



Teacher tunes in to Dow

Mylon Schwager looks at the Dow Jones Industrial Average and hears music. No kidding.

"The market is playing a tune," insists the Hartt School of Music professor, who has a system for charting stock market trends by using musical ratios.

"Music's base is mathematical," Schwager said, so he thinks there's nothing unusual about his system.

When the market is gaining or declining, Schwager sees voice ranges instead of bulls and bears to describe its behavior.

He compares a soaring Dow, for instance, with a *coleratura soprano* singing trills.

But the slip-slop-doodle of the Dow Jones average in recent days has him worrying that he might soon be hearing the market singing *basso profundo*.

How does a professor of ornithology come to the stock market?

"When I was studying for my doctorate at Harvard in the 1950s, I was doing so much trading (buying and selling stocks) that Entabrook gave me a desk in its Cambridge office," Schwager said, referring to the brokerage house of Entabrook & Co., now part of Moseley Securities Corp.

Obviously, Schwager was not your usual graduate student.

How did he finance his trading career?

"My wife was working," he said. "And I used to play night and weekend gigs." His instrument in the celli and while he was at Harvard he was the principal cellist with the Springfield Orchestra.

"I've never had as much money as I had then," Schwager said about his Harvard days.

He has been teaching at Hartt, which is part of the University of Hartford, for 14 years.

"I don't own a single stock now," he said, but that's not because he is hearing sour music from the stock market.

"I bought a house in Bloomfield," Schwager said, and he sold off his stock portfolio to help pay for it. One of the stocks he sold was Genber Scientific Inc. in South Windsor. "I sold 1,100 shares and if I had held it for another year, I would have made \$55,000."

He is philosophical about that experience, however. "The house is worth \$100,000 more than when I bought it," he said.

See Walling, Page C2

Byron Schwager, a professor at the University of Hartford's Hartt School of Music, developed during his college days a system of using musical ratios to chart the stock market's performance.

Waiting for Dow average to sing along in key of C

Continued from Page C1

"Schwager developed his system of using musical ratios to chart the stock market during his Cambridge days.

"I was a technical analyst. I charted," he said. A technical analyst will study price and volume trends of a stock to hopes of predicting price movements. They use charts to plot performance and projections.

"Fundamental analysis, on the other hand, we (financial statisticians) work at the conditions of a company's balance sheet and earnings history, to assess whether a stock is overvalued or undervalued.

Then there is unsophisticated stock analysis, which attempts to track where the stock market is going by measuring the length of Dow bars or by whom National Football League conference wins the Super Bowl.

"I believe that music is related to that about anything you can imagine," Schwager said. "For example, if you read market writers, so many of them are people who use mathematics."

He discovered in looking at the market's major highs and lows that they topped out or bottomed out at musical ratios based on mathematics.

These ratios were established by Pythagoras, the same Greek who also gave us the Pythagorean theorem in geometry. With Pythagoras on his side, Schwager continued on.

"There are certain intervals in music, the distance between pitches, and they're mathematical; they have definite, simple mathematical ratios," he said.

What I was doing was plotting a time the market was playing and it's my conviction the Dow has been playing a tune which I plotted back to 1942, the significant beginning of this great bull market.

So let's go back to 1942 and pick up on Schwager's charting.

"Since the Dow, between 1942 and 1971, moved up and down in multiples of 14 points, we need merely divide this constant figure into the difference between 85, the low in 1942 and analogous to C in our scale, and any given peak or valley to determine the ratio to the pitch of C," Schwager said.

He goes on: "Starting at 43 (or C), the first step of the bull market was completed in 1944 at a peak of 123, a rise of 102 points."

This figure was exactly 8 times the constant of 14, producing a ratio to C of 8:1 and sounding another C in a higher octave.

This was an coincidence to Schwager.

"The subsequent reaction saw the Dow drop to 415, down 124 points (2 times 62)."

By November 1945, the index had risen to 515, "exactly one octave above its previous low and therefore in the pitch of G."

Schwager said the reaction was "sharp" and in 1942, the Dow had very sharp end. In 1942, the Dow had

ended at 100, the C sounded previously in 1934.

