

# The Relation between Regional Government Supply Chain Management and Decision Making: Case Study on Regional Election in Indonesia

Dyah Purwanti <sup>1\*</sup>, Sekar Mayangsari<sup>2</sup>

<sup>1</sup>*Politechnic of State Finance-STAN*

<sup>2</sup>*Trisakti University*

<sup>1</sup>dyahpurwanti@pknstan.ac.id

**Abstract**— This research aims to explore the possible benefits of regional government supply chain management information towards decision making in regional election (“Pilkada”) in Indonesia. This research is important due to the rarity of researches that discuss the empirical and theoretical proofs of people’s needs towards government Supply chain management information. By using data from 2017 and 2018 regional election in Indonesia, I observed 198 regional governments at province/regency/city level. These sampled regions were chosen by deciding if the regional heads went to run for a second term. This decision was intended to evaluate the success of public policies applied in the first terms, which should be reflected in the regions’ government Supply chain management information that could be used by customers to consider if the ruling government (the incumbents) should be upheld or replaced. By using cluster analysis, I grouped the sampled regions into several clusters based on sociodemographic similarities. Then, I used discriminant analysis towards these clusters and found that regional government Supply chain management information has strong discriminant values towards regional election results. This research proves that customers have good awareness towards Supply chain management information involved in decision making. The implication of this research shows the existence of customers’ needs and interests towards regional government supply chain management information in regional election, thus regional government should improve the quality of supply chain management information and information dissemination, while also make sure that supply chain management information reaches and is reachable the whole society through vast publication and education.

**Keywords**— *supply chain management, decision making, government, regional development, information..*

## 1. Introduction

This research stands on previous researches [1-4]

that have successfully proven the strong correlation between government Supply chain management information and regional election results. There has been a little to zero research done to test the benefits of regional government supply chain management information in Indonesia. The regional elections held in 2017 and 2018 in Indonesia becomes the perfect moments to re-test the benefits of regional government supply chain management information towards decision making. The existence of regional government supply chain management information users is often doubtful [5], yet when the elections take place, customers as the potential users get to be more aware with supply chain management information that reflects regional government public policies [6], to decide if the currently ruling governments (the incumbents) should be upheld or replaced with other candidates.

This research focuses on the incumbents who went to run for a second ruling term. Why incumbents? The most basic reason is that incumbents are the ones that leave track records of public policies incorporated within the regional government budgetary Supply chain management numbers. In 2017 and 2018 regional elections in Indonesia, 198 incumbents ran as candidates. When elected for the first terms, these incumbents strategically designed public policies that tried to meet their campaign promises as well as to increase their chances to get re-elected in case they decided to run for second terms. These policies include establishing priority development programs that were funded by regional government budget. Regional government’s spending allocation and revenue realization policies are recorded using supply chain management principles, so it can be concluded that regional government Supply chain management information may reflect government’s public policies implementation [7].

Empirically, during 2012-2017 regional governments in all over Indonesia set out budget allocation policies that show an increasing trend in both revenue and

spending in order to support public services. This trend vary in every regional government. However, the increasing trend in several basic service programs such as capital spending, education, health, housing, public facilities, and social security did not necessarily ensure that the incumbents who run for second terms would get re-elected. Regional election result showed that of these 198 incumbents who run for second terms, only 131 were actually re-elected while the other 67 were lost. This fact strengthen my motivation to identify some types of regional government Supply chain management information that are consistent to customers' judgment and decisions.

Regional government's spending and revenue allocation policies naturally vary depending on sociodemographic condition in every region. Regions whose residents work mostly in agriculture fields need subsidy policies and agricultural feasibility more than regions whose residents work in other fields, while regions with high income per capita have stronger preference towards public policies that cover not only basic services but also safety and social securities, compared to regions with low level of income per capita. This condition is what makes this research used cluster analysis to categorize regions based on sociodemographic similarities, so that from these clusters I can identify types of spending budget allocation policies that are assigned and recorded in regional government budgetary Supply chain management records [8].

The result of this research shows a strong association between regional election results and incumbents' policy options which are recorded in supply chain management information. Cluster analysis result shows 2 clusters of regional governments that inhibit contrast sociodemographic conditions. This result makes it easy for me to identify the types of supply chain management information that are used as discriminators of regional election results from each of the two clusters. The result of discriminant analysis from Cluster 1 shows that information concerning social security spending, goods and services spending, and regional Own-Source Revenue serves as discriminators for regional election result. In Cluster 2, information concerning capital spending, housing and public facilities spending, education spending, economy spending, and regional government revenue serves as discriminators for regional election result. In [9] stated that decision making is influenced by

sociodemographic conditions, sources of information, and customers' political party alliances. Due to limited data concerning political party alliances and sources of information, this research used sociodemographic condition as the only factor to control the use of regional government Supply chain management information in decision making.

#### Previous Researches

This research adopts integration of sociodemographic factors, thus I used cluster analysis that aims to create homogenic groups of regions. The results of [10] proves that there is a strong indication that Supply chain management ratios are helpful as discriminators for variations in United States' mayor election results in 1972-1977. Generally, [11] found that customers put high attention towards the level of public services, especially healthcare, welfare, and loans. Incumbents who increased healthcare spending and welfare spending managed to be re-elected. However, mayors who lost the election are those who increased short-term loans to fund operational activities and decreased healthcare spending and road services. In [12] only used one independent variable, that is, supply chain management ratios combined with customers' sociodemographic characteristics. And by using discriminant analysis, Ingram et al. could not describe the strength of the impact of Supply chain management information towards the variety of results from the mayor election. Data from the election was collected in different time periods (1972-1977), alarmingly causing different social-economic condition among regions. Moreover, [10] suggested that future researches in the same area should include other variables such as incumbents' campaign funds and incumbents' profiles. In [10] also suggested to modify their research model by including cash-to-accrual Supply chain management system transition, fixed asset supply chain management, and pension obligation reporting.

