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Talent and Innovation, Effects of the „Supersonic Management" in the Boeing Company

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ABSTRACT

Boeing is the greatest company from the aerospace field with an expansion in 70 countries. The Boeing Company has three vectors of influence in the "galaxy of the businesses", namely: the first vector with the target in the merchandising of the jetliners; the second vector with the action in defense, space and security systems and the third vector with the "fingerprint" in the supply of services. The diagnostic analysis of the Boeing Company shows that she is a firm with economic performance, because the top management inserts in research, in each year, more than 3 billlions of dollars.

1. Introduction

The Boeing Company which is a true „aerospace jewel", was established in 1916 by William Edward Boeing, in Seattle and meanwhile the seat was moved in Chicago. The Boeing Company is the second provider of the Pentagon, concerning the aerospace and technological equipment. We can see at the Boeing Company, along of the time, a „boom of talent and innovation". The Boeing Company achieved the 737, 747, 767, 777, 787, 737 Max 9, 787-10 Boeings aircrafts. As brand new, the Boeing Company released the Boeing Analyt X, the Boeing Horizon X and the Boeing T-7A Red Hawk. This statistical approach, focused on the Boeing Company, pursues as aim the making of the prediction which visa the number of Boeing aircrafts in 2019. In the first area of this original study, it observes how we can estimate the number of Boeing aircrafts in 2019. In the second area of this statistical approach, we view the technique whereby we can achieve the architecture of the route which describes the values regarding the Boeing worldwide revenues, in the spell of time 2007-2018. For touch and perform the objective of this statistical processing, we observe as spent method the prognosis through the „Least Squares Method". Johann Carl Friedrich Gauss accomplished, in 1823, the „Least Squares Method" which represents the „engine" through we can identify the „profiles" of the values which belong to the equations's parameters.

2. The statistical processing which reflects the estimation in 2019 concerning the number of Boenig aircrafts

Table 1. The string concerning the number of Boeing aircrafts, in the spell of time 1998-2018

YEARS	BOEING'S AIRCRAFTS (ξ_i)	YEARS	BOEING'S AIRCRAFTS (ξ_i)
1998	564	2009	481
1999	620	2010	462
2000	492	2011	477
2001	527	2012	601
2002	381	2013	648
2003	281	2014	723
2004	285	2015	762
2005	290	2016	748
2006	398	2017	763
2007	441	2018	806
2008	375		

Source: „Statista Portal the United States of America"

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- if the technique of the processing for the ξ variable, where ξ = **the number of Boeing aircrafts,** „stylizes" a linear route $\xi_{t_i} = a + b \cdot t_i$, *a* and *b* will be [2]:

$$a = \frac{\begin{vmatrix} \sum_{i=1}^{n} \xi_i & \sum_{i=1}^{n} t_i \\ \sum_{i=1}^{n} \xi_i t_i & \sum_{i=1}^{n} t_i^{\,2} \end{vmatrix}}{\begin{vmatrix} n & \sum_{i=1}^{n} t_i \\ \sum_{i=1}^{n} t_i & \sum_{i=1}^{n} t_i^{\,2} \end{vmatrix}} = \frac{\sum_{i=1}^{n} \xi_i \sum_{i=1}^{n} t_i^{\,2} - \sum_{i=1}^{n} \xi_i t_i \sum_{i=1}^{n} t_i}{n \sum_{i=1}^{n} t_i^{\,2} - \left(\sum_{i=1}^{n} t_i \right)^2} \qquad b = \frac{\begin{vmatrix} n & \sum_{i=1}^{n} \xi_i \\ \sum_{i=1}^{n} t_i & \sum_{i=1}^{n} \xi_i t_i \end{vmatrix}}{\begin{vmatrix} n & \sum_{i=1}^{n} t_i \\ \sum_{i=1}^{n} t_i & \sum_{i=1}^{n} t_i^{\,2} \end{vmatrix}} = \frac{n \sum_{i=1}^{n} \xi_i t_i - \sum_{i=1}^{n} t_i \sum_{i=1}^{n} \xi_i}{n \sum_{i=1}^{n} t_i^{\,2} - \left(\sum_{i=1}^{n} t_i \right)^2}$$

Table 2. The string regarding the number of Boeing aircrafts, if this „galaxy" indicates a linear route

YEARS	BOEING'S AIRCRAFTS (ξ_i)	LINEAR TENDENCY				
		t_i	t_i^2	$t_i \xi_i$	$\xi_{t_i} = a + bt_i$	$\lvert \xi_i - \xi_{t_i} \rvert$
1998	**564**	-10	100	-5640	357,2943723	207
1999	**620**	-9	81	-5580	374,5411256	245
2000	**492**	-8	64	-3936	391,7878788	100
2001	**527**	-7	49	-3689	409,0346321	118
2002	**381**	-6	36	-2286	426,2813853	45
2003	**281**	-5	25	-1405	443,5281386	163
2004	**285**	-4	16	-1140	460,7748918	176
2005	**290**	-3	9	-870	478,0216451	188
2006	**398**	-2	4	-796	495,2683983	97
2007	**441**	-1	1	-441	512,5151516	72
2008	**375**	0	0	0	529,7619048	155
2009	**481**	+1	1	481	547,0086581	66
2010	**462**	+2	4	924	564,2554113	102
2011	**477**	+3	9	1431	581,5021646	105
2012	**601**	+4	16	2404	598,7489178	2
2013	**648**	+5	25	3240	615,9956711	32
2014	**723**	+6	36	4338	633,2424243	90
2015	**762**	+7	49	5334	650,4891776	112
2016	**748**	+8	64	5984	667,7359308	80
2017	**763**	+9	81	6867	684,9826841	78
2018	**806**	+10	100	8060	702,2294373	104
TOTAL	**11125**		770	13280	11125	2337

