



Day 3 – 2 June 2015(3hrs)

VBA Programming for MIF

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Day 1,2 - RECAP

- **Day 1: Module 1, Module 2 Part 1**

- Record macros
- Implement SUBROUTINE vs. FUNCTION
- Datatype in VBA
 - Primitive: Integer, Single, Double and etc..
 - Object: Workbook, Worksheet and etc..
- VBA Integrated Development Environment, aka IDE(ALT+F8)
 - Project Explorer(Sheets, Modules, Class, Forms and etc..)
 - Properties Windows
 - Immediate Windows
 - Watch Windows
- **Debugging code with F8(Step into), breakpoint, watch window and etc..**

- **Day 2: Module 2 Part 2.1 and 2.2**

- 2.1 Structural Programming – if then else, for loop, error handling
- 2.2 Working with Excel Object – Open /close multiple files, insert/delete multiple sheets

Day 3 – Agenda

- **Module 3 – Data Processing & Cleaning for Financial Research**
 - Aggregate Data from multiple files
 - Insert a new sheet for each data file
 - Aggregate all data from all file in 1 sheet
 - Eliminate un-wanted data
 - Data transformation, from **Time-Series Data** to **Panel Data**
 - Data Processing tips when the data is from
 - **Datastream**
 - **Bloomberg**
 - **Thomson Reuters Eikon Excel**

Module 3

Data Processing & Cleaning for Financial Research

Workshop 1

- Suppose you **HAVE 12 DATAFILES**. You need to import them into a single workbook(create a new sheet for every imported file; hence there will be 12 new sheets)
 - Source files: [Workshop1.zip](#)
- Think! Write down your idea here..
 1. First, I need to get the namelist of those file..(recall Day2, last program?)
 2. Then,..

Workshop 2

- Now, suppose you have many **TimeSeries datafiles**. You need to aggregate them into 1 big table, so that you can later import them into STATA ,SAS or MatLab or Etc...; hence there will be only 1 sheet
 - Source files: [Workshop2.zip](#)
- Think! Write down your idea here..
 1. First, I need to get the namelist of those file..(recall Day2, last program?)
 2. Then,..

Workshop 2.1 – Delete BLANK data

- Form previous problem, you'll see that some stocks are totally **BLANK**. It means that these stock are not **EXISTED** during the downloading period. **DELETE** them..

