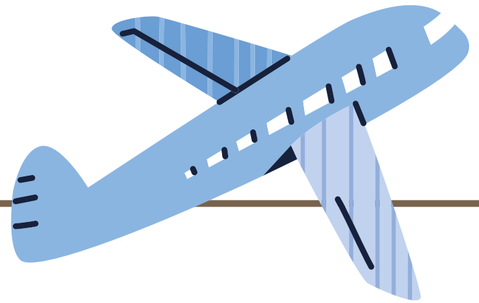
01



DECREASING IN SALES OF PUBLIC TRANSPORTATION IN THAILAND

Group A

01

TRANSPORTATION IN THAILAND

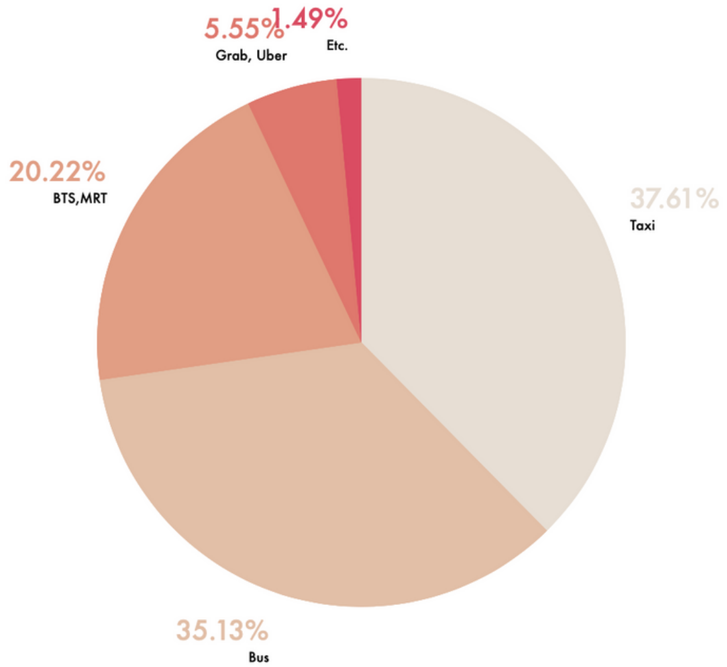
Types of Public Transportation

ROAD TRANSPORTATION	• TAXI • TUK-TUKS • BUS	• SONG THEAW • MOTORCYCLE TAXI
RAIL TRANSPORTATION	• BTS • MRT • BRT	• AIRPORT LINK • TRAIN
WATER TRANSPORTATION	• SHUTTLE BOAT • CHAO PHRAYA EXPRESS • FERRY	
AIR TRANSPORTATION	• AIRPLANE	

- AVERAGE OF PUBLIC TRANSPORTATION USAGE PER WEEK

1-2 DAY (S) / WEEK	35.60 %
3-4 DAYS / WEEK	38.66 %
5-6 DAYS / WEEK	19.45 %
EVERYDAY	6.29 %

- PERCENTAGE OF PUBLIC TRANSPORT USAGE



SOURCE BY BLT OCTOBER 3, 2017

02

SOURCES OF DATA

- ECONOMIC INDICATORS, BANK OF THAILAND , DATA FROM 2019 - PRESENT
- GOOGLE TREND , DATA FROM 2019 - PRESENT

Analytical methodologies

PHRASE 1 : ISSUE AND CONCERN

1. IDENTIFY ISSUE AND CONCERN
2. REVIEW BACKGROUND OF PUBLIC TRANSPORTATION IN THAILAND

PHRASE 2 : DEFINE AND ALIGN OBJECTIVE

3. ALIGN OBJECTIVES AND DEFINE TARGETS

PHRASE 3 : ANALYZE AND DEVELOP DATA

4. DISCOVER AND NORMALIZE THE GIVEN DATA
5. ANALYZE THE DATA USIGNG EXCEL AND STATA.

PHRASE 4 : SUMMARY

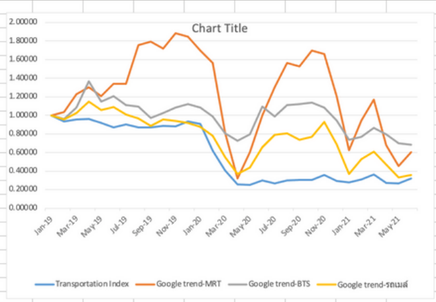
6. CONCLUDE AND POLICY RECOMMENDA-TIONS.

