Effect of Payment Balance and Current Account on Deficit of Jordanian Budget (1992 -2012) through Johansen Co integration Method

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Abstract

Jordanian government as other developed countries implemented or envisaging fiscal operations to improve the budgetary figures , this paper aimed to check the impact of deficit current account and deficit of payment balance of Jordan government data of budget from 1992 up 2012 , the paper concentrate on assessing the impact of fiscal adjustment which followed by the government during the period from 1996 -1999 and the events after this period up to 2012, also to check the impact of government policies on Jordanian net worth through the changes in government balance sheet and fiscal imbalances and output projections, otherwise these represents through the budget deficit , co integration of johnsen – jousloius method used to have the short term and long run relationship in data . major results that there is one co integration and there is long relationships between variables in the study . if there is no remediates to budget deficit , the dynamic relationships are available .

Key words : Jordan budget , payment balance ,current account deficit , co integration , johnsen – josloius method .

1 – introduction :

The Jordanian government balance sheet (budget) composes of three elements , first the assets which composed of stock of governments non – financial assets (public capital stock , and the stock of financial assets , the second is liabilities which represents as the stock of financial liabilities , were the third is the net of worth , which can be obtained by the differencing between total assets and liabilities , according to this dividend we can notes in Jordan budget that changes in various components items occurs due to many factors affecting the sheet balance yearly (later we have took about them) some of these items slipped down others rises up because the transaction valuation effect , the budget of it nature issue reflects all operations resulting in changes of government expenditures and revenues , which are documentations and accumulation of these assets and liabilities , which caused by the mutually agreed interactions between government institutional unites . The Maastricht criteria indicates to the stability and growth pacts refer to ; 1: deposits and currency (notes and coins) ,2: loans which is closely related to the stock of gross financial liabilities , and 3: shares (excluding financial derivatives , but the most important for any government is the government debts on consolidated basis . and other accounts payable ,were the fiscal balance (net of lending or borrowing) should be equal the deference between transaction in financial assets and transaction of liabilities , therefore we can view this process as an indicator of financial impacts of government activity of economic acts in country .

The term deficit refer to the portion of actual spending of government that has spent since the start of government accounting for fiscal year , the deficit only includes actual payments made and does not reflects their future requirements or future needs to pay more .government budget deficit and debts are concepts used to analyzed government fiscal policies in order of stability and growth pacts . All economists advises Jordanian government to have great care of debts and deficit of budget, but government claims about the irrelevance of labeling government payments , and want always to levy a lump –sum –tax on a debt – holders equal of outstanding government debt to eliminate the debt , in other hands Jordanian government faced a big problem that debt never a relevant constraint , due to the increases of financial needs ;while the government promises to repay the debts or eliminate on which the government can't default .let me argued that taxation is distortionary on the margin , the Jordanian debts is not just relevant for excess and solvency issues ,but also for intergenerational redistribution.

Researcher notes that government decisions among the study period faced many financial troubles in budget deficit and these decisions are made in a discretionary way to compels liating generations to redistributed resources in their favor by issuing more government debts , also the official services of publicly holds of government is increased during the period of study , in other sight the net worth is declines sharply after the government privatization process , hence the whole followed governments calculations excluded the social security system . to be more precise , one can argued from the negaouation of parliament of budget that corruption is swallow civil rights , and the government treatment in this phase just imposes a taxes or create

new taxes , then other free monetary policy that not prevent the rich consumers to make more consume of goods and services or concealing their wealth , however the government from taxes , custom duties ,which is evasion is high .

The primary budget deficit measures the direct government pay out to the current generation of tax payers , otherwise the theoretical analyses suggest that all contractual obligation of Jordan .some recent   economic models that setup to check financial distress , where others developed newly technique to achieve same goals such as Gerteler and Kiyotaki (2010), and Biertler – Kiyotaki and Querallo (2012) , however these models assumes that governments policies has formed according to market situations are not similar types of financial fractions , therefore these policies have no direct impacts on the financial fragility that led to distress situation , also these models assumptions are; the models have a leverage constraints on the intermediary side effects is funded because of the capacity of privet sector firms through the banks credit .Tabellini (1990) , and (1991) as a recent studies   suggested   that   social security and debts of government may secured by similar political mechanisms, in this sense amateur social security system creates entitlements that can be as safe as government debts .Puti,E, and Franco (2003)explained the issues of some commentators have casted doubts on the effectiveness of the fiscal constraints inherent in the stability and growth pacts , also put forward proposals increase transparency .

