

Are fruits and vegetables market efficient?

Vertical price integration of selected crops in southern Philippines

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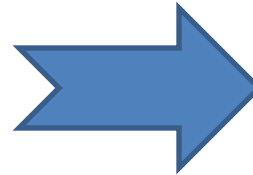
Kirrily Pollock

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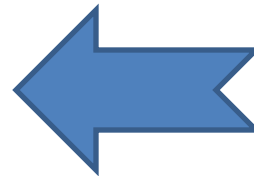


UNIVERSITY OF THE PHILIPPINES MINDANAO
SCHOOL OF MANAGEMENT

Introduction



Market Integration
about the *impact* of EU policies on the energy market



Introduction

1. Ilocos Norte
2. Kalinga Apayao
3. Cagayan
4. Ilocos Sur
5. Abra
6. Mountain Province (Baguio)
7. Ifugao
8. Isabela
9. La Union
10. Benguet
11. Nueva Viscaya
12. Quirino
13. Pangasinan
14. Tarlac
15. Nueva Ecija
16. Aurora
17. Zambales
18. Pampanga
19. Bulacan
20. Bataan
21. Metro Manila (NCR)
22. Rizal
23. Cavite
24. Laguna
25. Batangas
26. Quezon
27. Camarines Norte
28. Camarines Sur
29. Catanduanes
30. Albay
31. Sorsogon
32. Occidental Mindoro
33. Oriental Mindoro
34. Marinduque
35. Romblon
36. Masbate
37. Northern Samar
38. Eastern Samar
39. Western Samar
40. Palawan
41. Antique
42. Aklan (Boracay)
43. Capiz
44. Iloilo
45. Negros Occidental
46. Negros Oriental
47. Cebu
48. Bohol
49. Leyte
50. Southern Leyte



51. Surigao del Norte
52. Agusan del Norte
53. Surigao del Sur
54. Zamboanga del Norte
55. Misamis Occidental
56. Zamboanga del Sur
57. Lanao del Norte
58. Misamis Oriental
59. Agusan del Sur
60. Lanao del Sur
61. Bukidnon
62. Davao del Norte
63. Davao Oriental
64. Maguindanao
65. North Cotabato
66. Davao del Sur
67. Sultan Kudarat
68. South Cotabato
69. Basilan
70. Sulu
71. Tawi-Tawi

Introduction

Objective

- Measure the extent of vertical price integration of the top producing areas.

Limitation

- Nodes with different level of stationarity were not analyzed, i.e., $I(0)$ and $I(1)$ pairs.

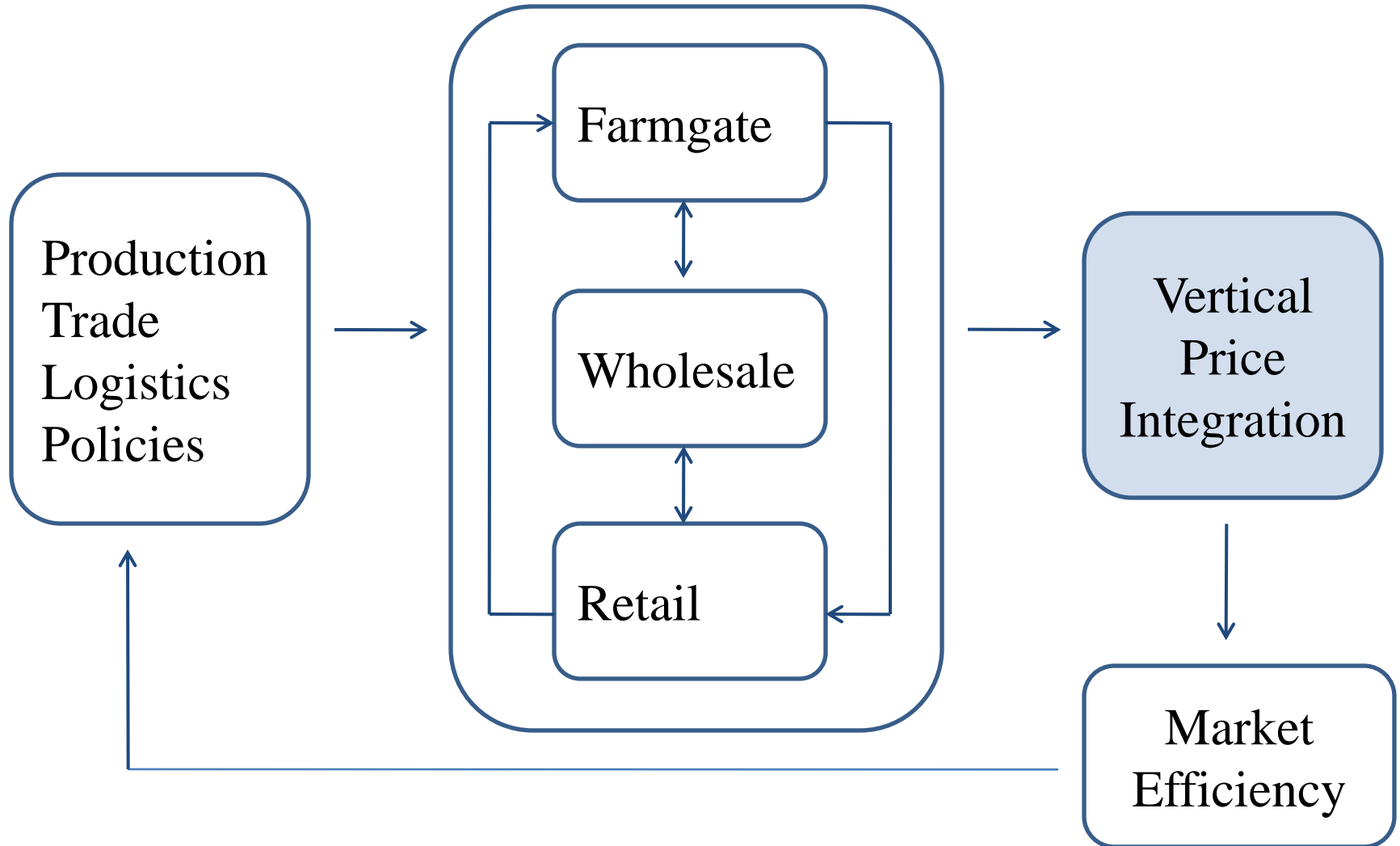
Review of Literature

- Fossati et al. (2007) – the law of one price
- Mukhtar and Javed (2007) identified three types of market integration; (1) intertemporal, (2) vertical, and (3) spatial.
- Rufino (2011) made use of Augmented Dickey-Fuller and Philips Peron tests, Engle-Granger and Johansen tests, for non-stationary variables Granger Causality.