DATE	R_v	PST	STW0	SPK	RMS	ADCO	ABDT	ITCP	TAKS	APCH	ACES	ACDG	ACCR	EICH	ACOM	ACED	ADW	ADER	APCO	ADVA	ARIC	ARID	ADVM	KTSR	ABQH
1/21/1991	-0.0133	0.12214		-0.00266	-0.15306		-0.01706		-0.08140		-0.0001		-0.0001		-0.0001		0.01183	-0.01065						-0.00011	0.01712
2/04/1991	0.13607	0.18471		0.12107	-0.25053		0.00064		0.1041		0.30023		0.30023		0.30023		0.00716	0.10153						0.14784	0.20163
2/04/1991	0.00253	0.01892		0.01344	0.05411		0.12211		-0.01055		-0.00426		-0.00426		-0.00426		0.12768	0.07579						0.0201	0.1177
4/03/1991	-0.00372	0.01337		0.00866	-0.01406		0.0095		-0.0146		-0.01467		-0.01467		-0.01467		0.01642	-0.06665						-0.01077	-0.0106
5/01/1991	0.00093	0.11442		0.01037	0.00445		0.00337		0.07146		-0.01337		-0.01337		-0.01337		0	-0.0064						0.01146	0.00033
5/08/1991	-0.07708	0.05833		-0.06798	-0.07433		-0.03339		-0.14843		-0.10085		-0.10085		-0.10085		-0.07381	-0.10758						-0.0841	-0.0523
7/01/1991	0.01381	-0.1039		-0.03006	-0.0417		0.01441		0.00666		0.01401		0.01401		0.01401		-0.01355	0.05545						0.01634	-0.04442
8/01/1991	-0.07077	0.07462		-0.01811	-0.16048		0.00118		-0.10725		-0.10725		-0.10725		-0.10725		0.00793	-0.01335						-0.14583	-0.18141
9/01/1991	0.05618	-0.0582		0.00886	0.01106		-0.04787		0.11881		0.17441		0.17441		0.17441		0.07305	-0.03134						0.03053	0.05115
#####	0.01971	0.00386		0.02176	0.119		0.07358		0.10213		0.07513		0.07513		0.07513		0.06266	-0.1653						0	-0.06859
#####	-0.06825	-0.11857		0.01075	-0.0831		-0.01517		-0.18512		-0.14506		-0.14506		-0.14506		-0.14511	-0.05176						-0.10382	-0.11894
#####	-0.00685	0.00485		0.04161	0.0664		0.11881		0.00118		-0.01597		-0.01597		-0.01597		0.05185	-0.03011						-0.00669	0
1/01/1992	-0.03007	0.093		-0.05266	-0.11437		-0.07355		-0.10425		-0.06337		-0.06337		-0.06337		-0.06362	-0.01765						-0.08867	0.11884
2/08/1992	-0.04801	0.1615		-0.10141	-0.04059		0.01404		-0.04155		-0.01116		-0.01116		-0.01116		0.01616	-0.14604						-0.04994	-0.14765
3/01/1992	-0.00153	0.01763		-0.1071	-0.04115		0.00241		-0.00665		-0.07629		-0.07629		-0.07629		-0.04772	0.11597						0.06413	-0.08833
4/01/1992	-0.07981	0.10356		-0.08317	-0.16312		0.06744		-0.10092		-0.10614		-0.10614		-0.10614		-0.10279	0.01013						-0.01985	-0.09494
5/08/1992	0.04371	-0.01764		0.07933	0.23082		-0.0187		0.11274		0.14325		0.14325		0.14325		0.07187	0.04126						-0.01156	0.0774
6/01/1992	-0.10737	0.01777		-0.1537	-0.08862		-0.00706		-0.10563		-0.11766		-0.11766		-0.11766		-0.18016	-0.04869						-0.09385	-0.11347
7/01/1992	-0.01381	0.04185		0.00813	-0.11853		0.05739		-0.07154		-0.08165		-0.08165		-0.08165		0.03965	-0.11883						-0.08711	-0.0827
8/01/1992	0.13783	-0.08021		0.14411	0.11032		-0.08623		0.13451		0.11579		0.11579		0.11579		0.08743	-0.01841						0.13049	-0.0396
9/01/1992	-0.03538	-0.08784		0.11817	-0.05392		-0.11184		-0.07916		-0.01947		-0.01947		-0.01947		0.09399	-0.01511						-0.0861	-0.11587
#####	-0.01448	0.042		-0.05281	-0.01186		0.07009		-0.05515		0.00149		0.00149		0.00149		0	-0.04453						0	-0.03077
#####	0.03415	0.10021		0.01064	-0.03476		0.05862		0.00148		0.00148		0.00148		0.00148		0.10876	0.01151						0.11557	0.01054
#####	-0.01152	0.07171		-0.02624	-0.01006		0.01006		-0.10251		-0.03023		-0.03023		-0.03023		-0.13053	0.18748						0.11512	0.14662
1/05/1993	-0.00874	0.11863		-0.00874	-0.01016		-0.10385		-0.10385		-0.01018		-0.01018		-0.01018		0.03941	0.01001						-0.04101	-0.01101
2/06/1993	-0.01126	-0.0362		-0.0135	0.00255		-0.07909		-0.01267		-0.08724		-0.08724		-0.08724		0.11851	0.0006						-0.01275	-0.02702
3/01/1993	0.10884	-0.03623		-0.01715	0.07814		-0.1087		0.18184		0.14961		0.14961		0.14961		0.01669	0.1706						0.06204	0.11009
4/01/1993	0.11333	-0.08057		0.11778	0.10081		0.0483		0.00689		0.11688		0.11688		0.11688		0.08653	0.15167						0.13016	0.09788
5/01/1993	0.00871	0.11883		0.04818	0.11872		0.00334		0.00739		-0.08516		-0.08516		-0.08516		-0.03684	0.18941						0.13416	0.06965
6/01/1993	-0.03504	0.11888		0.06714	0.16138		-0.05887		-0.08516		-0.11323		-0.11323		-0.11323		-0.07207	-0.14994						-0.05576	0.01908
7/01/1993	0.04518	0		0.08777	0.03548		-0.06938		0.05004		0.04998		0.04998		0.04998		0.01706	0.15617						-0.01812	0.01779
8/01/1993	0.01879	0		0.08073	0.05857		0.00365		0.04615		-0.00615		-0.00615		-0.00615		0.0551	0.11516						-0.06733	-0.08618
9/01/1993	-0.04028	0		-0.08839	-0.15314		-0.03774		-0.02968		-0.06821		-0.06821		-0.06821		-0.08973	0.18154						-0.05505	-0.04901

