



An Exploratory and Time-based Analysis of KIVA Crowdfunding Loans in Philippines

The Big Impact of Small Loans

Advisor: Professor Kam Ting Seong
Hyder Ali | Matthias Oh



Introduction

The amalgamation of the Crowdfund concept with humanitarian objectives has birthed KIVA Crowdfunding, which is a loans platform that provides financial servicing to financially excluded and poor communities.

Although KIVA’s reach has already extended to 86 countries and has facilitated loans totalling up to \$1.13 billion, the organization is challenged by a lack of information on the poverty levels at a granular level. This has compromised the lender’s ability to prioritize his/her investments according to their intended target community.

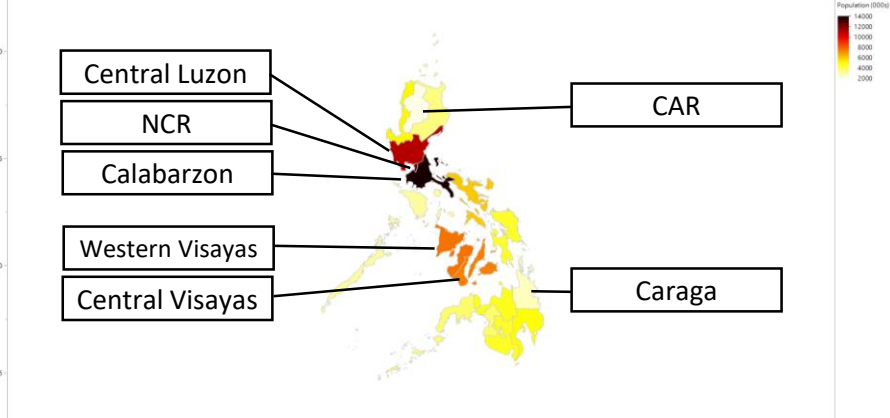
Objective

- To facilitate better understanding of communities and loan trends in Philippines, we explore the following:
- Exploratory Analysis on KIVA Loans with supplementary data sources such as *Family Income and Expenditure Survey (FIES) 2015* and *Philippines Regional Population 2014 - 2016*
 - Identification of Loan Types/Administrative Regions which exhibit similar time-series pattern through dynamic time-warping and sliding between Jan 2014 to Jun 2017

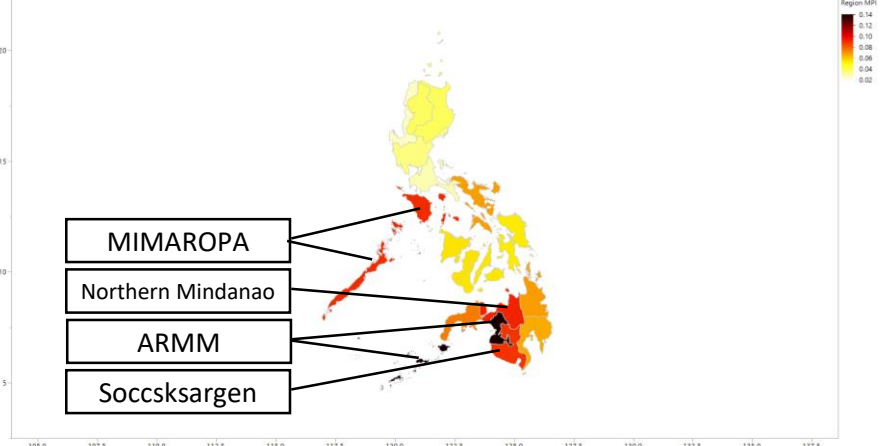
Data Exploration

The prevailing loan types across the Main Islands and Administrative Regions are for the purpose of Retail, Food and Agriculture. Central Luzon, is an exception with majority of loans in Education.

