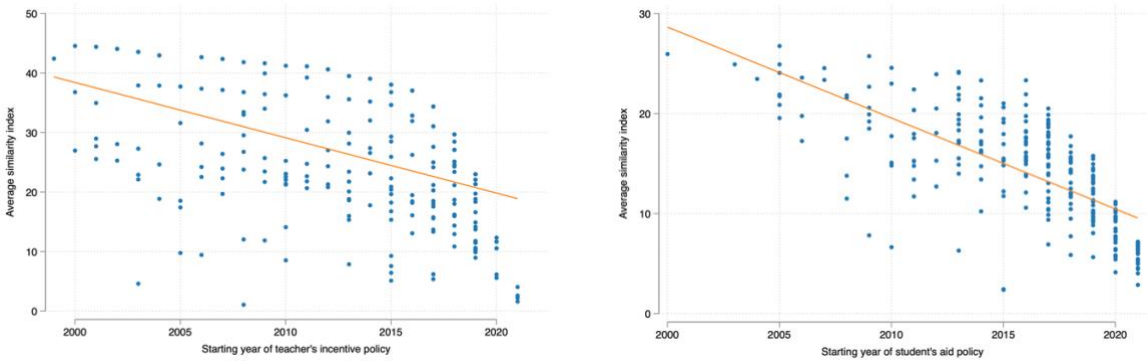
2020



There are two main points that we observe using this index: First, the index further reinforces the possibility that adoptions are locally spread within regions or provinces. Second, early adopters tend to have higher influence towards similar policies implemented in other regions. From Figure 12 and 13, the policy spread is relatively concentrated within regions around early adopters, as previously described in adoption maps. Both the high score in the average and granular level similarity index between those neighboring regions provides a strong correlation of the policy learning pattern is concentrated within several clusters that follows early adopters' policy type.

Scatter plot between similarity index and starting year in figure 14 strengthens the second point. Average similarity index tends to be higher in regions that have implemented the policy in later years and the score decreases in regions that have implemented policies in earlier years. This correlation is particularly strong in student's aid policy while relatively weaker in teacher's incentive policy, signifying stronger effect in other factors in shaping teacher's incentive policy. While early adopters might strongly influence late adopters, another plausible explanation is late adopters also learn more information and enable them to adjust policies according to their needs, hence lower average similarity with other regions' policies.

Figure 14. Scatter plot between similarity index and starting year of teacher's incentive (left) and student's aid (right) policy



Regression Results

Our regression analysis will be divided into two parts. Firstly, we will evaluate the correlation of the policy on its target outcomes. As discussed above, the motivation of regency governments in adopting a policy are often political and populist in nature, rather than based on the needs of the region. Through analysing the change in select outcome variables, we will be able to gain the big picture on the motivation idea of the policy, inferred through its effectiveness and its correlation on the outcomes. Secondly, we will assess the factors that affects the likelihood of a region adopting a particular policy. In particular, we will look at any indications of spill over effects and the role of politics in the adoption of the policy.

Correlation of the Policies Relative to Certain Outcome Variables

We use the following regression model to analyse the relationship of the policy on certain outcomes:

$$Y_{rpt} = \beta_0 + \beta_1 \times T_{rt} + \beta_2 \times \ln(PAD_{rt}) + \beta_3 \times Politicisation_r + \beta_4 \times (T_{rt} \times \ln(PAD_{rt})) + \beta_5 \times (T_{rt} \times Politicisation_r) + \boldsymbol{\alpha X}'_{rpt} + \epsilon_{rpt}$$

where Y_{rpt} is a particular outcome Y in region r of province p at year t. T_{rt} is a dummy variable that is equal to 1 when the policy exists in region r at year t and 0 if otherwise. $\ln(PAD_{rt})$ is the natural logarithmic values of the Local Revenues of region r at year t and $Politicisation_r$ is a dummy variable that is equal to 1 if the district head of region r is a political office and 0 if it is a merit-based office. We construct the variable $Politicisation_r$ by asking the district head of each region of their previous post prior to assuming office as the district head. If the previous positions are unrelated to education (e.g. campaign team of the district head), we consider the office to be a political position. Whereas if the previous employment is related to education (e.g. staff at the education office, principal), we consider the office to be merit-based. $\boldsymbol{\alpha X}'_{rpt}$ is a vector of control variables, including year fixed effects, province level fixed effects, and region-level fixed effects, including GRDP of the region, gini ratio, whether it is a municipality (usually highly urbanised) or a district (often covers a large rural area), and poverty rate.