While [10] only used one independent variable (that is, supply chain management ratios), [13] used municipal bond rating as an indicator or basis to categorize regions. Municipal bond rating was believed not only as an indicator for regional financial factors, but also as a representation of sociodemographic characteristics of the bond issuers. Besides, [12] also utilized political competition to categorize economic forces among regions, where it was assumed that political competition is another thing that customers put more attention to, other than economic forces. In [13] made use of questionnaires spread out in 812 cities, which become the basis to analyze if incumbent mayors would get re-elected.

supply chain management ratios used in [12] included cash and investment balance, property tax proportion, capital spending, civil servant wage spending, loans, healthcare spending, welfare spending, interaction between healthcare spending and number of people aged 65 years or above, as well as interaction between welfare spending and number of people below the poverty line. The results of [12] proved that financial supply chain management measures are more relevant in mayor elections with low political competitions. Financial Supply chain management measures used in the research were selected ratios in the year before the election, showing certain “levels” of those ratios. The result was in line with [10], that is, customers put more attention towards two important things: quality of basic services (i.e. healthcare and welfare) and loans. [11] noted that the relation between service quality demanded and incumbents’ votes gathered depended on the size and type of certain interest groups. Future researches were expected to dig deeper into explaining those interests.

In [12] did similar research in Spain by adding Supply chain management ratios and budgeting ratios into it. Ratios in this research put changes of budgetary items from the first and the last year towards the election year into consideration. The result shows that significant independent variables include modified spending index, spending realization index, and budget surplus in current year. In [6] also found that customers put attention towards budget management in the year before the election as well as spending management, showing that customers actually cared about how much tax should be paid and how big public loans were then. This result is different from the results of [5], where [6] added a new independent variable, that is budget management ratios. However, their research lacked on low statistical significance level due to data rarity, as well as low level of citizens’ awareness. I used the real results of 2017 and 2018 regional elections in Indonesia as a proxy of customers’ decision result about whether incumbents were re-elected or not. This is different from previous researches, where varieties of general election results made use of questionnaires to customers like in [5], and data were obtained not at the same time like in [3, 11]. Other differences of this research compared to previous researches include the use of Supply chain management ratios and modified government budget that was aligned with the structure of regional government fiscal

policies in Indonesia, where budgeted spending’s are classified based on governmental functions. By using function-based classification, I have a guidance to determine regional government supply chain management information determinants that reflect regional government public policies for public service implementation. Supply chain management information was measured by using differences between spending/revenue realization in the beginning of incumbent’s ruling term and spending/revenue realization towards the election year. Using spending/revenue realization differences instead of spending/revenue budget level only towards the election year made for more accurate discriminators. This result supported earlier statement that information concerning budgeting result serves as the main determinant in decision making.

This research implies the need to enhance customers’ literacy towards regional government supply chain management information. Considering the number of regional governments in Indonesia that carry out regional elections in every 5 year, so that there may always be regional elections held in every year, it is important to educate people about regional government’s performance results. This can be achieved by disseminating information about regional government’s performance so that supply chain management information can reach and be reached by people. For government supply chain management standard setters, I suggest to formulate a simpler, briefer, and more understandable supply chain management information so that it can benefit more towards decision making.

The structure of this research consists of 5 parts: the first part is the introduction that covers research background, problem formulation, and research signification. The second part is theoretical basis that explains the problems discussed in this research and previous researches. The third part explains the method and variables used in this research. The fourth part discusses the research result and the fifth part is conclusion, research limitation, and suggestion for future researches.

## 2. Literature review

### B.1. Customers and Regional Government supply chain management information

The relation between customers and regional government heads can be described as the relation between principal and agents. Agency theory puts customers as principals who provide funding sources in the form of tax payment and owning rights of natural resources. Customers choose regional heads as

agents, who are given authority to manage public finance. This delegation of authority requires agents to be held responsible to the principals, and as the consequences of this responsibilities, principals may either maintain or replace the agents. Customers are the potential users of government Supply chain management information, where customers consider to use all of the information as a basis to decide if regional heads should be upheld or replaced.

From public choice theory perspective, politicians, political parties, bureaucracy, and government serve as suppliers, while customers serve as demanders. The kind of transaction used as public commodities are the votes transaction. Public policies are taken based on the exchange principle from rational thoughts. The interaction between supply and demand happens when politicians are seen as a producer who offers the best way to consume public commodities and the people are seen as consumers who will benefit from and consume those commodities. If the power of both supply and demand is balanced, the policies chosen will be beneficial to all parties. Public choice theory is considered as a theory that overcomes the weaknesses of agency theory if it is implemented to public sector. Public choice theory approach is related to unique agency issues in governmental organizations.

Regional elections open a chance for customers to consider regional government's achievement and performance as a decision basis to either uphold or replace the incumbents. Incumbents leave performance tracks while ruling, so customers can predicate these tracks in their decision making. Elections at regional level is considered beneficial because customers can see government's performance more closely. By assuming that customers are all rational, customers' decision will be based on economic rationality principles [5]. Customers will only vote for candidates that will give them maximum economic benefits, in the form of chances to obtain income from the creation of jobs. If most customers still live under the line of poverty, customers will long for regional heads that provide public services that meet their basic necessities in health, education, social security, and public facilities. Priority development policy choice, followed by government spending allocation, becomes customers' references to measure incumbents' performance.

Customers also retrieve government Supply chain management information from other tangible measures such as public service quality improvement and public facilities enhancement that directly relates to customers' everyday lives [12]. It is considered highly improbable for customers to take time to access regional government financial reports. Another way to retrieve the information is through intermediary institution, i.e. the spread of government policy

result information through mass or electronic media or in campaign period. When the elections take place, customers gather all information about incumbents policy choices either from intermediary institution, from campaign, or from direct response of public service quality improvement. Decision making is adapted from the context of investment decisions detailed by [8], where the idea of usefulness comes from the context of "becoming relevant... Supply chain management information should be able to make differences in decision making process by helping information users to make predictions out of past, present, and future results or to confirm or correct their expectancies". AAA Committee has implemented a test on financial report basic purposes: if strong correlation between Supply chain management information and election results is found, it can be concluded that regional government Supply chain management information system that captures the data incorporated within regional government financial attributes is consistent with the information used by constituents to determine their decision making even though customers obtained the information with or without the help of financial reports.