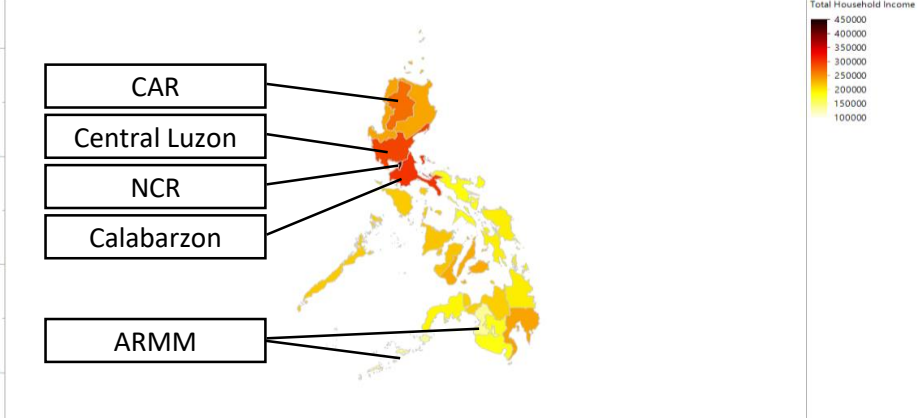
Population by Admin Region



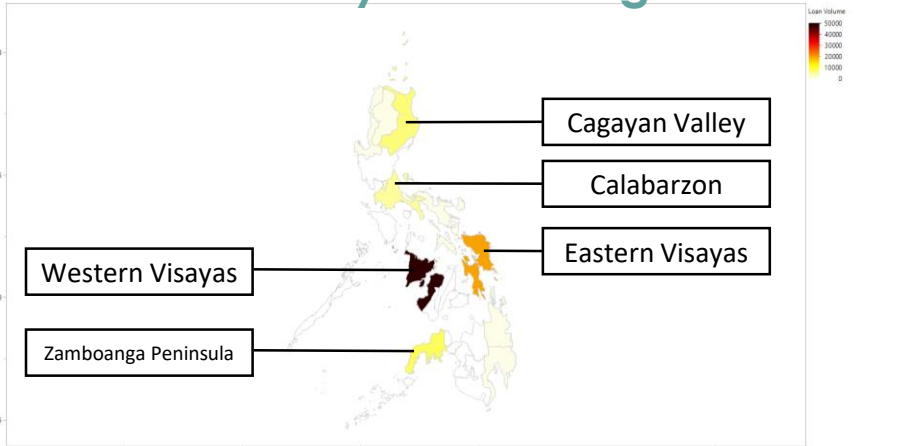
MPI by Admin Region



Household Income by Admin Region



Loan Volume by Admin Region



Summary Contingency Table

Main Island	Admin Region	Loan Volume %	2015 Population %	% HH with Income < Nat Median	Region MPI	% Region Poptn in MD Poverty
Visayas	Western Visayas (Region VI)	30.2	7.59	7.75	0.0552	11.4
Visayas	Central Visayas (Region VII)	26	7.33	6.5	0.0546	11.2
Visayas	Eastern Visayas (Region VIII)	12.3	4.47	7.52	0.0538	11.6
Luzon	MIMAROPA (Region IV-B)	8.78	3.04	3.57	0.0913	17.1
Luzon	Northern Mindanao (Region X)	8.49	4.63	5.48	0.0929	18
Mindanao	Zamboanga Peninsula (Region IX)	5.02	3.71	5.6	0.0754	15.6
Mindanao	Cagayan Valley (Region II)	4.06	3.44	5.2	0.0394	8.41
Luzon	Calabarzon (Region IV-A)	2.93	13.9	6.53	0.0287	7.13
Luzon	NCR	1.62	12.5	2.84	0.0264	6.92
Luzon	CAR	0.202	1.76	3.52	0.0389	8.52
Luzon	Central Luzon (Region III)	0.151	10.9	5.23	0.0348	7.86
Mindanao	Soccsksargen (Region XII)	0.0917	4.53	6.89	0.0897	17
Mindanao	Davao (Region XI)	0.0861	4.89	6.09	0.0659	13.4
Mindanao	Caraga (Region XIII)	0.0561	2.68	5.4	0.0688	15
Luzon	Bicol (Region V)	0.00125	5.94	7.59	0.0683	14.6
Luzon	Ilocos (Region I)	0.00125	5.06	5.33	0.0268	5.99
Mindanao	ARMM	0	3.65	8.95	0.14	24.9