Miliesi – Ferretti (2003) cleared in their empirical study hampered by measurement problems , in their study focused in U.S states , and clearly budget roles . other study such as Bunch (1991) shows that U.S states with constitutional debt limits use public authorities to circumvent borrowing restrictions . Rubin, et al (2004) discussed in their paper the substantial ongoing deficit may negatively influence expectations and confidence that can generate a Self reinforcing negative cycle among the underlying fiscal deficit , financial markets and real economy .were Akbostanci , and Tunc (2001) , and Lochman . and Francis (2002) ; all of them adhere to the Keynesian propositions in which an increase in budget deficit leads to a worsen current account position . For a small open developing economies such as Jordan that highly depends on foreign capital inflows (e.g. foreign direct investments ,and foreign investment portfolio) to finance its economic developments , hence the budget position of a country will be affected by large capital inflows or small amount of it , but either Jordan finance depends on debts to finance their needs , and debts here accumulated year to other , and with that a country will eventually run into a budget deficit . Mansouri (1998); state that there is a bi-directional short and long run causality between fiscal and external deficit . Bartolini , and Lahiri (2006) ; suggested a wider fiscal deficit as the Keynesian model typically should be a accompanied by wider current account deficit . also many researchers studied the current account imbalances to testify the possible link between budget deficit and current account deficit such as Megarbane (2002).

The main contribution of this paper is examine the relationship between budget deficit and payment balance and current account deficit in Jordan by co integration johnsen – jousloiuse method , and to have toda- yammamato causality between them if there is a causal relationships , and to have the impulse response of them . The paper organized as five section ; first section is introduction , were the second section is the model , third section data and methodology , then forth section included the empirical results and analyses of the paper , the fifth section concluded remarks .

2 - Theory and some notes about budget deficit :

The relation between net lending or borrowing of Jordanian government and the change of net worth can be stated as :

$$\Delta p_t = \Delta Ma_t – \Delta ML_t + p \, \Delta F_t + \Delta CX_t \quad …………(1) .$$
$$= \quad a_t + p\Delta Ft + \Delta CX_t \quad …………(2).$$

Where :

ΔCXt : represents the change of financial and non financial assets or liabilities .

Ft : is changes in financial liabilities   per time . where MLt   presents the changes of stock in financial assets ,and p is the value of a unit of public capital Ma is stock of non financial assets of government .

This equation is effected and its component with the fluctuation of prices and the exchange rates also interest rates , but researcher opinion there is always difference between the net worth of government and the net of lending or borrowing , this can be interpreted to that government net worth includes net capital formation and excluded valuation changes , therefore the government net worth can be written as :

$$Net \ wor \quad = \ Mat \ - \ Ft + pMa \quad …………(3) .$$

This fiscal balance sheet of Jordanian government can be determined by the difference between the government saving (Sgt) , and the aggregate investment (Igt) , actually the government saving is the difference between the revenues of government and the expenditures , the following equation presents the   saving of government :

$$Sgt = \Theta + Ret + Rt^{ML} ML_{t-1} + r_t^{MA} MA_{t-1} \ - \ \exp^c t – r^{ft} tFt_{t-1} \quad …………(4)$$

Where :

exp ^{c}t : is government expenditures (inclusive of net capital transfers), and Θ is total tax revenue , Rt is the non tax and non interest revenue ,MA : is the rate of returns on government non financial assets , r ^{ft} t, rt ^{ML} is the rate of financial assets returns .

the suggestion to amend the fiscal balance between Sg refers to by excluding net investment expenditures . Jordanian government solvency of deficit requires that the sum of government assets is presented in discount value of future taxes spending, in hence we expressed the equation as :

$$\Sigma \, In_t \, (\, 1 + r \,)^{\, t-i} \; \geq Pex \, (\, 1 + r \,)^{\, t-I} + Ut \quad \dots\dots\dots\dots\dots(5) \, .$$

Where :

$\Sigma \, In_{t \, .}$ is the non interest revenue , P_{ex} is the primary expenditures and r is the rate of interest .

Fiscal measures in Jordan budget can have an impact on the governments in temporal position   when they reduced present spending and this happen during the period of December of 2012 , and thet try to treat the deficit as in their opinion by increasing taxes   , to make some effect of revenue of future taxes receipts , and they decline the pension reform which reduced public benefits in order to improve public accounts to finance the future spending and borrow more loans from local financial markets and external to finance the government activities and to repay some of existing debts .

