

A cura di Sanfilippo Giuseppe Antonio

L'immatricolazione, nell'ambito dei trasporti, è sostanzialmente la procedura di base alla quale un veicolo viene riconosciuto idoneo alla circolazione. In qualsiasi posto noi decidiamo di vivere, nell'Unione Europea, siamo tenuti ad immatricolare le nostre automobili nel paese in cui viviamo normalmente o in cui manteniamo la nostra residenza permanente. Di norma, infatti, non è possibile immatricolare la propria auto in un paese in cui si ha una residenza secondaria o una casa di villeggiatura. Inoltre non esiste alcuna normativa europea sull'immatricolazione dell'auto: ogni nazione, infatti, applica determinate e ben precise pratiche.

Acquistando un'automobile nuova in Italia, è obbligatorio sottoporla ad un controllo tecnico nel quarto anno dalla data del primo controllo tecnico e dell'immatricolazione. Se s'immatricola un'automobile in quanto nuovo residente in Italia che si è trasferito da un altro paese dell'UE, egli è tenuto a sottoporla al controllo tecnico. Per immatricolare il veicolo si usufruisce del servizio "STA - Sportelli Telematici dell'Automobilista", presente nella località in cui si ha residenza, uno sportello al servizio del cittadino che consente di ottenere subito le targhe, la carta di circolazione e il certificato di proprietà digitale; tuttavia, quando si acquista un veicolo nuovo di fabbrica, il concessionario usualmente incarica uno studio di consulenza automobilistica (agenzia di pratiche auto) per immatricolare il veicolo all'ufficio provinciale della Motorizzazione Civile (UMC) ed iscriverlo al Pubblico Registro Automobilistico (PRA).

Nel seguente database, relativo alle Immatricolazioni di Autovetture in Italia dal 1983 al 2015, analizzerò l'aumento del numero di immatricolazioni nell'ultimo trentennio e le varie correlazioni che questo potrebbe presentare con altri indicatori quali il prezzo della benzina, del gasolio, il reddito medio delle famiglie italiane, le tariffe relative al RC Auto e, sfruttando gli strumenti d'analisi studiati durante il corso di Statistica Economica, come l'F-Test e la Regressione, cercherò di trovare quelle variabili che presentano dei valori significativi in relazione con la variabile dipendente (le immatricolazioni, per l'appunto); procederò successivamente con le previsioni relative ai prossimi 5 anni. Inoltre, analizzerò la serie storica relativa ai prezzi di Benzina e del Gasolio negli ultimi anni che, a causa del notevole aumento dei prezzi (l'Italia è uno degli Stati col prezzo dei carburanti più alto del mondo), influisce negativamente sulle scelte delle famiglie italiane relative all'acquisto delle automobili.

IMMATRICOLAZIONI AUTOVETTURE IN ITALIA 1983 AL 2015

Anno di riferimento	Immatricolazioni	Prezzo Medio Benzina	Prezzo Medio Gasolio	Prezzo Medio Petrolio (In dollari)	Pil Pro Capite (in dollari)	Tariffa Media RCA	Reddito Medio Familiare	Tasso di Occupazione	Tasso di Prestito
1983	1451512	1,549	0,7	29,04	7,8096	80	10443	53,7	22,3
1984	1572402	1,533	0,759	28,02	7,717	85	11489	53,4	22
1985	1653217	1,456	0,79	27,01	7,9672	88	11976	53,3	18,1
1986	1769191	1,355	0,643	13,53	11,282	90	12139	53,3	15,9
1987	1929568	1,313	0,646	17,73	14,193	110	14977	53,5	13,6
1988	2119193	1,297	0,669	14,24	15,698	120	15050	53,8	13,6
1989	2296784	1,237	0,706	17,31	16,339	150	17997	54,2	14,2
1990	2283362	1,187	0,817	22,26	20,765	150	18236	54,8	14,9
1991	2220321	1,147	0,88	18,62	21,892	150	19219	54,9	14,7
1992	2389395	1,073	0,883	18,44	23,175	180	20012	54,4	16,5
1993	1695264	1,083	0,87	16,33	18,684	254	20431	53,7	14,6
1994	1683652	1,116	0,846	15,53	19,281	300	21500	52,8	12
1995	1737108	1,121	0,874	16,86	20,604	360	22111	52,5	13,2
1996	1723117	1,122	0,892	20,29	23,029	420	23720	52,9	12,8
1997	2393495	1,063	0,886	18,86	21,788	430	24540	53	10,5
1998	2378592	1,101	0,831	12,26	22,261	454	24930	53,7	8,6
1999	2349200	1,211	0,874	17,44	21,946	530	25113	54,5	6,3
2000	2437231	1,149	1,001	27,6	20,059	600	26098	55,5	7
2001	2429903	1,117	0,949	23,12	20,409	620	26578	56,6	7,3
2002	2281245	1,102	0,914	24,36	22,206	600	27868	57,4	6,5
2003	2251307	1,152	0,915	28,1	27,399	583	28473	57,5	5,8
2004	2264562	1,344	0,965	36,05	31,189	580	29483	57,6	5,5
2005	2237225	1,22	1,109	50,59	31,974	570	30114	57,5	5,3
2006	2325404	1,285	1,164	61	33,426	601	31792	58,3	5,6
2007	2490570	1,299	1,163	69,04	37,716	624	32000	58,6	6,3
2008	2160131	1,38	1,344	94,1	40,66	650	32146	58,6	6,8
2009	2158010	1,233	1,08	60,86	36,995	690	32317	57,4	4,8
2010	1960282	1,364	1,215	77,38	35,878	750	32714	56,8	4
2011	1748143	1,556	1,449	107,46	38,365	735	31547	56,8	4,6
2012	1402089	1,786	1,705	109,45	34,845	698	30816	56,6	5,2
2013	1304648	1,748	1,657	105,87	35,421	589	30147	55,5	5,1
2014	1360293	1,712	1,609	96,29	35,223	488	30525	55,7	4,9
2015	872951	1,534	1,405	49,49	30,594	475	30500	56,3	2,8