$$a = \frac{11125 \cdot 770 - 13280 \cdot 0}{21 \cdot 770 - 0^2} = 529{,}7619048$$

$$b = \frac{21 \cdot 13280 - 0 \cdot 11125}{21 \cdot 770 - 0^2} = 17{,}24675325$$

$$v_I = \left[\frac{\sum_{i=1}^{m} \left| \xi_i - \xi_{t_i}^{I} \right|}{n} : \frac{\sum_{i=1}^{m} \xi_i}{n} \right] \cdot 100 = \frac{\sum_{i=1}^{m} \left| \xi_i - \xi_{t_i}^{I} \right|}{\sum_{i=1}^{m} \xi_i} \cdot 100 = \frac{2337}{11125} \cdot 100 = 21{,}01\%$$

- if the technique of the processing for ξ variable, where ξ = **the number of Boeing airfcrafts,** „stylizes" a parabolic route $\xi_{t_i} = a + b \cdot t_i + ct_i^2$, *a* and *b* will be [2]:

$$a = \frac{\sum_{i=1}^{n} t_i^4 \sum_{i=1}^{n} \xi_i - \sum_{i=1}^{n} t_i^2 \sum_{i=1}^{n} t_i^2 \cdot \xi_i}{n \sum_{i=1}^{n} t_i^{\,4} - \left(\sum_{i=1}^{n} t_i^2 \right)^2} \quad ; \quad b = \frac{\sum_{i=1}^{n} \xi_i t_i}{\sum_{i=1}^{n} t_i^{\,2}} \quad ; \quad c = \frac{n \cdot \sum_{i=1}^{n} t_i^2 \cdot \xi_i - \sum_{i=1}^{n} t_i^2 \cdot \sum_{i=1}^{n} \xi_i}{n \sum_{i=1}^{n} t_i^{\,4} - \left(\sum_{i=1}^{n} t_i^2 \right)^2}$$

Table 3. The string concerning the number of Boeing aircrafts, if this „galaxy" indicates a quadratic route

YEARS	BOEING'S AIRCRAFTS (ξ_i)	PARABOLIC TENDENCY						
		t_i	t_i^2	t_i^3	t_i^4	$t_i^2\xi_i$	$\xi_{t_i} = a + bt_i + ct_i^2$	$\lvert\xi_i - \xi_{t_i}\rvert$
1998	**564**	-10	100	-1000	10000	56400	560,6747600	3
1999	**620**	-9	81	-729	6561	50220	516,9073969	103
2000	**492**	-8	64	-512	4096	31488	479,5625724	12
2001	**527**	-7	49	-343	2401	25823	448,6402865	78
2002	**381**	-6	36	-216	1296	13716	424,1405391	43
2003	**281**	-5	25	-125	625	7025	406,0633303	125
2004	**285**	-4	16	-64	256	4560	394,4086600	109
2005	**290**	-3	9	-27	81	2610	389,1765283	99
2006	**398**	-2	4	-8	16	1592	390,3669351	8
2007	**441**	-1	1	-1	1	441	397,9798805	43
2008	**375**	0	0	0	0	0	412,0153645	37
2009	**481**	+1	1	1	1	481	432,4733870	49
2010	**462**	+2	4	8	16	1848	459,3539481	3
2011	**477**	+3	9	27	81	4293	515,1359327	38
2012	**601**	+4	16	64	256	9616	532,3826860	69
2013	**648**	+5	25	125	625	16200	578,5308628	69
2014	**723**	+6	36	216	1296	26028	631,1015781	92
2015	**762**	+7	49	343	2401	37338	690,0948320	72
2016	**748**	+8	64	512	4096	47872	755,5106244	8
2017	**763**	+9	81	729	6561	61803	827,3489554	64
2018	**806**	+10	100	1000	10000	80600	905,6098250	100
TOTAL	**11125**		770		50666	479954		1224

$$a = \frac{\sum_{i=1}^{n} t_i^4 \sum_{i=1}^{n} \xi_i - \sum_{i=1}^{n} t_i^2 \sum_{i=1}^{n} t_i^2 \cdot \xi_i}{n\sum_{i=1}^{n} t_i^{\,4} - \left(\sum_{i=1}^{n} t_i^2\right)^2} = \frac{50666 \cdot 11125 - 770 \cdot 479954}{21 \cdot 50666 - 770^2} = 412{,}0153645$$

$$b = \frac{\sum_{i=1}^{n} \xi_i t_i}{\sum_{i=1}^{n} t_i^{\,2}} = \frac{13280}{770} = 17{,}24675325$$

$$c = \frac{n \cdot \sum_{i=1}^{n} t_i^2 \cdot \xi_i - \sum_{i=1}^{n} t_i^2 \cdot \sum_{i=1}^{n} \xi_i}{n\sum_{i=1}^{n} t_i^{\,4} - \left(\sum_{i=1}^{n} t_i^2\right)^2} = \frac{21 \cdot 479954 - 770 \cdot 11125}{21 \cdot 50666 - 770^2} = 3{,}21126928$$

$$v_{II} = \left[\frac{\sum_{i=1}^{m} \left|\xi_i - \xi_{t_i}^{II}\right|}{n} : \frac{\sum_{i=1}^{m} \xi_i}{n}\right] \cdot 100 = \frac{\sum_{i=1}^{m} \left|\xi_i - \xi_{t_i}^{II}\right|}{\sum_{i=1}^{m} \xi_i} \cdot 100 = \frac{1224}{11125} \cdot 100 = 11\%$$