Incumbents will try to maximize their chances to get re-elected and to gather as many votes as they can in the next election by designing policies that will not only meet their campaign promises to the constituents, but also maximize their votes. In ruling the governments, incumbents should follow laws and regulations where government should provide basic services that are ultimately considered as government's duties, including healthcare, education, infrastructure, security and order, housing and public facilities, and also social securities. Government spending are used to fund all of these services. However, executive-level government has a discretion to determine development priority and spending allocation policies to fund development programs promised in their campaign. This results in variations of spending and revenue budgetary allocation policies among regions, thus regional spending and revenue Supply chain management information in every region varies as well.

## B.2. Government Structure and Regional Elections in Indonesia

The structure of Indonesia's government consists of central government and regional government. Regional governments consist of provincial government (34), city government (97), and regency government (415), so in total there are 546 regional governments in Indonesia. Every regional government holds regional election once in every 5 year. Other than regional election (to elect regional heads), regional government together with central government also holds legislative election to elect legislative members in both central and regional levels. These regional elections are not held simultaneously at the same time, instead they can be held at any times depending on the regions' preference. Recently, regional elections are held in 2015, 2017, and 2018,

but for this research I chose 2017 and 2018 regional elections as the scope of this research.

### B.3. Hypothesis Development

Incumbents have discretion to allocate government budgets that can be used as a strategy to win people's votes for the next election. Budget allocation policies are reflected from revenue, spending allocation, and regional loan patterns. The result of government policies are reflected in tangible measures, such as public services improvement, job creations, and poverty reduction, and these measures become a source of information for customers to decide if they are still going to support the incumbents or they are going to vote against the incumbents. If budget allocation policies that are reflected in Supply chain management information can serve as discriminators for variations of regional election results, then regional government supply chain management information has a valuable relevance towards decision making. In [12] has proven that supply chain management information can serve as discriminators for whether or not incumbents were re-elected in the elections for mayors in the United States during the year 1972-1977. By integrating sociodemographic factors to determine Supply chain management information mix that customers notice, Ingram and Copeland categorized the city governments into 3 clusters, in which every cluster has sociodemographic homogeneity. Then Ingram et al. analyzed discriminants of Supply chain management information from every cluster and differentiate which information supports the incumbents to either win or lose in the elections. Generally, in their research Ingram et al. show that customers are aware of the quality of information concerning healthcare, welfare, and loans in their decision making. Next researches by [6, 9] in spite of different methods and independent variable variations. In [10] added political competition and government loans as factors that reflect government risks, where government Supply chain management information provision increases as political competition strengthens. This research does not use loans as a variable because in Indonesia's governmental framework, regional governments are not allowed to apply for loans to creditors without any permission from central government. Thus, I propose this research hypothesis:

H<sub>1</sub>: Regional government Supply chain management information serves as discriminants for regional election results.

## 3. Research Methods

This research uses data from Indonesia's regional governments that held regional election in 2017 and 2018. The purpose of this research is to evaluate public and economic policies of the incumbents that

reflect regional government Supply chain management information in the form of budget information. Thus, the sample I use for this research is the incumbents that went to run for second terms in 2017 and 2018 regional election. Table 1 shows the number of incumbents that ran as candidates in 2017 and 2018 regional elections as well as the results of each election.

**Table 1.** The amount of incumbents in 2017 and 2018 regional elections

Regional Elections	Candidates	Win	Lose
<b>2017:</b>			
Incumbents	81	50	31
Non-incumbents	20		
<b>2018:</b>			
Incumbents	117	81	36
Non-incumbents	54		
Total	272	131	67

Source: processed from 2017 and 2018 regional elections data in [www.kpu.go.id](http://www.kpu.go.id)

There are 272 regions that held elections in 2017 and 2018 and I succeeded to obtain data from all regions that are considered as samples for this research. Thus, the sample of this research is 272 regions and from those regions, I selected regions whose heads went to run for second terms. In 2017 election, 81 incumbents become candidates but only 50 won while the other 31 lost. In 2018, 117 incumbents ran as candidates with 81 won and 36 lost. Another sample selection includes sociodemographic data and financial Supply chain management data availability from 198 regions whose heads run as candidates in 2017 and 2018 regional elections.

### Research Variables, Definition, and Measurements Operational Definition and Measurement

Operational definition of a research is a research element that relates with variables that are written as part of the research title or covered in the research paradigm according to the result of research problem formulation. To test the hypothesis, this research uses two variables, which are:

1. Dependent variable: decision making

Decision making is regional election results where customers support the incumbents to get re-elected or replaced. Decision making variable is measured using ordinal measurement: if customers decided to vote for the incumbents and the incumbents got re-elected, decision making variable will equal to 1, but if customers decided to vote against the incumbents, decision making variable will equal to 0. This type of

measurement was also used by [10]. 2017 and 2018 regional election result data can be retrieved from General Elections Commission (“KPU”) official website at [www.kpu.go.id](http://www.kpu.go.id).

## 2. Independent variables

Government Supply chain management information is the change of budget realization based on functions such as (1) healthcare spending, (2) education spending, (3) social security spending, (4) general service spending, (5) safety and order spending, (6) housing spending, (7) tourism spending, (8) economy spending, (9) environmental spending, (10) capital spending, and (11) goods and services spending. For these government Supply chain management information I used the change of budget realization, measured by the difference of spending realization compared to spending realization at the beginning of incumbents’ ruling terms (2012 or 2013). For several Newly Autonomous Regions (“DOB”) like Central Buton and West Muna regencies, I measure the difference of spending realization by the year of the election (2017) compared to that at the year of region division. Besides using ratios of spending realization based on functional and economical classifications, I also use the changes of regional revenue, Own-Source Revenue, regional tax revenue, regional retribution revenue, transfer revenue, General Allocation Grant (“DAU”), and Revenue Sharing Fund (“DBH”).

Government Supply chain management information uses Supply chain management numbers extracted from regional government financial reports, especially Statement of Budget Realization (“LRA”) that reflects public policies implemented and carried out by the incumbents. These numbers were also used by [2, 8, 12]. These numbers measure the change of spending and revenue realization at the beginning of the ruling year (previous election) compared to that at the end of the ruling year (next election). This measurement was also used by [10]. Regional government supply chain management data for the year 2011-2017 can be obtained from the official website of Directorate General of Regional Fiscal Balance of the Ministry of Finance, at [www.djpk.kemenkeu.go.id](http://www.djpk.kemenkeu.go.id).