Fonti:

Immatricolazioni: http://www.motornet.it (elaborazioni UNRAE su dati del CED)

Prezzo Medio Benzina: www.figisc.it (fino a 2004) & www.mise.gov.it (analisi del Ministero dello Sviluppo Economico)

Prezzo Medio Gasolio: www.figisc.it (fino a 2004) & www.mise.gov.it (analisi del Ministero dello Sviluppo Economico)

Prezzo Medio Petrolio al barile: www.statista.com (indagine effettuata sui prezzi medi di greggi OPEC)

PIL Pro Capite: www.worldbank.org (GDP per capita in \$)

Tariffa Media RCA: www.ania.it (confronto con dati ISVAP ed IVASS)

Reddito Medio Familiare: www.bancaditalia.it (analisi delle tabelle di infostat)

Tasso di Occupazione: www.istat.it (tabella aggiornata 2015 su dati.istat)

Tasso di Prestito: www.worldbank.org (Lending interest rate %)

Correlazione

$$\rho_{XY} = \frac{\sigma_{XY}}{\sigma_X \sigma_Y}$$

Date le variabili statistiche Y ed X, facendo riferimento all'*indice di correlazione di Pearson*, ossia la covarianza delle due variabili rapportata al prodotto delle loro deviazioni standard, possiamo trovare la correlazione esistente tra esse

Il coefficiente assumerà sempre dei valori compresi tra -1 e 1.

Più esso sarà vicino ad 1, più la correlazione sarà forte e diretta, cioè all'aumentare di una variabile aumenterà anche l'altra.

Se, invece, il coefficiente avrà un valore vicino a -1, la correlazione sarà forte ma inversa: all'aumentare di una variabile, l'altra diminuirà. Infine, se il valore del coefficiente sarà intorno allo 0, significherà che la correlazione è pressoché nulla.

	Immatricolazioni	Prezzo Medio Benzina	Prezzo Medio Gasolio	Prezzo Medio Petrolio (In dollari)	Pil Pro Capite (in dollari)	Tariffa Media RCA	Reddito Medio Familiare	Tasso di Occupazione	Tasso di Prestito
Immatricolazioni	1	T TOZZO IVICAIO BOTIZITA	1 TOZZO IVICAIO GASCIIO	1 10220 Wedie 1 ctrolle (III dellari)	Til To Capite (iii dellari)	Tarina Modia 11071	reduite Wedle Farmillare	Tuoso di Gocupazione	Tabbo all Toblic
Prezzo Medio Benzina	-0,702009773	1							
Prezzo Medio Gasolio	-0,387677382	0,636577334	1						
Prezzo Medio Petrolio (In dollari)	-0,343064787	0,732643241	0,923987245	1					
Pil Pro Capite (in dollari)	0,037164314	0,257862239	0,824951328	0,796256431	1				
Tariffa Media RCA	0,148610656	0,119738193	0,707003095	0,645398785	0,842084943	1			
Reddito Medio Familiare	0,1169229	0,11266191	0,77018365	0,669411848	0,937120431	0,95053074	1		
Tasso di Occupazione	0,255291519	0,188736626	0,578824083	0,615915064	0,777997595	0,756253378	0,78271867	1	
Tasso di Prestito	-0.099265536	-0 139431408	-0.710711964	-0.59361586	-0.848628627	-0.91242161	-0.943452861	-0.735456619	1

Osservando la matrice ricavata dall'operazione di correlazione, ne ricaviamo che i valori in rosso sono tutti quelli che mostrano una correlazione forte e diretta, mentre quelli blu scuro sono quei valori in cui la correlazione si mostra forte ma inversa.

In questa particolare matrice, possiamo osservare come i valori di correlazione più alti siano quelli tra il Reddito Medio Familiare e la Tariffa Media RCA (forte e diretta) e quella tra il Reddito Medio Familiare ed il Tasso di Prestito (forte ed inversa).

F-Test

Dopo aver trovato la matrice di correlazione precedente, utlizziamo il Test F per verificare l'eventuale **significatività** dei coefficienti di correlazione. Calcoliamo dunque il nostro Valore Teorico F e tutti i valori empirici relativi alla tabella sopra riportata.

(Valore Teorico F) 0,337264126

	Immatricolazioni	Prezzo Medio Benzina	Prezzo Medio Gasolio	Prezzo Medio Petrolio (In dollari)	Pil Pro Capite (in dollari)	Tariffa Media RCA	Reddito Medio Familiare	Tasso di Occupazione
Prezzo Medio Benzina	30,12200938							
Prezzo Medio Gasolio	5,483196499	21,1210495						
Prezzo Medio Petrolio (In dollari)	4,135180538	35,92083902	180,9693322					
Pil Pro Capite (in dollari)	0,042875994	2,208104305	66,04017851	53,70507828				
Tariffa Media RCA	0,700100754	0,450919219	30,98182399	22,13128283	75,56841307			
Reddito Medio Familiare	0,429673956	0,398532338	45,20131159	25,17083982	223,5045305	290,2724467		
Tasso di Occupazione	2,16124287	1,145055547	15,61915755	18,9477455	47,53673569	41,41623056	49,03067328	
Tasso di Prestito	0,308502923	0,614623612	31,64037191	16,86756108	79,78176207	154,089206	251,0830849	36,5228916

Ipotesi nulla

Ipotesi alternativa

 $H_0 : \rho = 0$

 $H_1: \rho \neq 0$

Se il valore stimato è > del valore teorico allora si rigetta l' ipotesi nulla per accettare l'ipotesi alternativa. In quel caso il coefficiente di correlazione corrispondente sarà **significativo**. Se il valore stimato è < del valore teorico allora accetto l' ipotesi nulla. In questo caso, il coefficiente di correlazione corrispondente sarà **non significativo**.