- Hint: COUNTBLANK

Workshop 2.2 – Delete DEAD stocks

- Next, notice that some stock has a stream of 0, this **PROBABLY** means that these stock are **DEAD** or **UNLISTED**.**DELETE** them as well...

DATE	Rm	FIRT	SSBK	ASAS	ABBT	AP@N	EZ@N	ASDK	ADER	KTSR	AB@N
8/29/2003	0.064522	0	-0.07013	0.057068	0	0	0.020481	0.07994	-0.00394	0.379099	0.203563
9/30/2003	0.016617	0	0.260283	0.074966	0	0	0	-0.05638	0.041629	-0.10627	-0.08569
10/31/2003	0.023821	0	-0.04742	-0.05295	0	0	-0.00678	-0.00883	-0.09751	0.039929	0.100087
11/28/2003	-0.0427	0	0.006933	-0.25906	0	0	-0.0926	-0.03618	-0.07863	-0.14756	-0.04495
12/31/2003	0.043013	0	0.040485	-0.01428	0	0	0.014817	0.018247	-0.06697	0.127732	0.082101
1/30/2004	0.003653	0	-0.08095	0.170415	0	0	0.323777	0.060175	0.093705	0.202131	0.034679
2/27/2004	0.03283	0	0.062603	0.011932	0	0	0.184097	0.002422	0.154489	0.029071	-0.07919
3/31/2004	0.085616	0	0.096059	0.269666	0	0	-0.00444	0.092382	0.113686	0.070059	0.050917
4/30/2004	0.005986	0	0.021378	-0.0091	0	0	-0.09936	0.01109	-0.09574	-0.04885	-0.01654
5/31/2004	-0.03987	0	0.011946	-0.08616	0	0	-0.005	0.031469	0.028617	-0.0366	-0.11081
6/30/2004	0.042641	0	0.101756	0.095262	0	0	0.053542	0.151405	0.019312	-0.03964	-0.027
7/30/2004	-0.0432	0	-0.05807	-0.1155	0	0	-0.08399	-0.05086	-0.0324	-0.18677	-0.11437
8/31/2004	-0.00859	0	-0.06468	-0.01022	0	0	-0.05837	0.012479	-0.07113	0.020171	0.065306
9/30/2004	-0.02459	0	-0.05625	0.161491	0	0	-0.06199	-0.04798	0.037356	-0.10272	-0.05698
10/29/2004	-0.01525	0	0.019186	0.198217	0	0	0.011572	-0.06125	0.006789	-0.07553	0.123372
11/30/2004	0.012233	0	0.059958	0.028417	0	0	-0.00578	0.061251	0.031456	-0.02912	0.035784
12/31/2004	0.045231	0	0.073337	-0.0212	0	0	0.028507	0.061514	0.04527	0.08464	0.134991
1/31/2005	-0.00304	0	0.039416	0.133531	0	0	0.106475	0.063296	0.012585	0.065396	-0.01489
2/28/2005	0.026917	0	-0.01472	0.095274	0	0	0.063582	-0.00446	0.038608	0.130313	0.046255
3/31/2005	0.004043	0	0.053762	-0.05248	0	0	-0.00502	-0.00274	-0.08426	-0.01763	-0.09543
4/29/2005	-0.0452	0	-0.08731	-0.14818	0	0	-0.07003	-0.05372	0.102338	-0.07896	-0.10509
5/31/2005	0.012664	0	-0.03875	0.027371	0	0	0.025579	0.063584	0	-0.10829	0.100218
6/30/2005	0.028319	0	-0.00289	0.132734	0	0	0.015031	0.052191	0.040827	0.112424	0.001227
7/29/2005	0.023324	0	-0.03118	0.494092	0	0	0.071979	-0.03011	0.039225	0.020157	0.094307
8/31/2005	0.053569	0	0.128784	0.003629	0	0	-0.03294	0.074047	-0.05184	-0.09445	-0.04082
9/30/2005	0.105173	0	0.105697	-0.13455	0	0	0.073756	0.083364	0.187468	0.028266	0.021275