In its peaks and valleys, Schwager found a preference for the pitches of C and G, "the first and fifth degrees, respectively of the scale of C."

In this and other respects, the Dow has proceeded in the same way composers of the Western world have since the 17th century," Schwager said.

OK, but how about something more current?

Schwager says there was a very significant recession Nov. 23, 1961, when the Dow reached a new high of 1,247. This was 1,194 points above the low of 10 (in 1942) and "exactly six points in excess of 19 (times) 64, or the pitch of F."

The time that since 1942 has been played by the Dow has been fluctuating mainly between the pitches of C and G," Schwager said, and finally made a decisive move to F in 1961.

The significance of this is that "in virtually every piece of local music written since the 17th century, composers have moved to the fourth degree of the scale, shortly before the end."

But we know that the bull market didn't come to an end in 1961. It has continued to rush on, eventually hitting a high of 1,522.62 last month.

In 1964, when the Dow was down around 1,100, Schwager said he calculated that "somewhere in 1964 or 1965 the market was going to hit 1,500."

"It would top out at the note G, which I call the dominant, and indeed it hit this level, although it went slightly higher to 1,578, but all that really is in my figures is a slightly out of tune G, maybe a sharp G."

Schwager, in a bit of hedging on his system, reminds that "all instruments are not tuned according to the same system and the pitch used by orchestras in tuning does not always exactly adhere to the same number of vibrations per second."

Granted. But what's ahead?

"Now I'm looking for what is called the tonic in music," he said. "I'm looking for the note C," a downward movement. But he doesn't know how far down, he concedes.

For investors with true pitch, this might be disastrous and Schwager cautions that "this is not the most beautiful time in the world but it follows all the rules of Western music."

Schwager said he is a bit confused about where the Dow, which Wednesday fell 24.25 points to close at 1,522.15, is going.

"I'm not as confident now as I was people where it's headed, as I was over the last few years," he said.

"It's hard to know what octave that C is in," he said. Based on the G of the Dow at 1,600, the next C down is 1,225, a decline of 415, which is 8 times 54, or a ratio of 8:1.

Schwager



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9/22/87

Mr. Don Sondergeld
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Dear Mr. Sondergeld:

Enclosed, find a copy of the promised article. I think answers to your questions may be found in my relative vibrations scale and the ratios to C. If there is any error in my thinking, all I can say is that it has worked thus far. The final tonic is to be sought at 2253, or whatever I told the reporter. If that doesn't hold, the next octave down is in the 1800's; the worst case would be 957 (if our balance of payments continues to get worse and inflation takes off again). Notice that a trendline, drawn along the low points of my tune chart would be ultimate support for a 957 reading (maybe a year or two from today).

If things happen fast, and the market shoots up here, my 2685 figure (or 2722, sharp g) might appear to be a blip rather than a major top. If that is the case, the next G is at 3333 in the Dow. That would, of course, be an extraordinary climax to an otherwise, fairly orderly Dow; perhaps this is why, three years ago, I saw 2685 as a selling point. As it turns out, anyone would have been happy to have sold there.

Thank you for calling. Do not hesitate to do so again.

Sincerely,


Myron Schwager

$(2592)(2) = 5184 + 93 = 5277$ is next G

$$\begin{array}{r} 3333 \\ -93 \\ \hline 3240 \end{array} \div 2592 = \frac{5}{4} \Rightarrow 3333 \text{ is } \underline{\underline{B}}!$$

MUSICAL DOW

Myron Schwager
ANSA, CT
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Where is the market headed?

According to advertisements by market advisory services, it is going up or it is going down. Bulls claim it is headed north—bears, that it is moving south of the border. Observers who expect it to shift sideways do not tend to advertise their belief, since such markets rarely excite the imagination let alone open many purse strings. The seriousness with which subscribers view market prognostications varies tremendously; while some get wholly involved in the mathematics of their favorite guru and follow him to the often bitter end, others seek simpler clues to market direction, such as the outcome of the Superbowl or, over the longer term, the direction of ladies' hemlines.