- if the technique of the processing for ξ variable, where ξ **= the number of Boeing aircrafts,** „stylizes" a parabolic route of three degree $\xi_{t_i} = a + b \cdot t_i + ct_i^2 + dt_i^3$, *a, b, c* and *d* will be [2]:

Table 4. The string regarding the number of Boeing aircrafts, if this „galaxy" indicates a quadratic route of three degree

YEARS	BOEING'S AIRCRAFTS (ξ_i)	PARABOLIC TENDENCY OF THREE DEGREE							
		t_i	t_i^2	t_i^3	t_i^4	t_i^6	$t_i^3\xi_i$	$\xi_{t_i} = a + b \cdot t_i + ct_i^2 + dt_i^3$	$\lvert\xi_i - \xi_{t_i}\rvert$
1998	**564**	-10	100	-1000	10000	1000000	-564000	651,1793711	87
1999	**620**	-9	81	-729	6561	531441	-451980	554,3092413	66
2000	**492**	-8	64	-512	4096	262144	-251904	475,6255361	16
2001	**527**	-7	49	-343	2401	117649	-180761	416,4878236	111
2002	**381**	-6	36	-216	1296	46656	-82296	375,2556721	54
2003	**281**	-5	25	-125	625	15625	-35125	350,2886498	69
2004	**285**	-4	16	-64	256	4096	-18240	339,9463250	55
2005	**290**	-3	9	-27	81	729	-7830	342,5882658	53
2006	**398**	-2	4	-8	16	64	-3184	356,5740405	41
2007	**441**	-1	1	-1	1	1	-441	380,2632173	61
2008	**375**	0	0	0	0	0	0	412,0153645	37
2009	**481**	+1	1	1	1	1	481	450,1900502	31
2010	**462**	+2	4	8	16	64	3696	493,1468427	31
2011	**477**	+3	9	27	81	729	12879	539,2453102	62
2012	**601**	+4	16	64	256	4096	38464	586,8450210	14
2013	**648**	+5	25	125	625	15625	81000	634,3055432	14
2014	**723**	+6	36	216	1296	46656	156168	679,9864451	43
2015	**762**	+7	49	343	2401	117649	261366	722,2472949	40
2016	**748**	+8	64	512	4096	262144	382976	759,4476608	11
2017	**763**	+9	81	729	6561	531441	556227	789,9471111	27
2018	**806**	+10	100	1000	10000	1000000	806000	812,1052139	6
TOTAL	**11125**		770		50666	3956810	703496		929

$$a = \frac{\sum_{i=1}^{n} t_i^4 \sum_{i=1}^{n} \xi_i - \sum_{i=1}^{n} t_i^2 \sum_{i=1}^{n} t_i^2 \cdot \xi_i}{n\sum_{i=1}^{n} t_i^4 - \left(\sum_{i=1}^{n} t_i^2\right)^2} = \frac{50666 \cdot 11125 - 770 \cdot 479954}{21 \cdot 50666 - 770^2} = 412{,}0153645$$

$$b = \frac{\sum_{i=1}^{n} t_i^6 \cdot \sum_{i=1}^{n} t_i \cdot \xi_i - \sum_{i=1}^{n} t_i^4 \cdot \sum_{i=1}^{n} t_i^3 \cdot \xi_i}{\sum_{i=1}^{n} t_i^2 \cdot \sum_{i=1}^{n} t_i^6 - \left(\sum_{i=1}^{n} t_i^4\right)^2} = \frac{3956810 \cdot 13280 - 50666 \cdot 703496}{770 \cdot 3956810 - 50666^2} = 35{,}23682174$$

$$c = \frac{n \cdot \sum_{i=1}^{n} t_i^2 \cdot \xi_i - \sum_{i=1}^{n} t_i^2 \cdot \sum_{i=1}^{n} \xi_i}{n\sum_{i=1}^{n} t_i^4 - \left(\sum_{i=1}^{n} t_i^2\right)^2} = \frac{21 \cdot 479954 - 770 \cdot 11125}{21 \cdot 50666 - 770^2} = 3{,}21126928$$

$$d = \frac{\sum_{i=1}^{n} t_i^2 \cdot \sum_{i=1}^{n} t_i^3 \cdot \xi_i - \sum_{i=1}^{n} t_i^4 \cdot \sum_{i=1}^{n} t_i \cdot \xi_i}{\sum_{i=1}^{n} t_i^2 \cdot \sum_{i=1}^{n} t_i^6 - \left(\sum_{i=1}^{n} t_i^4\right)^2} = \frac{770 \cdot 703496 - 50666 \cdot 13280}{770 \cdot 3956810 - 50666^2} = -0{,}273405296$$

$$v_{III} = \left[\frac{\sum_{i=1}^{m} \left| \xi_i - \xi_{t_i}^{III} \right|}{n} : \frac{\sum_{i=1}^{m} \xi_i}{n} \right] \cdot 100 = \frac{\sum_{i=1}^{m} \left| \xi_i - \xi_{t_i}^{III} \right|}{\sum_{i=1}^{m} \xi_i} \cdot 100 = \frac{929}{11125} \cdot 100 = 8{,}35\%$$