We ran the regression on three outcomes. The first is the average share of education expenditure over household expenditure, second is average teacher's income, and third is teacher per capita. The first is analysed within the context of the student assistance policy, given by table 4 while the latter two is on the context of contract teacher's assistance, given by table 5 and 6. There are six columns in each regression table, each corresponding to different models and inclusion of control variables.

In column 4 of table 3, we can see that after including year and province-level controls, the correlation of the student assistance policy on household share of education expenditure is rather small; the existence of the policy is correlated with a decrease of 0.86 percentage points in household share of expenditure on education. However, as we see in column 6 of table 3, this result covers a high level of heterogeneity. After including region-level controls and interaction variables, we see that the correlation of the policy is dependent on regency revenue. At very low level of regency revenues, the correlation with policy is positive and large, but as the regency revenues grow larger, the positive relationship decreases significantly and eventually become negative. Regions with very low level of regency revenues also very poor regions. For this reason, it is likely that in very poor regions, the policy may enable households to satisfy the minimum expenditure level of education where previously their maximum willingness to spend is below the threshold. While in richer regions, the substitution effect takes hold. As households have already determined the optimal level of education expenditure and offset their spending in response to the additional input, a similar relationship that is observed in Das et al. (2013). Furthermore, from column 6, we can see an indication that the policy has a larger effect in regions where the office head is politicised.

From the results in column 6 of both table 4, we can see that the contract teachers' support policy only has significant correlation with teacher's wage in regions where the office is politicised. However, it is significantly correlated with teacher's employment even in regions where the office head is not politicised, though the relationship becomes even more positive in regions that are.

This positive relationship between politicised regions and relevant policy outcomes is surprising, as heads from a political background is often regarded as being less qualified relative to merit-based appointment. A probable explanation to this result is the likelihood that the district head (*bupati*) who are willing to adopt the policy plays a larger role in designing and promoting the policy in politicised regions, with the head of the education office only acting as the implementor. That is, there may be selection bias among politicised regions that adopts the policy: adoption may be correlated with good leadership or strong political will, or district heads are more careful in adopting policy, only choosing ones that they are confident to have high success rate (Arif et al., 2022).

Factors Affecting the Adoption of the Policies

To analyse the factors affecting the adoption of the policies, we use the following regression framework:

$$Exist_{rpt} = \beta_0 + \beta_1 \times Regional\ Presence_{p,t-1} + \beta_2 \times Politicisation_r$$
$$+\beta_3 \times \left(Regional\ Presence_{p,t-1} \times Politicisation_r\right) + \boldsymbol{\alpha X}'_{rpt} + \epsilon_{rpt}$$

where $Exist_{rpt}$ is a dummy that is equal to 1 when the particular policy exists in the region r in province p at year t. $Regional\ Presence_{p,t-1}$ is a dummy variable that is equal to one when the policy is adopted by one or more region in province p excluding the region r at year $t-1$. As the prior regression, $Politicisation_r$ is a dummy variable that is equal to 1 if the district head of region r is a political office and 0 if it is a merit-based office. $\boldsymbol{\alpha X}'_{rpt}$ is a vector of control variables, which includes year fixed effects, province fixed effects, and region-level fixed effects such as poverty rate, local tax revenues, enrolment rate of poor children, average household share of education expenditure, and the highest education attained by the education district head. The variable $Regional\ Presence_{p,t-1}$ is constructed to capture the mechanism through which a policy spread across regions. The control variables included in the vector $\boldsymbol{\alpha X}'_{rpt}$ are also internal factors that could influence regency government to adopt the policy. If the variable $Regional\ Presence_{p,t-1}$ is still significant despite the controls, it suggests that the policy spread through spillover effects. The interaction term is included to measure any potential differences in the diffusion mechanism of a policy between regions with politicised education office and otherwise.