Though one might be amused at the thought of a person, intently viewing the final minutes of the Superbowl as a prelude to a weekend phone call to his broker, the most outrageous methods of making market decisions have often been the ones which have paid off the most. Experts have noted that since the Superbowl was founded in 1967, it has been an almost perfect market indicator: When the National Conference team wins, the Dow heads higher. When the American Conference team wins, the Dow plummets.

Widespread awareness of the Superbowl theory suggests that a profit-oriented audience would surely entertain yet another preposterous theory if it worked. Let us consider that of the musical Dow. The theory is that there is a direct relationship between the rises and tumbles of the Dow Jones Industrial Average and the mathematics of music. The market is playing a tune, and if we can simply identify it, we can complete it in advance, cashing in on market profits.

The ancient Greek mathematician, Pythagoras, showed that the intervals used in music (distance bet-

ween two pitches) can be expressed in simple whole number ratios of the numbers of vibrations of the pitches in question. The octave (eight consecutive pitches apart, for example, C - C) has the ratio 2:1; the fifth (five consecutive pitches apart, C - G), 3:2; the fourth (four consecutive pitches apart, C - F), 4:3, etc. Similarly, anyone even slightly familiar with stock market theory has observed that simple ratios are fundamental to the market's internal behavior. Examples of this would include the many times in which the market at major highs has doubled previous major lows, or at lows, has cut highs in half. The simple ratio involved in these very common cases is 2:1, the same as that expressed in music by the octave.

With the aid of a simple C Major scale and an indication of the relative vibrations of each pitch, relationships between music and the market are easily shown. When a price or an average doubles (48/24), it is sounding an octave above its starting point (2:1). When it makes a halfway move, it is sounding the fifth pitch, as G in the C scale, whose vibrations are halfway between the C below and the C above.

Using the following scale, we are able to correlate peaks and valleys of the Dow with specific pitches and thereby decipher the tune which it has been playing.

pitch	C	C	D	E	F	G	A	B	C	D	E	F	G
vibrations	12	14	16	18	20	24	27	30	32	36	40	48	72
times to C	1	2	3	4	5	6	7	8	9	10	11	12	