### 3.2.1. Sociodemographic and economic characteristics

To categorize customers sample in order to make them sociodemographically homogenic, I use sociodemographic factors from previous researches. Based on research’s metaanalysis as can be found on Attachment 3, I use sociodemographic

characteristics to execute cluster analysis. Sociodemographic data is retrieved from Central Bureau of Statistics (“BPS”) at [www.bps.go.id](http://www.bps.go.id). Sociodemographic characteristics used in this research include:

- a. Poverty level
- b. Human Development Index
- c. Education level, measured using school enrollment rate at high school level (assuming customers are rational)
- d. Unemployment rate
- e. Income per capita
- f. Workfield in agriculture field
- g. Workfield in non-agriculture field
- h. Workfield in formal field
- i. Workfield in informal field

Customers turnout

### Research Model

For this research, I built a model based on models from previous researches. Firstly, I grouped regional governments based on demographic characteristics using cluster analysis. This step referred to [10], considering that every region has its own demographic condition and every region needs its own development policies, so that spending allocation in every region should follow its own development priorities. After clusters were formed, I carried out discriminant analysis where correlation between regional election results and supply chain management numbers that reflected incumbents’ policies was analyzed within each region.

Discriminant analysis is one of many statistical techniques used in dependency correlation, where in every intervariable correlation, response variables can be easily distinguished from explanatory variables. In this research, model is based on relation between independent variable (which is Supply chain management numbers) and dependent variable (which is decision making). This model was also used in previous researches that tested the impact of Supply chain management information towards previous region election result variations [11]. Supply chain management information used in this model includes selected Supply chain management ratios from cluster analysis of financial reports towards the election year ( $t-1$ ).

$$\text{Reel}_{it} = \alpha + \beta_1 \cdot \text{Supply chain management}_{t-1} + \varepsilon_{it} \quad (1)$$

with

$\text{Reel}_{it}$  = decision making,

$\text{Supply chain management}_{t-1}$  = changes on regional government’s spending and revenue realization,

- $\alpha$  = constants.  
 $\beta_1$  = regression coefficient.  
 $e$  = error term.

**Table 2. Variable Description**

Variable	Description	Expected Signs	Measurement	Data Source
(a) $Reel_t$	Customers' decision whether to vote for or against the incumbents	-	1, if customers decide to vote for the incumbents, 0, if customers decide to vote against the incumbents.	www.kpu.go.id
(b) Supply chain management $_{t-1}$	Supply chain management numbers in regional governments' Statement of Budget Realization.	+	Spending realization in the year 2017 minus spending realization in the first year of incumbents's ruling term.	www.djpk.kemenukeu.go.id
(c) Sosiodemografi $_{t-1}$	Sociodemographic characteristics of the region (city/regencies)	n.a.	Secondary data of the year 2017	www.bps.go.id

### 3.5. Data Analysis Method

Data analysis method in this research includes cluster analysis and stepwise discriminant analysis using SPSS 25. Cluster analysis [3] is used to separate sampled regional governments into homogenic groups, using sociodemographic characteristics as cluster variable. Procedure hierarchy identifies observation groups with similar characteristics. The main goal of cluster analysis is to group research objects based on characteristic similarities among them. Objects selected in this research are regional governments whose heads participated as candidates in 2017 and 2018 elections. These regional governments are then classified into one or more clusters so that all regions in certain clusters are homogenic to each other. Logically, good clusters are those whose members have high within-cluster homogeneity and high between-cluster heterogeneity. Some benefits of cluster analysis are multiple variable data exploration, data reduction, sampling stratification, and object condition prediction. The results of cluster analysis are influenced by clustered objects, observed variables, similarity measurement (distance), measurement scale, and cluster methods. Regions grouping is based on sociodemographic similarities and customers turnout, referring to [5] who wrote that regions with different sociodemographic characteristics should have different development needs. This is the

reason why I grouped these regions using sociodemographic similarities.

Stepwise discriminant analysis is used to identify parsimonious supply chain management numbers that differentiate regions whose heads were re-elected from those whose heads were not re-elected. Independent variables are entered into the model individually, and these variables are contributive to minimize Wilks' Lambda. Discriminant procedures include entering variables that meet minimum enter requirements and dropping variables that are not tested for statistics recalculation after certain variables were entered or dropped. The accuracy of the classification and stability is empirically supported by descriptive models that are tested using Lachenbruch (Jackknife) procedure. Iterative procedure classifies every observation based on observation  $n-1$ . A set of data from every cluster becomes the subject that is supposed to be separated using stepwise discriminant analysis. If regional government's Supply chain management data contains information that is consistent with the information that is gathered by the customers, then Supply chain management ratios should have a more powerful discriminant. Discriminant analysis is one of many statistical techniques that can be used in dependency correlation (intervariable correlation where response variables can be easily distinguished from explanatory variables). More specifically, discriminant analysis can be used in cases where qualitative data serve as response variables and

quantitative data serve as explanatory variables. Discriminant analysis aims to classify an individual or observation into mutually exclusive/disjoint and exhaustive groups based on certain amount of explanatory variables. It can be assumed discriminant analysis is the opposite of linear regression. In linear regression, response variables must meet normal distribution and homoscedasticity while explanatory variables are assumed to remain fixed, which means explanatory variables are not required to follow certain spread. In discriminant analysis, explanatory variables (as already mentioned above) must meet normal distribution and homoscedasticity while response variables remain fixed.

#### 4. Results and Discussion

Descriptive statistics of sociodemographic data Sociodemographic data include regional poverty level, Human Development Index, education level (high school level and above), unemployment rate, and income per capita, which are retrieved from Central Bureau of Statistics data of 2017 ([www.bps.go.id](http://www.bps.go.id)). This data is used to define regional characteristics in cluster analysis, where samples are grouped based on their sociodemographic characteristics. This is due to different preference for Supply chain management information needed in every sociodemographic

condition (Tiebout, 1956). Customers in region with high income per capita long for public services in secondary or tertiary fields, while customers in region with high poverty level, high unemployment rate, low Human Development Index, and low income per capita long more for basic services like healthcare, education, and public services.