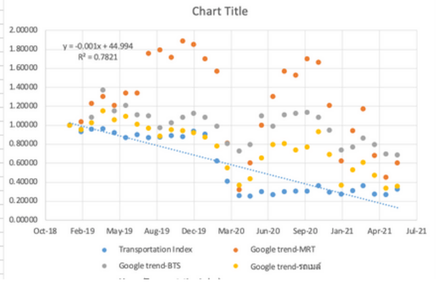
Analytical methodologies

&

```
      ___  ____  ____  ____  ____ (R)
     /__    /   ____/   /   ____/
    ___/   /   /___/   /   /___/   14.0
Statistics/Data Analysis

      MP - Parallel Edition
```

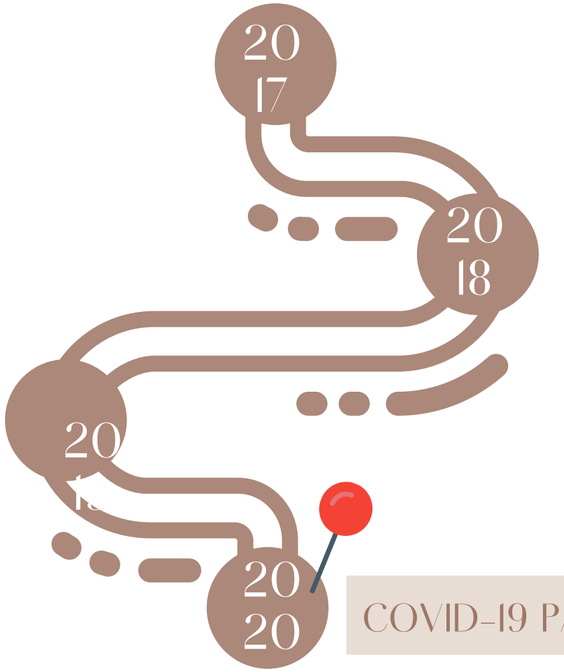
BN	BO	BP	BQ	BR	BS	BT	BU	BV
de trend-ไปต่างประเทศ	Normalized			Month	Transportation Index	Google trend-MRT	Google trend-BTS	Google trend-รถเมล์
59	1			Jan-19	1.00000	1.00000	1.00000	1.00000
61	1.0339			Feb-19	0.93236	1.03774	0.95890	0.95402
65	1.10169			Mar-19	0.95489	1.22642	1.08219	1.02299
60	1.01695			Apr-19	0.96053	1.30189	1.36986	1.14943
62	1.05085			May-19	0.92005	1.20755	1.15068	1.05747
62	1.05085			Jun-19	0.86890	1.33962	1.20548	1.09195
62	1.05085			Jul-19	0.90040	1.33962	1.10959	1.01149
56	0.94915			Aug-19	0.86923	1.75472	1.09589	0.96552
58	0.98305			Sep-19	0.87219	1.79245	0.97260	0.88506
62	1.05085			Oct-19	0.88788	1.71698	1.02740	0.95402
61	1.0339			Nov-19	0.87862	1.88679	1.08219	0.94253
52	0.88136			Dec-19	0.93507	1.84906	1.12329	0.91954
63	1.0678			Jan-20	0.90562	1.69811	1.08219	0.87356
54	0.91525			Feb-20	0.62205	1.56604	0.98630	0.78161
36	0.61017			Mar-20	0.40762	0.81132	0.80822	0.55172
39	0.66102			Apr-20	0.25528	0.32075	0.72603	0.36782
40	0.67797			May-20	0.25348	0.60377	0.79452	0.43678
37	0.62712			Jun-20	0.29667	1.00000	1.09589	0.65517
37	0.62712			Jul-20	0.26892	1.30189	0.98630	0.79310
41	0.69492			Aug-20	0.29750	1.56604	1.10959	0.80460
40	0.67797			Sep-20	0.30368	1.52830	1.12329	0.73563
43	0.72881			Oct-20	0.30435	1.69811	1.13699	0.77011
41	0.69492			Nov-20	0.36051	1.66038	1.08219	0.93103
30	0.50847			Dec-20	0.29179	1.20755	0.94521	0.68966
42	0.71186			Jan-21	0.27531	0.62264	0.73973	0.36782
43	0.72881			Feb-21	0.30744	0.94340	0.76712	0.52874
37	0.62712			Mar-21	0.36147	1.16981	0.86301	0.60920
37	0.62712			Apr-21	0.27522	0.67925	0.79452	0.47126
55	0.9322			May-21	0.26692	0.45283	0.69863	0.33333
57	0.9661			Jun-21	0.32300	0.60377	0.68493	0.35632