The results are presented in table 6. From columns 1, 2, and 3, we see an indication that the student assistance policy spread through regional networks. The estimate of the coefficient of regional presence seems to be fairly consistent between columns 2 and 3, despite having to drop observations due to missing data. The presence of the student assistance policy is correlated with an increase of 9.9 percentage points of a region adopting the policy. It also seems that a politicised office is negatively related to a region adopting the student assistance policy. Columns 4, 5, and 6 portrays a completely opposite picture for the policy on contract teacher support. While columns 4 and 5 shows indication that there is a regional influence in policy adoption, the variable is no longer significant on column 6. Instead, it seems that regional influence is only relevant for regions with politicised education office, which is what likely drive the significance of the regional presence coefficients in columns 4 and 5. An interesting result is how the coefficient of politicisation of the office itself is not significant in column 6. This implies that politicisation only matters in the spread of the policy but does not motivate the adoption of the policy itself. It suggests that the policy may spread through political network rather than the policy being politically charged. In contrary, the student assistance policy does not seem to spread by the same political mechanism. Rather, it seems to be motivated by internal factors but spread through regional network.

Table 3. Correlation of Student Assistance Policy on Share of Education Expenditure

	Average Share of Education Expenditure over Household Expenditure					
	(1)	(2)	(3)	(4)	(5)	(6)
Policy Exist (Student Assistance)	-0.228***	-0.00980***	-0.00705*	-0.00866**	0.371***	0.413***
	(0.00587)	(0.00366)	(0.00374)	(0.00415)	(0.122)	(0.128)
ln(PAD)				0.0182***	0.0214***	0.0125***
				(0.00271)	(0.00333)	(0.00319)
Politicised Office					-0.000470	-0.00690
					(0.00603)	(0.00601)
Policy Exist*ln(PAD)					-0.0154***	-0.0172***
					(0.00478)	(0.00499)
Policy Exist*Politicised Office					0.00899	0.0184**
					(0.00932)	(0.00908)
Constant	0.275***	0.236***	0.236***	-0.205***	-0.285***	-0.136*
	(0.00420)	(0.00226)	(0.00222)	(0.0665)	(0.0813)	(0.0792)
Year Fixed Effects	No	Yes	Yes	Yes	Yes	Yes
Province Fixed Effects	No	No	Yes	Yes	Yes	Yes
Region Controls	No	No	No	No	No	Yes
N	9006	9006	9006	8123	6672	5992

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4. Correlation of Contract Teacher Support Policy on Teacher Wage

	Log of Average Teacher Wage					
	(1)	(2)	(3)	(4)	(5)	(6)
Policy Exist (Contract Teacher Support)	0.230***	-0.00477	-0.0169*	-0.0183*	-0.124	-0.116
	(0.0129)	(0.00935)	(0.00958)	(0.00967)	(0.148)	(0.161)
ln(PAD)				0.00392	0.00437	0.00204
				(0.00241)	(0.00293)	(0.00342)
Politicised Office					0.00189	-0.00309
					(0.00893)	(0.00913)
Policy Exist*ln(PAD)					0.00356	0.00327
					(0.00601)	(0.00650)
Policy Exist*Politicised Office					0.0341*	0.0381**
					(0.0185)	(0.0182)
Constant	14.19***	14.24***	14.25***	14.17***	14.16***	14.22***
	(0.00594)	(0.00398)	(0.00385)	(0.0591)	(0.0717)	(0.0863)
Year Fixed Effects	No	Yes	Yes	Yes	Yes	Yes
Province Fixed Effects	No	No	Yes	Yes	Yes	Yes
Region Controls	No	No	No	No	No	Yes
N	7065	7065	7065	6676	5475	4796

Robust Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5. Correlation of Contract Teacher Assistance Support Policy on Teacher Employment

	Proportion of Teacher Employment in Labor Force					
	(1)	(2)	(3)	(4)	(5)	(6)
Policy Exist (Contract Teacher Support)	0.00543*** (0.000554)	0.00189*** (0.000572)	0.000985* (0.000543)	0.000888 (0.000543)	0.0285*** (0.00867)	0.0254*** (0.00962)
ln(PAD)				-0.0000944 (0.000290)	0.000684** (0.000148)	0.0000262 (0.000202)
Politicised Office					-0.000188 (0.000558)	-0.000591 (0.000544)
Policy Exist*ln(PAD)					-0.00118*** (0.000347)	-0.00107*** (0.000387)
Policy Exist*Politicised Office					0.00203* (0.00108)	0.00286*** (0.00102)
Constant	0.0279*** (0.000262)	0.0286*** (0.000244)	0.0288*** (0.000239)	0.0316*** (0.00709)	0.0129*** (0.00363)	0.0187*** (0.00508)
Year Fixed Effects	No	Yes	Yes	Yes	Yes	Yes
Province Fixed Effects	No	No	Yes	Yes	Yes	Yes
Region Controls	No	No	No	No	No	Yes
N	7078	7078	7078	6689	5488	4806