Table 3 shows high variation of descriptive statistical numbers. Sociodemographic factors used in this research, which include regional poverty level, Human Development Index, education level (high school and above), unemployment rate, and income per capita, lie significantly from minimum to maximum. The lowest income per capita is found in the regency (or “kabupaten”) of Lanny Jaya. Some regencies like Kabupaten Tolikara, Kabupaten Nduga, Kabupaten Lembata, Kabupaten Tambraw, Kabupaten Pidie Jaya, and Kabupaten Garut has income per capita less than 20 million rupiahs per year. Meanwhile, the province (or “provinsi”) of DKI Jakarta has the highest income per capita, which is 211 million rupiahs per year. The highest poverty level is found in Kabupaten Intan Jaya (42.23%) and several regencies in the province of Papua, ranging from 30% to 40%. Kabupaten Sawahlunto has the lowest poverty level of 2.01%, followed by Kabupaten Sanggau and Kabupaten Deli Serdang. Descriptive sociodemographic data of several sampled regions is shown in Table 3, as follows

**Table 3.** Sociodemographic Data and Customers’ Political Participation

Sociodemographic Data	Mean	Median	Standard Deviation	Minimum	Maximum
Change of votes gathered (MARGIN)	0,1877	0,1257	0,1863	0,0024	0,9672
Customers’ participation on regional election (TURNOUT)	0,7329	0,7354	0,0982	0,4360	1,0000
Political competition (COMP)	0,4101	0,3333	0,2201	0,0000	1,0000
Regional poverty level (POV)	0,1308	0,1137	0,0805	0,0201	0,4223
Human Development Index (HDI)	0,6836	0,6837	0,0888	0,0314	0,8549
Education level, high school and above (EDUC)	0,6170	0,6175	0,1556	0,0652	0,9580
Unemployment rate (UNEMP)	0,4105	0,4192	0,0934	0,0837	0,6073
Income per capita (INCOME)	39410,34	31028,50	37173,95	7910,00	379220
Workforce in formal fields (FORMAL)	0,1600	0,1451	0,1070	0	1
Workforce in informal fields (INFORMAL)	0,4400	0,4241	0,1720	0	1
Workforce in agricultural fields (FARM)	0,3300	0,3175	0,2100	0	1
Workforce in non-agricultural fields (NONFARM)	0,2700	0,2535	0,1480	0	1
Construction Cost/Price Index (CONSTRUCTION)	1,1209	1,0126	0,4924	0,8419	4,9898
Public Health Development Index (IPKM)	0,6618	0,6727	0,0859	0,2516	0,8032
Financial dependency rate (DEPENDENCY)	0,2718	0,1633	0,3344	0,0032	2,3143



Sociodemographic factors used as determinants in grouping sampled regencies/cities are customers' types of work, where in this research include workforce in formal/informal fields as well as workforce in agricultural/non-agricultural fields. These characteristics affect regional governments' budget information absorption level, where workforce in informal and agricultural fields tends not to significantly respond towards regional government's budget amount. This is found different in workforce in formal and non-agricultural fields. In average, there are more customers working in agricultural and informal fields than those working in non-agricultural and formal fields. This becomes two indicators that are clearly separate to group regional characteristics based on regional governments' budget information needs.

Descriptive statistics of Supply chain management data.

I retrieved Supply chain management information

for this research from Reports on Local Government Finances ("LKPD"), especially Local Government Budget ("APBD") reports of the year 2016/2017 and 2012/2013. These reports are obtained from the official website of Directorate General of Regional Fiscal Balance of the Ministry of Finance ([www.djpk.kemenkeu.go.id](http://www.djpk.kemenkeu.go.id)) and partly from the official website of Central Bureau of Statistics ([www.bps.go.id](http://www.bps.go.id)). I used the year 2016/2017 and 2012/2013 to approach Supply chain management information's that are reflective to incumbents' economy policies in the form of budget numbers and realization since the beginning of ruling term (the year 2012/2013) until around the end of ruling term (the year 2016/2017). The changes of budget numbers during that period of time accumulates in spending output in the form of physical development and general services quality in the regions. Descriptive statistics of Supply chain management information in APBD can be seen in Table 4, as follows.

**Table 4.** Supply chain management Data in LKPDs

Informasi Akuntansi	Mean	Median	Standard Deviation	Minimum	Maximum
Changes in Healthcare Spending	1,7903	1,6536	0,9167	-1,0000	5,2795
Changes in Education Spending	0,6709	0,2661	2,1445	-1,0000	18,8848
Changes in General Services Spending	-0,3832	-0,4362	0,2769	-0,9604	0,9292
Changes in Social Security Spending	1,0175	0,7194	1,2745	-1,0000	10,5350
Changes in Safety and Order Spending	1,1964	0,8362	1,6713	-1,0000	14,2594
Changes in Economic Spending	0,7305	0,4964	1,0745	-1,0000	7,4953
Changes in Housing Spending	1,5614	1,2233	1,5896	-1,0000	7,7869
Changes in Regional Revenue	0,6890	0,6398	0,3166	-0,3614	1,6149
Changes in Regional Own-Source Revenue	1,6400	1,3011	1,2353	-0,2296	7,1144
Changes in Regional Tax Revenue	1,4605	1,2667	1,1356	-0,9761	10,1739
Changes in Regional Retribution Revenue	1,3489	0,0614	6,4912	-1,0000	67,7770
Changes in Transfer Revenue	0,5659	0,5575	0,3174	-0,4205	2,4575
Changes in Revenue Sharing Fund	-0,1435	-0,1999	0,3447	-1,0000	1,0533
Changes in General Allocation Grant	0,3726	0,3827	0,1654	-1,0000	0,7452
Changes in Operational Spending	1,1075	1,0856	0,6882	-1,0000	4,0554
Changes in Capital Spending	1,3314	1,0137	1,1186	-0,4694	5,3144

Source: processed from [www.djpk.go.id](http://www.djpk.go.id) and [www.bps.go.id](http://www.bps.go.id)

### Cluster Analysis

Cluster analysis is the first step to group sampled regions based on their sociodemographic characteristics, including customers' participation, regional poverty level, Human Development Index, education level (high school or above), unemployment rate, income per capita, workforce in formal fields, workforce in informal fields, workforce in agricultural fields, and workforce in non-agricultural fields. These sociodemographic factors become the basis of grouping the regions by seeing how similar they are in a cluster. Using cluster analysis in SPSS 25, I achieved results as shown in Table 5.