- Hint: COUNIF

You'll need to count how many zero at **the last 60 trading days**...if there is more than **30** of zero, may be we can safely assume this stock is DEAD....
(Note: 30 of 60 or 50% of zeros number? This is subject to your judgment)

3 Data Type in Econometric

- Time Series Data, the t subscript

- Data of 1 company in many time(t) period

Don't get confused, this is basically a time-series of price/volume data of 1 company, sitting side by side with another company

Date	AAPL	GOOG	BAC
8/28/2014	102.25	569.2	16.01
8/27/2014	102.13	571	16.2
8/26/2014	100.89	577.86	16.33
8/25/2014	101.54	580.2	16.29

Date	AAPL	GOOG	BAC
8/28/2014	68,389,800	1,289,400	61,862,400
8/27/2014	46,827,400	1,698,700	62,651,300
8/26/2014	33,119,800	1,635,200	73,164,900
8/25/2014	40,144,700	1,357,700	88,818,400

- Cross-sectional Data, the i subscript

- Data of many company(i) in 1 time period

Time	Stock	Price	Volume
8/28/2014	AAPL	102.25	68,389,800.00
8/28/2014	GOOG	569.2	1,289,400.00
8/28/2014	BAC	16.01	61,862,400.00

Time	Stock	Price	Volume
8/26/2014	AAPL	100.89	33,119,800.00
8/26/2014	GOOG	577.86	1,635,200.00
8/26/2014	BAC	16.33	73,164,900.00

Time	Stock	Price	Volume
8/27/2014	AAPL	102.13	46,827,400.00
8/27/2014	GOOG	571	1,698,700.00
8/27/2014	BAC	16.2	62,651,300.00

Time	Stock	Price	Volume
8/25/2014	AAPL	101.54	40,144,700.00
8/25/2014	GOOG	580.2	1,357,700.00
8/25/2014	BAC	16.29	88,818,400.00

3 Data Type in Econometric

- Panel Data, the *it* subscript
 - Cross-Sectional+Time Series altogether

Time	Stock	Price	Volume
8/28/2014	AAPL	102.25	68,389,800.00
8/28/2014	GOOG	569.2	1,289,400.00
8/28/2014	BAC	16.01	61,862,400.00

Time	Stock	Price	Volume
8/27/2014	AAPL	102.13	46,827,400.00
8/27/2014	GOOG	571	1,698,700.00
8/27/2014	BAC	16.2	62,651,300.00

Time	Stock	Price	Volume
8/26/2014	AAPL	100.89	33,119,800.00
8/26/2014	GOOG	577.86	1,635,200.00
8/26/2014	BAC	16.33	73,164,900.00

Time	Stock	Price	Volume
8/25/2014	AAPL	101.54	40,144,700.00
8/25/2014	GOOG	580.2	1,357,700.00
8/25/2014	BAC	16.29	88,818,400.00

Sort By Time

Time	Stock	Price	Volume
8/28/2014	AAPL	102.25	68,389,800.00
8/28/2014	GOOG	569.2	1,289,400.00
8/28/2014	BAC	16.01	61,862,400.00
8/27/2014	AAPL	102.13	46,827,400.00
8/27/2014	GOOG	571	1,698,700.00
8/27/2014	BAC	16.2	62,651,300.00
8/26/2014	AAPL	100.89	33,119,800.00
8/26/2014	GOOG	577.86	1,635,200.00
8/26/2014	BAC	16.33	73,164,900.00
8/25/2014	AAPL	101.54	40,144,700.00
8/25/2014	GOOG	580.2	1,357,700.00
8/25/2014	BAC	16.29	88,818,400.00