The $\varphi^s_{\, a j}$, of the matrix φ , is interrupted as the impulse response :

$$\varphi^s_{\, a j} \; = \; d \, Yi_{\, t+s} \; / \; d \, U_{j,t} \qquad \dots\dots\dots\dots\dots\dots\dots\dots (6)$$

It is possible to decompose the h- step ahead forecast error variance in to the proportions due to each chock U^{jt} . There is beyond the structural fiscal measures anon structural fiscal measures in board categories , the highlighting effects on fiscal balance , government debts as well as net worth and future taxes they are many categories :

   A : Special dividends :   T he booking revenues arising from the tax revenues which constitute of capital gains on Jordanian central bank gold holdings , as reducing the budget deficit , the dividend are large and exceptional one – off payments based on accumulated reserve or holding gains .   B – assets sales (privatization and corporation) ,   Sales of non financial assets are classified as negative gross fixed capital formation in the Jordanian capital account and they proceeds typically imply an increase in currency and deposits in the financial accounts .

C : capital injections .   d- Quasi – fiscal activities .

 e- securitization .   j – off – budget items and infrastructure .

3 - Data and Methodology :

data sources are :

1 -the issues of finance ministry of Jordan debts (several issues for foreign debts of government since 2001 – 2009).

2- Central bank of Jordan (monthly and annual reports for many years).

3- Arab unified economic reports for the study period .

4-.M.F annual reports (several issues related of the study period).

Many financial time series appears to be none – stationary , new statistical issues arise when analyzing non – stationary data , unit root tests are used to detect the presence of unit root or not to performed whether the data are stationary or not , in this paper researcher used principal methods of detecting non – stationary :

- visually inspection of time series non- stationarity .

- formal statistical testes of unit root test such as Augmented Dickey -Fulier test and KPSS test . we may wish to support these finding on the basis of estimating unit root tests ADF and KPSS by autocorrelation and normality test and Jarque – Bera test . second support comes from using Garch model , there is three stylized facts about the volatility of budget deficit or financial data

 (time series) as general first stylized fact is financial series series which are fat tails , second were volatility mean reversion, and third is volatility clustering   testing data by the alternative approach which introduced by Johnsen - Josloiuse , some notice explained previously in the model part of this paper , the granger causality used to test check the type of relationships between the deficit of budget and the current account and payment balance deficits , then Toda- yammamato causality has used to insure of this relationships between variables and impulse response test has been done . in this paper we have used the OLS estimation method of the unrestricted VAR, the specifications of the lags pairs and list of endogenous variables follow , then impulse response diagram done   .

4 - empirical analyses and results :

1 – 4 : Q-statistic and serial correlation and normality tests :

Before drawing any conclusions from the estimated regression , its necessary to perform residual diagnostic to make sure that the assumption of model or analyses are satisfied , this can be done with Q- statistic and correlogram, the provide values of the Ljung – Box , Q- statistics of autocorrelation of residuals , the P –value of both tests LM test and Breusch – Godfrey test confirmed the absence of serial correlation up to second order the no autocorrelation available results in table (1) , null hypotheses is also not rejected by the Durbin – Watson test which is equal to normal (1.99)which in the acceptance region and Rho is equal to 0.1468.

2 -4 : *Autocorrelations tests* :
From payment balance autocorrelation we notice after 5th lags ACF damped out slowly toward zero also PCF, while PCF has spikes at 4th lags and disappears afterwards and decays oscillating toward zero .were autocorrelation function for budget and current account and the Jarque – Bera statistics indicates to that the residuals from the regression OLS is normally distributed .

3 – 4 : Stability test : We can test the model for coefficients stability and structural breaks by the designed test for this purpose . we can't reject the null hypotheses due to the P- value of results of test therefore we start stability test with recursive residuals test which can help us to detect visually potential break points .we notice that the recursive residuals is within the confidence limits of intervals , these are potential points for the structural breaks in the models , we can go further and test the specified series with Chaw – test . result of test indicates that we can reject the null hypotheses of the parameters constancy at 5% level , the p- value of chaw test is ( ).

4 – 4 : *The unit root tests* : The unit root test of ADF and KPSS are rejected the null hypotheses of the presence of a unit root in the data according the p- value and critical values of both tests , table (4) declaring these results . in table (3) , the results of structural breaks in both the slope and intercept indicates to a strong evidence against unit hypotheses , and all results of table of table shows that all variables under investigation rejects unit root hypotheses , therefore these results give us an evidence that two structural breaks are stronger than one .