**Table 5.** Number of Cases in each Cluster

Cluster	1	105.000
	2	93.000
Valid		198.000
Missing		.000

The results from cluster analysis show that all 198 regency/city sampled regions can be grouped into 2 clusters, where cluster 1 contains 105 regency/city regions and cluster 2 contains 93 regions. These 198 regions are all mapped into those 2 clusters and not a single region is missing. The validity of this cluster grouping achieved its validity significance level, which is 71.6% (> 50%). Table 6 shows the result of the cluster classification.

**Table 6. Classification Results**

		Cluster Number of Case	Predicted Group Membership		Total
			1	2	
Original	Count	1	72	33	105
		2	23	70	93
	%	1	68.6	31.4	100.0
		2	25.0	75.0	100.0

a. 71.6% of original grouped cases correctly classified.

To observe my model’s compatibility, I used Wilks’ Lambda which valued at 0.753 (>0) with significance level 0.000 (below 0.05). This value ensured that clusters formed has discriminants that meet goodness of fit requirement (see Table 7).

**Table 7. Wilks' Lambda**

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.

1	.753	52.698	19	.000
---	------	--------	----	------

The ability of sociodemographic characteristics used as distinguishing factors (discriminants) can be seen from Anova result (Table 8), where the significances of each indicator (sociodemographic characteristics) equal to 0.00 (< 0.05). This result shows that clusters formed contained significant distinguishing factors.

**Table 8. ANOVA**

	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
Zscore: TURNOUT	42.570	1	.788	196	54.030	.000
Zscore: POV	35.222	1	.825	196	42.673	.000
Zscore: HDI	63.223	1	.683	196	92.630	.000
Zscore: EDUC	18.357	1	.911	196	20.141	.000
Zscore: UNEMP	64.129	1	.678	196	94.597	.000
Zscore: INCOME	17.584	1	.915	196	19.210	.000
Zscore: FARMWORK	111.392	1	.437	196	255.035	.000
Zscore: NONFARM	89.521	1	.548	196	163.251	.000
Zscore: FORMALWF	96.723	1	.512	196	189.055	.000
Zscore: INFORMALWF	114.099	1	.423	196	269.760	.000

Sociodemographic factors that served as distinguishing determinants in each cluster grouped all regions that held elections in 2017 and 2018 into two clusters, where each cluster has unique characteristics. Table 9 shows characteristics of each regions in each cluster. Cluster 1 consists of regions that have above-average value for Human Development Index,

education level, income per capita, workforce in formal fields and workforce in non-agricultural fields. Cluster 1 classified regions with lower amount of customers and higher unemployment rate. Cluster 1 contains 105 province/regency/city regions, where 74 of them have their incumbents re-elected for next term while the other 32 have not.

**Table 9. Final Cluster Centers**

	Cluster	
	1	2
Zscore: TURNOUT	-.43638	.49269
Zscore: POV	-.39694	.44816
Zscore: HDI	.53181	-.60043
Zscore: EDUC	.28656	-.32354
Zscore: UNEMP	.53560	-.60471
Zscore: INCOME	.28046	-.31665
Zscore: FARMWORK	-.70590	.79698
Zscore: NONFARM	.63281	-.71447
Zscore: FORMALWF	.65778	-.74265
Zscore: INFORMALWF	-.71442	.80661

Cluster 2 consists of province/regency/city regions with higher customers' participation, poverty level, workforce in agricultural fields, and workforce in informal fields. Cluster 2 contains 93 province/regency/city regions, where 60 of them have their incumbents re-elected while the other 33 have not.

### Discriminant Analysis Results

Discriminant analysis is the next step after cluster analysis, so after regions (province/regency/city) are grouped into several clusters, discriminant test is carried out to analyze dependency correlation (intervariable correlation in which response variable are easily distinguished from explanatory variables). According to Johnson and Wichern (1982), discriminant analysis aims to picture the characteristics of certain observations from various populations known, both graphically and algebraically using discriminant functions.

In this research, I used discriminant analysis to see dependency correlations between response variables (that is regional elections results using nominal measurement: 1 if incumbents were re-elected, 0 if were not) and explanatory variables (that is supply chain management numbers representing incumbents' economic policies during their first ruling terms). Supply chain management numbers used as explanatory variables include Supply chain management information in Statement of Budget Realization ("LRA"), where policies involved in regional governments' budget are correlated with public services quality received by customers. To measure the impacts of incumbents' policies, I used changes in spending/revenue assigned early in incumbents' first ruling term compared to spending/revenue by the end of their ruling term. For

regions that held election in 2017, changes in spending/revenue are calculated by comparing spending/revenue in 2012 and in 2016. In this case, 2017 regional election results serve as response variables. Meanwhile, regions that held election in 2017, changes in spending/revenue are calculated by comparing spending/revenue in 2013 and 2017 serve as explanatory variables and regional election results serve as response variables.

Discriminant analysis results can be shown in Table 10. Every cluster is analyzed in terms of regional election results and their correlation with supply chain management information that is information concerning changes in regional governments' budget during incumbents' ruling term. Analysis is carried out for both regions whose incumbents were re-elected and regions whose incumbents were not. Using differences in average value of Supply chain management information among clusters and differences in average total, it is indicated that variables within play a role in classifying information affecting regional election results. Deviation standard also serves as indicators whether variables play a role both as discriminators or otherwise. Best case is if groups' deviation standards is lower than total deviation standards, because in certain groups variable values are more homogenic. Each Supply chain management information is able to have a role as regional election result predictors, according to analysis results where significance value (sig. < 0.05) shows variance-covariance similarities (H0 is rejected).