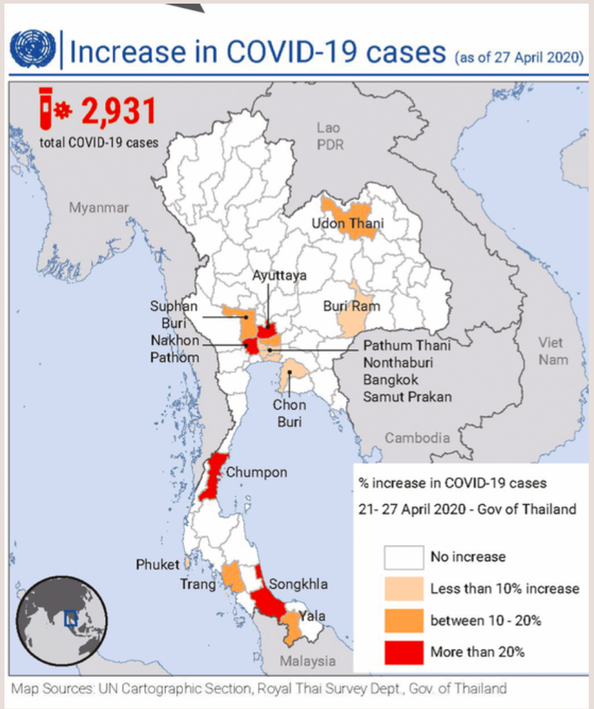



```
. reg transportationindex bts รถเมล mrt

      Source |       SS           df       MS      Number of obs   =        30
-------------+----------------------------------   F(3, 26)        =     30.06
       Model |  2.11781996         3  .705939987   Prob > F        =    0.0000
    Residual |  .610680976        26  .02348773    R-squared       =    0.7762
-------------+----------------------------------   Adj R-squared   =    0.7504
       Total |  2.72850094        29  .094086239   Root MSE        =    .15326

------------------------------------------------------------------------------
transporta~x |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         bts |  -1.132077   .3777339    -3.00   0.006    -1.90852   -.3556338
      รถเมล |   1.802712   .2586569     6.97   0.000     1.271035    2.334389
         mrt |  -.0564324    .097096    -0.58   0.566    -.2560161    .1431513
       _cons |   .3822686   .2107488     1.81   0.081    -.0509318    .8154691
------------------------------------------------------------------------------
```

Results



COVID-19 PANDEMIC



พิษโควิดฉุดผู้โดยสารระบบรางลดลง 82.87%

โควิดทุบผู้โดยสาร “ระบบขนส่งสาธารณะ” ลดฮวบยกแผง

วันที่ 1 พฤษภาคม 2564 - 12:17 น.