Con l'F-Test abbiamo dimostrato che il coefficiente di correlazione tra PIL e Immatricolazioni e quello tra Tasso di Prestito è Immatricolazioni è non significativo.

Regressione

Con l'analisi della regressione ricaveremo una funzione lineare da cui osservare come e quanto varia la nostra variabile dipendente Y (Immatricolazioni) al variare delle altre variabili indipendenti X.

OUTPUT RIEPILOGO

Statistica della regressione							
R multiplo	0,861855399						
R al quadrato	0,742794729						
R al quadrato corretto	0,657059639						
Errore standard	240948,7504						
Osservazioni	33						

ANALISI VARIANZA

Il valore di R multiplo è quasi 1, allora ci sarà una forte correlazione e multicolinearità tra le variabili. Il valore di R al quadrato è il <u>coefficiente di determinazione c</u>he consente di valutare la bontà d'adattamendo del modello di regressione. Indica la porzione di variabilità della nostra variabile dipendente spiegata dalle variabili esplicative Esso è dato dal rapporto tra la somma dei quadrati della regressione e la somma dei quadrati totali: r²= SQR/SQT Invece R al quadrato "corretto" è il coefficiente che indica se le variabili esplicative sono idonee a prevedere o spiegare il valore della variabile dipendente, tenendo conto delle variabili esplicative e della grandezza del campione. Secondo la tabella a lato, R al quadrato corretto indica che la nostra variabilità è spiegata solo per il 65%. L'errore standard misura la variabilità degli scostamenti dei valori osservati da quelli previsti.

a regressione non fornirà mai delle previsioni prive di errore, tranne che nel caso in cui itti i valori siano perfettamente disposti sulla stessa retta.

	gdl	SQ	MQ	F	Significatività F
Regressione	8	4,02392E+12	5,0299E+11	8,663835624	1,69E-05
Residuo	24	1,39335E+12	58056300336		
Totale	32	5.41727E+12			

La significatività F (detta anche p-value) ci indica se esiste una relazione significativa tra la variabile dipendente e quelle indipendenti.

Nel caso in cui il suo valore risulta inferiore al valore di α=0,05, come in questo caso, la relazione è significativa. Il valore empirico F, invece, indica il rapporto che c'è tra la varianza spiegata e quella non spiegata.

	Coefficienti	Errore standard	Stat t	Valore di significatività	Inferiore 95%	Superiore 95%	Inferiore 95,0%	Superiore 95,0%
Intercetta	614294,346	2524702,057	0,2433136	0,809830121	-4596434,597	5825023,29	-4596434,597	5825023,29
Prezzo Medio Benzina	-1911581,706	642195,4465	-2,976635409	0,006559538	-3237007,964	-586155,4472	-3237007,964	-586155,4472
Prezzo Medio Gasolio	-681453,8087	710786,6942	-0,958731803	0,34725332	-2148445,444	785537,8271	-2148445,444	785537,8271
Prezzo Medio Petrolio (In dollari)	7774,43493	8379,764062	0,927762986	0,362767642	-9520,548065	25069,41792	-9520,548065	25069,41792
Pil Pro Capite (in dollari)	11305,55842	29190,55747	0,387301902	0,701946049	-48940,79116	71551,90799	-48940,79116	71551,90799
Tariffa Media RCA	620,5784095	1025,358666	0,60523057	0,550706437	-1495,657867	2736,814686	-1495,657867	2736,814686
Reddito Medio Familiare	-63,17170023	68,13961822	-0,927092078	0,36310878	-203,8049603	77,4615598	-203,8049603	77,4615598
Tasso di Occupazione	99358,09078	43026,22851	2,309244715	0,029849765	10556,31964	188159,8619	10556,31964	188159,8619
Tasso di Prestito	-28220,84782	28939,36152	-0,97517175	0,339202461	-87948,75445	31507,05881	-87948,75445	31507,05881

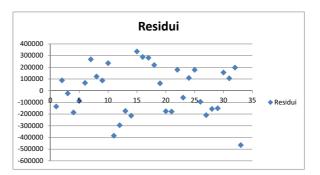
L'intercetta è il valore che assume in media Y indipendentemente dalle variabili dipendenti.
Il suo <u>valore di significatività</u> indica quanto sia significativa la relazione tra la variabile dipendente ed una sola variabile indipendente.
Se quest'ultimo valore è **non supera** il valore di α=0,05, allora il risultato è **significativo**.

I valori in rosso (Prezzo Medio Benzina e Tasso di Occupazione) sono risultati non significativi, per i quali i coefficienti corrispondenti sono approssimabili allo 0.