- if the technique of the processing for ξ variable, where ξ **= the number of Boeing aircrafts,** „stylizes" an exponential route $\xi_{t_i} = ab^{t_i}$, *a* and *b* will be [2]:

$$\lg a = \frac{\begin{vmatrix} \sum_{i=1}^{n} \lg \xi_i & \sum_{i=1}^{n} t_i \\ \sum_{i=1}^{n} t_i \lg \xi_i & \sum_{i=1}^{n} t_i^{\,2} \end{vmatrix}}{\begin{vmatrix} n & \sum_{i=1}^{n} t_i \\ \sum_{i=1}^{n} t_i & \sum_{i=1}^{n} t_i^{\,2} \end{vmatrix}} = \frac{\sum_{i=1}^{n} \lg \xi_i \sum_{i=1}^{n} t_i^{\,2} - \sum_{i=1}^{n} t_i \lg \xi_i \sum_{i=1}^{n} t_i}{n \sum_{i=1}^{n} t_i^{\,2} - \left(\sum_{i=1}^{n} t_i \right)^2}$$

$$\lg b = \frac{\begin{vmatrix} n & \sum_{i=1}^{n} \lg \xi_i \\ \sum_{i=1}^{n} t_i & \sum_{i=1}^{n} t_i \lg \xi_i \end{vmatrix}}{\begin{vmatrix} n & \sum_{i=1}^{n} t_i \\ \sum_{i=1}^{n} t_i & \sum_{i=1}^{n} t_i^{\,2} \end{vmatrix}} = \frac{n \cdot \sum_{i=1}^{n} t_i \lg \xi_i - \sum_{i=1}^{n} \lg \xi_i \sum_{i=1}^{n} t_i}{n \sum_{i=1}^{n} t_i^{\,2} - \left(\sum_{i=1}^{n} t_i \right)^2}$$

Table 5. The string concerning the number of Boeing aircrafts, if this „galaxy" indicates an exponential route

YEARS	BOEING'S AIRCRAFTS (ξ_i)	EXPONENTIAL TENDENCY				
		$\lg \xi_i$	$t_i \lg \xi_i$	$\lg \xi_{t_i} = \lg a + t_i \lg b$	$\xi_{t_i} = ab^{t_i}$	$\lvert \xi_i - \xi_{t_i} \rvert$
1998	**564**	2,751279104	-27,51279104	2,565213674	367,4630488	197
1999	**620**	2,792391690	-25,13152521	2,578893654	379,2221132	241
2000	**492**	2,691965103	-21,53572082	2,592573634	391,3574756	101
2001	**527**	2,721810615	-19,05267431	2,606253614	403,8811777	123
2002	**381**	2,580924976	-15,48554985	2,619933594	416,8056467	36
2003	**281**	2,448706320	-12,24353160	2,633613574	430,1437074	149
2004	**285**	2,454844860	-9,819379440	2,647293554	443,9085950	159
2005	**290**	2,462397998	-7,387193994	2,660973534	458,1139683	168
2006	**398**	2,599883072	-5,199766144	2,674653514	472,7739230	75
2007	**441**	2,644438589	-2,644438589	2,688333494	487,9030062	47
2008	**375**	2,574031268	0	2,702013474	503,5162302	129
2009	**481**	2,682145076	2,682145076	2,715693454	519,6290878	39
2010	**462**	2,664641976	5,329283951	2,729373434	536,2575677	74
2011	**477**	2,678518379	8,035555137	2,743053414	553,4181701	76
2012	**601**	2,778874472	11,11549789	2,756733394	571,1279233	30
2013	**648**	2,811575006	14,05787503	2,770413374	589,4044005	59
2014	**723**	2,859138297	17,15482978	2,784093354	608,2657373	115
2015	**762**	2,881954971	20,17368480	2,797773334	627,7306495	134
2016	**748**	2,873901598	22,99121278	2,811453314	647,8184520	100
2017	**763**	2,882524538	25,94272084	2,825133294	668,5490777	94
2018	**806**	2,906335042	29,06335042	2,838813274	689,9430973	116
TOTAL	**11125**	56,74228295	10,53358471			2262