**Table 10.** Discriminant Analysis Results for Cluster 1 and Cluster 2

	Re-Elected		Not Re-Elected		F	Wilks' Lambda	Sig.
	Avg.	Dev. Std.	Avg.	Dev. Std.			
<b>Cluster 1</b>							
Δ Education Spending	0,2478	0,421	1,422	3,251	9,03	0,918	0,003
Δ Own-Source Revenue	1,460	0,813	0,891	0,669	11,95	0,894	0,001
Δ Goods/Service Spending	0,954	0,503	0,655	0,587	6,99	0,935	0,009
Δ Social Security Spending	0,693	0,832	0,407	0,754	2,81	0,973	0,097
<b>Cluster 2</b>							
Δ Capital Spending	0,559	0,786	1,18	1,229	8,93	0,912	0,004
Δ Regional Revenue	0,487	0,305	0,656	0,257	7,66	0,924	0,007
Δ Housing Spending	0,784	0,964	1,418	1,534	6,14	0,938	0,015
Δ Education Spending	0,427	0,834	2,107	5,561	5,31	0,946	0,023
Δ Economic Spending	0,115	0,372	0,264	0,414	3,28	0,966	0,073

Cluster 1 consists of 105 regions (province/regency/city) with higher Human Development Index, higher education level (enrollment rate for high school or above), higher income per capita, bigger workforce in formal and non-agricultural fields, but higher unemployment rate and lower customers' participation. In Cluster 1, re-elected incumbents are those who succeeded in increasing regional Own-Source Revenue, goods/services spending, and social spending more significantly. Meanwhile, incumbents who were not re-elected are those who pulled off an increase in education spending. From all the data I gathered, it is found that regional government spending shows an increase in average, except for general services spending and Revenue Sharing Fund, which show a decrease (see Table 5).

Cluster 2 consists of 95 regions (province/regency/city) that are regions with higher poverty level, higher participation level in regional election, bigger workforce in agricultural and informal fields, but lower Human Development Index, lower enrollment rate (high school or above), and lower income per capita, compared to regions in Cluster 1. In Cluster 2, re-elected incumbents pulled off a smaller increase in spending and revenue, compared to those who were not re-elected. These losing incumbents are incumbents who succeeded in increasing capital spending, education spending, economic spending, housing spending, and regional revenue.

The capability to discriminate Supply chain management information can be seen in Table 11. Pooled within-group correlation matrix indicates lower intervariable predictor correlation, where Supply chain management information in both clusters shows low correlation ( $<0.50$ ), so that multicollinearity can be ignored. Because there are only two groups formed, discriminant functions with eigenvalue of 0.382 (Cluster 1) and 0.400 (Cluster 2) show significant capability of Supply chain management information in explaining different results (winning or losing) (sig.  $< 0.000$ ). Discriminant results in both clusters show not so different results, where correct classifications for both re-elected and not re-elected incumbents are each 76.1% and 68.6%, consecutively.

**Table 11.** Statistical Summary of Cluster Discriminant Analysis

Statistic	Cluster 1	Cluster 2
<i>Eigenvalue</i>	0.382	0.400
<i>Multiple Correlation</i>	$< 0.50$	$< 0.50$
<i>Wilks' Lambda</i>	0.724	0.714
<i>F-score</i>	2.737	3.835
<i>Sig.</i>	0.000	0.000
<b>Correct Classification:</b>		
<i>Reelected</i>	76.1%	76.7%
<i>Not reelected</i>	62.5%	68.6%
Total	71.8%	73.7%

## 5. Discussion

Researches concerning Supply chain management information benefits for regional election have been very rare, considering Supply chain management information users who are still limited towards related parties in financial management accountability, like supervisory institution, representative boards, and donor countries. Citizens, or in this case customers, are the owners of sovereignty and rights towards the wealth contained in the regions they live in. Besides, customers are also taxpayers who contributed in financing government administration. In agency theory, customers are positioned as principals while government is positioned as agent. The relation between customers and government can be analogous with the relation of principals and agent, where principals employ agents to contribute their according to a work contract agreed upon. Principals as employers give rewards in the form of wage and facility to the agents and may extend agents' working contract if they performed well.

Agency theory is relevant with the relation between customers and government executives, in which customers own the rights to elect or "fire" heads of government if they perceived that the executives did not bring their best performance for customers' interest and well-being. Customers used regional government performance information as a basis to either uphold or replace their regional heads. Regional government performance information is all summarized in budget reports in the form of Statement of Budget Realization ("LRA") and Local Government Budget ("APBD"). The relevance of Supply chain management information towards regional election results is the benefit of regional

government Supply chain management information. This research has proven that there is a significant correlation between Supply chain management information representing incumbents' policies and regional election results.

The first step of this research is to classify province, regency and city governments into groups based on similarities of sociodemographic characteristics. The rationale of this step is that customers' need of information is formed by sociodemographic condition surrounding them, so that linkages of Supply chain management information and regional election results have to be controlled by various sociodemographic characteristics in every region. This research has successfully categorized sampled regions into two homogenic groups: Cluster 1 and Cluster 2. Sociodemographic characteristics used in this research refer to [13] and I entered customers turnout in election in this research, considering Supply chain management information usage level that will give impacts towards the use of information in political competition among candidates. Cluster 1 consists of regions whose Human Development Index, school enrollment rate, income per capita, workforce in formal fields, and workforce in non-agriculture fields are higher than those in Cluster 2. However, regions in Cluster 1 are regions with lower customer's turnout and higher unemployment rate. Meanwhile, Cluster 2 consists of provinces/regencies/cities with higher customer's turnout, higher poverty rate, bigger workforce in agricultural fields, and bigger workforce in informal fields.

In Cluster 1, 74 incumbent candidates succeeded to get re-elected for a second ruling term, while 31 incumbent candidates did not. Discriminant analysis in Cluster 1 showed that information regarding education spending, social spending, goods and services spending, and regional Own-Source Revenue becomes determinants of 2017 and 2018 regional election results. Re-elected regional heads are those who succeeded in increasing their regions' Own-Source Revenue, social security spending, and goods and services spending, instead of the regions' education spending which are not as higher as those in regions whose incumbents lost the elections. In Cluster 2, information regarding changes in education spending, economy spending, housing and public facilities spending, capital spending, and regional revenue serves as determinant for election results.