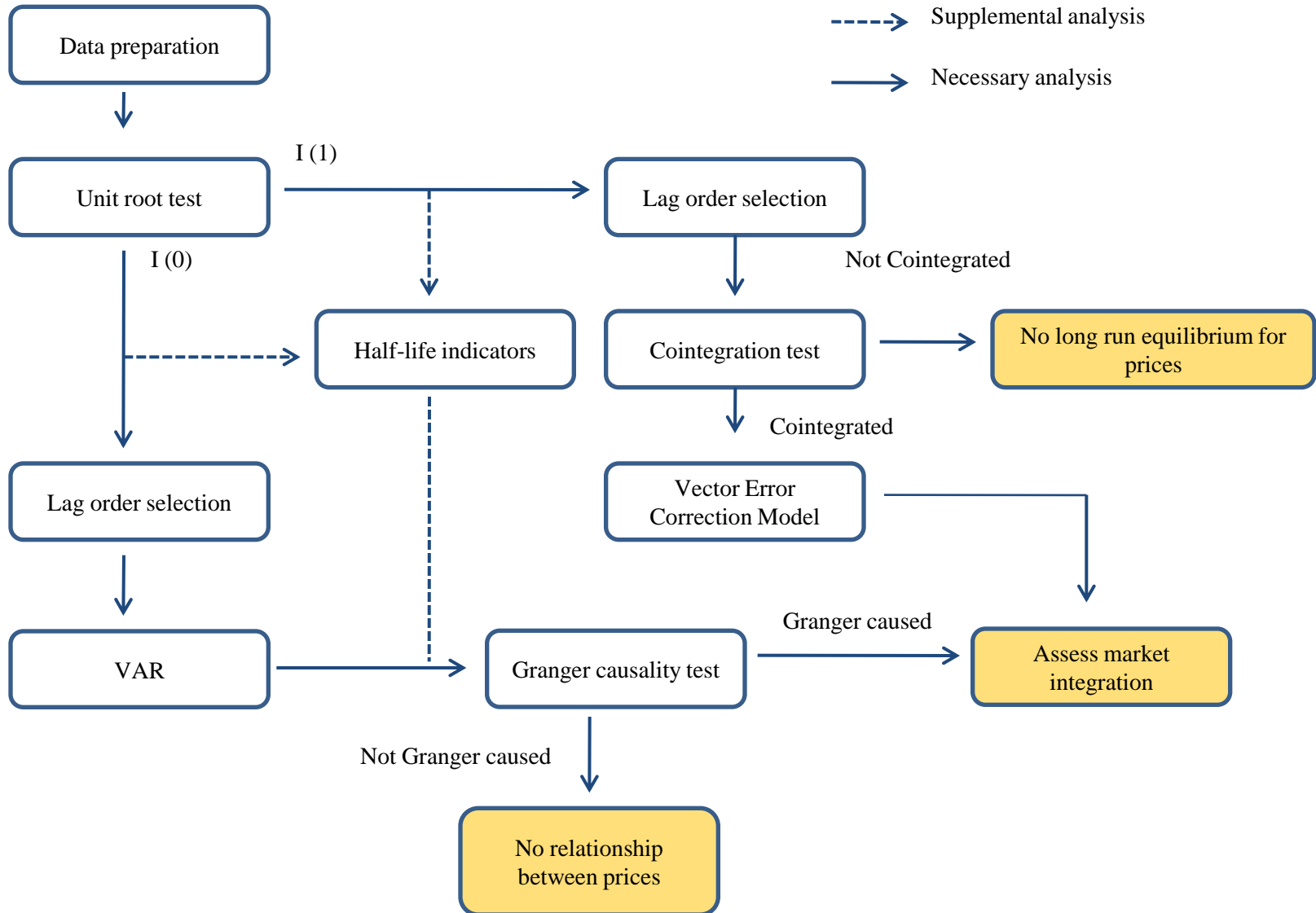
Review of Literature

- Fossati et al. (2007) introduced the use of weak Exogeneity test for cointegrated variables and Half-life persistence indicators.
- Koumkwa and Susmel (2008) further discussed the use of Half-life indicator.
- Sanogo (2008) used Ravallion and Error correction model.
- Hossain and Verbeke (2010) highlighted the use of Vector Auto Regression (VAR) model.

Methodology



Methodology



Methodology

Table 2. Data Information

Data/Period/Sample	Areas		
Mango Carabao January 2001 to March 2011 123	Farm Gate Prices Misamis Occidental Northern Mindanao Iloilo Western Visayas Cebu Central Visayas Zamboanga Peninsula Davao del Sur Davao Region SOCCSKSARGEN	Wholesale prices - ripe Northern Mindanao NCR	Retail Prices Misamis Occidental Northern Mindanao Iloilo Western Visayas Cebu Central Visayas Zamboanga Peninsula Davao del Sur Davao Region SOCCSKSARGEN NCR
Papaya Hawaiian April 2001 to April 2011 120	Farm Gate Prices Northern Mindanao Davao Region North Cotabato SOCCSKSARGEN	Wholesale prices Northern Mindanao NCR	Retail Prices Northern Mindanao Davao Region North Cotabato SOCCSKSARGEN NCR
Cabbage March 1993 to March 2011 217	Farm Gate Prices Cebu Negros Oriental Central Visayas Bukidnon Northern Mindanao Davao del Sur Davao City Davao Region North Cotabato SOCCSKSARGEN	Wholesale prices Cebu Central Visayas Northern Mindanao Davao del Sur Davao Region NCR	Retail Prices Cebu Negros Oriental Central Visayas Bukidnon Northern Mindanao Davao del Sur Davao City Davao Region North Cotabato SOCCSKSARGEN NCR

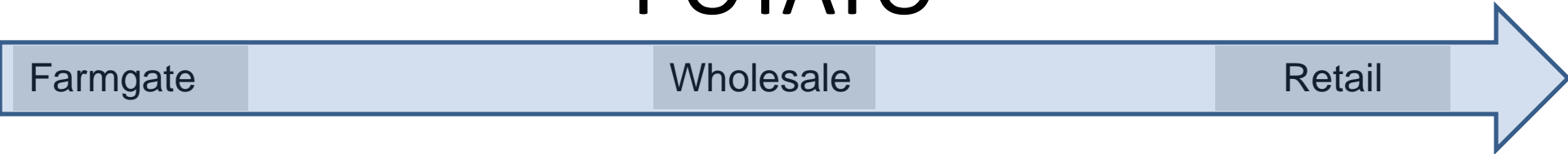
Methodology

Table 2. Cont...Data Information

Data/Period/Sample	Areas		
Eggplant January 1996 to March 2011 183	Farm Gate Prices Iloilo Western Visayas SOCCSKSARGEN	Wholesale prices Western Visayas NCR	Retail Prices Iloilo Western Visayas SOCCSKSARGEN NCR
Tomato January 1995 to March 2011 195	Farm Gate Prices Misamis Oriental Northern Mindanao Iloilo Western Visayas	Wholesale prices Northern Mindanao NCR	Retail Prices Northern Mindanao NCR
Potato January 1993 to April 2010 208	Farm Gate Prices Davao del Sur Davao Region	Wholesale prices Northern Mindanao Davao del Sur Davao Region NCR	Retail Prices Northern Mindanao Davao Region NCR