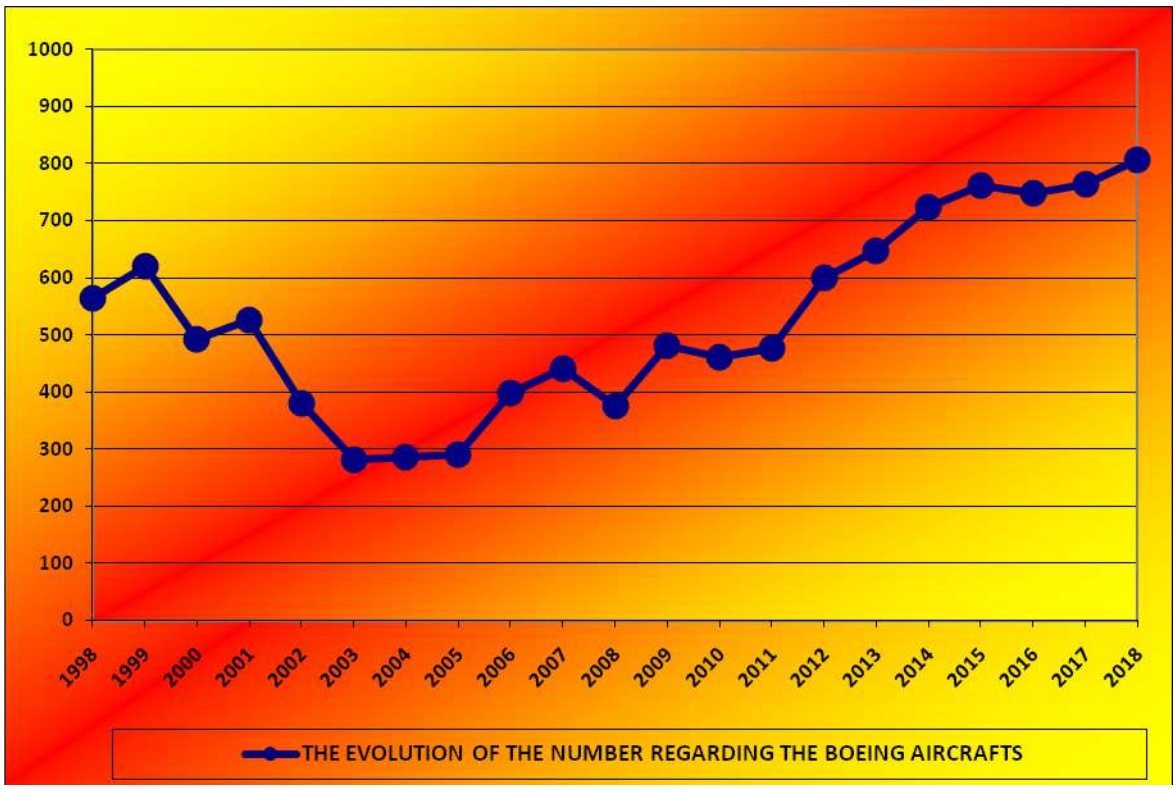
$$\lg a = \frac{56{,}74228295 \cdot 770 - 10{,}53358471 \cdot 0}{21 \cdot 770 - 0^2} = 2{,}702013474$$

$$\lg b = \frac{21 \cdot 10{,}53358471 - 56{,}74228295 \cdot 0}{21 \cdot 770 - 0^2} = 0{,}01367998$$

$$v_{\exp} = \left[\frac{\sum_{i=1}^{n} \left| \xi_i - \xi_{t_i}^{\exp} \right|}{n} : \frac{\sum_{i=1}^{n} \xi_i}{n} \right] \cdot 100 = \frac{\sum_{i=1}^{n} \left| \xi_i - \xi_{t_i}^{\exp} \right|}{\sum_{i=1}^{n} \xi_i} \cdot 100 = \frac{2262}{11125} \cdot 100 = 20{,}33\%$$

$$v_{III} = 8{,}35\% < v_{II} = 11\% < v_{\exp} = 20{,}33\% < v_I = 21{,}01\%$$

The „mix" of the processing, which has as target **the number of Boeing aircrafts**, pursues a quadratic route of three degree $\xi_{t_i} = a + b \cdot t_i + ct_i^2 + dt_i^3$



Graph 1. The quadratic route of three degree for the packet unveiled by the values which indicate the dynamic of the number concerning the Boeing aircrafts

$$\xi_{2019}^{BOEING\_AIRCRAFTS} = 412{,}0153645 + 35{,}23682174 \cdot 11 + 3{,}21126928 \cdot 11^2 + (-0{,}273405290) \cdot 11^3 = 824{,}28 \cong 824$$

a) 3. The statistical processing which analyses the worldwide revenues of the Boeing Company, in the spell of the time 2007-2018, for to identify them trend

Table 6. The string of numbers regarding the worlwide revenues of the Boeing Company, in the spell of time 2007-2018

YEARS	BOEING'S WORLDWIDE REVENUES (billions $) (ω_i)
2007	66,387
2008	60,909
2009	68,281
2010	64,306
2011	68,735
2012	81,698
2013	86,623
2014	90,762
2015	96,114
2016	93,496
2017	94,005
2018	101,127

Source: „Statista Portal the United States of America"

- if the technique of the processing for ω variable, where ω = **Boeing's worlwide revenues**, „stylizes" a linear route $\omega_{t_i} = a + b \cdot t_i$, *a* and *b* will be [2]:

Table 7. The string of numbers concerning the Boeing's worldwide revenues, if this serial indicates a linear route

YEARS	BOEING'S WORLDWIDE REVENUES (billions $) (ω_i)	LINEAR TENDENCY				
		t_i	t_i^2	$t_i\omega_i$	$\omega_{t_i} = a + bt_i$	$\lvert\omega_i - \omega_{t_i}\rvert$
2007	**66,387**	-6	36	-398,322	60,62429029	5,763
2008	**60,909**	-5	25	-304,545	64,02639469	3,117
2009	**68,281**	-4	16	-273,124	67,42849909	0,853
2010	**64,306**	-3	9	-192,918	70,83060348	6,524
2011	**68,735**	-2	4	-137,470	74,23270788	5,498
2012	**81,698**	-1	1	-81,698	77,63481227	4,063
2013	**86,623**	+1	1	86,623	84,43902107	2,184
2014	**90,762**	+2	4	181,524	87,84112546	2,921
2015	**96,114**	+3	9	288,342	91,24322986	4,871
2016	**93,496**	+4	16	373,984	94,64533425	1,149
2017	**94,005**	+5	25	470,025	98,04743865	4,042
2018	**101,127**	+6	36	606,762	101,4495430	0,323
TOTAL	**972,443**		182	619,183	**972,443**	41,308