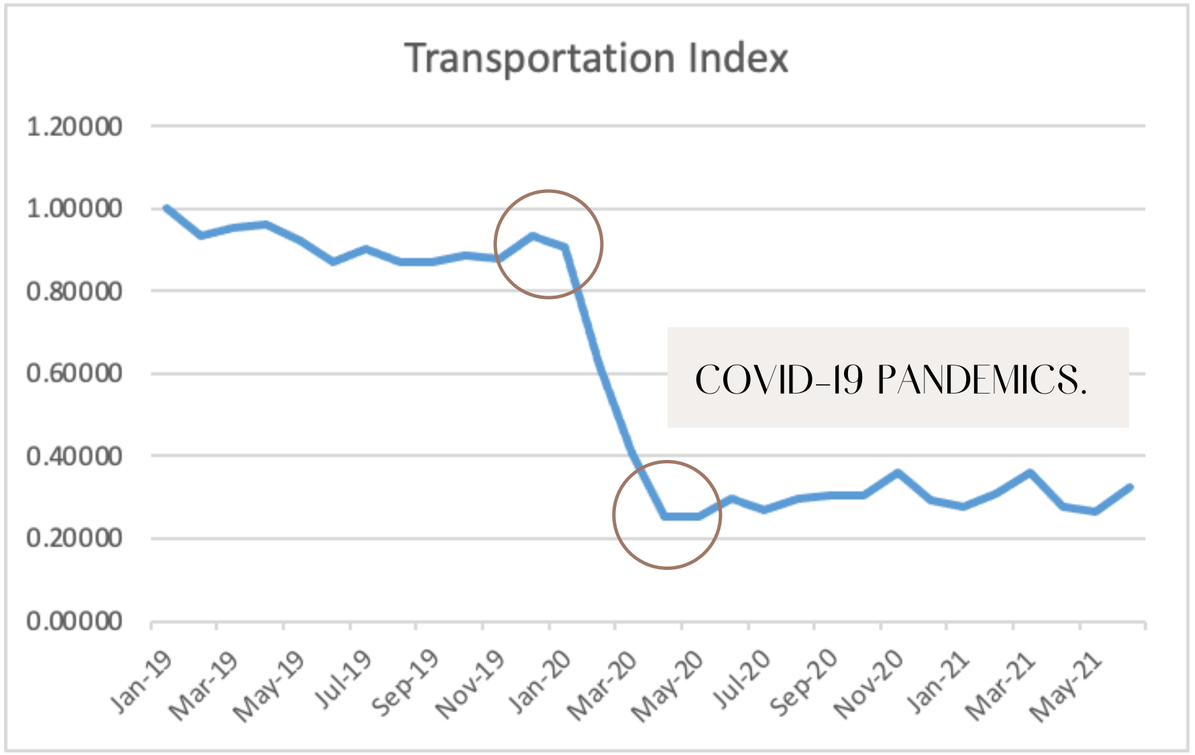
Source by Prachachat.com

“รถเมล์”คนใช้วูบ 40-60%

นายจิรุตม์ วิศาลจิตร อธิบดีกรมการขนส่งทางบก (ขบ.) เปิดเผย “ประชาชาติธุรกิจ” ว่า จากการแพร่ระบาดระลอกใหม่ และการที่แต่ละจังหวัดมีมาตรการลดการเดินทางที่ไม่จำเป็นตามนโยบายของศูนย์บริหารสถานการณ์การแพร่ระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 (ศบค.)