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6. Propensity of Adoption

	Student Financial Assistance			Contract Teacher Support		
	(1)	(2)	(3)	(4)	(5)	(6)
Regional Presence (Lagged)	0.281*** (0.00640)	0.0988*** (0.0120)	0.0994*** (0.0267)	0.360*** (0.00646)	0.0738*** (0.0129)	0.0227 (0.0394)
Politicised Office			-0.0484*** (0.0181)			-0.0169 (0.0243)
Regional Presence (Lagged) * Politicised Office			-0.0295 (0.0241)			0.112*** (0.0304)
ln(PAD)			0.0453*** (0.0145)			0.0336** (0.0152)
GRDP Education			-0.0202* (0.0116)			-0.0763*** (0.0130)
Constant	0.0106*** (0.00168)	0.119*** (0.00727)	-0.836*** (0.298)	0.0182*** (0.00314)	0.248*** (0.0103)	0.475 (0.319)
Year Fixed Effects	No	Yes	Yes	No	Yes	Yes
Province Fixed Effects	No	Yes	Yes	No	Yes	Yes
Region Controls	No	No	Yes	No	No	Yes
N	9111	9111	3467	9185	9185	3096

Robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Discussion

Our results provide modest evidence that in adopting policies, local governments are not necessarily motivated to improve their primary outcomes. While we do not have enough information on national examination scores to measure the effect of the policies on learning outcomes, existing literature suggests that they are unlikely to have any influence on the measure. A study by De Ree et al. (2017) exhibits that even doubling (civil servant) teacher's wage had no significant effect on student's learning outcome. Increasing contract teacher's salary will likely result in the same feat. Even when they succeeded in increasing teachers employment to address the shortage, it is also unlikely to affect learning outcomes, as the quality of teachers will still be low. Beatty et al. (2021) also shows that Indonesia's learning profile have been declining since 2000, despite a significant increase in input, including a large student-based grant transferred to schools from the central government. Furthermore, there is evidence of substitution effect in more-developed regions, which likely resulted in an unchanged input for the child's education and hence no effect in learning outcomes (Das et al, 2013).

Despite their likely ineffectiveness in affecting learning outcomes—the supposed primary measure of the education system—the policies succeeded in changing the outcomes that matters to its recipients, which highlights a strong political influence in their adoption and implementation. The contract teacher's support policy positively affects teacher's wage and employment, which are two pressing concerns of the teacher labour unions. The paper by De Ree et al. (2017) also found that increasing teacher's wage significantly increase teacher's satisfaction with their role. The household substitution effect also suggests that it acts as a financial relief for the recipient households, which will likely increase household welfare and satisfaction. The extensive spread of the policies can likely be attributed to the 'successes' of the policy in achieving these outcomes, which makes them attractive to local governments despite bearing no correlation on learning outcomes.

Beyond its 'success' as a policy, there are evidence that suggests local governments are also influenced by both internal and external factors in making adoption decisions. Our results shows that region's wealth, as proxied by local tax revenues, is a significantly positive factor in promoting adoption. This is consistent with the idea that wealthier local districts acts as the primary experimental policy laboratories, as their resources enable them to be riskier in policy adoption (Elazar, 1972). In contrary, education rents (i.e. GRDP from the education sector) is negatively related with policy adoption. We interpret education rents as a proxy for the level of development of the education sector in a region. The negative relationship between the two variables means that regions with less developed education sector are more likely to adopt these policies, which suggests that decentralization do promote adoption of policies by regions that needed it most. In a decentralized system, this might imply that local leaders or representatives understood problems in their own regions better or larger pressure from local residents might influence the policy implementation (Bardhan, 2002; Faguet, 2001).