OUTPUT RESIDUI

Osservazione	Previsto Immatricolazioni	Residui
1	1586446,873	-134934,873
2	1483533,708	88868,29208
3	1675799,517	-22582,51725
4	1954749,296	-185558,2964
5	2016464,325	-86896,32499
6	2052659,959	66533,0406
7	2028516,528	268267,4717
8	2161738,32	121623,6801
9	2133194,617	87126,38329
10	2153758,557	235636,4428
11	2079847,126	-384583,1263
12	1978617,674	-294965,6738
13	1910240,662	-173132,662
14	1936768,217	-213651,217
15	2057741,37	335753,6304
16	2090044,676	288547,324
17	2067176,457	282023,5428
18	2217624,421	219606,5794
19	2366274,908	63628,09219
20	2456915,994	-175670,9939
21	2429363,297	-178056,2972
22	2085658,654	178903,3456
23	2296121,818	-58896,81821
24	2215992,622	109411,3777
25	2312105,658	178464,3418
26	2254836,851	-94705,85051
27	2367118,84	-209108,8404
28	2115628,092	-155346,0925
29	1898596,33	-150453,3296
30	1246568,907	155520,093
31	1198745,325	105902,675
32	1162512,928	197780,0723
33	1338004,472	-465053,4717
		- 0,00000003

I **Residui** sono il risultato della differenza tra il valore osservato e quello previsto. Attraverso la somma dei residui divisi per il numero delle nostre osservazioni possiamo ricavarne la varianza indipendentemente dall'adattamento della funzione lineare ai dati osservati (1-r^2)



Analiticamente è confermata la nostra analisi grafica poiché la somma dei residui è 0.

Il modello di regressione multipla è definito dalla seguente equazione: Y = intercetta + β 1 * variabile indipendente +... β j * variabile indipendente + ϵ

 $Y = 0 - 1911581,70*X_1 + 99358,09*X_7 + 240948,7504$

Dataset coi valori significativi Si riportano in un database a parte tutti quei valori per cui i coefficienti corrispondenti sono diversi da 0.

Anno di riferimento	Immatricolazioni	Prezzo Medio Benzina	Tasso di Occupazione
1983	1451512	1,549	53,7
1984	1572402	1,533	53,4
1985	1653217	1,456	53,3
1986	1769191	1,355	53,3
1987	1929568	1,313	53,5
1988	2119193	1,297	53,8
1989	2296784	1,237	54,2
1990	2283362	1,187	54,8
1991	2220321	1,147	54,9
1992	2389395	1,073	54,4
1993	1695264	1,083	53,7
1994	1683652	1,116	52,8
1995	1737108	1,121	52,5
1996	1723117	1,122	52,9
1997	2393495	1,063	53
1998	2378592	1,101	53,7
1999	2349200	1,211	54,5
2000	2437231	1,149	55,5
2001	2429903	1,117	56,6
2002	2281245	1,102	57,4
2003	2251307	1,152	57,5
2004	2264562	1,344	57,6
2005	2237225	1,22	57,5
2006	2325404	1,285	58,3
2007	2490570	1,299	58,6
2008	2160131	1,38	58,6
2009	2158010	1,233	57,4
2010	1960282	1,364	56,8
2011	1748143	1,556	56,8
2012	1402089	1,786	56,6
2013	1304648	1,748	55,5
2014	1360293	1,712	55,7
2015	872951	1,534	56,3

Seconda Regressione (relativa al dataset coi valori significativi)

OUTPUT RIEPILOGO

Statistica della regressione							
R multiplo	0,992826469						
R al quadrato	0,985704398						
R al quadrato corretto	0,952985185						
Errore standard	249276,9628						
Osservazioni	33						

Secondo il seguente modello, le variabili dipendenti relative al Prezzo Medio della Benzina e al Tasso di Occupazione, riescono a spiegare il 95,29% della variabilità della Y (le Immatricolazioni), con un errore standard di 249276,96 di autovetture immatricolate.

ANALISI VARIANZA

	gdl	SQ	MQ	F	Significatività F
Regressione	2	1,32822E+14	6,6411E+13	1068,749512	1,31E-28
Residuo	31	1,92631E+12	62139004180		
Totale	33	1,34748E+14			

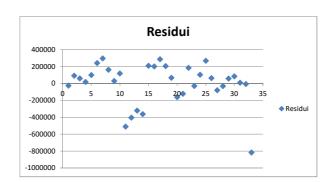
Il valore della significatività di F risulta inferiore al valore di α=0,05, e la relazione è dunque significativa. Il valore di F è il rapporto tra la varianza spiegata e quella non spiegata.

	Coefficienti	Errore standard	Stat t	Valore di significatività	Inferiore 95%	Superiore 95%	Inferiore 95,0%	Superiore 95,0%
Intercetta	0	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D
Prezzo Medio Benzina	-1561400,541	218232,6992	-7,154750623	4,83387E-08	-2006489,065	-1116312,016	-2006489,065	-1116312,016
Tasso di Occupazione	72551,43255	5193,789279	13.96888257	6.40134E-15	61958.62948	83144.23562	61958.62948	83144.23562

L'intercetta, questa volta, l'abbiamo fatta passare dall'origine (nella prima regressione era risultata non significativa).
I valori di significatività delle nostre due variabili X (Prezzo Medio Benzina e Tasso di Occupazione) sono ovviamente inferiori allo 0,05.

OUTPUT RESIDUI

Osservazione	Previsto Immatricolazioni	Residui
1	1477402,49	-25890,49017
2	1480619,469	91782,53094
3	1593592,167	59624,83255
4	1751293,622	17897,37793
5	1831382,731	98185,2687
6	1878130,57	241062,4303
7	2000835,175	295948,8248
8	2122436,062	160925,9382
9	2192147,227	28173,77335
10	2271415,15	117979,8496
11	2205015,142	-509751,1422
12	2088192,635	-404540,6351
13	2058620,203	-321512,2026
14	2086079,375	-362962,3751
15	2185457,15	208037,8498
16	2176909,932	201682,0675
17	2063197,019	286002,981
18	2232555,285	204675,7149
19	2362326,678	67576,32179
20	2443788,832	-162543,8324
21	2372973,949	-121666,9486
22	2080440,188	184121,812
23	2266798,712	-29573,7118
24	2223348,823	102055,1773
25	2223254,645	267315,3551
26	2096781,201	63349,79893
27	2239245,362	-81235,36151
28	1991171,031	-30889,03113
29	1691382,127	56760,87271
30	1317749,716	84339,28362
31	1297276,361	7371,638869
32	1367997,067	-7704,067112
33	1689457,223	-816506,2229