Sort By Stock

Time	Stock	Price	Volume
8/28/2014	AAPL	102.25	68,389,800.00
8/27/2014	AAPL	102.13	46,827,400.00
8/26/2014	AAPL	100.89	33,119,800.00
8/25/2014	AAPL	101.54	40,144,700.00
8/28/2014	BAC	16.01	61,862,400.00
8/27/2014	BAC	16.2	62,651,300.00
8/26/2014	BAC	16.33	73,164,900.00
8/25/2014	BAC	16.29	88,818,400.00
8/28/2014	GOOG	569.2	1,289,400.00
8/27/2014	GOOG	571	1,698,700.00
8/26/2014	GOOG	577.86	1,635,200.00
8/25/2014	GOOG	580.2	1,357,700.00

Workshop 3

- Convert Time-Series to Panel Data

- Source files: [Workshop3](#)

DATE	Market	SSBK	ASAS	EZ@N	ASDK	ADER	KTSR	AB@N
1/31/1991	-0.0133	-0.00396	-0.15208	-0.09051	0.011832	-0.32285	-0.08011	0.017235
2/28/1991	0.136071	0.121068	0.350631	0.360246	0.057158	0.291533	0.24784	0.291934
3/29/1991	0.005296	0.01344	0.054105	-0.00438	0.127681	0.075782	0.020099	0.117698
4/30/1991	-0.00372	0.088963	-0.01406	-0.03467	0.01942	-0.06865	-0.03107	-0.0296
5/31/1991	0.000687	0.010572	0.008457	-0.02327	0	-0.02884	0.01148	0.050235
6/28/1991	-0.07708	-0.08798	-0.07433	-0.10066	-0.07381	-0.10758	-0.09841	-0.0632
7/31/1991	0.021811	-0.03506	-0.0417	0.024015	-0.01355	0.055448	0.01624	-0.04442
8/30/1991	-0.07077	-0.01811	-0.16049	-0.10725	0.007316	-0.25235	-0.14383	-0.18141
9/30/1991	0.056183	0.089858	0.011063	0.174413	0.073047	-0.03134	0.030531	0.052153
10/31/1991	0.029709	0.032765	0.119005	0.075131	0.092659	-0.1653	0	-0.06695
11/29/1991	-0.08635	0.010749	-0.08834	-0.14606	-0.14651	-0.06226	-0.10322	-0.12998
12/31/1991	-0.00965	0.04161	0.096436	-0.02597	0.091951	-0.03931	-0.00669	0
1/31/1992	-0.05007	-0.05236	-0.11437	-0.06337	-0.08582	-0.02785	-0.08867	0.118842
2/28/1992	-0.04801	-0.10181	-0.04059	-0.01128	0.018157	-0.14604	-0.04994	-0.14765

Date	Stock	Price
1/31/1991	Market	-0.013296
2/28/1991	Market	0.1360706
3/29/1991	Market	0.0052963
4/30/1991	Market	-0.003716
5/31/1991	Market	0.0006873
1/31/1991	SSBK	-0.003956
2/28/1991	SSBK	0.1210677
3/29/1991	SSBK	0.0134395
4/30/1991	SSBK	0.0889627
5/31/1991	SSBK	0.0105723
1/31/1991	ASAS	-0.152083
2/28/1991	ASAS	0.3506313
3/29/1991	ASAS	0.0541051
4/30/1991	ASAS	-0.014056
5/31/1991	ASAS	0.0084574
6/28/1991	ASAS	-0.074326
1/31/1991	EZ@N	-0.090509
2/28/1991	EZ@N	0.3602464
3/29/1991	EZ@N	-0.004382
4/30/1991	EZ@N	-0.034668
5/31/1991	EZ@N	-0.023275

- Hint

- You should name "DATESERIES", becoz you will reuse it quite a lot for copy paste
- You can also count how many row in a range selection for e.g. Range("DATESERIES").Rows.Count

Data Processing: DataStream

- Source files: [Sample Datastream Indo.xlsm](#)
 - **Data Summary:** The files contains 4 sheets: price(P),total price(RI),market value(MV) and the list of ordinary equity
 - Things to clean
 - Delete all ERROR, NODATA stock
 - Delete all that IS NOT ordinary stock
 - Delete all “NA”, “\$\$ERR” and etc.
 - Then
 - Rename all column to the stock name, e.g. ID:WHU(P)→WHU
 - Since each sheet represent different fundamental data, save each sheet to new CSV file...(CSV can be imported by many other program such as SAS, STATA, MatLab and etc..)
 - Macro
 - RunAll_Loop

Data Processing: Bloomberg and Eikon

- Pretty much the same logics from the previous programs can handle the data from both **Bloomberg** and **Eikon**
 - Bloomberg : <https://db.tt/QMCTacEF>
 - Eikon: <https://db.tt/dzGQnoxA>
- The missing values... what to do with it?
 - Either 1) delete the whole line of observation or, 2) replace with the previous price, or 3) consolidate them
 - **SAS PROC EXPAND/TIMESERIES** can do it with 4 line of code..