$$a = \frac{\sum_{i=1}^{n}\omega_i\sum_{i=1}^{n}t_i^{\,2} - \sum_{i=1}^{n}\omega_i t_i\sum_{i=1}^{n}t_i}{n\sum_{i=1}^{n}t_i^{\,2} - \left(\sum_{i=1}^{n}t_i\right)^2} = \frac{972{,}443\cdot 182 - 619{,}183\cdot 0}{12\cdot 182 - 0^2} = 81{,}03691667$$

$$b = \frac{n\sum_{i=1}^{n}\omega_i t_i - \sum_{i=1}^{n}t_i\sum_{i=1}^{n}\omega_i}{n\sum_{i=1}^{n}t_i^{\,2} - \left(\sum_{i=1}^{n}t_i\right)^2} = \frac{12\cdot 619{,}183 - 0\cdot 972{,}443}{12\cdot 182 - 0^2} = 3{,}402104396$$

$$v_I = \left[\frac{\sum_{i=1}^{n}\left|\omega_i - y_{t_i}^{I}\right|}{n} : \frac{\sum_{i=1}^{n}\omega_i}{n}\right]\cdot 100 = \frac{\sum_{i=1}^{n}\left|\omega_i - \omega_{t_i}^{I}\right|}{\sum_{i=1}^{n}\omega_i}\cdot 100 = \frac{41{,}308}{972{,}443}\cdot 100 = 4{,}25\%$$

- if the technique of the processing for ω variable, where ω = **Boeing's worlwide revenues**, „stylizes" a quadratic route $\omega_{t_i} = a + b\cdot t_i + ct_i^2$, *a* and *b* will be [2]:

Table 8. The string of numbers regarding the Boeing's worldwide revenues, if this serial indicates a quadratic route

YEARS	BOEING'S WORLDWIDE REVENUES (billions $) (ω_i)	PARABOLIC TENDENCY						
		t_i	t_i^2	t_i^3	t_i^4	$t_i^2\omega_i$	$\omega_{t_i} = a + bt_i + ct_i^2$	$\lvert\omega_i - \omega_{t_i}\rvert$
2007	**66,387**	-6	36	-216	1296	2389,932	60,54462192	5,842
2008	**60,909**	-5	25	-125	625	1522,725	63,98879122	3,080
2009	**68,281**	-4	16	-64	256	1092,496	67,42531235	0,856
2010	**64,306**	-3	9	-27	81	578,754	70,85418532	6,548
2011	**68,735**	-2	4	-8	16	274,940	74,27541013	5,540
2012	**81,698**	-1	1	-1	1	81,698	77,68898677	4,009
2013	**86,623**	+1	1	+1	1	86,623	84,49319556	2,130
2014	**90,762**	+2	4	+8	16	363,048	87,88382771	2,878
2015	**96,114**	+3	9	+27	81	865,026	91,26681170	4.847
2016	**93,496**	+4	16	+64	256	1495,936	94,64214752	1,146
2017	**94,005**	+5	25	+125	625	2350,125	98,00983518	4,005
2018	**101,127**	+6	36	+216	1296	3640,572	101,3698747	0,243
TOTAL	**972,443**		182		4550	14741,875	972,443	41,124

$$a=\frac{\sum_{i=1}^{n}t_i^4\sum_{i=1}^{n}\omega_i-\sum_{i=1}^{n}t_i^2\sum_{i=1}^{n}t_i^2\cdot\omega_i}{n\sum_{i=1}^{n}t_i^{\,4}-\left(\sum_{i=1}^{n}t_i^2\right)^2}=\frac{4550\cdot 972{,}443-182\cdot 14741{,}875}{12\cdot 4550-182^2}=81{,}09491525$$

$$b=\frac{\sum_{i=1}^{n}\omega_i t_i}{\sum_{i=1}^{n}t_i^{\,2}}=\frac{619{,}183}{182}=3{,}402104396$$

$$c=\frac{n\cdot\sum_{i=1}^{n}t_i^2\cdot\omega_i-\sum_{i=1}^{n}t_i^2\cdot\sum_{i=1}^{n}\omega_i}{n\sum_{i=1}^{n}t_i^{\,4}-\left(\sum_{i=1}^{n}t_i^2\right)^2}=\frac{12\cdot 14741{,}875-182\cdot 972{,}443}{12\cdot 4550-182^2}=-0{,}003824082$$

$$v_{II}=\left[\frac{\sum_{i=1}^{n}\left|\omega_i-\omega_{t_i}^{II}\right|}{n}:\frac{\sum_{i=1}^{n}\omega_i}{n}\right]\cdot 100=\frac{\sum_{i=1}^{n}\left|\omega_i-\omega_{t_i}^{II}\right|}{\sum_{i=1}^{n}\omega_i}\cdot 100=\frac{41{,}124}{972{,}443}\cdot 100=4{,}23\%$$

- if the technique of the processing for ω variable, where ω **= Boeing's worlwide revenues,** „stylizes" a parabolic route of three degree $\omega_{t_i}=a+b\cdot t_i+ct_i^2+dt_i^3$, *a, b, c* and *d* will be [2]:

Table 9. The string of numbers concerning the Boeing's worldwide revenues, if this serial indicates a quadratic route of three degree