La nuova formula della nostra retta di regressione sarà:

 $Y = 0 - 1561400, 54 \times X_1 + 72551, 43 \times X_2 + 249276, 962$

Previsione

Previsione Puntuale:

Variazione Percentuale Ipotizzata sul Prezzo Medio della Benzina

2016X2aT(1)= -6,30% 2017X2aT(1)= -0,220% 2018X2aT(1)= -0,002197666 2019X2aT(1)= -0,002197666

Fonte: http://it.globalpetrolprices.com/ (prezzo medio fino a Maggio 2016) (2017-2019, calcolati col saggio medio di var.) Fonte: https://www.senato.it

			Immatricolazioni		
Anno di riferimento*	Prezzo Medio Benzina	Tasso di Occupazione	Y*inf	Y*	Y*sup
2013	1,748	55,5		1304648	
2014	1,712	55,7		1360293	
2015	1,534	56,3		872951	
2016*	1,437	56,8	1361054	1877116	2393178
2017*	1,434	57,1	1386594	1902655	2418717
2018*	1,431	57,4	1412226	1928286	2444348
2019*	1.428	57.6	1433788	1949848	2465909

Per calcolare i valori puntuali Y* occorre sostituire alla retta di regressione,
Y = intercetta + β1 * variabile indipendente +...βj * variabile indipendente + ε 0 -1561400,54'X₁ + 72551,43'X₂ + 249276,962 i valori ipotizzati negli anni futuri del Prezzo Medio della Benzina e del Tasso di Occupazione, così da trovarci anche le Immatricolazioni.

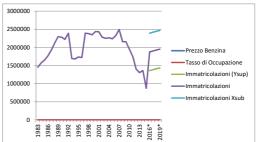
Calcoliamo invece i valori superiori (Y*sup) ed inferiori (Y*inf) della previsione intervallare (1-a) utilizzando la seguente formula:

T= 2,039513446 SE= 249276,9628 Media X1 1,301363636 Media X2 55,30606061 S^2 X1 0,042240176 S^2 X2 3,646212121

$$Y_{T}^{a}(1) \pm t_{\alpha_{2},N-m} S_{e} \sqrt{1 + \frac{1}{N} + \frac{\left(X_{T}^{a}(1) - \bar{X}\right)^{2}}{(N-1)s_{X_{1}}^{2}}}$$

TABELLA FINALE

Anno di riferimento	Prezzo Medio Benzina	Tasso di Occupazione		Immatricolazioni	
1983	1,549	53,7		1451512	
1984	1,533	53,4		1572402	
1985	1,456	53,3		1653217	
1986	1,355	53,3		1769191	
1987	1,313	53,5		1929568	
1988	1,297	53,8		2119193	
1989	1,237	54,2		2296784	
1990	1,187	54,8		2283362	
1991	1,147	54,9		2220321	
1992	1,073	54,4		2389395	
1993	1,083	53,7		1695264	
1994	1,116	52,8		1683652	
1995	1,121	52,5		1737108	
1996	1,122	52,9		1723117	
1997	1,063	53		2393495	
1998	1,101	53,7		2378592	
1999	1,211	54,5		2349200	
2000	1,149	55,5		2437231	
2001	1,117	56,6		2429903	
2002	1,102	57,4		2281245	
2003	1,152	57,5		2251307	
2004	1,344	57,6		2264562	
2005	1,22	57,5		2237225	
2006	1,285	58,3		2325404	
2007	1,299	58,6		2490570	
2008	1,38	58,6		2160131	
2009	1,233	57,4		2158010	
2010	1,364	56,8		1960282	
2011	1,556	56,8		1748143	
2012	1,786	56,6		1402089	
2013	1,748	55,5		1304648	
2014	1,712	55,7		1360293	
2015	1,534	56,3		872951	
2016*	1,437	56,8	1361054	1877116	2393178
2017*	1,434	57,1	1386594	1902655	2418717
2018*	1,431	57,4	1412226	1928286	2444348
2019*	1,428	57,6	1433788	1949848	2465909