Green Middle: Regions with qualitatively and quantitatively lower measures of poverty tend to have a moderate volume of KIVA loans relative to other regions

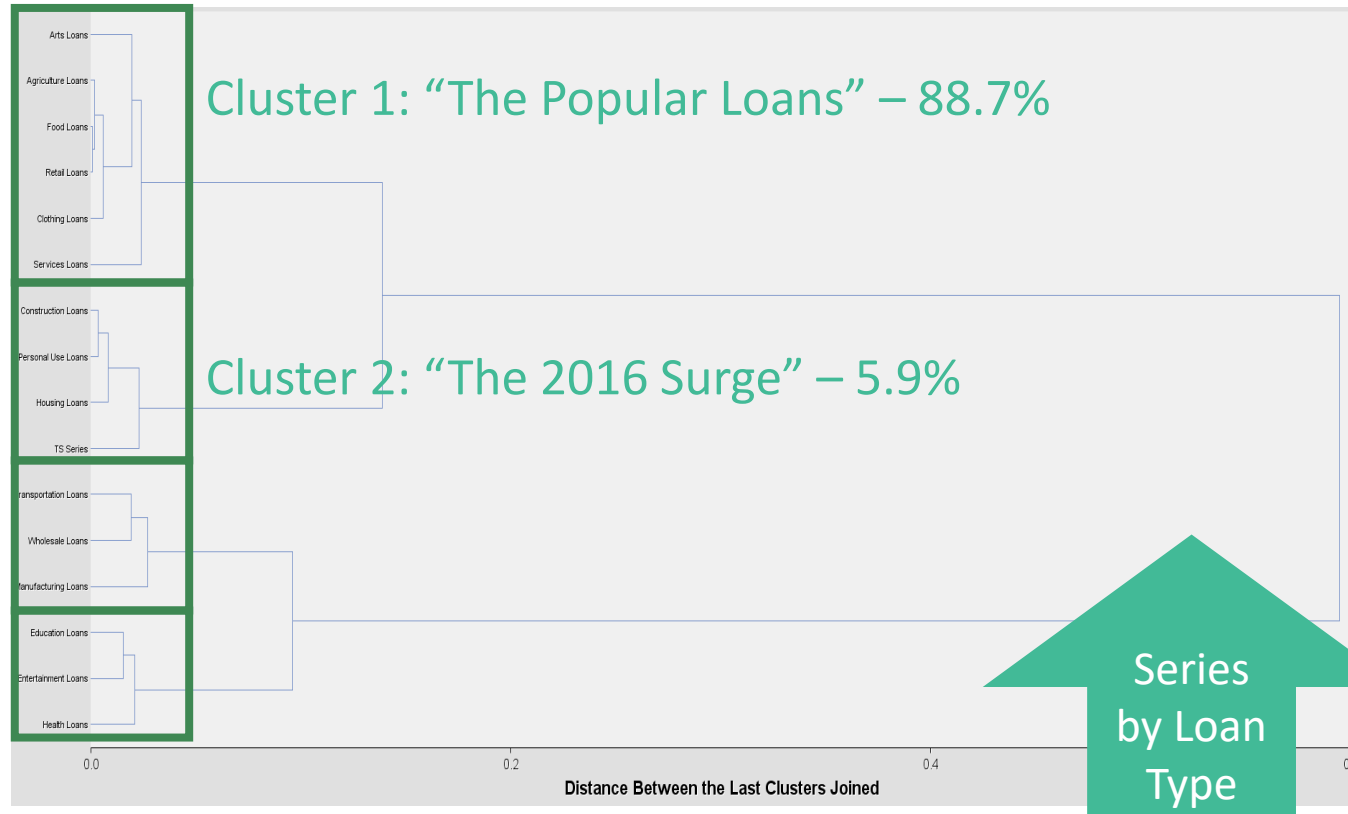
Yellow-Orange Bottom: Regions with qualitatively and quantitatively higher measures of poverty that do not have access to KIVA loans:

Soccsksargen (Mindanao), Davao (Mindanao), Caraga (Mindanao), Bicol (Luzon). In addition, two-thirds of Administrative Regions from Mindanao (Island with MPI) are found to have low number of KIVA loans

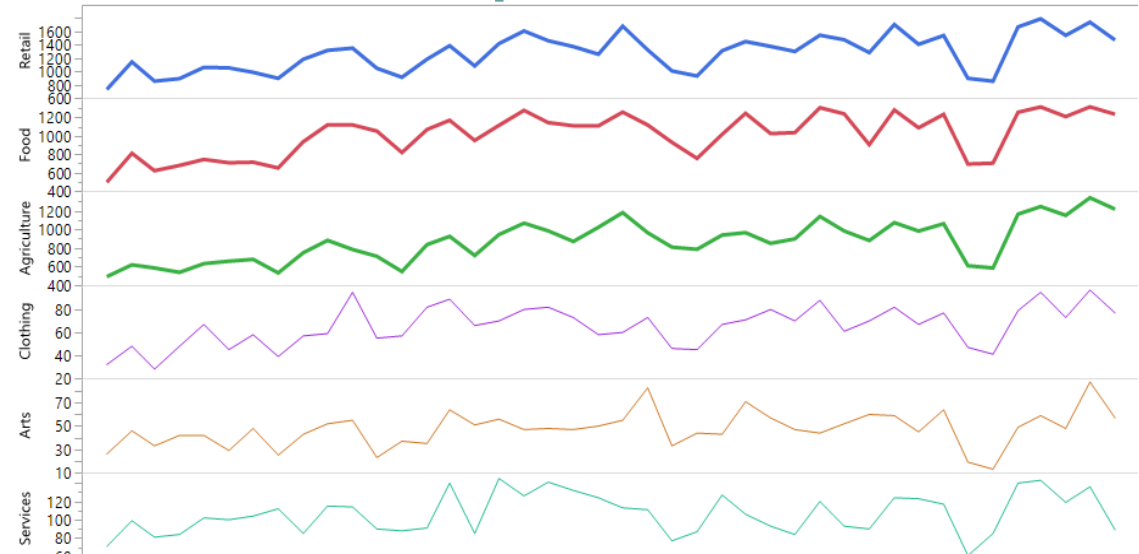
Red Floor: The ARMM has the highest poverty indicator measurements but does not have any KIVA loans. This is likely due to Muslim apprehension towards loans with interest, and thus a lack of KIVA Field Partners who require interest to cover operational overheads.

Time-Series Clusters by Loan Type and Administrative Regions

Time Series Similarity Node (SAS Enterprise Miner) was used to cluster KIVA Loans data between Jan 2014 and Jun 2017, against Loan Type and Administrative Region separately. 4 interesting clusters of higher loan counts were noted:

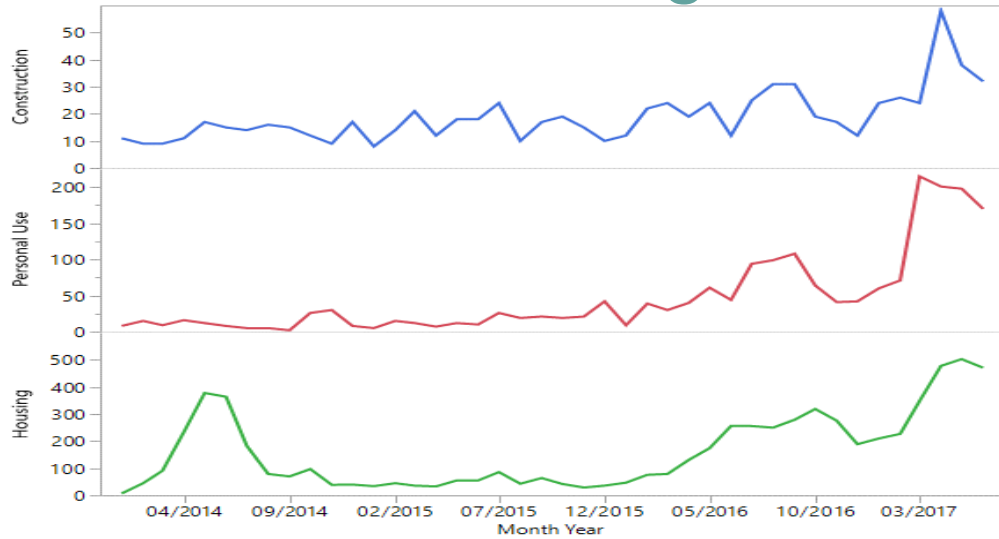


The Popular Loans

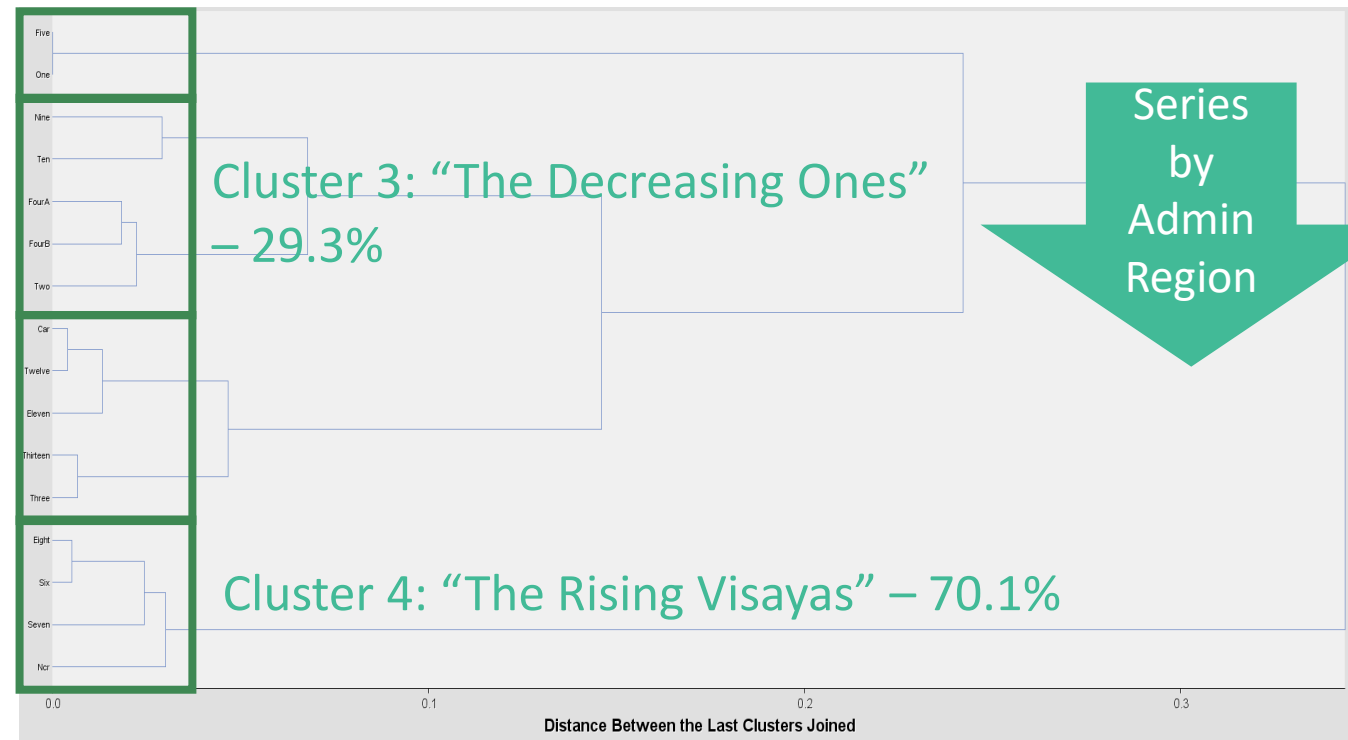


Comprising 88.7% of total loans, loan types in this cluster trend upwards throughout the time period. The dip in the last quarter of 2016 coincided with the devastation wrought by Typhoons “Karen” and “Lawin”, which may have caused impoverished individuals to put off business projects.