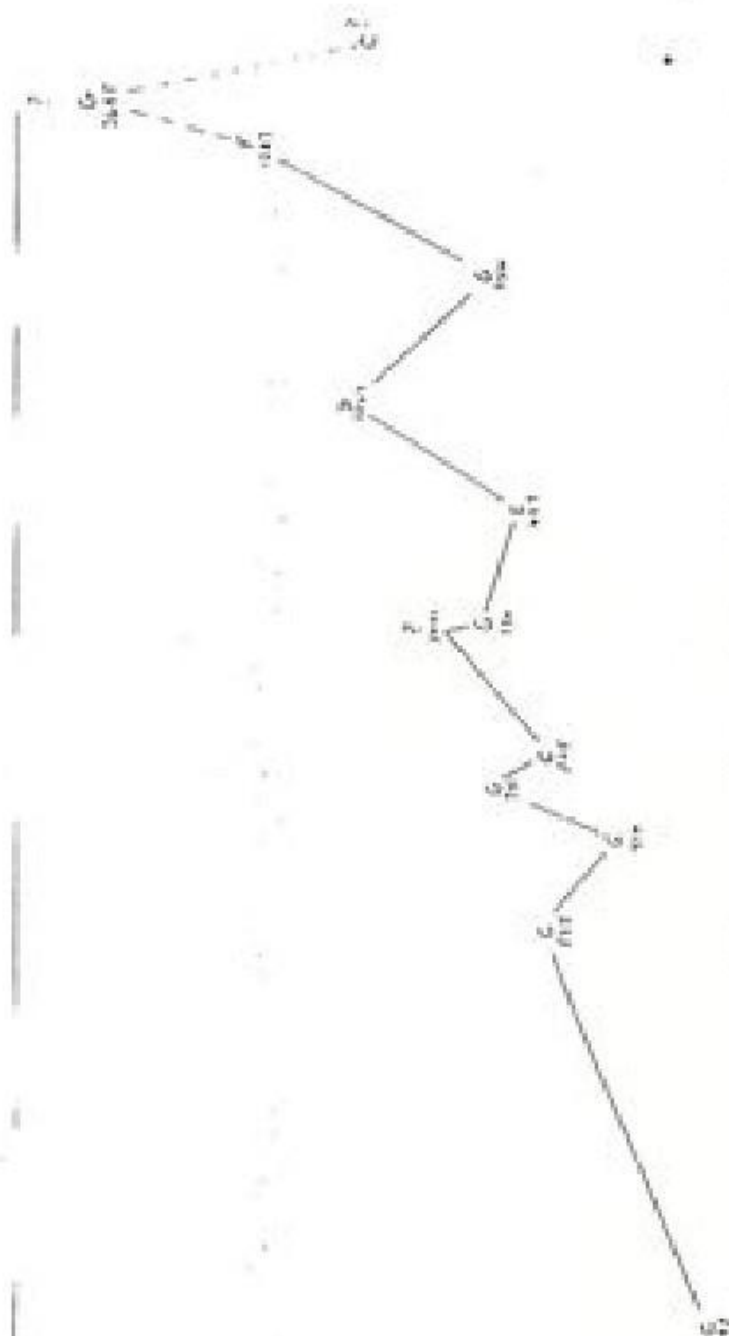
Since the Dow, between 1942 and 1973, moved up and down in multiples of fifty-four points (an observation for which we thank investment advisor Elton Gould), we need merely divide this constant figure into the difference between 93, the low in 1942 and analogous to C in our scale, and any given peak or valley to determine the ratio to the pitch of C. Starting at 93 for C, the first step of the bull market was completed in 1956 at a peak of 525, a rise of 432 points. Could it be a coincidence that this figure is exactly eight times our fifty-four constant, producing a ratio to C of 8:1 and sounding another C in a higher octave? The subsequent reaction saw the Dow drop to 416, down 109 points (2 x 54). At this juncture, the Dow was 323 points above its 1942 starting point. In terms of musical vibrations, the Dow had moved in its reaction low to the pitch of G or 6 x 54. The next rise took the DJIA to 741 by November 1961, exactly one octave above its previous low and therefore to the pitch of C. The following reaction was very sharp and, in 1962, the average had returned to the 525 level or—in musical terms—the C sounded previously in 1956. (See Chart).

The market in its peaks and valleys has shown a distinct preference for the pitches of C and G, the first and fifth degrees respectively of the scale of C. In this and other respects, the Dow has proceeded in the same way composers of the Western world have since the seventeenth century. A particularly significant correlation was achieved on Nov. 28, 1983, when the DSI reached an all-time closing high of 1287. This figure, 1194 points above the low of 93, is only six points in excess of 22×54 , or the pitch of F. The tune that since 1942 has been played by the Dow has been fluctuating mainly between the pitches of C and G, but it has finally made a decisive move to F. In virtually every piece of tonal music written since the seventeenth century, composers have moved to this fourth degree of the scale, shortly before the end. If the musical Dow is to fulfill the remaining expectations of tonal music, it will soon move to the fifth degree (G) and come ultimately to rest where it started, on the first degree, C.

Before we get lost in abstractions, what does all this mean in terms of playing the market? Since we are now in what sophisticated observers refer to as an up-leg, our anticipated pitch of G could be achieved at 2037 in the average ($13 \times 12 \times 54$ or $1944 + 93$), or possibly even at 2685 ($4 \times 12 \times 54$ or $2592 + 93$). If these levels are considerably in excess of the 1400 Dow which many advisers had been looking for sometime last year, it is probable that they have not been listening to our tune. Whatever the case, the market over the near term is headed higher, rather than lower.

But the fact that the tune should come to an end on C, sometime after our higher figure (probably in '86 or early '87) causes one to ponder. When the final chord is sounded, perhaps the DSI will no longer be considered a useful index. Already known to give an inexact picture of the economy as a whole, perhaps it will be relegated to the pages of financial history. Or maybe the Dow has a store of tunes from which it will start to play us a new one. Fortunately, we should not have to wait more than a few years to find out. For now, buy the Dow and sell at 2037. If it goes higher, buy back in and wait for 2685. When the tune is over, there will be time to plan further strategies.