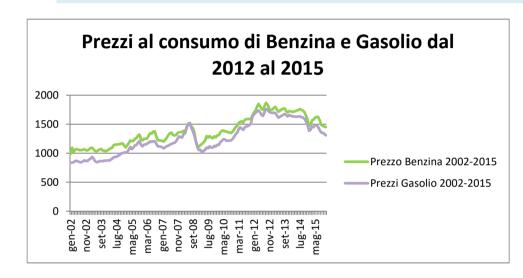
Serie Storica

Anno	Prezzi benzina	Prezzi Gasolio
gen-02	992,39	836,14
feb-02	1095	837,04
mar-02	1023,92	844,64
apr-02	1063,36	866,36
mag-02	1071,58	868,07
giu-02	1061,11	857,43
lug-02	1052,43	846,06
ago-02	1052,57 1061,73	842,69 859,39
set-02	1061,73	875,67
ott-02		
nov-02	1052,98	864,11
dic-02	1045,69	864,37
gen-03	1068,53	891,6
feb-03	1087,79	906,23
mar-03	1095,02	936,62
apr-03	1065,23	906,74
mag-03	1039,79	860,9
giu-03	1032,03	845,88
lug-03	1045,49	850,63
ago-03	1065,9	865,55
set-03	1071,84	863,72
ott-03	1043,94	860,8
nov-03	1043,37	873,95
dic-03	1036,82	869,89
gen-04	1047,2	875,28
feb-04	1063,1	872,51
mar-04	1082,15	886,94
apr-04	1091,99	899,36
mag-04	1131,29	924,13
giu-04	1148,14	937,48
lug-04	1146,85	935,83
ago-04		954,81
set-04	1155,81	970,13
ott-04	1168,69	996,25
nov-04	1168,11	996,73
dic-04	1132,57	1013,93
gen-05	1098,07	1009
feb-05	1135,12	1022,64
mar-05	1170,15	1057,44
apr-05	1219,72	1106,3
mag-05	1208,74	1070,75
giu-05	1209	1090,44
lug-05	1244,86	1131,04
ago-05	1255,86	1140,61
set-05	1303,59	1182,41
ott-05	1321,38	1211,12
nov-05	1243,77	1144,61
dic-05	1220,03	1119,45
gen-06	1248,31	1146,96
feb-06	1248,37	1150,89
mar-06	1253,42	1163,23
apr-06	1298,51	1178,56
mag-06	1341,37	1204,87
giu-06		1197
lug-06	1371,5	1203,07
ago-06	1374,96	1206,67
set-06	1296,75	1168,81
ott-06	1222,56	1119,64
nov-06	1219,52	1115,58
dic-06	1219,13	1113,87
gen-07	1209,85	1099,4
feb-07	1202,28	1082,64
mar-07	1236,25	1105,33
apr-07	1267,15	1120,63
mag-07	1315,3	1120,03
	1346,24	1150,31
giu-07	1346,24	
lug-07		1161,84 1173,59
ago-07	1315,04	
set-07	1306	1180,67
ott-07	1313,33	1205,28
nov-07	1347,84	1252,41
dic-07	1360,84	1286,11
gen-08	1364,44	1277,74
feb-08	1367,6	1271,89
mar-08	1386,16	1332,28
apr-08	1374,79	1345,5
mag-08	1455,25	1443,16
giu-08	1512,13	1507,25
lug-08	1522,64	1518,14
ago-08	1458,25	1436,88
set-08	1435,35	1383,87
ott-08	1346,35	1301,48
nov-08	1211,92	1194,82
dic-08	1120,88	1092,9
u.0 00	. 120,00	1002,0

Anno	Prezzi benzina	Prezzi Gasolio
gen-09	1113,64	1051,4
feb-09	1140,8	1056,72
mar-09 apr-09	1162,61 1185,29	1022,79 1041,44
mag-09	1224,56	1061,58
giu-09	1294,84	1096,02
lug-09	1270,52	1086,2
ago-09	1295,63	1117,38
set-09	1271,35	1096,09
ott-09	1256,37	1095,73
nov-09	1289,44	1126,04
dic-09 gen-10	1273,66 1305,08	1114,67 1145,25
feb-10	1312,88	1142,32
mar-10	1358,36	1189,58
apr-10	1386,46	1215,83
mag-10	1391,58	1241,21
giu-10	1377,42	1236,3
lug-10	1371,76	1215,31
ago-10	1362,67	1211,44
set-10 ott-10	1355,34 1351,82	1217,18 1221.46
nov-10	1369,93	1242,84
dic-10	1411,52	1286,38
gen-11	1452,56	1328,14
feb-11	1469,63	1351,26
mar-11	1523,15	1416,73
apr-11	1542,19	1448,06
mag-11	1548,69	1423,26
giu-11	1529,36	1402,52
lug-11 ago-11	1576,16 1586,02	1450,28 1461,04
set-11	1589,69	1465,79
ott-11	1592,27	1483,92
nov-11	1591,67	1512,89
dic-11	1655,16	1631,65
gen-12	1700,9	1671,71
feb-12	1737,8	1692,94
mar-12	1799,67	1724,27
apr-12 mag-12	1850,22 1805,67	1735,05 1703,01
giu-12	1760,7	1657,23
lug-12	1750,95	1647,02
ago-12	1818,26	1716,81
set-12	1870,89	1764,22
ott-12	1833,91	1745,65
nov-12	1759,07	1712,85
dic-12	1746,45	1701,11
gen-13 feb-13	1749,94 1781	1694,38 1699,67
mar-13	1796.91	1693,94
apr-13	1753,8	1651,11
mag-13	1716,16	1612,31
giu-13	1733,76	1626,46
lug-13	1753,53	1644,02
ago-13	1767,85	1658,04
set-13	1773,23 1728,78	1676,67
ott-13 nov-13	1728,78	1659,69 1636,63
dic-13	1727,63	1656,56
gen-14	1723,07	1648,99
feb-14	1714,05	1637,83
mar-14	1715,3	1631,47
apr-14	1725,6	1628,55
mag-14	1737,53	1630,68
giu-14 lug-14	1743,96 1761,19	1632,08 1635,64
ago-14	1761,19	1621,61
set-14	1734,56	1614,78
ott-14	1709,22	1593,24
nov-14	1652,41	1553,45
dic-14	1585,65	1493,47
gen-15	1472,04	1387,26
feb-15	1489,44	1400,39
mar-15 apr-15	1565,9 1580,63	1462,26 1447,72
mag-15	1614,05	1447,72
giu-15	1622,84	1477,54
lug-15	1626,46	1451,55
ago-15	1567,82	1398,76
set-15	1494,74	1360,03
ott-15	1473,21	1348,4
nov-15	1457,35	1340,52
dic-15	1450,68	1308,85

Serie Storica

L'analisi delle serie storiche rappresenta una descrizione sintetica dell'andamento del fenomeno. Il modello generatore della serie storica è composto dalla componente sistematica e dalle variabili casuali, dette componenti stocastiche della serie: Yt = f(t)+ut



Nel grafico accanto possiamo osservare come l'andamento delle due serie storiche dal 2002 al 2015 non sia prettamente lineare: infatti, sia nel caso della benzina, sia nel caso del gasolio, possiamo notare alcuni picchi verso l'alto (come il gasolio a metà del 2008) e alcuni picchi verso il basso (come il crollo del prezzo della benzina nel Gennaio del 2012).