RESULTS AND DISCUSSION

POTATO



Davao Region



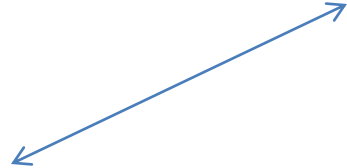
Davao Region

NCR



NCR

Northern Mindanao



Not Cointegrated

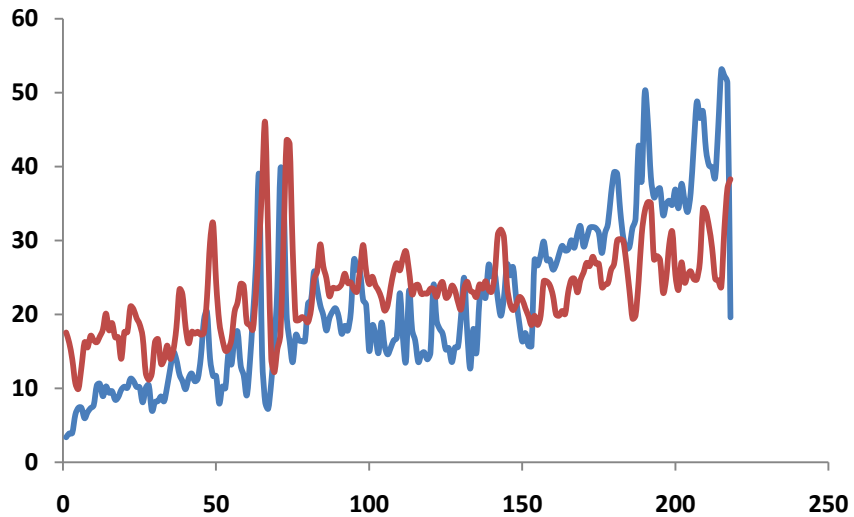


Unidirectional

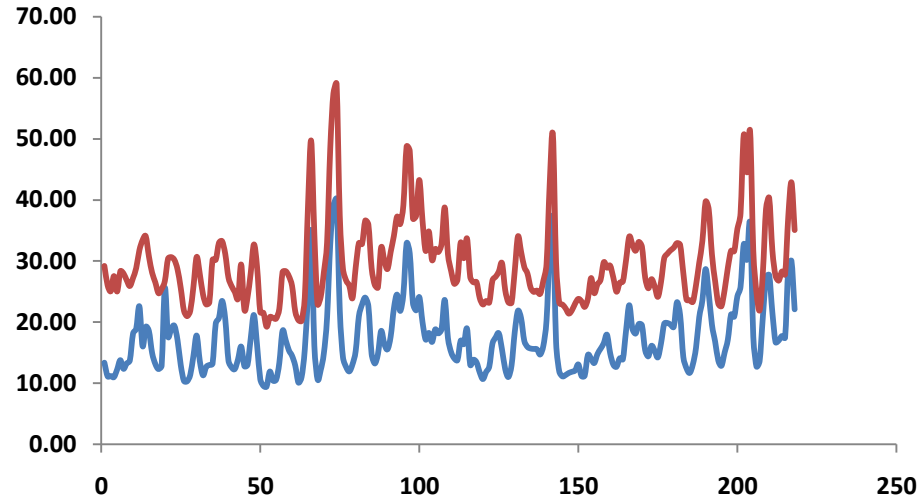


Bidirectional

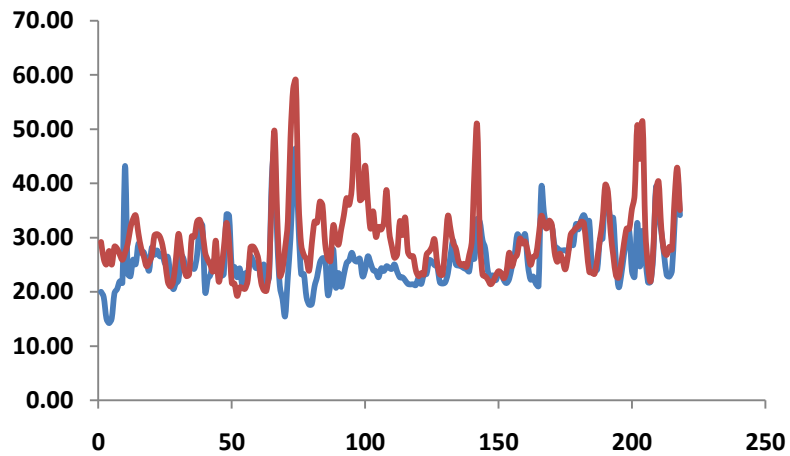
POTATO



F_DavReg W_DavReg

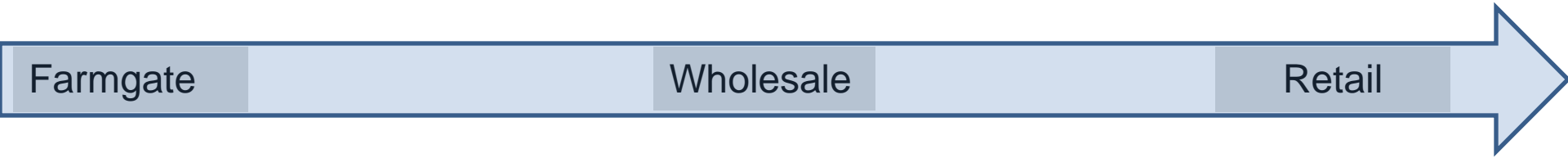


W_NCR R_NCR



W_NorMin R_NCR

PAPAYA



SOCCSKS
ARGEN

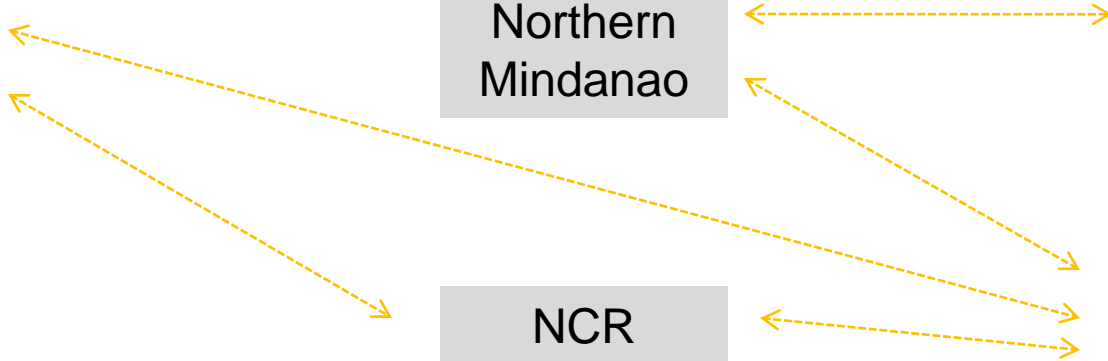
Northern
Mindanao

Northern
Mindanao

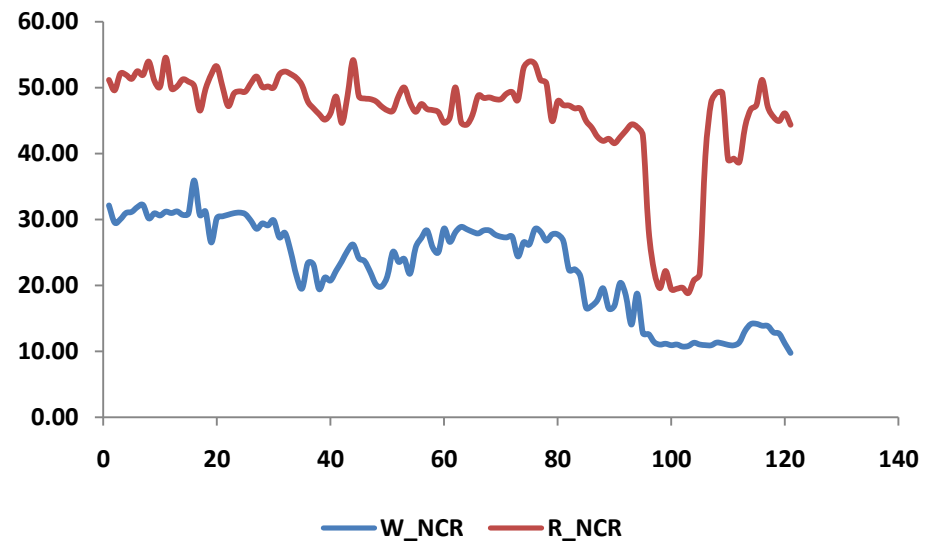
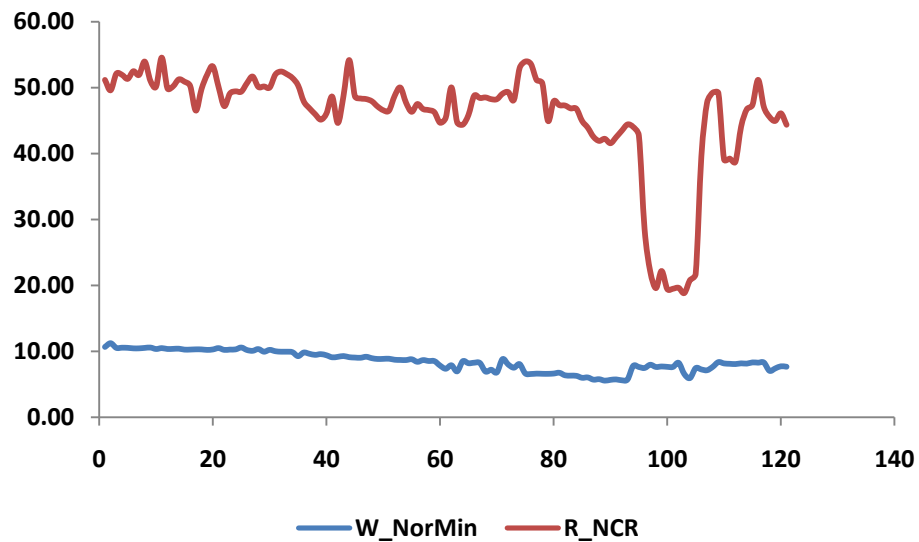
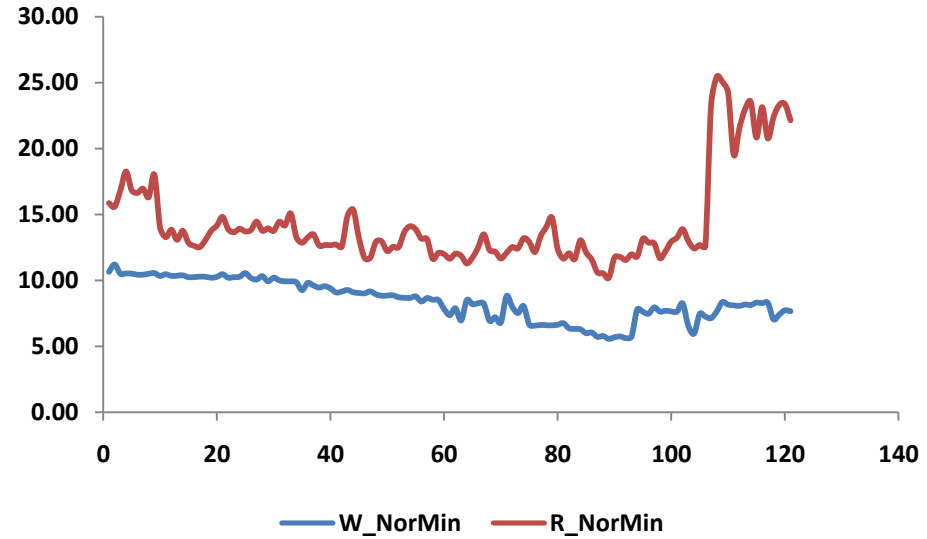
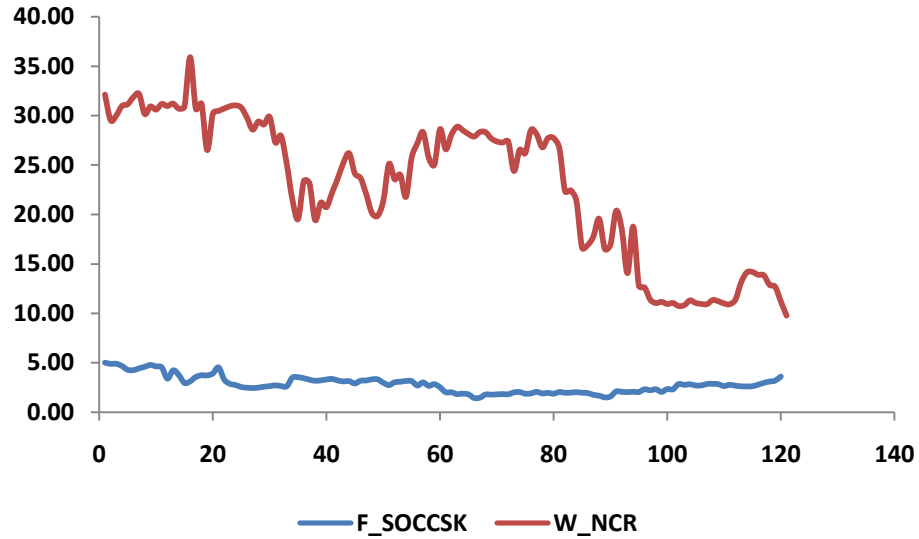
NCR