Though all peaks and valleys up to the present have not been so well in tune, and some have even failed to follow the score, the number of points of correlation to patterns found in Western music for centuries is astonishing. If the ratios are not invariably precise, it should be pointed out that all instruments are not tuned according to the same system and that the pitch used by orchestras in tuning does not always exactly adhere to the same number of vibrations per second.



①

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September 25, 1987

Re: Musical Dots

Dear Myron

Thank you for your article on the dots. It was much better than the article in the Statistical Current.

I do have some questions and comments.

First look at Table I which shows the ratios of the frequency of various notes.

I expect you are familiar with these ratios.

Next look at Table II in which I attempted to reproduce what you

had done for C and G . Although I think 93 can represent anything you want

it to represent, I reproduce the C major scale at 93, at 525

and the G at 417⁷⁴¹, and 2685.

①

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Re: Musical Don

Dear Myron

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had done for Court G. Although I think you can request anything you want

it to request, I reproduce the Ci major scale at 43, and 525

and the Gi at 117, and 2685.

②

1. However, you had a 1001 in your chart as a high for 1966.

This would be $1001 - 93 = 908$ which divided by 364 is the "Cable Day" column

along with E, yields $908 \div 364 = 2.5$. Since before C, I must be

$(1/6)(364) = 60.666$ then 908 (or 1001) is $\frac{908 - 60.666}{364 - 60.666} = \frac{847.334}{303.334} = 2.8$ or

about $\frac{1}{3}$, so 1001 represents approximately C* (C-bar) Is that

why you had the question mark?

2. You had an E in 1970 that looks like 627. To get E, I would take

C, $843 \times 1.25 = 1053.75$ and add 93 = 1146.75 which is very close to 627, so

I would ^{also} call 627 an E.

3. In 1973 you had a D above in your chart of over 1000. I would take C =

$864 \times \frac{1}{6} = 144$ and add 93 and get 237. I guess this is very close

to 1048 (but in 1973 as I had trouble reading this).

4. In 1975 you had an F of 1207. I think C = $864 \times \frac{1}{3} = 288$, add 93,

and get 381 which is close to 1207 than to 1389 which G. It's a slightly high F as

③

it is $\frac{1273-1244}{1289-1244} = \frac{29}{45} = .29$ or about $\frac{1}{3}$ of the way from E to G.

4. On the second page of your article you mention in the second paragraph "... G could be achieved at 2037 ... or possibly even

at 2025..." I have no problem with G being represented by

2025 - but 2037? $2037-93 = 1944$, $1944 \div 1728 = \frac{1}{4}$ which

is E! I think some words are missing in that paragraph.

5. Look at ~~Table I~~ Table II. You could have written your article with

it being internally consistent at least 5 ways. One way is the way

(2)

Is the call a C interest or am I really showing
my ignorance?

6. How long does it take money to double at a fixed rate of
interest? Well $1(1+i)^n = 2$. Using logarithms we

get a good approximation of $n \approx \frac{69}{100i}$ or $\frac{70}{100i}$. If i

is 10%, it takes about 7 years for this to happen. If i

is 14%, it takes about 5 years, etc.

The market will probably double, double again, and again, and again, etc.

over a long period. The big question as you know is when does it
stop going up and stop going down.

I mentioned I had both of Prechter's books on Elliott wave theory

- which I don't understand as I don't know how to recognize

"peaks and valleys". It reminds me of climbing a mountain and

thinking I had reached the peak, or rather had approached

⑤ the peak, only to find the lake summit I had been looking at was hiding from my view a higher peak behind it and a small valley. It was only after I had climbed the same mountain more than once that I knew where the real peak was. They say head sight is wise.

Not having all of the Dow statistics, I couldn't check to see if others would have drawn the chart the way you did in your article. In other words, I don't know if you saw whatever you wanted to see. I'm not trying to point out any error in your chart - but simply raising the question of did you see what you wanted to see? Related to this rambling is why did you show the 730 G in 1966 when the Dow had a lower figure of 627 in 1970?