Fonte: NS Elaboraz. Dati del Ministero dello Sviluppo Economico (www.mise.gov.it)

Secondo l'approccio classico all'analisi delle serie storiche, la componente stocastica rappresenta l'insieme di tutte le circostanze che fanno variare il fenomeno: esse sono accidentali, assimilabili a residui o eventuali errori

Per questo motivo, ciò che assume più importanza nell'analisi è la stima della componente sistematica. essa non è altro che il risultato dell'azione congiunta di tre diverse componenti:

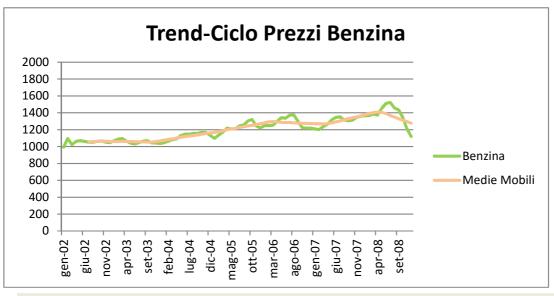
- il **TREND**, ovvero la tendenza di fondo del fenomeno considerato, crescente o decrescente, riferita ad un lungo periodo di tempo e sempre nello stesso verso.
- il CICLO, composto da ripetute oscillazioni, verso l'alto o il basso, attorno al trend, senza una necessaria regolarità. Tali oscillazioni vengono generate dall'alternarsi di periodi di sviluppo e di contrazione.
- la **STAGIONALITA'**, ovvero tutte quelle fluttuazioni periodiche regolari che si ripetono anno dopo anno per ogni periodo di 12 mesi, chiamate variazioni stagionali.

Attraverso l'analisi delle serie storica per ciascuna di queste singole componenti, siamo in grado di costruire una nuova seria che contenga solo l'effetto della componente scelta o modificare i dati della serie rilevata rimuovendo l'influenza della componente analizzata.