NCR

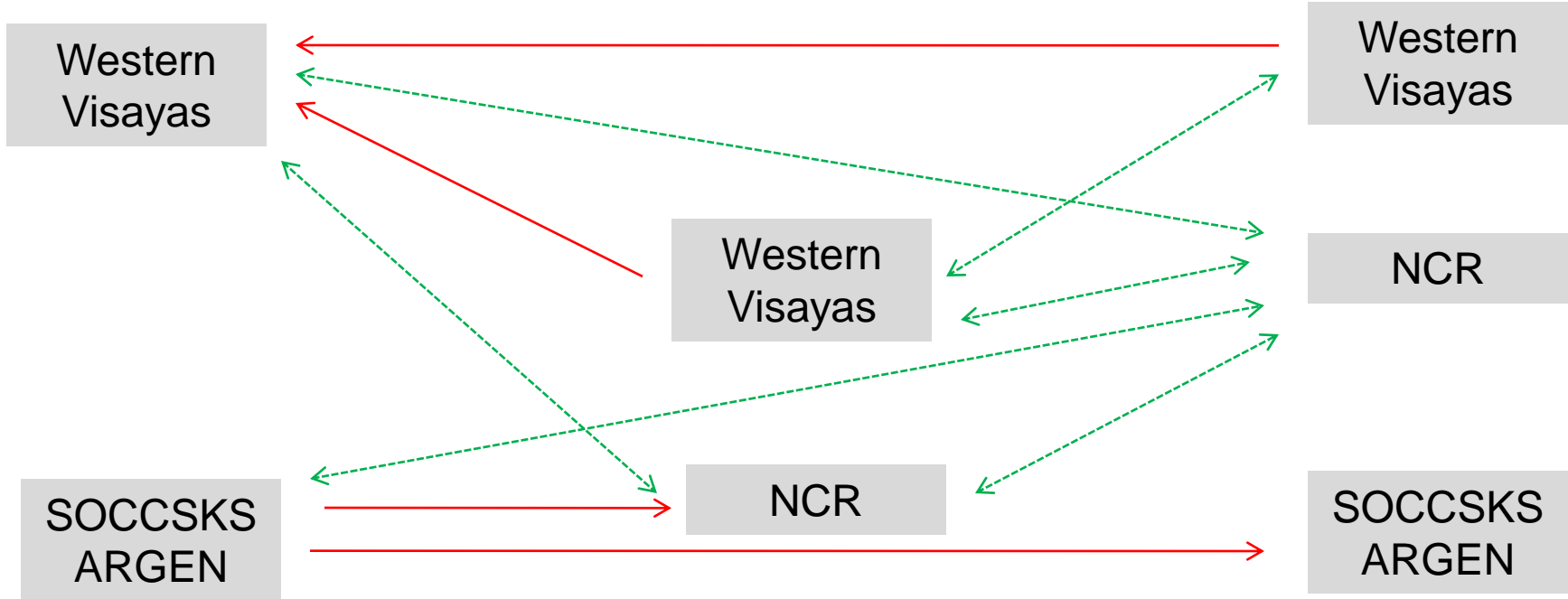
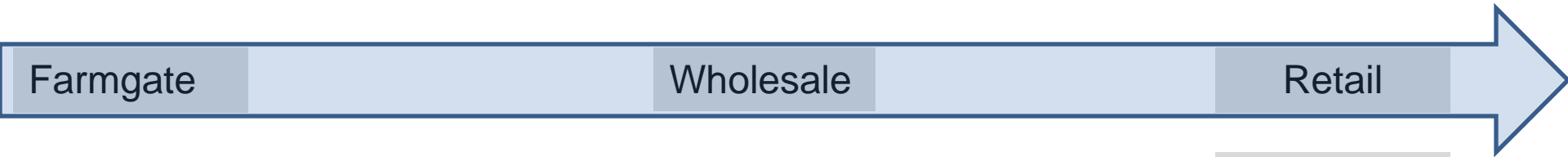
←-----> Not Cointegrated



PAPAYA

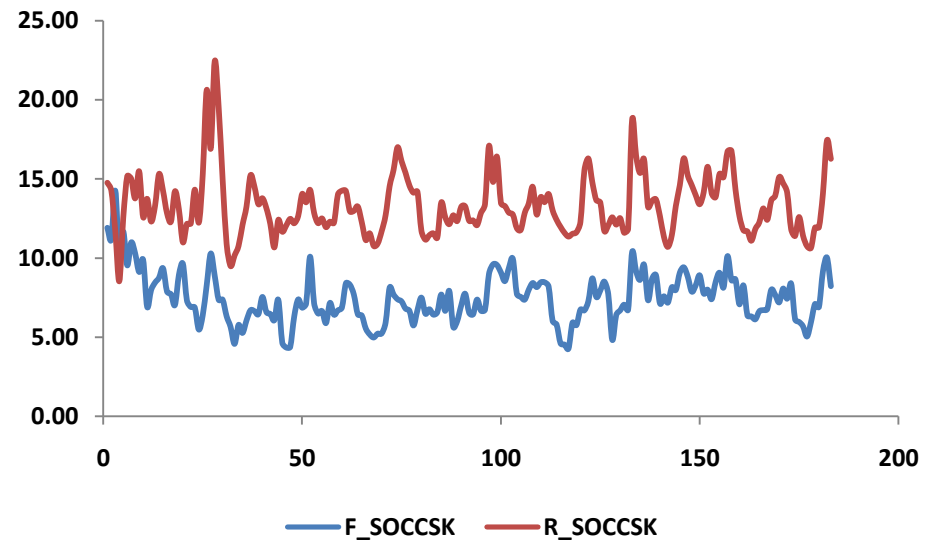
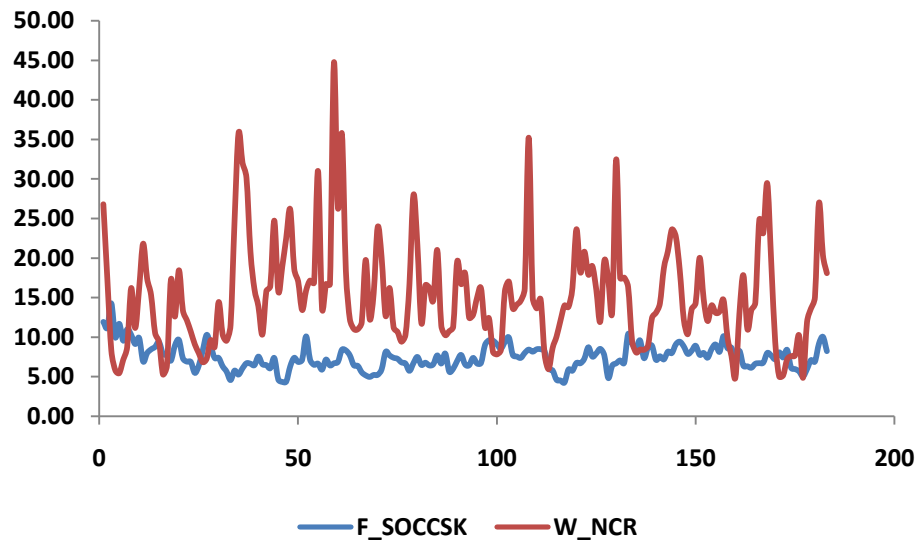
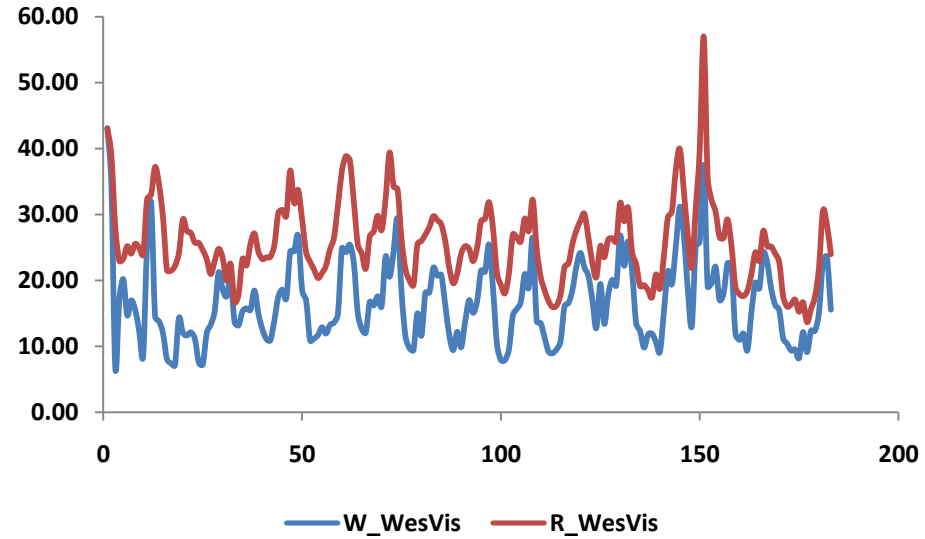
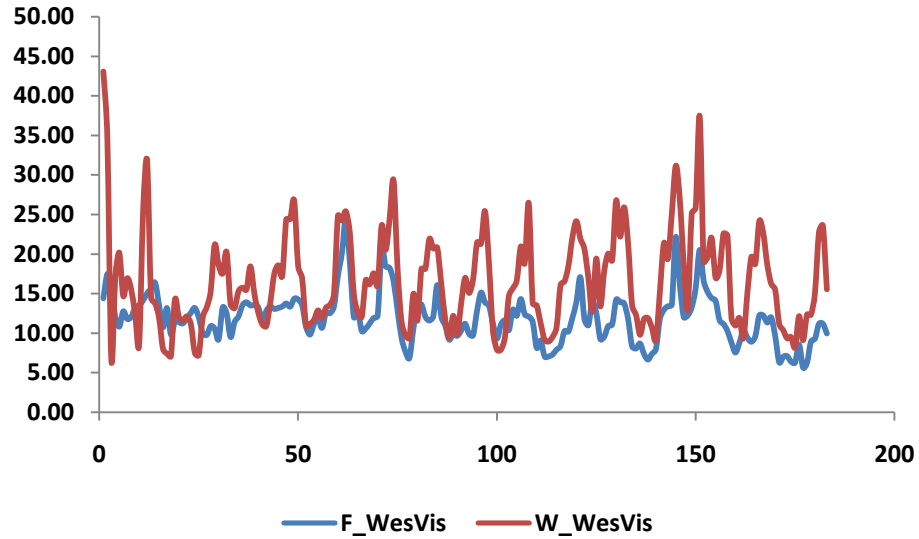