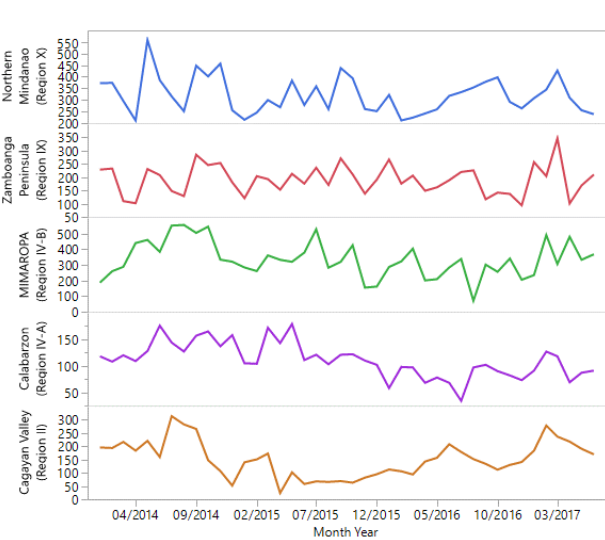
The 2016 Surge



Comprising 5.9% of total loans, the sharp increase in KIVA loans for Housing, Personal Use and Construction may be due to more construction projects following the devastating effects of “Karen” and “Lawin” typhoons. Therein lies the possible inverse relationship between this cluster and the “Popular Loans” cluster during the monsoon period.

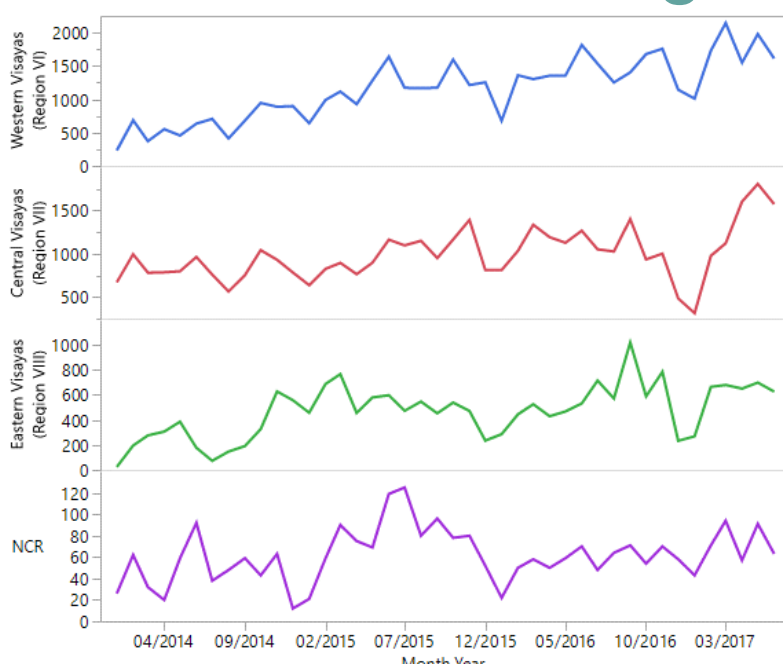


The Decreasing Ones



Comprising 29.3% of total loans, administrative regions in this cluster exhibit overall decreasing trend between mid 2014 to late 2016.