	เดือนก.พ. 63	เดือนมี.ค. 63	เดือนเม.ย. 63
จำนวนผู้โดยสาร (ล้านเที่ยว)	17.9	11.7	3.5
เปลี่ยนแปลง (% YoY)	-5.7%	-45.2%	-81.5%

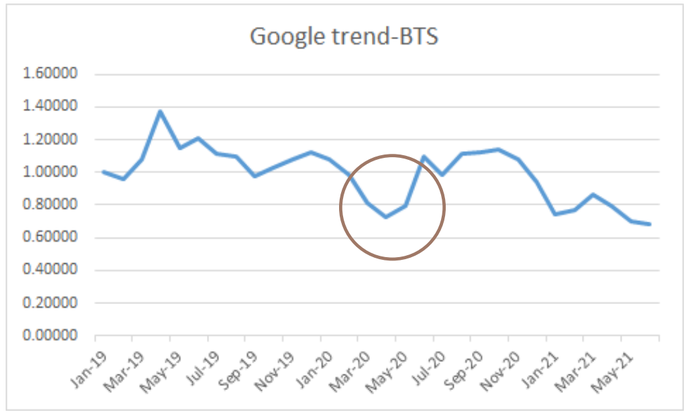
Historical trends of conventional indicators

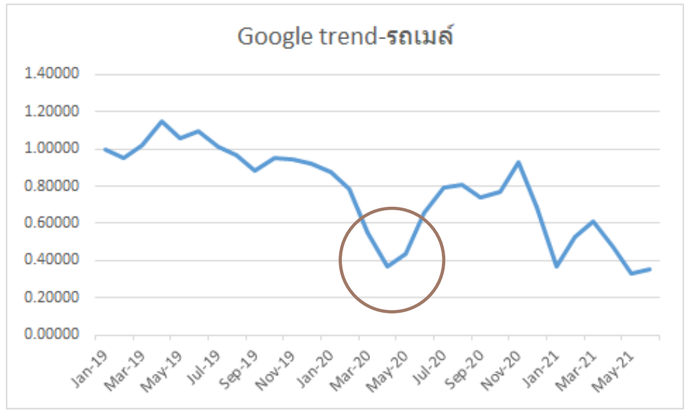


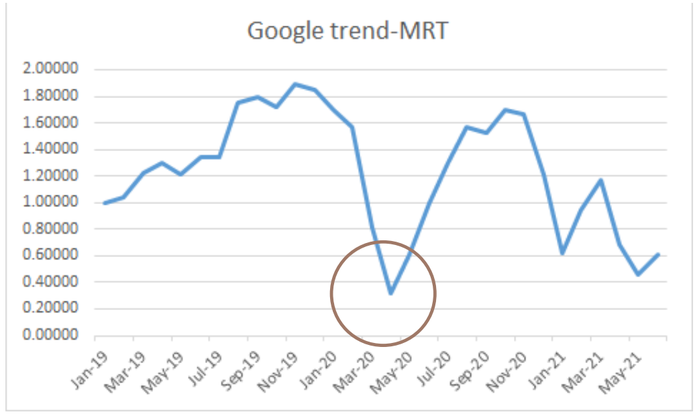
OBSERVATIONS

- TRANSPORTATION INDEX INITIATED AT HIGH LEVEL IN 2019
- THERE IS A DRAMATIC DECREASE IN TRANSPORTATION INDEX IN THE FIRST QUARTER OF 2020
- TRANSPPORTATION INDEX REMAINS STABLE SINCE MAY 2020 UNTIL NOW

Historical trends of alternative indicators







OBSERVATIONS

- FOR THE ALTERNATIVE INDICATORS WE HAVE BTS, MRT, **รถเมล์**.
- WE DECIDED TO PICKED THESE KEY WORDS BECAUSE ITS CORRELATE WITH OUR HISTORICAL TRENDS OF CONVENTIONAL INDICATOR.
- IN THE FIRST QUARTER OF 2020 (DURING COVID-19 PANDEMIC), IT CAN BE SEEN THAT DATA OF ALL TRANSPORTATION DROPPED