YEARS	BOEING'S WORLDWIDE REVENUES (billions $) (ω_i)	PARABOLIC TENDENCY OF THREE DEGREE							
		t_i	t_i^2	t_i^3	t_i^4	t_i^6	$t_i^3\omega_i$	$\omega_{t_i}=a+b\cdot t_i+ct_i^2+dt_i^3$	$\left\|\omega_i-\omega_{t_i}\right\|$
2007	**66,387**	-6	36	-216	1296	46656	-14339,592	64,34275650	2,044
2008	**60,909**	-5	25	-125	625	15625	-7613,625	63,98879120	3.080
2009	**68,281**	-4	16	-64	256	4096	-4369,984	65,35360255	2,927
2010	**64,306**	-3	9	-27	81	729	-1736,262	68,09190560	3,786
2011	**68,735**	-2	4	-8	16	64	-549,880	71,85841537	3,123
2012	**81,698**	-1	1	-1	1	1	-81,698	76,30784691	5,390
2013	**86,623**	+1	1	+1	1	1	86,623	85,87433543	0,749
2014	**90,762**	+2	4	+8	16	64	726,096	90,30082247	0,461
2015	**96,114**	+3	9	+27	81	729	2595,078	94,02909143	2,085
2016	**93,496**	+4	16	+64	256	4096	5983,744	96,71385733	3,218
2017	**94,005**	+5	25	+125	625	15625	11750,625	98,00983521	4,005
2018	**101,127**	+6	36	+216	1296	46656	21843,432	97,57174010	3,555
TOTAL	**972,443**		182		4550	134342	14294,557	972,443	34,423

$$a=\frac{\sum_{i=1}^{n}t_i^4\sum_{i=1}^{n}\omega_i-\sum_{i=1}^{n}t_i^2\sum_{i=1}^{n}t_i^2\cdot\omega_i}{n\sum_{i=1}^{n}t_i^{\,4}-\left(\sum_{i=1}^{n}t_i^2\right)^2}=\frac{4550\cdot 972{,}443-182\cdot 14741{,}875}{12\cdot 4550-182^2}=81{,}09491525$$

$$b=\frac{\sum_{i=1}^{n}t_i^6\cdot\sum_{i=1}^{n}t_i\cdot\omega_i-\sum_{i=1}^{n}t_i^4\cdot\sum_{i=1}^{n}t_i^3\cdot\omega_i}{\sum_{i=1}^{n}t_i^{\,2}\cdot\sum_{i=1}^{n}t_i^6-\left(\sum_{i=1}^{n}t_i^4\right)^2}=\frac{134342\cdot 619{,}183-4550\cdot 14294{,}557}{182\cdot 134342-4550^2}=4{,}840791751$$

$$c = \frac{n \cdot \sum_{i=1}^{n} t_i^2 \cdot \omega_i - \sum_{i=1}^{n} t_i^2 \cdot \sum_{i=1}^{n} \omega_i}{n\sum_{i=1}^{n} t_i^4 - \left(\sum_{i=1}^{n} t_i^2\right)^2} = \frac{12 \cdot 14741{,}875 - 182 \cdot 972{,}443}{12 \cdot 4550 - 182^2} = -0{,}003824082$$

$$d = \frac{\sum_{i=1}^{n} t_i^2 \cdot \sum_{i=1}^{n} t_i^3 \cdot \omega_i - \sum_{i=1}^{n} t_i^4 \cdot \sum_{i=1}^{n} t_i \cdot \omega_i}{\sum_{i=1}^{n} t_i^2 \cdot \sum_{i=1}^{n} t_i^6 - \left(\sum_{i=1}^{n} t_i^4\right)^2} = \frac{182 \cdot 14294{,}557 - 4550 \cdot 619{,}183}{182 \cdot 134342 - 4550^2} = -0{,}057547494$$

$$v_{III} = \left[\frac{\sum_{i=1}^{m} \left|\omega_i - \omega_{t_i}^{III}\right|}{n} : \frac{\sum_{i=1}^{m} \omega_i}{n}\right] \cdot 100 = \frac{\sum_{i=1}^{m} \left|\omega_i - \omega_{t_i}^{III}\right|}{\sum_{i=1}^{m} \omega_i} \cdot 100 = \frac{34{,}423}{972{,}443} \cdot 100 = 3{,}54\%$$

- if the technique of the processing for ω variable, where ω = **Boeing's worlwide revenues**, „stylizes" an exponential route $\omega_{t_i} = ab^{t_i}$, *a* and *b* will be [2]:

Table 10. The string of numbers regarding the Boeing's worldwide revenues, if this serial indicates an exponential route

YEARS	BOEING'S WORLDWIDE REVENUES (billions $) (ω_i)	EXPONENTIAL TENDENCY				
		$\lg \omega_i$	$t_i \lg \omega_i$	$\lg \omega_{t_i} = \lg a + t_i \lg b$	$\omega_{t_i} = ab^{t_i}$	$\left\|\omega_i - \omega_{t_i}\right\|$
2007	**66,387**	1,822083044	-10,93249826	1,790873007	61,78357110	4,603
2008	**60,909**	1,784681469	-8,923407347	1,809419732	64,47921359	3,570
2009	**68,281**	1,834299873	-7,337199492	1,827966457	67,29246805	0,989
2010	**64,306**	1,808251496	-5,424754489	1,846513182	70,22846596	5,922
2011	**68,735**	1,837177937	-3,674355874	1,865059907	73,29256266	4,558
2012	**81,698**	1,912211425	-1,912211425	1,883606632	76,49034716	5,208
2013	**86,623**	1,937633221	1,937633221	1,920700082	83,31056542	3,312
2014	**90,762**	1,957904057	3,915808115	1,939246807	86,94543947	3,817
2015	**96,114**	1,982786652	5,948359955	1,957793532	90,73890457	5,375
2016	**93,496**	1,970793031	7,883172124	1,976340257	94,69788009	1,202
2017	**94,005**	1,973150954	9,865754769	1,994886982	98,82958734	4,825
2018	**101,127**	2,004867124	12,02920274	2,013433707	103,1415627	2,015
TOTAL	**972,443**	22,82584028	3,37550404			45,396