5 - 4 :Garch model : Garch model provides a reasonably good and suitable model for analyzing financial time series to capture the volatility of series and estimating conditional volatility , the sign of residuals or chock has no effects on the conditional volatility ..

6 – 4 : Co integration method of Engle – Grager and johnsen – jousloiuse method
The co integration of Engle – Grager approach estimation of the static model is equivalent to omitting the short-run components from the Error correction model , if the results for autocorrelations are accepted null hypotheses in residuals of series , although the results still hold asymptotically. This approach leads to a better performance as it does not push the short term dynamic into residuals , unit roots are often fund in the levels of spot and forward budget .

A- OLS results indicates that overall significant of the regression is reflected in the value of F-statics which is high enough to reject the null hypotheses and significance of all slope coefficients , were R2 is good fitness the model (0.714) ,where the adjusted R is (0,682)and P – value of coefficient payment balance is in significant , and the current account deficit is significant , and log likelihood is not large enough (- 158.2957), table (5) shows the results of the regression .

B- In table (6) the results of indicates the residual stationirty by ADF test , which indicates , it strongly reject the presence of unit root in the residual series in favor of stationarity hypotheses . The results of various hypotheses tested from no co integration (r = 0) to increasing number of co integration vectors , all values of Ʌ $_{trace}$ and LR max statistics according to table (7) results is higher than the cross pondering critical value at 5 percent level , this means that we are reject the null hypotheses of no co integration . according Ʌ max it is possible to accept that there is only one co integrating vector and only one integrating relationship between variables . the Eigen values are in significant at 5 percent level also Ʌ $_{trace}$ are insignificant ,also Ʌ $_{max}$ are insignificant , therefore at least one co integration equation is available , the co integration equation is : Budget deficit = - 477.542 - 5.4351 payment deficit - 2.2783 current account deficit . Log likelihood ; (- 390.784) .

C- Table (8) stated the long - run relationships matrix between budget deficit and current account and payment balance deficits . the table indicates for available of long – run relationship if the same conditions are going to be continuous in future of Jordanian budget or deteriorate more than now .

D- The ECM model : this model can be used to capture any short - run dynamic relationships of the system , and it can be to distinguished the short and long - run , if the variables in the long –run model are fund to be co integrated , then there must be exists an associated error correction ECM .

table (9) of ECM shows results , VECM equation of budget deficit correction model is :
        -o.56538 payment balance deficit - 0.61442 current account deficit
        The correction model EC1 coefficient is – o.263241 and St / Error is too few , the p- value is

insignificant , no serial correlation due to use of 1st difference of series . lastly the AIC equal 46.2779 is best criterion due to the smallest criterion results than others .

E – Wald - test results of Granger causality :

Restricted and unrestricted models of Granger causality , table (10) shows that hypotheses is rejected in both restricted and unrestricted correction models .the calculated F – statistics indicates to reject of null hypotheses .

F – Toda - Yammamato causality test :

This test would results in table (11) lead to conclude that two variables budget deficit I and current account deficit does not Granger cause each other, in other words, they appear to be independent, also other test for budget deficit and payment balance deficit does not Granger cause each other , , enhance the test shows us bidirectional Granger causality relationship between variables .

J – impulse response : as in figure (2) , in this model there is a unidirectional dynamic relation from budget deficit to the deficit of payment balance and current account , thus the vector of independents is affected by the past movements of the budget deficit , while verse versa is not right , the budget deficit is contemporaneously and are not lag relation .

5 - Concluded remarks

This study recommended that is very important to reconsider the manner of dealing with external and internal debt of government because it shifted the liquid of money from local financial market and it is impact to the actuation of economics due to the all austerity policies ,and reduction of external and internal debt did not achieve tangible results , also government must reconsidered the rate of expenditure to the budget regarding to economic needs , at the time in which the rate of spending of education , health care ,food , subsidiary ,and work recode , if we add the prosperity index to conclude the achievement of Jordanian government which classified by U.N number (42) country of all states of the world ,and (51) as health index , these indexed are tied to a great extent with effectiveness and credibility to the political system .