Obs	time	FES	FSP	SPY
868	10:00:04	1378.50	.	.
869	10:00:06	1379.75	.	.
870	10:00:07	1379.50	.	.
871	10:00:08	.	1379.50	.
872	10:00:13	1378.25	.	.
873	10:00:15	1379.00	1379.80	.
874	10:00:18	1378.25	.	.
875	10:00:19	.	1380.00	.
876	10:00:22	.	.	1380.78
877	10:00:23	1378.00	.	.



```
PROC EXPAND DATA=PRICES_TS
  OUT=PRICES_TS_FULL TO=SECOND METHOD=STEP;
  ID TIME;
  VAR FES FSP SPY;
RUN;
```

```
PROC TIMESERIES DATA=PRICES_TS
  OUT=PRICES_TS_5MIN;
  ID TIME INTERVAL=MINUTE5 ACCUMULATE=AVERAGE;
  VAR FES FSP SPY;
RUN;
```

Convert Time-Series to Panel Data Using SAS

VIEWTABLE: Work.Prices_ts2

	DATE	Market	SSBK	ASAS	EZ_N	ASDK	ADER	KTSR	AB_N
1	01/31/1991	-0.013295752	-0.003955793	-0.152082963	-0.090509156	-0.011831768	-0.322846796	-0.080105235	-0.017234766
2	02/28/1991	0.136070643	0.121067705	0.350631333	0.360246351	0.057158414	0.291533083	0.247840129	0.291934141
3	03/29/1991	0.005296307	0.013439546	0.054105132	-0.004382187	0.127680726	0.07578223	0.020098654	0.117698171
4	04/30/1991	-0.003716182	0.088962663	-0.014056143	-0.034668129	0.019419573	-0.068650663	-0.031070951	-0.029600106
5	05/31/1991	0.000687339	0.010572295	0.008457372	-0.023274906	0	-0.0288386	0.011479719	0.050234981
6	06/28/1991	-0.077082793	-0.087894670	-0.074235337	-0.105651995	-0.073812135	-0.107576256	-0.098403461	-0.063198173
7	07/31/1991	0.02181086	-0.035058941	-0.041695929	0.024014876	-0.013552921	0.055447549	0.015424207	-0.044424927
8	08/30/1991	-0.070768712	-0.018107664	-0.160493437	-0.10724553	0.007316028	-0.252354597	-0.143831896	-0.181408506
9	09/30/1991	0.056182885	0.089857989	0.011063394	0.174412767	0.073046792	-0.031340002	0.030530747	0.052153144
10	10/31/1991	0.029709281	0.032764763	0.11900478	0.075131427	0.026599217	-0.16529843	0	-0.066950559
11	11/29/1991	-0.08535414	0.010749274	-0.085343441	-0.1405959	-0.148511874	-0.062260788	-0.103221111	-0.12998116
12	12/31/1991	-0.00964097	0.041610081	0.096435555	-0.029374805	0.091950565	-0.03930637	-0.006690136	0
13	01/31/1992	-0.050069939	-0.052359355	-0.114365849	-0.063371022	-0.08820437	-0.02785276	-0.088671336	0.118842033
14	02/28/1992	-0.04809018	-0.101806189	-0.040591102	-0.01128185	0.018156852	-0.146041157	-0.049938086	-0.147647218
15	03/31/1992	-0.09153443	-0.107200379	-0.040151301	-0.078589734	-0.047715769	0.225966418	0.064130668	-0.068345474
16	04/30/1992	-0.073908434	-0.051650597	-0.16311582	-0.13913917	-0.323730913	0.020230896	-0.019850639	-0.09494267
17	05/29/1992	0.04370763	0.078219403	0.228624341	0.143282811	0.07286769	0.041353886	-0.012562023	0.077400445
18	06/30/1992	-0.107371112	-0.155702271	-0.089165669	-0.157579259	-0.180163641	-0.048889573	-0.052051392	-0.112467706
19	07/31/1992	-0.013806243	0.00623055	-0.218534344	-0.082649768	0.039654574	-0.118827422	-0.087706894	-0.08270282
20	08/31/1992	0.127832387	0.144108527	0.210317593	0.11574882	0.057421832	-0.01341243	0.130489172	-0.039598539
21	09/30/1992	-0.055583255	0.118172641	-0.052919445	-0.062866611	0.09339027	-0.015206375	-0.086097217	-0.115874378
22	10/30/1992	-0.024476995	-0.062912476	-0.021962975	0.002491032	0	-0.044625079	0.219571093	-0.030773787
23	11/30/1992	0.034158248	0.012641004	-0.024767551	0.024049482	0.103761527	0.022510329	0.125121549	0.020643652
24	12/31/1992	-0.01192712	-0.058244878	-0.016079911	-0.030233549	-0.130531393	0.027475951	0.042213801	0.146831722
25	01/29/1993	-0.006736926	-0.006737944	-0.052262098	0.010179751	0.036409868	0.022019238	-0.042213801	-0.031313831
26	02/26/1993	-0.011358611	-0.013495481	0.03358869	-0.087241588	0.118521387	0.000604778	-0.032746435	-0.037021613
27	03/31/1993	0.108817539	-0.01715962	0.07514451	0.143950591	0.016932701	0.370640884	0.083038578	0.222087215
28	04/30/1993	0.123923402	0.117783036	0.100913412	0.155875157	0.086528706	0.315870339	0.159195706	0.09737784
29	05/31/1993	0.009707234	0.048179477	0.418718917	0.075426809	-0.036842585	0.269409011	0.134158011	0.069648818
30	06/30/1993	-0.035037857	0.062742468	0.16237803	-0.113247838	-0.07207029	-0.149936729	-0.055761093	0.019082349