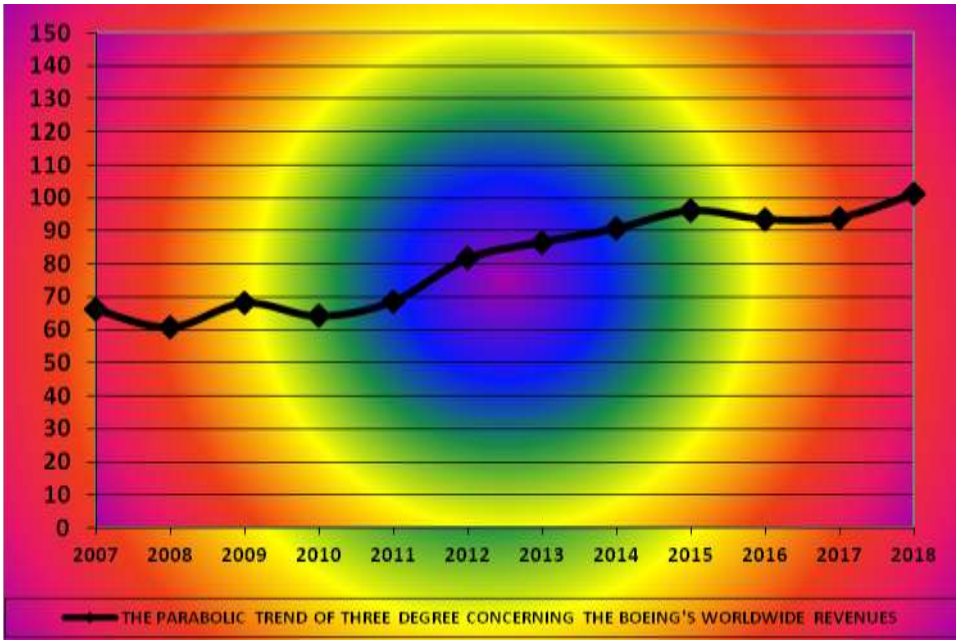
$$\lg a = \frac{\sum_{i=1}^{n} \lg \omega_i \sum_{i=1}^{n} t_i^2 - \sum_{i=1}^{n} t_i \lg \omega_i \sum_{i=1}^{n} t_i}{n\sum_{i=1}^{n} t_i^2 - \left(\sum_{i=1}^{n} t_i\right)^2} = \frac{22{,}82584028 \cdot 182 - 3{,}37550404 \cdot 0}{12 \cdot 182 - 0^2} = 1{,}902153357$$

$$\lg b = \frac{n \cdot \sum_{i=1}^{n} t_i \lg \omega_i - \sum_{i=1}^{n} \lg \omega_i \sum_{i=1}^{n} t_i}{n\sum_{i=1}^{n} t_i^2 - \left(\sum_{i=1}^{n} t_i\right)^2} = \frac{12 \cdot 3{,}37550404 - 22{,}82584028 \cdot 0}{12 \cdot 182 - 0^2} = 0{,}018546725$$

$$v_{\exp} = \left[\frac{\sum_{i=1}^{n} \left|\omega_i - \omega_{t_i}^{\exp}\right|}{n} : \frac{\sum_{i=1}^{n} \omega_i}{n}\right] \cdot 100 = \frac{\sum_{i=1}^{n} \left|\omega_i - \omega_{t_i}^{\exp}\right|}{\sum_{i=1}^{n} \omega_i} \cdot 100 = \frac{45{,}396}{972{,}443} \cdot 100 = 4{,}67\%$$

$$v_{III} = 3{,}54\% < v_{II} = 4{,}23\% < v_I = 4{,}25\% < v_{\exp} = 4{,}67\%$$

The „mix" of the processing which unveils the evolution of the values concerning the **Boeing's worldwide revenues**, pursues a parabolic route of three degree $\omega_{t_i} = a + b \cdot t_i + ct_i^2 + dt_i^3$



Graph 2. The quadratic route of three degree for the packet unveiled by the values which specify the evolution of the Boeing's worldwide revenues

4. Conclusions

The Boeing Company represents a „supersonic land" which incorporates a lot of qualities: gift, innovation, efficiency and performance. Because the management is applied to the highest quotas, the Boeing Company cans be a true model in the aeronautic and aerospace industry. We observe that the production will rise with 18 aircrafts in 2019, comparative to 2018, because the predicted stage in 2019 constitutes the level of 824 aircrafts. Also, the Boeing's Company worldwide revenues pursue a quadratic „itinerary" of three degree, in the spell of time 2007-2018. As novelty, the Boeing team specialized in the modern aerospace engineering inserted the new propulsion techniques: the electric propulsion, the ion propulsion and the computational fluid dynamics.

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