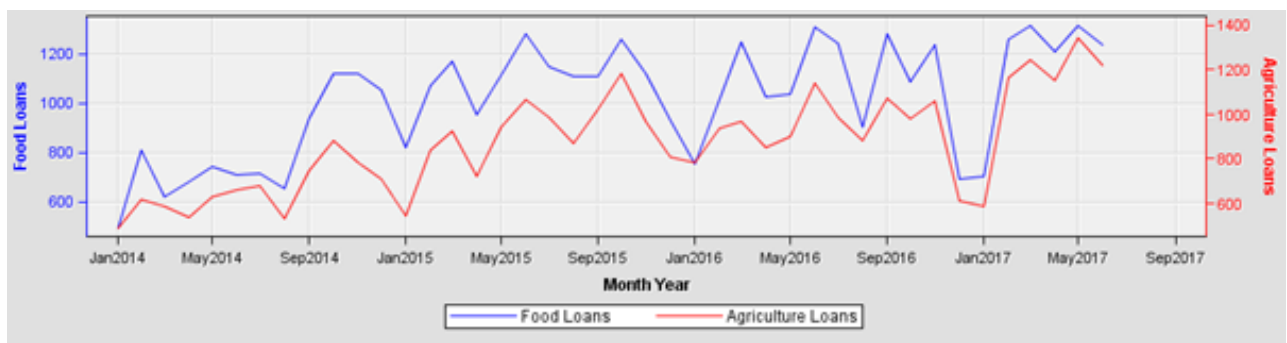
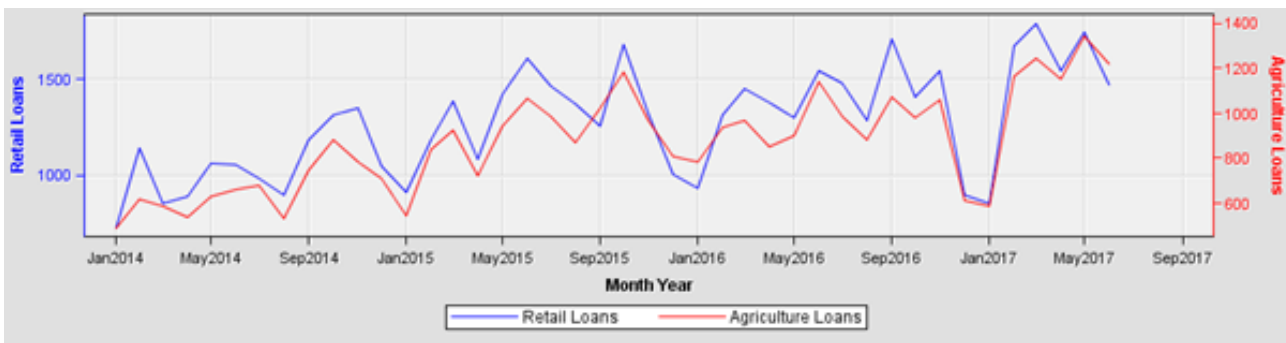
The Rising Visayas