EGGPLANT

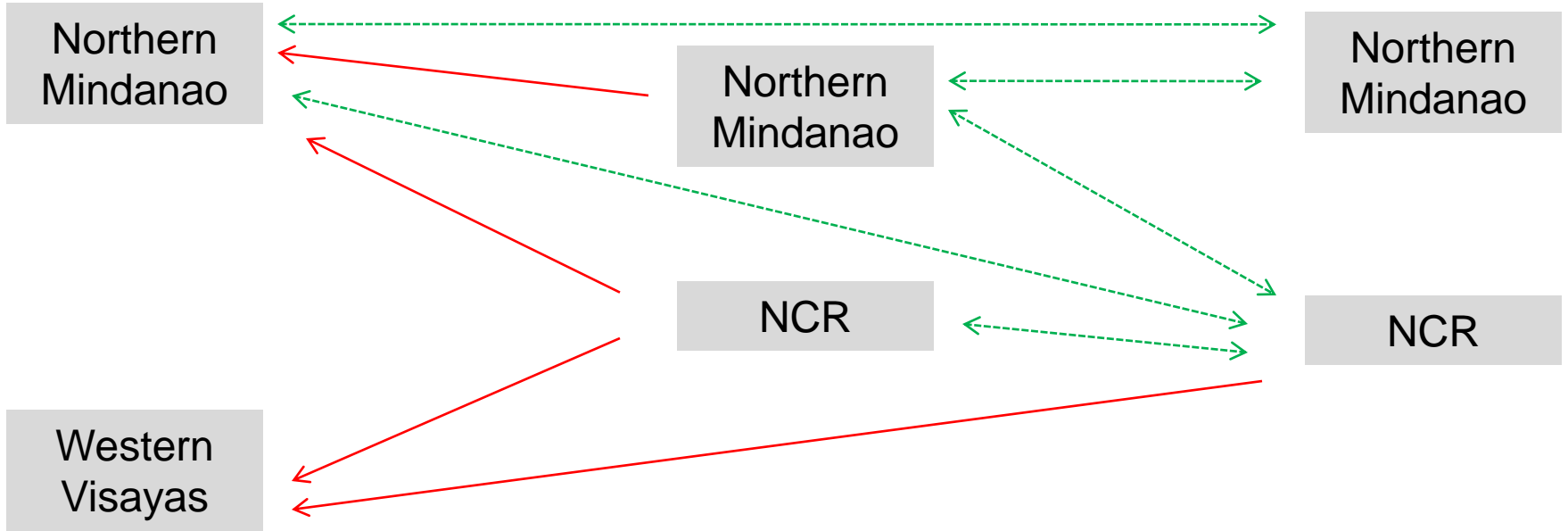
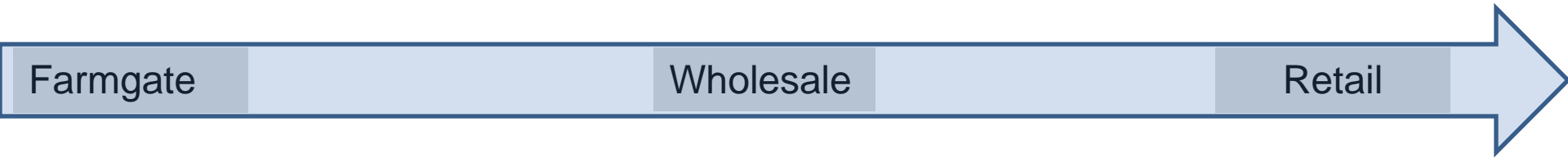