The paper aims to examine the budget deficit and other main component the deficit of current account and the deficit of payment balance , therefore date designed as the first difference of all variables , and the budget deficit considered as dependent variable and other variables are independent variables , the period of the study extended from 1992 up to 2012 , this period full of events such as 2nd gulf war , the adjustment and structural program in Jordan economy, then privatization process which failed and not satisfied the effort to improve the economics and solve the debt problem.

The researcher used the normality test and the Q – statistics then unit root to insure of normality and normal distributed , and test the residuals of OLS , then we use the chaw test to check the structural breaks , and then co integration procedure used , Toda - yammamato causality test to insure of type of relationships whether there is a relation and whether it is directional or bi – directional or unidirectional relationships , also VECM model utilizes to find the error correction equation of data .

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. ***Appendix :***

Table (2) : Normality test for data

Variables / tests	Coefficients	P – value
Current account deficit		
• Dormok – Hensen	3.13392	0.20367
• Shapiro –Wilkenson	0.92230	0,964889
• Lillieffors	0.180276	0.07
• Jerque – Bera	1.57717	0.455626
Budget deficit		
• Dormok – Hensen	24.8704	0.0000087
• Shapiro –Wilkenson	0.714711	0.0000422
• Lillieffors	0.315638	0.0000
• Jerque – Bera	6.90376	0.031689
Payment balance deficit		
• Dormok – Hensen	7.11016	0.283579
• Shapiro –Wilkenson	0.852905	0.004786
• Lillieffors	0.227302	- 0.01
• Jerque – Bera	2.42913	0.29684

Table (3) : Augmented dickey – fuller test and KPSS TEST

Variables	ADF 1st diff	KPSS 1st diff
Budget deficit	1.87352 **	0.737732
	0.607934**	0.560366
	0.87653*	0.546358

• ,** significant at 5, 10 levels

Critical values of KPSS test is (0.357), (0.483) . (0.697) at 10%, 5% , 1% levels

Table (4) : Unit root test results allowing for two structural breaks

Variables	TB 1	TB 2	T-student	HO: unit root
Budget	1999	2005	- 6.75**	reject
Current account	1999	2008	- 5.3362*	reject
Payment balance	1999	2012	- 7.1029**	reject

** sign at 5%level , and ** sign at 5% , 10 % levels .

Table (5) : OLS results of series , Dependent variable : Budget deficit . data (1992 - 2012)

Variables	Coefficients	ST /Error	T - value	Prob – leve
Const	507.6953	255.785	1.9857	0.0626 *
Current account	0.0519836	0.222616	0.2353	0.8180
Payment balance	0.352990	0.106418	3.317	0.0057 ***

- Sign at 5% level , and *** sign at 1%, 5% , 10% levels

R2   0.7139
Log likelihood   - 158.2957
F – (2, 19)   22. 46131   Prob - value   0.000013
Rho   0.550577
D . W   0.900448

Table (6) : testing for unit root of Ut

1st order autocorrelation for et	-0,6231
Tau _ c	-3.20423
Estimated value	-0.80548
P – value	0.16725

Table (7) : Eign value , $Λ_{trace}$ and $Λ_{max}$ of co integration test of series

Eign – value	$Λ_{trace}$	P - value	$Λ_{max}$	P – value
0.34572	14.990	0.78371	8.515	0.8639
0.25671	6.4746	0.6442	5.9334	0.6225
0.026700	0.54126	0.4619	0.59127	0.3783

Table (8) :   Long – run matrix (Alpha &Beta) of series

Variables	budget	Current account	Payment balance
Budget	- 0.28207	0.20849	- 0.19452
Current account	0.067681	- 0.69779	0.29566
Payment balance	0.46952	-0.20034	- 0.036918

Table (9) : VECM of budget deficit equation

VECM system,   lag order 1   Co integration rank = 1 , Unrestricted constant

Budget   0.32650
payment balance   -0.56538
Current account   -0.61442

	Coefficient	Std. Error	t-ratio	p-value
const	152.653	175.891	0.8679	0.39688
EC1	-0.263241	0.166268	-1.5832	0.13078

R-squared		0.122235	Adjusted R-squared		0.073470
rho		0.188200	Durbin-Watson		1.551003

Table (10) : Wald – test for Granger causality restricted and unrestricted model

	Calculated F –stat	df- num	df	Null hypotheses (Ho)
Unrestricted	22.32615	2	16	Reject Ho
Restricted	12.4611	2	16	Reject Ho