	DATE	STOCK	PRICE
1	01/31/1991	AB_N	0.017234766
2	02/28/1991	AB_N	0.291934141
3	03/29/1991	AB_N	0.117698171
4	04/30/1991	AB_N	-0.029600106
5	05/31/1991	AB_N	0.050234981
6	06/28/1991	AB_N	-0.063198179
7	07/31/1991	AB_N	-0.044424927
8	08/30/1991	AB_N	-0.181408506
9	09/30/1991	AB_N	0.052153144
10	10/31/1991	AB_N	-0.066950559
11	11/29/1991	AB_N	-0.12998116
12	12/31/1991	AB_N	0
13	01/31/1992	AB_N	0.118842033
14	02/28/1992	AB_N	-0.147647218
15	03/31/1992	AB_N	-0.068345474
16	04/30/1992	AB_N	-0.09494267
17	05/29/1992	AB_N	0.077400445
18	06/30/1992	AB_N	-0.112467706
19	07/31/1992	AB_N	-0.08270282
20	08/31/1992	AB_N	-0.039598539
21	09/30/1992	AB_N	-0.115874378
22	10/30/1992	AB_N	-0.030773787
23	11/30/1992	AB_N	0.020643652
24	12/31/1992	AB_N	0.146831722
25	01/29/1993	AB_N	-0.031313831
26	02/26/1993	AB_N	-0.037021613
27	03/31/1993	AB_N	0.222087215
28	04/30/1993	AB_N	0.09737784
29	05/31/1993	AB_N	0.069648818
30	06/30/1993	AB_N	0.019082349

```
PROC TRANSPOSE DATA=PRICES_TS2
OUT=PRICE_PANEL(RENAME=( _NAME_=STOCK COL1=PRICE)) ;
VAR AB_N ADER ASAS ASDK EZ_N KTSR MARKET SSBK;
BY DATE;

RUN;

PROC SORT DATA=PRICE_PANEL; BY STOCK;RUN;
```

Recommendations...

- Microsoft Online Training
 - <http://office.microsoft.com>
- Excel Quick Tips Videos
 - www.contextures.com
- Advanced VBA Excel Programming
 - www.cpearson.com
- Excel VBA & Macros Tips & Techniques
 - www.ozgrid.com/VBA/



End of The Show!
Thank You
Siraprapa Watakit