- Not Granger Caused
- Unidirectional
- Bidirectional

EGGPLANT

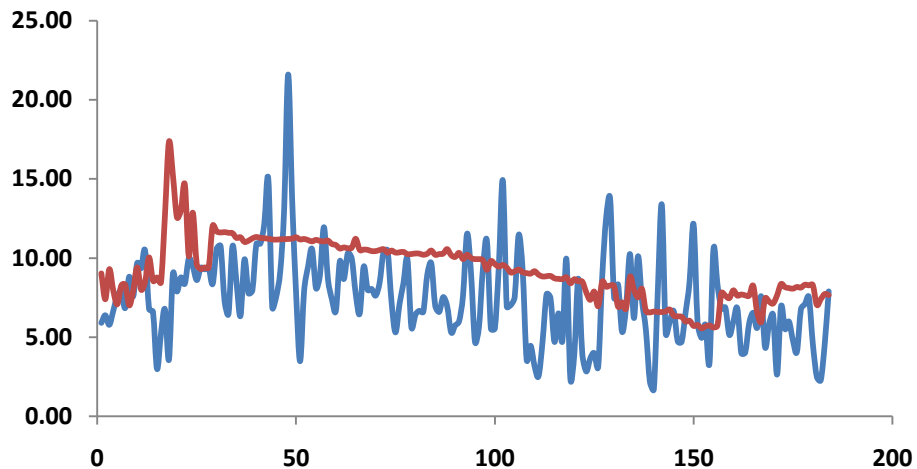


TOMATO

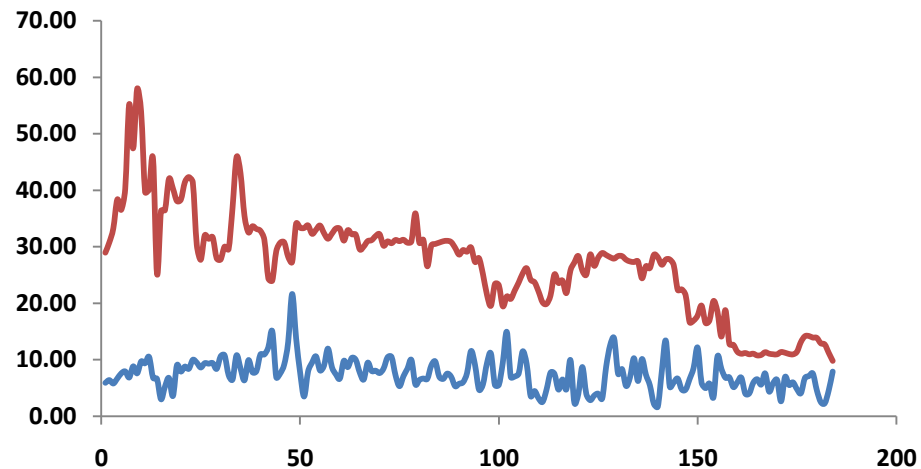


- Not Granger Caused
- Unidirectional
- Unidirectional
- Bidirectional

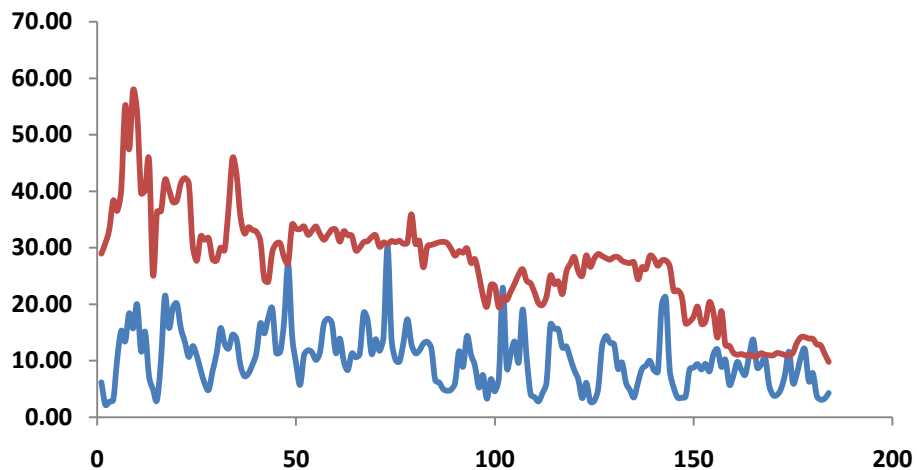
TOMATO



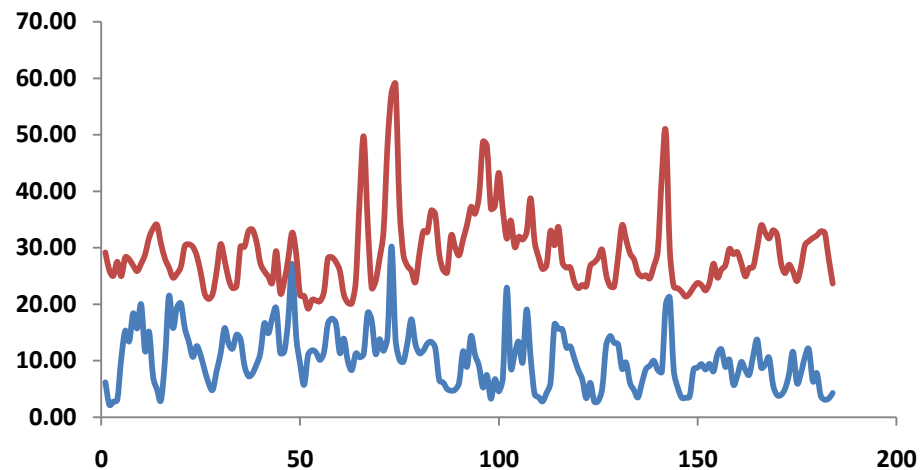
F_NorMin W_NorMin



F_NorMin W_NCR

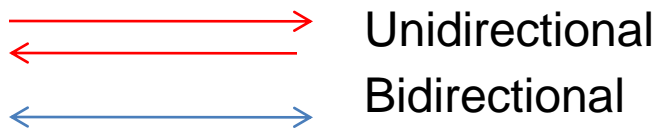
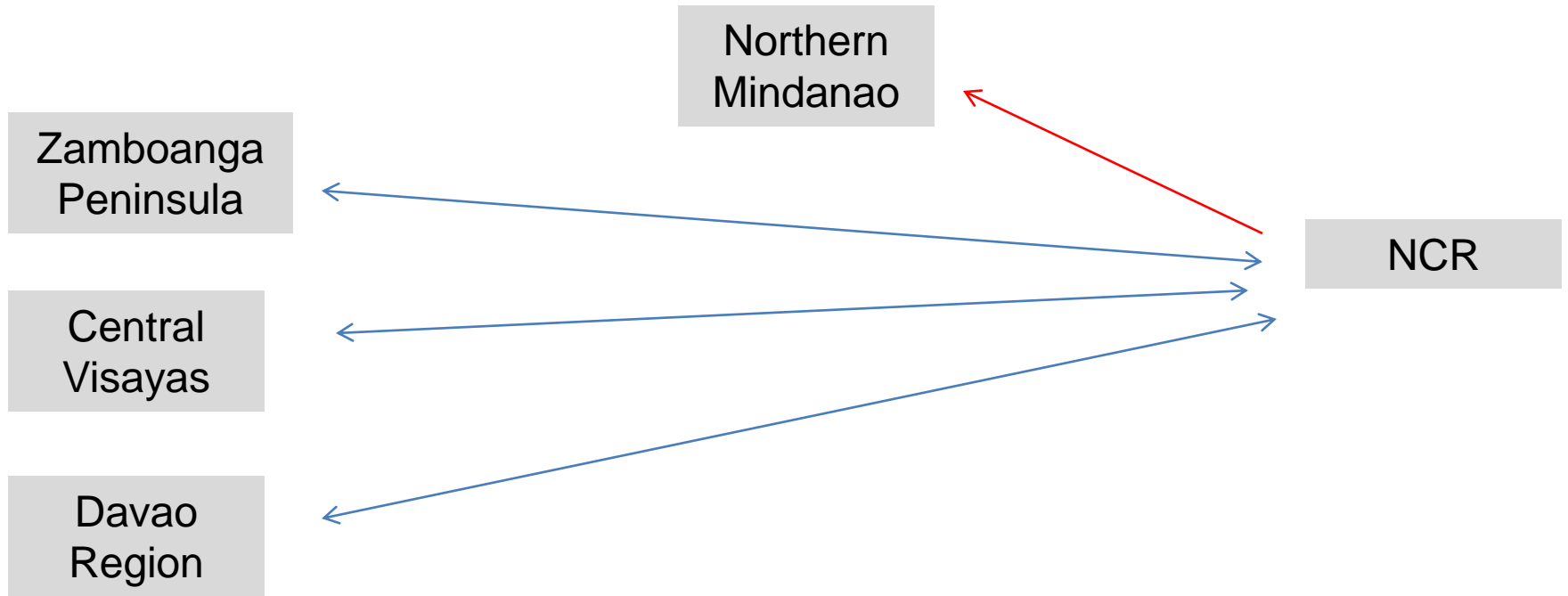
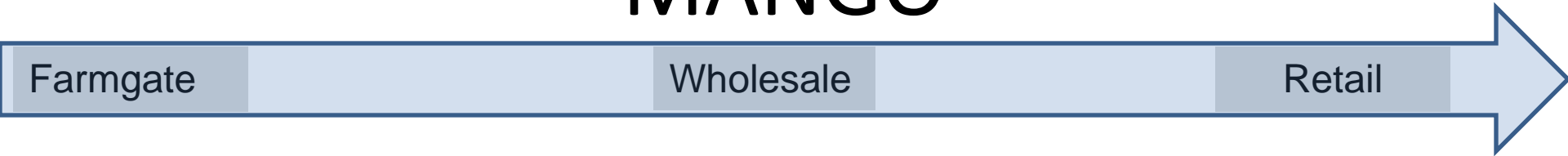