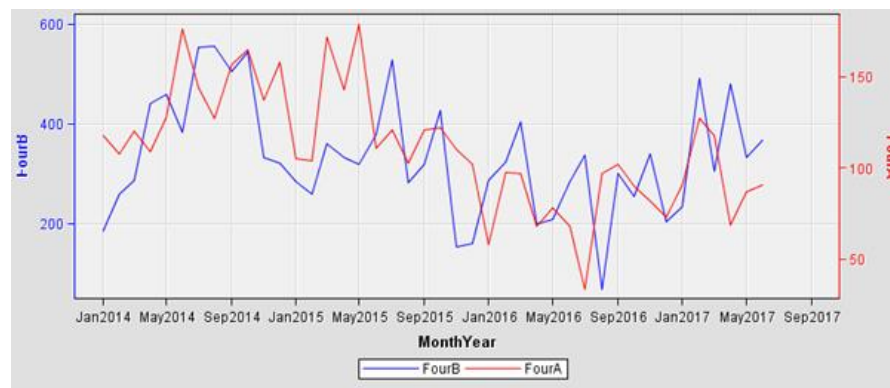
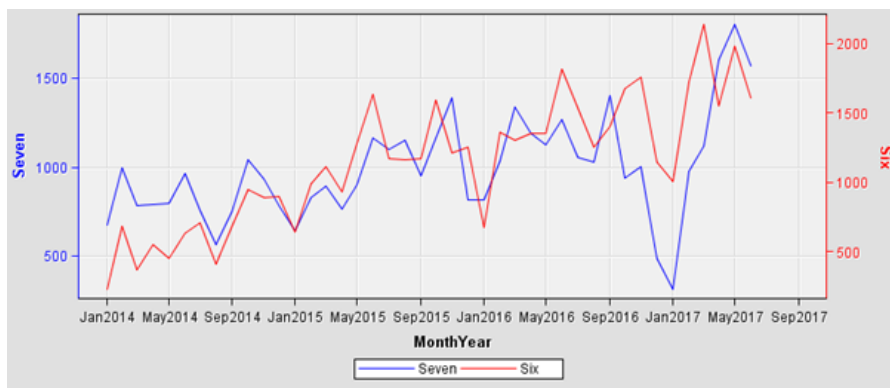
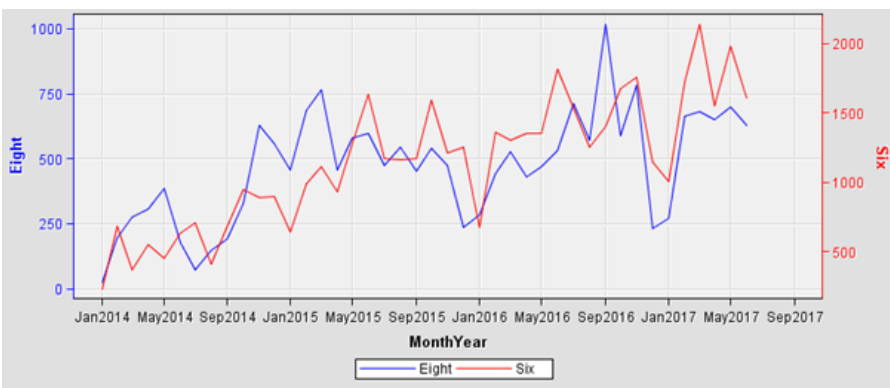
Comprising 70.1% of total loans, this cluster comprises mainly; Eastern, Western and Central Visayas. The graph shows a trend of rising loan volumes from late 2016 onwards, which could be associated with increased tourist arrivals to the Visayas main island.

Similarity Pattern Detection in Time-series

Similarity analysis can be used to compare time series and to find the series that exhibit similar characteristics over time. Finding time series with similar statistical behaviour can help to make inferences about the loan trends under observation. Retail, Food and Agriculture loans trend similarly. A strong growth in Philippines Retail sector could adversely create a stronger domestic demand for Agriculture and Food related products.



Central, Eastern and Western Visayas, Calabarzon and MIMAROPA are geographically adjacent to each other. It could be the case where a Field Partner established several branches within close proximity to one another at around the same time.



Conclusion & Recommendations

For KIVA:

- ✓ To consider tapping onto pre-existing non-profit humanitarian groups in the remaining financially excluded regions of Soccsksargen (Mindanao), Davao (Mindanao), Caraga (Mindanao), Bicol (Luzon), and especially the ARMM (Mindanao). These groups may be willing to serve as Field Partners to extend KIVA’s reach.
 - ✓ Specific to ARMM, to consider partnering with aforementioned non-profit humanitarian groups to set up special loans that comply with Sharia law, which do not involve interest repayments.
 - ✓ Consider adopting a strategy of searching for non-profit humanitarian groups in a central position with respect to the Mindanao regions. It is likely that these groups may have geographically proximal branches that they can push the KIVA concept to.
- Others:
- ✓ KIVA Field Partners can consider pushing for Education loans, to help alleviate the poverty condition in the Philippines in the long-run with more skilled / educated citizens.
 - ✓ Lenders interested in supporting post-typhoon restoration efforts may consider looking into Housing, Personal Use, and Construction loan-types for that period, since the demand for conventional popular loan types are expected to decline.