Relationships between conventional and alternative indicators

```
. reg transportation รถเมล์

      Source |       SS       df       MS              Number of obs =      30
-------------+------------------------------           F(1, 28)      =   59.12
       Model |  1.85161693     1  1.85161693            Prob > F      =  0.0000
    Residual |  .876884004    28  .031317286           R-squared     =  0.6786
-------------+------------------------------           Adj R-squared =  0.6671
       Total |  2.72850094    29  .094086239           Root MSE      =  .17697

------------------------------------------------------------------------------
transporta~n |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      รถเมล์ |     1.02769   .1336529     7.69   0.000      .753914    1.301465
       _cons |    -.2097236   .1074892    -1.95   0.061    -.4299053    .010458
------------------------------------------------------------------------------
```

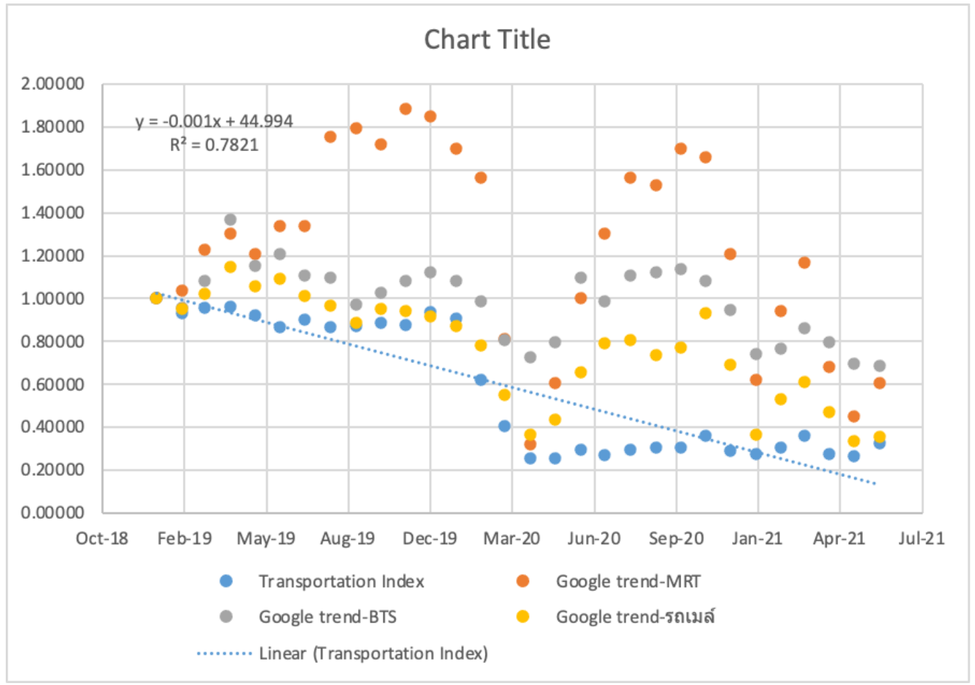
```
. reg transportation mrt

      Source |       SS       df       MS              Number of obs =      30
-------------+------------------------------           F(1, 28)      =    9.72
       Model |  .703063311     1  .703063311            Prob > F      =  0.0042
    Residual |  2.02543763    28  .072337058           R-squared     =  0.2577
-------------+------------------------------           Adj R-squared =  0.2312
       Total |  2.72850094    29  .094086239           Root MSE      =  .26896

------------------------------------------------------------------------------
transporta~n |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         mrt |   .3449601   .1106502     3.12   0.004      .1183035    .5716167
       _cons |   .1544159   .1446413     1.07   0.295     -.1418685    .4507002
------------------------------------------------------------------------------
```

```
. reg transportation bts

      Source |       SS       df       MS              Number of obs =      30
-------------+------------------------------           F(1, 28)      =   14.89
       Model |  .947418207     1  .947418207            Prob > F      =  0.0006
    Residual |  1.78108273    28  .063610097           R-squared     =  0.3472
-------------+------------------------------           Adj R-squared =  0.3239
       Total |  2.72850094    29  .094086239           Root MSE      =  .25221

------------------------------------------------------------------------------
transporta~n |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         bts |   1.056532   .273763     3.86   0.001      .4957537    1.61731
       _cons |  -.4639758   .2740342    -1.69   0.102     -1.025309    .0973577
------------------------------------------------------------------------------
```