Our analysis shows a strong indication of regional influence in policy adoption in Indonesia. The maps display a trend of regional clustering in the adoption, where the policies are more likely to spread to geographically closer regions. Furthermore, the significant increase in student assistance policy adoption post-2012 is likely inspired by the implementation of the Kartu Jakarta Pintar (KJP) in the capital. It was a student voucher program that was widely publicised across the country, and the rapid implementation of the student assistance program across the country following this strongly suggests that local governments are influenced by policies implemented elsewhere. Our estimate on the effect of this regional effect further supports this idea; policy presence in neighbouring regions has a significant relationship in explaining policy adoption, even after we have included the internal factor control variables. These results are consistent with findings from other literatures in the topic (Shipan & Volden, 2008; Anglum & Park, 2021; Ghosh, 2013). The importance of regional influence in the

proliferation of policies at the local level highlights the role of policy diffusion in the decentralization efforts of Indonesia.

Political influence also seems to assume an important role in policy diffusion in Indonesia. Our estimates show that political factors can significantly affect the dynamics of policy diffusion. But it will depend on the actors affected by the policy. Policies concerning student financial assistance, which directly target the masses rather than the demands of any particular organized groups or organisations, seems to be popular across all regions, regardless of how politically motivated the local government is. In contrast, contract teacher's support seems to have a duality as a policy. It seems to only correlate with improvement in teacher's welfare, as proxied by wage and are usually the demands of teacher labour unions, in politicised regions. Otherwise, there are indications that it only improves employment, which are the demand of the schools. This likely suggests that demands from actors salient mostly within the political sphere—as opposed to the general public—are mostly only pertinent to the governments familiar with their influence. Nonetheless, this result highlights the significance of political dynamics in policy diffusion, and the relevance of ideological stances in the discussion concerning decentralization (Gilardi and Wasserfallen, 2017).

Conclusion

Decentralization provides an opportunity for local government to adopt more suitable policies according to their regions' needs. However, the effectiveness of decentralization is unequal in all countries. With an imperfect decentralization system, the policy adoption might be affected by Misaligned political incentives, limitations in administrative capacity, and financial dependence. Thus, the implemented policy might be less successful in increasing welfare and addressing region's needs. Still, based on previous studies, a policy adoption in this condition might still produce a good policy. Our study explores how innovative policy is adopted and spread across regions in an imperfect decentralization setting. Using primary data of temporary teacher's assistance and student assistance policy in Indonesia, combined with Indonesia's household and workforce survey, we analyze the pattern of policy adoption, the correlation of policy adoption towards target indicators, and the role of external spillover from neighboring regions in the policy adoption.

Decentralization in Indonesia happened abruptly in 2000 after Asian Financial Crisis as a major social reform. However, being heavily centralized for decades, local government's capacity is mainly limited as a policy implementing agencies rather than policy planners. Limited government officials' capacities, coupled with uneven regional development, left most regency governments, except those who are more developed and have better human resources, are unable to utilize the decentralization. Regency governments received huge freedom in designing their education policies. Our observation clearly found that the adoption rate is growing rapidly in the past two decades. However, the evidence of the policy being effective in improving education outcomes, even increasing teachers' or students' welfare, is weak. Despite being ineffective, the policy is still adopted rapidly across districts and municipalities.

Our data consisted of two rounds of primary survey, media tracking, and secondary data. We interviewed officials working in local education department in each municipality and district. We obtained data on contract teacher and student assistance policies in 415 out of 510 municipalities and districts, including their type, distribution, and influencers. In addition, we also observed the background of education department heads and their previous occupation to identify their affiliations. We combined regency socioeconomic characteristics, the number of teachers and their average wage, and region's wealth through their local revenue. Using this data, we are able to conduct analyses on the policy's success and the propensity to adopt.

Our result found an interwoven interaction between policy adoption, decentralization, and political connections. Local government does not necessarily aim to improving their learning outcome

in the adopted policies. However, they seem to be more motivated to achieve other politically related outcome. For example, contract teacher's support policy strongly increases teacher's wage, thus increasing teacher's satisfaction. Regency capacity also provides strong pressure to the policy implementation. Region's wealth enabled regency government to adopt riskier approach in policy implementation, while lower education regency GDP also promotes more policy adoption, indicating policies are adopted in those benefited more, confirming one of the main attributes of decentralization. Implementation of policies within neighboring regions also pushes observed regions to adopt policies.