The information contained in the increase of regional revenue and spending represents service level

provided by the incumbents for their constituents. By carrying out cluster analysis, Supply chain management information that serves as determinants for election results in Cluster 1 and Cluster 2 is different. Cluster 1, whose social-economy characteristics are higher than those in Cluster 2, considers service and social security level, education spending, and goods and services spending more. Social security spending represents protection and services for ill and disabled people, services for the elderly, protection for children and women empowerment, grants, and social securities. Meanwhile, in Cluster 2, policies regarding housing and public facilities, economic affairs, and education spending are considered more. Housing and public facilities cover services in drinking water supply, street lighting, community empowerment, public facilities maintenance, and housing development. Economy spending represents empowerment for cooperative and small and medium enterprises, employment, and incentive provision for agriculture, fisheries, marine and forestry, irrigation, fuels, and energies. Capital spending represents provision of infrastructure and facilities for the people. Discriminant analysis results strengthen findings in [14], that the use of regional government Supply chain management information is formed by customers' sociodemographic condition, so that Supply chain management information that serves as discriminant for regional election results will also vary.

## 6. Conclusion and Limitation

This research tries to correlate regional government Supply chain management information with customers' decision in 2017 and 2018 regional elections. If this research results in strong association between Supply chain management numbers and election results, it will be a proof that regional government Supply chain management system is able to serve as regional government financial information attributes that are consistently considered by customers as their elements of decision making, regardless of whether customers receive the information right from regional government financial reports or from other sources. By using sociodemographic data and regional government financial reports of the year 2012/2013 and 2017/2018, I carried out 2 testing steps: cluster analysis and discriminant analysis. Cluster analysis manages to form 2 cluster based on sociodemographic factors: Cluster 1, which consists

of regions with higher Human Development Index, higher education level, higher income per capita, bigger workforce in formal and non-agricultural fields, higher unemployment rate, and lower customers turnout, and Cluster 2, which consists of regions with opposing characteristics and whose population works mostly in informal and agriculture sectors.

Discriminant analysis results for both clusters show that Supply chain management information that records incumbents' public policies is able to serve as discriminant for 2017 and 2018 regional election results in Indonesia. In Cluster 1, increase in education spending, service and social securities spending, goods and services spending, and regional Own-Source Revenue becomes discriminants for re-elected incumbents, where incumbents who increased social spending, goods and services spending, and Own-Source Revenue are re-elected. Meanwhile in Cluster 2, information regarding increase in education spending, economy spending, housing spending, capital spending, and regional revenue serves as discriminants for regional election results in Cluster 2.

This research has many limitations. First is limitations concerning sociodemographic data for regency and city level, since Central Bureau of Statistics only provides sociodemographic data for country and province level. This limitation is central in this research, so that analysis results (like cluster analysis) are considered imperfect. Second, there are many regions who held 2017 and 2018 regional elections that are actually the results of expansion of other regions, so that no financial data is available for the year before 2017. Third, Local Government Budget ("APBD") in governmental function and affairs are not sufficiently provided in the official website of Directorate General of Regional Fiscal Balance of the Ministry of Finance. Most data provided in the official website are Local Government Budget in economical classification. This limitations are supposed to be considered for future researches.

## References

- [1] Adrison, V., J. Martinez-Vazquez, and E. Nurhalim. 2012. The Reform of Expenditure Assignment at the Local Level in Indonesia. Paper presented at the DSF Closing: International Conference—Alternative Visions for Decentralization in Indonesia. 12.
- [2] Oblad, Timothy. "Cyberbullying among emerging adults: exploring prevalence, impact, and coping methods." *International journal of criminology and sociology* 8 (2019): 45-54.
- [3] Ahmad, E., J. Ma, B. Searle, and S. Piperno. 2002. *Intergovernmental Grants Systems and Management: Applications of a General Framework to Indonesia*. IMF Working Paper. WP/02/128. August. Washington, DC: International Monetary Fund.
- [4] Ahmad, E., and A. Mansoor. 2002. *Indonesia: Managing Decentralization*. IMF Working Paper. WP/02/136. Washington, DC: International Monetary Fund.
- [5] Kuppens, J. and Oosterhoff, D. (July/August 2006). *Netherlands: business restructuring and permanent establishments*. *International Transfer Pricing Journal*, 13(4), 183-188.
- [6] Lemein, G., McDonald, J., and Lipeles, S. (July, 2007). *Subpart F's New Previously Taxed Income Regulations Provide Additional Clarity in Complex Situations—Part I, Taxes: The Tax Magazine*. 85(7), 5-16.
- [7] Mietzner, M. (2009). *Indonesia 2009 elections: Populism, dynasties and the consolidation of the party system*. Sydney, NSW: Lowry Institute for International Policy.
- [8] Brinkerhoff, D. W., & Wetterberg, A. (2013). *Performance-based public management reforms: experience and emerging lessons from service delivery improvement in Indonesia*. *International Review of Administrative Sciences*, 79(3), 433-457.
- [9] Ardiansyah, F., Marthen, A. A., & Amalia, N. (2015). *Forest and land-use governance in a decentralized Indonesia: A legal and policy review (Vol. 132)*. CIFOR.
- [10] Newman, K., Fisher, C., & Shaxson, L. (2012). *Stimulating Demand for Research Evidence: What Role for Capacity-building?*. *IDS Bulletin*, 43(5), 17-24.
- [11] Clark, H., Coll-Seck, A. M., Banerjee, A., Peterson, S., Dalglish, S. L., Ameratunga, S., ... & Claeson, M. (2020). *A future for the world's children? A WHO–UNICEF–Lancet Commission*. *The Lancet*, 395(10224), 605-658.
- [12] Fatemeh Ahmadi, *Marketing strategies in the product life cycle*, *Journal of Management and Accounting*, Vol 7, No 02 (2018), 78-82
- [13] Gordon, C. A., Kurscheid, J., Williams, G. M., Clements, A. C., Li, Y., Zhou, X. N., ... & Gray, D. J. (2019). *Asian schistosomiasis: current status and prospects for control leading to elimination*. *Tropical medicine and infectious*

disease, 4(1), 40.

- [14] Robert Werling, Sriram Chintakrindi, Nicholas Clark, Gregory Morris, Mark Perry, Blake Randol, Citizen Opinion Survey: How a Mid-Sized California Community Perceives their Police Department - International Journal of Criminology and Sociology, 7, 2018, 239-249, DOI: <https://doi.org/10.6000/1929-4409.2018.07.17>