OBSERVATIONS

- "**รถเมล์**" IS A KEYWORD THAT HIGHLY CORRELATED WITH THE CONVENTIONAL INDICATOR (TRANSPORTATION)
  - R-SQUARED = 0.6786
- MRT
  - R-SQUARED = 0.2577
- BTS
  - R-SQUARED = 0.3472

Relationships between conventional and alternative indicators




```
. reg transportationindex bts รถเมล mrt

      Source |       SS       df       MS      Number of obs   =        30
-------------+------------------------------   F(3, 26)        =     30.06
       Model |  2.11781996     3  .705939987   Prob > F        =    0.0000
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------------------------------------------------------------------------------
transporta~x |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         bts |  -1.132077   .3777339    -3.00   0.006    -1.90852   -.3556338
      รถเมล |   1.802712   .2586569     6.97   0.000    1.271035    2.334389
         mrt |  -.0564324    .097096    -0.58   0.566    -.2560161    .1431513
       _cons |   .3822686   .2107488     1.81   0.081    -.0509318    .8154691
------------------------------------------------------------------------------
```

Relationships between conventional and alternative indicators

```
. tsset m
        time variable:  m, 1 to 5
                delta:  1 unit

. reg ti mrt bts may
```

Source	SS	df	MS		
Model	.208318762	3	.069439587	Number of obs	= 5
Residual	.000289539	1	.000289539	F(3, 1)	= 239.83
				Prob > F	= 0.0474
Total	.208608301	4	.052152075	R-squared	= 0.9986
				Adj R-squared	= 0.9944
				Root MSE	= .01702

ti	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
mrt	-.8234512	.1613594	-5.10	0.123	-2.873717	1.226815
bts	2.013465	.3628518	5.55	0.114	-2.597005	6.623935
may	2.056156	.5269242	3.90	0.160	-4.63905	8.751362
_cons	-1.683605	.1805936	-9.32	0.068	-3.978264	.6110541