Table (11)   : Taoda - yammamato Granger causality test of series

Null –hypotheses (Ho)	M – Wald test	Prob – level
Budget deficit does not Granger cause current account deficit	4.7876	0.3654
Budget deficit does not Granger cause payment balance deficit	5.21663	0.4573
Current account deficit does not Granger cause Budget	0.92254	0.2431
Payment balance deficit does not Granger cause Budget	0.87124	0.6542

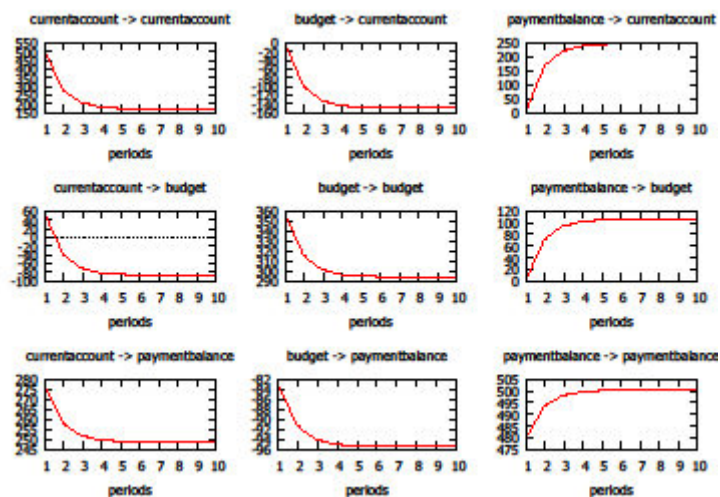Figure (1) : impulse response of series
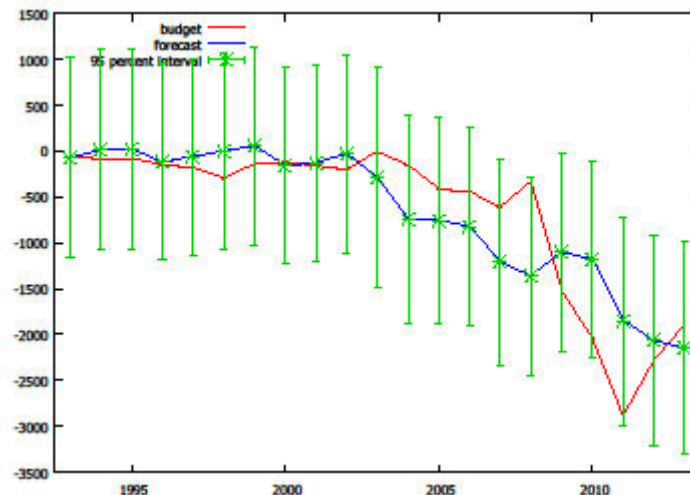

Figure (2) : forecast

Table (12   ) : forecast of budget deficit   For 95% confidence intervals, t(18, 0.025) = 2.101

Obs	budget	prediction	std. error	95% interval
1993	-62.3000	-75.0725	520.780	(-1169.19, 1019.05)
1994	-82.3000	12.2654	520.064	(-1080.35, 1104.88)
1995	-76.9000	22.8333	517.252	(-1063.87, 1109.54)
1996	-148.500	-119.422	509.573	(-1190.00, 951.151)
1997	-181.400	-57.8155	510.499	(-1130.33, 1014.70)
1998	-296.600	2.13437	512.428	(-1074.44, 1078.71)
1999	-140.900	55.3644	514.886	(-1026.37, 1137.10)
2000	-119.800	-160.337	509.028	(-1229.76, 909.091)
2001	-155.500	-127.775	508.919	(-1196.97, 941.424)
2002	-201.100	-30.4808	517.395	(-1117.49, 1056.53)
2003	-9.20000	-291.873	570.886	(-1491.26, 907.514)
2004	-154.100	-744.376	537.341	(-1873.29, 384.535)
2005	-416.800	-755.106	537.164	(-1883.65, 373.434)
2006	-443.200	-821.289	511.445	(-1895.79, 253.217)
2007	-615.000	-1212.90	540.772	(-2349.02, -76.7782)
2008	-338.200	-1362.18	512.959	(-2439.86, -284.491)
2009	-1509.30	-1103.19	513.731	(-2182.49, -23.8773)
2010	-2027.90	-1178.73	509.922	(-2250.03, -107.423)
2011	-2876.30	-1851.90	538.894	(-2984.08, -719.729)
2012	-2273.20	-2063.55	545.119	(-3208.80, -918.295)

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