Future research should focus on ascertaining the mechanism of adoption. We have established that policy diffusion mechanics is present and is an important supporting factor in Indonesia's decentralization efforts. But considering the pervasive inequality that is present in developing countries, the mechanism of adoption will significantly affect policy outcomes. Many literatures have highlighted the limited generalisability of policies. If local government only rely on learning (i.e. only adopting through the influence of how successful a policy was in other regions), policy adoption would likely be an ineffective mechanism. An ideal policy adoption would be through emulation, where local government adopt policies that they determine to be appropriate for their context and adjust the policy accordingly. Encouraging government to employ emulation in adoption will be vital in supporting decentralization efforts.

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Appendix

Constructing the similarity index

We calculate the similarity index using Jaccard similarity calculation method (Jaccard, 1912). The method is initially done to identify similarity between species and recently used in the data science field to calculate the proximity between two objects, such as text mining and recommendation systems. Jaccard similarity method is suitable to find the proximity in non-numeric attributes by adjusting them into binary vectors and suitable for attributes that carry the same weight to the object. These attributes are calculated as follows:

$$J(i,j) = \frac{a}{a+b+c}$$

Where i and j represents the attributes within an object. a is the number of attributes that equal to 1 in both i and j. b is the number of attributes that equal to 0 for i but 1 for j. While c is the number of attributes that equal to 1 for i but 1 for j. We normalize the similarity in 0 to 100 range by multiplying it with 100.

We utilize the variables in the primary survey variables to define the attributes. As some variables are categorical, we divided those variables to make them into binary. For example, incentive type in school voucher is coded from 1 to 3 where 1 is cash, 2 is in-kind, and 3 is voucher. In this index, we separated those 3 and make three new variables that represents incentive type in cash, in-kind, and voucher respectively and coded them as binary variables.

In summary, the defined attributes for both teacher's incentive policy and student's aid policy are summarized as follows

Teacher's incentive	**Student's aid**
• Influencing actors – local leaders • Influencing actors – education dept. officials • Influencing actors – education workers • Influencing actors – Civil society • Influencing actors – Political/central government • Influencing actors – Private entities • Influencing actors – Others • Policy reason – Teacher's welfare • Policy reason – Teacher's shortage • Policy reason – Law • Policy reason – Other • Incentive type – Wage increases below min. wage • Incentive type – Wage increases to minimum wage • Incentive type – Wage increases up to above min. wage • Incentive type – Food assistance • Incentive type – Housing incentive	• Influencing actors – local leaders • Influencing actors – education dept. officials • Influencing actors – education workers • Influencing actors – Civil society • Influencing actors – Political/central government • Influencing actors – Private entities • Influencing actors – Others • Policy reason – Students under poverty • Policy reason – Political reasons • Policy reason – Support outstanding students • Policy reason – Support dropout students • Policy reason – Other • Inspiration to adopt – First mover • Inspiration to adopt – Successfully implemented • Inspiration to adopt – Political reasons • Inspiration to adopt – Other • Policy adjustment reason – Political reasons

• Incentive type – Universal insurance (BPJS TK) • Incentive type – Universal insurance (BPJS Kesehatan) • Incentive type – Transportation • Incentive type – Bonus • Incentive type – PPG incentive • Incentive type – Non routine wage • Policy adjustment reason – Local budget • Policy adjustment reason – Political • Policy adjustment reason – Changes in the number of teachers • Policy adjustment reason – Teacher's welfare • Policy adjustment reason – Covid-19 • Policy adjustment reason – Other	• Policy adjustment reason – Student's welfare • Policy adjustment reason – Budgeting reasons • Policy adjustment reason – Others • Incentive type – Cash • Incentive type – In-kind • Incentive type – Voucher • Incentive goods – School equipment • Incentive goods – Transportation • Incentive goods – Cellphone quota • Incentive goods – F&B • Incentive goods – Out of pocket money • Incentive goods – Scholarship • Incentive goods – Housing • Incentive goods – Others • Distribution steps – 1 • Distribution steps – 2 • Distribution steps – 3 • Distribution steps – 4 • Parties involved in distribution – 1 • Parties involved in distribution – 2 • Parties involved in distribution – 3 • Parties involved in distribution – 4 • Parties involved – Parents • Parties involved – Local government • Parties involved – School • Parties involved – Private entities