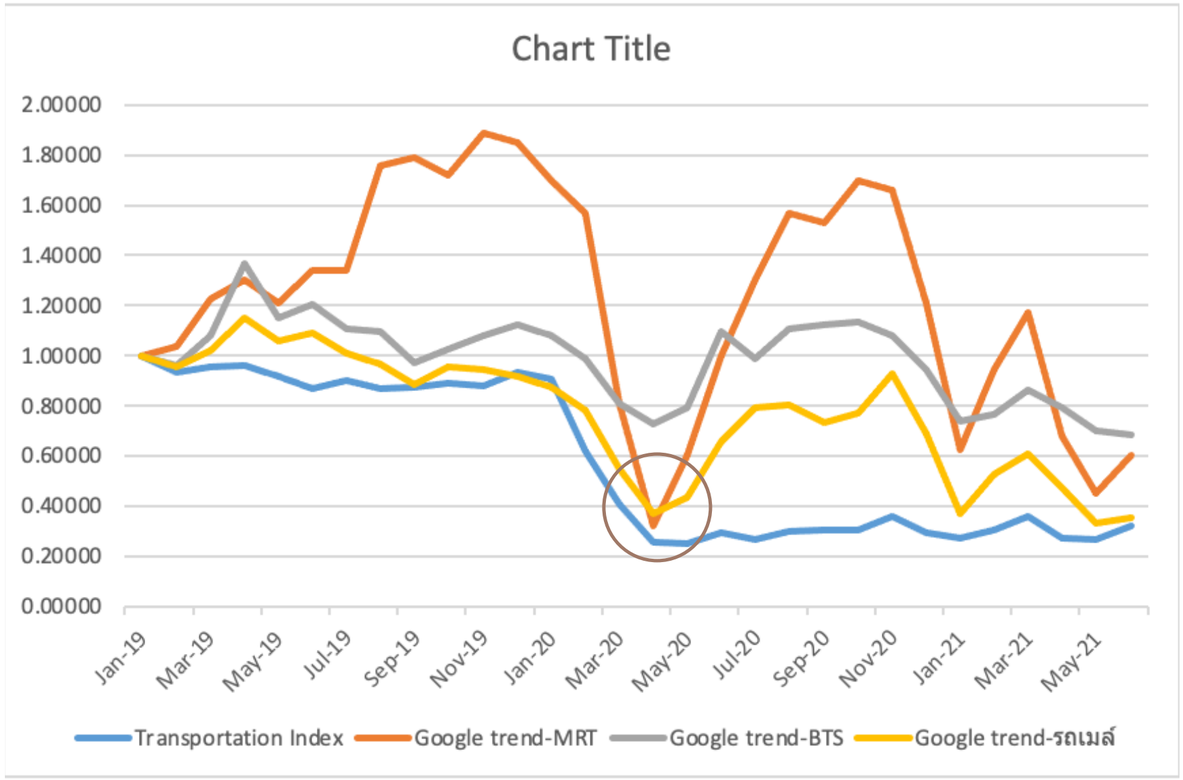
```
. corr ti mrt bts may
(obs=5)
```

	ti	mrt	bts	may
ti	1.0000			
mrt	0.9297	1.0000		
bts	0.9807	0.9758	1.0000	
may	0.9593	0.9928	0.9828	1.0000

```
. estat vif
```

Variable	VIF	1/VIF
may	96.89	0.010321
mrt	69.24	0.014443
bts	29.25	0.034186
Mean VIF	65.13	

Key finding from these relationships



OBSERVATIONS

- THERE IS A POSITIVE RELATIONSHIP BETWEEN THESE DATA
- ALL INDICATORS DECREASED DRAMATICALLY IN MARCH 2020
- SEARCH DATA CAN FORECAST THE DEMAND ON PUBLIC TRANSPORTATION

Summary

- R-SQUARED EQUAL TO 0.7762 MEANS THERE IS A STRONG RELATIONSHIP BETWEEN ALTERNATIVE SOURCE AND CONVENTIONAL ECONOMIC INDICATORS
- SEARCH TREND CAN IMPLY TO THE DEMAND OF PEOPLE ON PUBLIC TRANSPORTATION USAGE
- DURING THE COVID-19 PANDEMIC, WHILE THERE IS A INCREASING IN SEARCH DATA ON COVID, SEARCH DATA ON PUBLIC TRANSPORTATION, SUCH AS BTS, MRT, AND BUS DECREASED
- MEANING THAT THE INCRESING NUMBER OF INFECTED PEOPLE LEADS TO THE DECRESING NUMBER OF PEOPLE USING PUBLIC TRANSPORTATION

Policy Recommendation

- PROTECT TRANSPORT WORKERS
  - KEEPING TRANSPORT PERSONNEL SAFE IS CRITICAL FOR MAINTAINING ESSENTIAL SERVICES.
- SHIFTING DEMAND AWAY FROM PEAK TIMES
  - ENCOURAGING PEOPLE TO SPREAD TRAVEL OUT, SO NOT EVERYONE IS TRYING TO TRAVEL AT ONCE IN RUSH HOUR.
  - INCREASING THE NUMBER OF ROUND IN RUSH HOUR TO DECREASE THE NUMBER OF PEOPLE IN EACH ROUND
- HELPING RIDERS TO MAKE CHOICES THAT ALLEVIATE CROWDING
  - BY PROVIDING INFORMATION ON CROWDING. GIVES INFORMATION ON CARRIAGE CROWDING WHEN BOOKING TICKETS.
- FREE TICKET FOR THOSE WHO ARE FULLY VACCINATED IN ORDER TO ENCOURAGE PEOPLE TO USE MORE OF PUBLIC TRANSPORTATION.