F_WesVis W_NCR

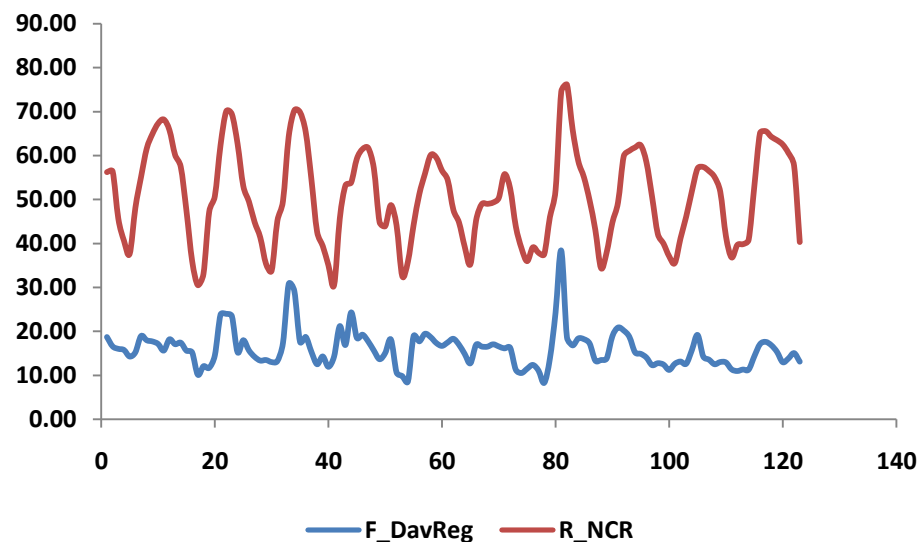
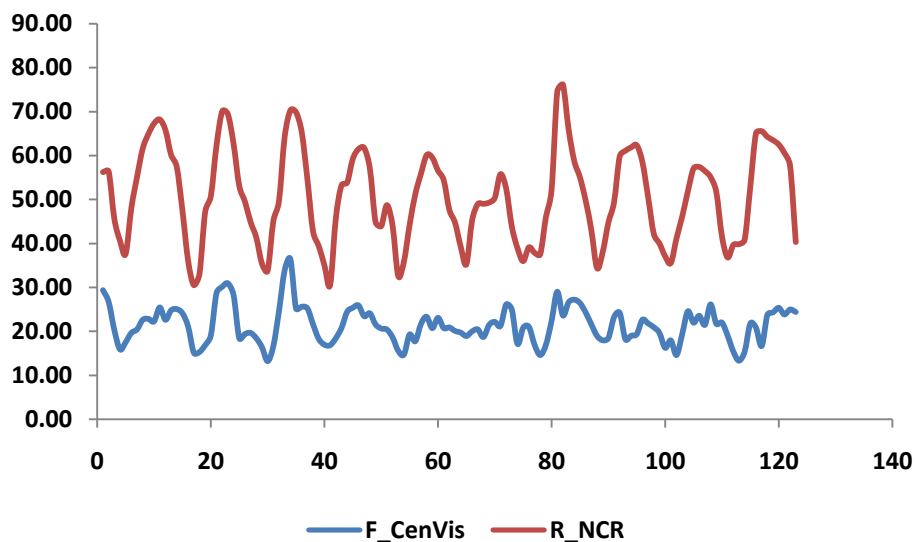
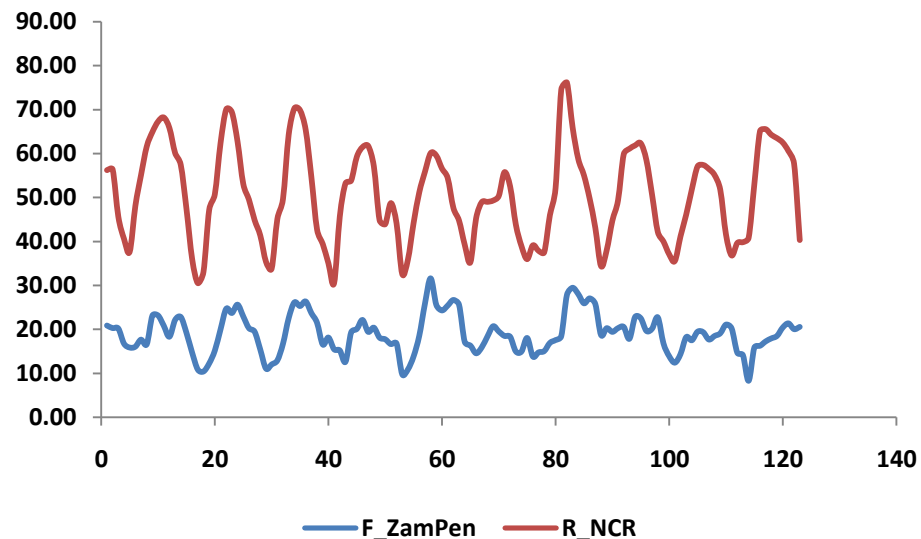
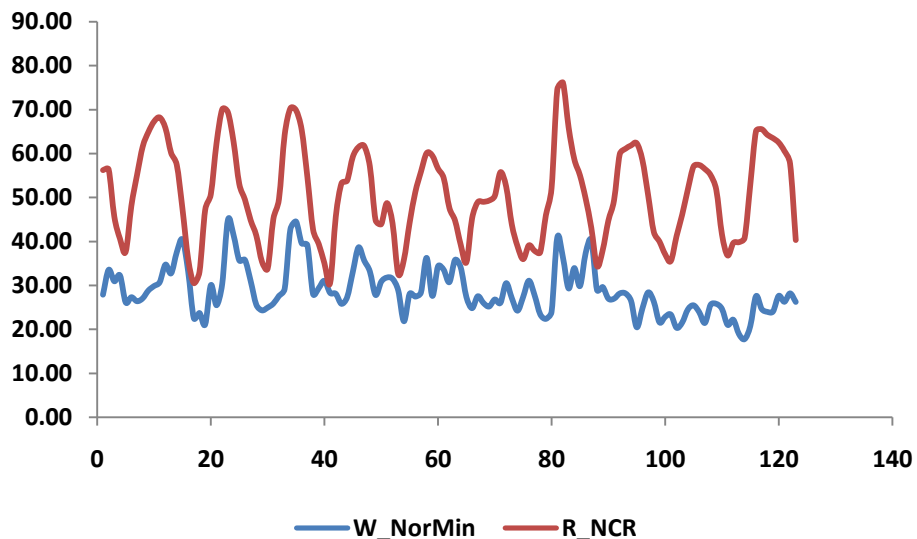


F_WesVis R_NCR

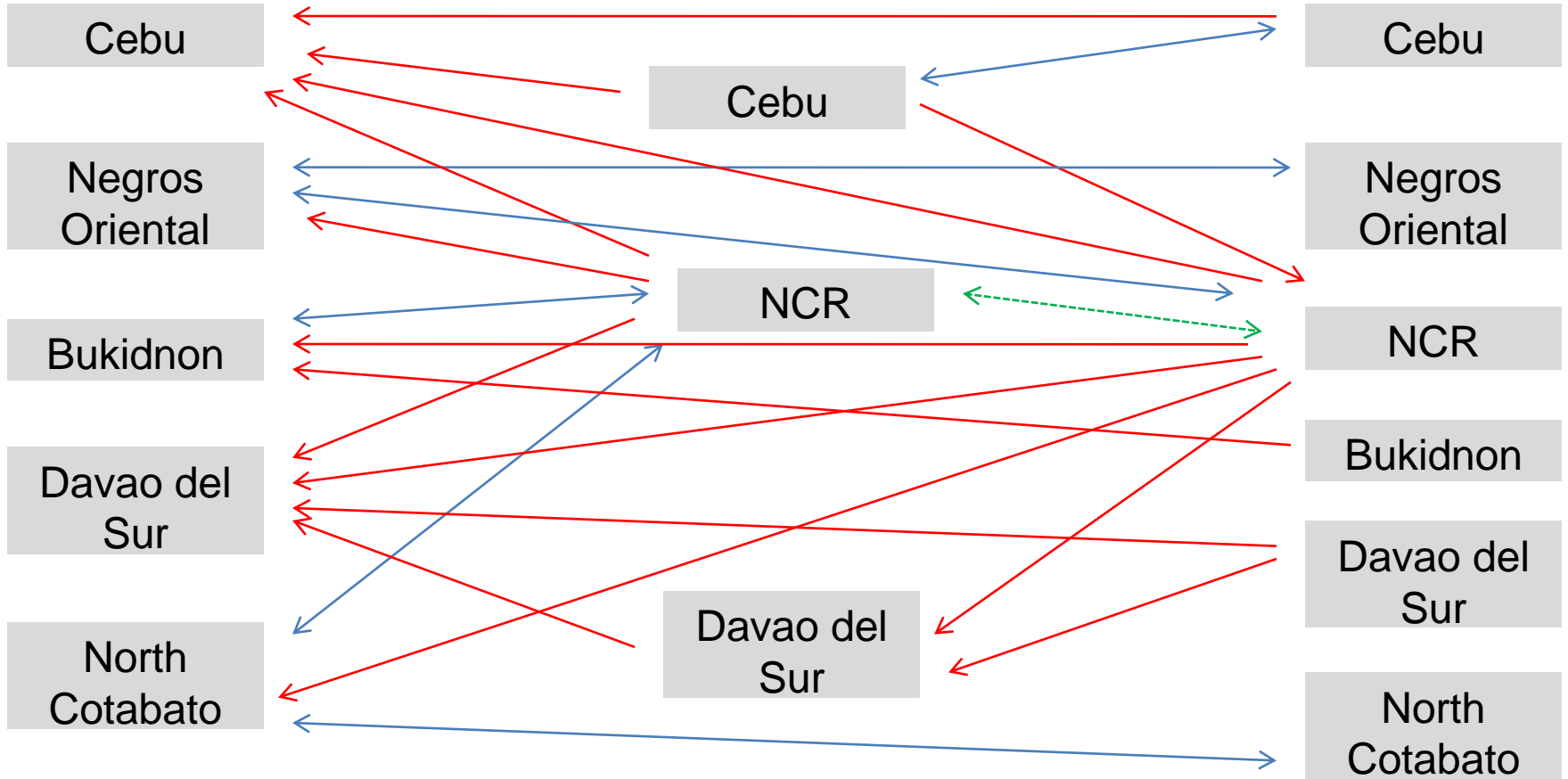
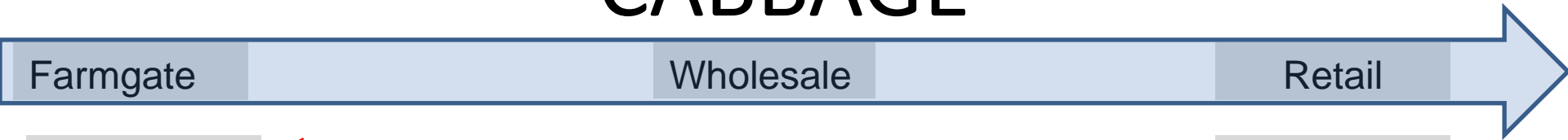
MANGO