7. As to listening to the team the Dow is playing
 to predict the market - I didn't follow the ^{part to the} last
 paragraph in your article. Presumably the Dow was at
 1257^F when you wrote the article. Why buy at 1257^F , sell
 at 2037^E and if you higher buy in, and then sell at 2005^G ???
 Obviously I missed the point you were making.

8. When I first read the article (which is at all written) in the
 Harvard Current (but not interesting) - you did mention a change

G of 2720. If G is 2685^G , then A is $(\frac{2}{3})(2592) + 93 = 2080 + 93 = 2173$

and $\frac{2720 - 2173}{2173 - 2128} = \frac{547}{45} = 1.21$, which means it is only a slight change. If we

adjust $2720 - 93 = 2627$ and relate this to C of ~~1728~~ ^{$1821 - 93 = 1728$} , we get

$\frac{2627}{1728} = 1.52$. I thought that perhaps the Fibonacci ratio

would arise $\frac{1 + \sqrt{5}}{2} = 1.618^+$ or ≈ 1.62 , but it's not close.

① In the Elliott wave theory the Fibonacci numbers are utilized.

You know the series $F_n = F_{n-1} + F_{n-2}$, where the first two terms are defined as 1 and 1, we get:

1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, ...

The ratio of $\frac{F_{n+1}}{F_n}$ as n grows gets closer and closer

to $\frac{1+\sqrt{5}}{2}$. This is also the Golden Ratio. A rectangle

whose length is about 60% greater than its width (a 3x5

card) is supposedly the most pleasing to the eye.

$\frac{1+\sqrt{5}}{2}$ is the only number which equals 1 less than its reciprocal.

That is $x-1 = \frac{1}{x}$. In solving this we get

$x^2 - x - 1 = 0$. The positive root to this quadratic is

$\frac{1+\sqrt{5}}{2}$, so the reciprocal is $\frac{\sqrt{5}-1}{2}$. Roughly 1.618 and .618, or

1.618 $\approx \frac{1}{.618}$. Enough of this.

Hope to hear from you by phone or by letter. Sincerely,
David R. ...

TABLE I

Note	Ratio of "Note" to :						
	C	D	E	F	G	A	B
B							2:1
A						2:1	16:9
G					2:1	9:5	8:5
F				2:1	16:9	8:5	64:45
E			2:1	15:8	5:3	5:2	4:3
D		2:1 16:9	9:5	27:16	3:2	27:20	6:5
C	2:1	16:9	8:5	3:2	4:3	6:5	16:15
B	15:8	5:3	3:2	45:32	5:4	9:8	1
A	5:3	40:27	4:3	5:4	10:9	1	
G	3:2	4:3	6:5	9:8	1		
F	4:3	32:27	16:15	1			
E	5:4	10:9	1				
D	9:8	1					
C	1						

TABLE II

		Available	Available	<u>Possible Notes represented by parts</u>				
		Available Down to 25%	Available Down to 93 parts					
2^6	64x	3456	3549	C	E	F	G	A
	32(1/2x)	2592	2685	G	B	C	D	E
2^5	32x	1728	1821	C	E	F	G	A
	16(1/2x)	1296	1389	G	B	C	D	E
2^4	16x	864	957	C	E	F	G	A
	8(1/2x)	648	741	G	B	C	D	E
2^3	8x	432	525	C	E	F	G	A
	4(1/2x)	324	417	G	B	C	D	E
2^2	4x	216	309	C	E	F	G	A
	2(1/2x)	162	255	G	B	C	D	E
2	2x	108	201	C	E	F	G	A
	1(1/2x)	81	174	G	B	C	D	E
1	1x	54	147	C	E	F	G	A
		40.5	132.5	G	E	C	D	E
		27	120	C	B	F	G	A
		20.25	113.25	G	E	C	D	E
		13.5	106.5	C	B	F	G	A
		10.125	101.25	G	E	C	D	E
		6.75	95.25	C	B	F	G	A
		0	93	C	B	F	G	A