MANGO

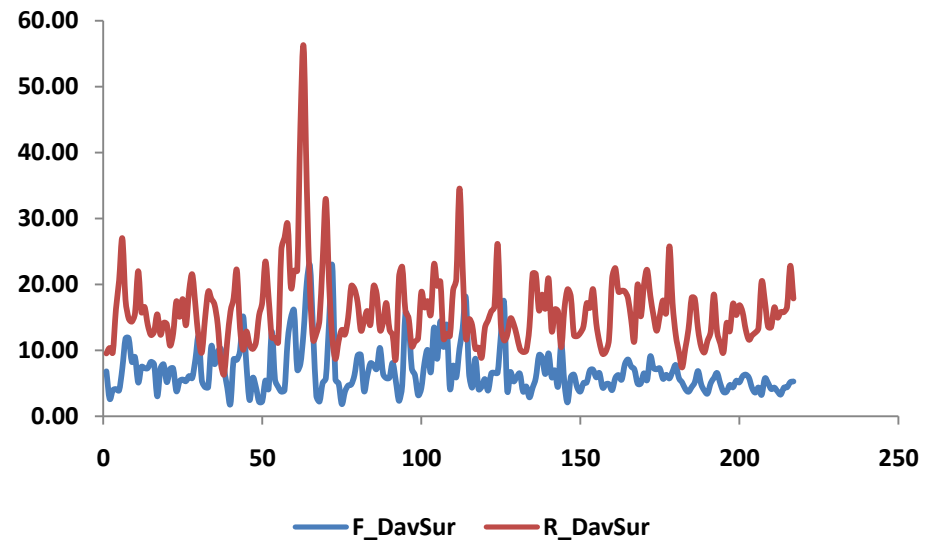
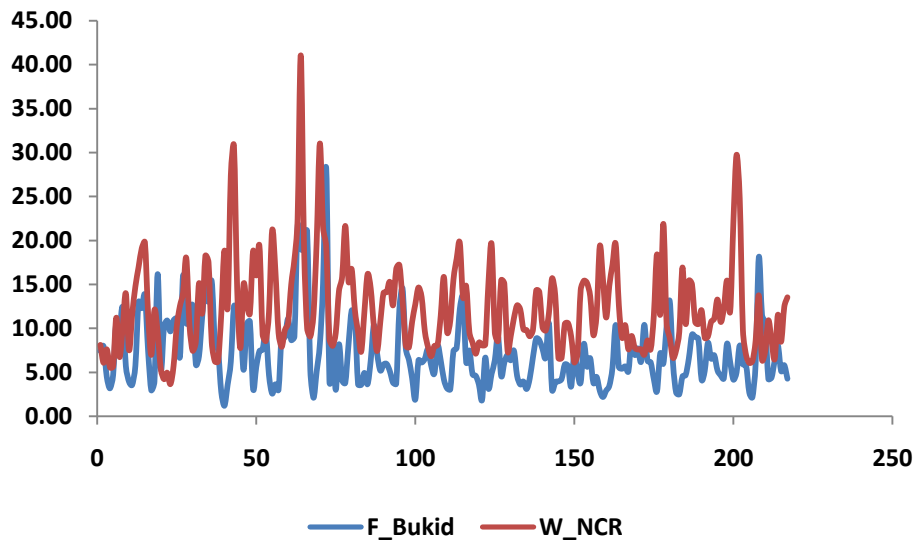
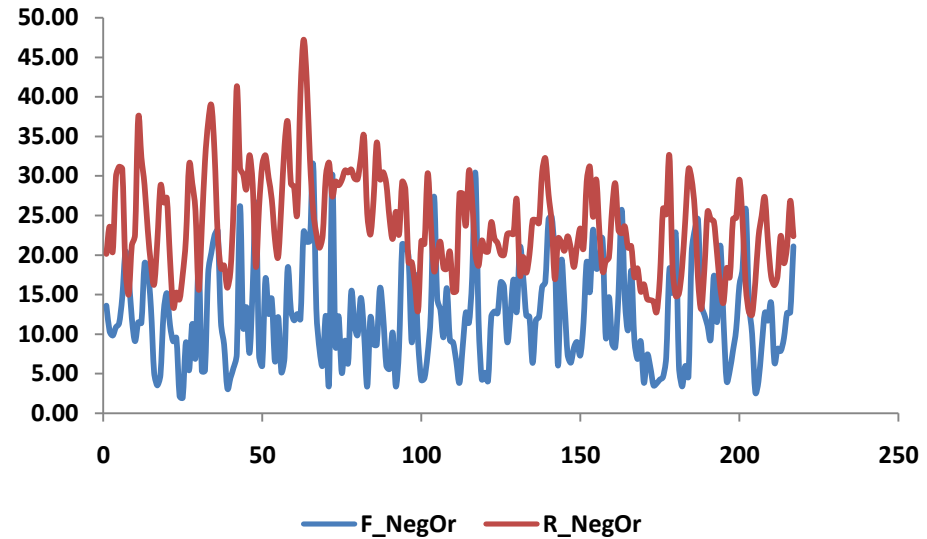
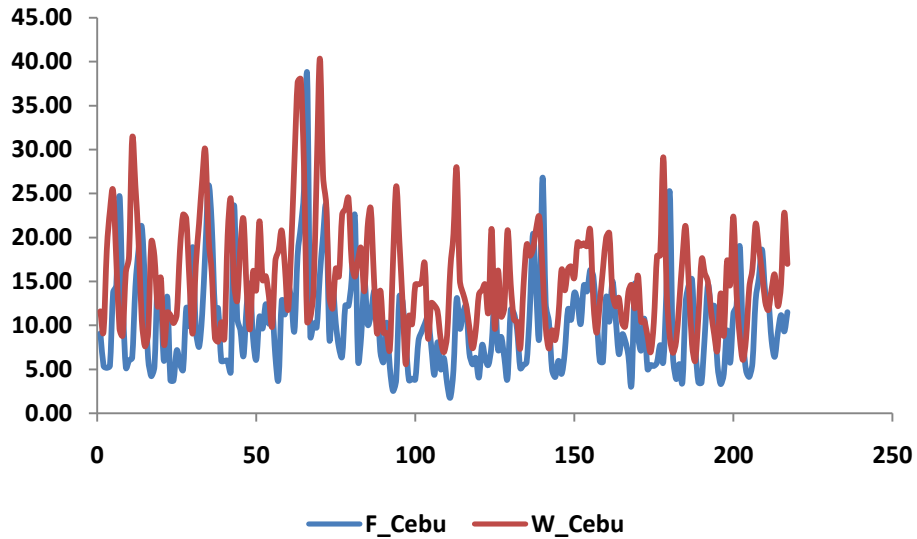


CABBAGE



- ←---→ Not Granger Caused
- Unidirectional
- ↔ Bidirectional

CABBAGE



SUMMARY

Crops

Market Integration

Potato

Inconclusive

Papaya

Segmented

Eggplant

NCR R is segmented; Regional <--, -->

Tomato

W-->F

Mango

NCR R<--> F

Cabbage

R --> F; W-->F

CONCLUSION

1. For cabbage and tomato, retail and wholesale prices are influencing the farm gate prices -> farmers do not have a command in pricing -> less incentive to farming -> less production.
2. For mango, farmgate and retail prices are influencing each other -> farmers may have a command in pricing -> there is an incentive to farming -> more production.

CONCLUSION

3. Eggplant, NCR retail market is segmented -> NCR has its own price behavior -> Regional surplus might be limited -> possible dominance of Luzon regional markets
4. Papaya, market is segmented -> each node behaves differently -> price information is limited -> possible presence of market distortion

RECOMMENDATION

1. Efforts on farm productivity improvement should be focused on the more efficient markets; cabbage, mango and tomato.
2. Eggplant and Papaya market distribution may be needing policy intervention.
3. Value chain analysis on the areas identified in this study is recommended to validate the results.

Thank you for your attention