Stima del Trend-ciclo di prima approssimazione

gen-02 992,39 836,14 mar-02 1023,92 844,64 apr-02 1063,36 866,36 mag-02 1071,58 868,07 glu-02 1061,11 877,43 lug-02 1052,43 1056,57833 846,06 857,475 set-02 1061,73 1062,11 859,39 863,384167 ort-02 1052,67 1059,447917 842,69 862,68875 set-02 1052,57 1059,447917 842,69 862,68875 set-02 1052,67 1059,447917 842,69 862,68876 ort-02 1056,80 1065,10047 875,67 874,8991667 ort-02 1052,98 1063,90375 884,11 876,2829167 dic-02 1045,69 1061,3675 884,37 875,522167 gen-03 1065,37 1059,186667 891,6 875,212083 reb-03 1087,79 1060,132917 906,23 875,212083 apr-03 1065,23 1060,525 906,74 877,04875 apr-03 1065,33 1053,34875 845,88 877,4791667 glu-03 1032,03 1053,34875 845,88 877,491667 set-03 1071,84 1053,007917 850,55 877,991667 set-03 1071,84 1053,007917 850,55 877,991667 set-03 1043,37 1059,114167 860,9 889,9916657 ort-03 1043,37 1059,114167 860,9 889,9916667 ort-03 1043,37 1059,114167 860,9 889,991667 ort-03 1043,37 1059,114167 860,9 889,971687 ort-04 1081,39 111,21 924,13 921,498333 gen-04 1047,2 1076,825833 889,89 877,83 gen-04 1047,2 1076,825833 899,85 877,87 apr-04 1081,99 1100,814583 899,36 877,89 apr-04 1148,85 1126,50625 935,83 944,186667 de-04 1135,61 1138,294167 970,13 glu-05 1146,85 1126,50625 935,83 944,186667 de-04 1135,71 1155,83203 967,7 998,316667 de-04 1148,41 1120,397065 937,44 939,486667 de-05 1131,52 1116,596 1039,37 1039,39 1039,31667 de-06 1131,57 1168,69 1147,28917 up-06 1248,87 1225,54667 1090,44 1102,754167 up-06 1248,87 1225,54667 1090,44 1122,754167 up-06 1248,87 1226,5667 1090,44 1122,754167 up-06 1248,87 1226,5667 1090,44 1122,754167 up-06 1248,87 1226,6667 1131,4	Anno	Prezzi benzina	MMt(benzina)		MMt(gasolio)
mag-02	gen-02	992,39		836,14	
mag-02					
mgg-02					
Mg-02					
Beg.					
set-02					
December 2					
December 2			,		
gen-03					
mar-03 1095.02 1061,109583 936.62 877,4879167 apr-03 1095.03 1065.23 1060,525 906,74 877,04875 mag-03 1039,79 1059,11875 860,9 876,8391667 jpu-03 1039,03 1058,94875 845,88 877,4791667 jpu-03 1045,49 1057,090417 850,63 877,0291667 ago-03 1071,84 1053,607917 865,55 874,941667 ago-03 1043,94 1054,186667 860,8 869,0916667 nov-03 1043,94 1068,15 1092,117917 866,94 900,68876 deb-04 1062,15 1092,117917 866,94 900,68876 agr-04 1081,99 1100,814683 899,36 91,073625 agr-04 1081,99 1100,814683 899,36 91,073625 agr-04 1148,14 1120,397083 937,48 932,6133333 jpu-04 1148,14 1120,397083 937,48 932,6133333 jpu-04 1148,14 1120,397083 937,48 932,6133333 jpu-04 1146,85 1126,50625 9358,3 944,1866667 ago-04 1155,74 1131,626667 954,81 956,01375 nov-04 1168,69 1147,282917 996,25 995,11 nov-04 1168,69 1147,282917 996,25 995,11 nov-04 1168,11 1155,832083 996,73 999,8316667 nov-04 1188,15 1176,48333 1002,24 1042,696667 mag-05 1129,72 1199,235417 1106,3 1077,08125 nov-05 1129,72 1199,235417 1106,3 1077,08125 nag-05 129,72 1199,235417 1106,3 1077,08125 nag-05 129,72 1199,235417 1106,3 1077,08125 nag-05 1244,74 1250,75833 1144,61 1143,769833 apr-05 129,72 1199,235417 1106,3 1077,08125 nag-06 1244,87 1226,77 139,3333 1150,81 1172,99167 nag-06 1244,81 125,676667 1199,48 1131,49 1112,99167 nag-06 1244,81 125,676667 1199,48 1133,022,81 144,61 1149,760833 nag-06 1248,31 1281,609167 1146,96 1167,230417 pol-06 1246,68 1255,68 1266,67 1156,67 1135,81 1129,931667 nag-06 1341,37 1286,935667 1199,48 1133,022,81 146,68 1127,166467 nag-06 1341,37 1286,69667 1136,81 113				864,37	,
mar-03 1095.02 1061.109583 936.62 877.4879167 apr-03 1065.23 1060.525 906.74 877.04875 map-03 1032.03 1059.34875 86.9, 876.8391667 giu-03 1043.04 1057.090417 86.0.3 876.8391667 ago-03 1065.9 1055.172917 865.55 874.941667 set-03 1071.84 1053.607917 863.75 871.4891667 set-03 1074.84 1053.607917 863.72 871.4891667 out-03 1043.94 1054.186667 860.8 869.0916667 nov-03 1043.37 1059.114167 873.95 871.41875 dic-03 1036.2 1067.764583 869.89 877.87 gen-04 1047.2 1076.825833 875.28 885.2366667 feb-04 1063.1 1034.84167 872.51 892.5058333 mar-04 1082.15 1092.117917 886.94 990.65875 apr-04 1091.99 1100.814583 899.36 910.73625 mag-04 1148.14 1120.397083 937.48 932.6133333 giu-04 1148.68 1126.50625 935.83 944.1866667 ago-04 1155.81 1138.294167 950.81 956.01375 set-04 1168.61 1126.50625 935.83 944.1866667 ago-04 1155.81 1138.294167 970.13 969.3733333 e10.004 1146.86 11467.482917 996.25 985,1 nov-04 1168.61 1147.62917 996.25 985,1 nov-04 1168.11 1155,832083 996.73 999.8316667 dic-04 1132.57 1161.595 1013.33 1012.614159 gen-05 1098.07 1168.214583 1009 102.68.2125 feb-05 1135.12 1176.428333 1057.44 1059.28333 apr-05 129.72 1199.235417 1106.3 1077.08125 per-05 129.72 1199.235417 1106.3 1077.08125 per-05 129.72 1199.235417 1106.3 1077.08125 per-06 1244.86 1225.450833 1140.61 1123.99125 per-06 1244.86 1225.450833 1140.61 1123.99125 per-06 1244.86 1225.450833 1140.61 1123.99125 per-06 1244.87 1299.1848333 1057.44 1059.283333 apr-06 1298.74 1298.75 1291.848333 1150.89 1177.09165 per-06 1244.87 1291.9484533 1144.61 1149.760833 apr-06 1244.86 1225.450833 1140.61 1123.99125 per-06 1244.87 1291.948333 1150.89 1177.98165 per-06 1244.87 1291.948333 1150.89 1177.98167 per-06 1243.77 1260.179583 1144.61 1149.760833 apr-06 1244.87 1291.848333 1150.89 1177.98165 per-07 1292.58 1255.86 1236.429583 1140.61 1123.99125 per-07 1292.58 1255.86 1236.429583 1140.61 1123.99125 per-07 1292.58 1275.737917 1190.4 1112.93.31 1175.70 per-07 1292.58 1275.737917 1190.4 1113.33.22917 per-07 1292.58 1275.737917 1190.4 1113.33.22917 per-07 1292.58 1275.73917 1150.3		,			,
mag-03 1036,72 1066,525 906,74 877,04976 gju-03 1032,03 1055,41875 860,9 876,8391667 ago-03 1045,49 1057,090417 850,63 877,0291667 set-03 1041,49 1053,607917 863,72 871,4691667 ort-03 1043,34 1054,186667 860,8 869,0916667 nov-03 1043,34 1054,186667 860,8 869,0916667 nov-03 1043,37 1059,114167 873,95 871,41875 dic-03 1036,82 1067,764583 869,89 877,87 gen-04 1047,2 1076,825833 875,28 885,286667 feb-04 1063,1 1094,834167 872,51 892,505833 mar-04 1091,99 1100,814583 869,39 910,73625 mag-04 1047,2 1076,82533 875,28 885,286667 ago-04 1041,2 1111,21 924,13 921,4958333 igu-04 1148,41 1120,397083 937,48 932,6133333 lug-04 1146,48 1126,50625 935,83 944,1866667 set-04 1155,81 1138,294167 970,13 969,373333 ott-04 1155,81 1138,294167 970,13 969,373333 ott-04 1155,81 1138,294167 970,13 969,373333 ott-04 1168,69 1147,282917 996,25 985,1 100-04 1168,69 1147,282917 996,25 985,1 00-04 1168,11 1155,81 138,294167 970,13 969,373333 ott-04 1155,81 1138,294167 970,13 969,373333 ott-04 1155,81 1138,294167 970,13 969,373333 ott-04 1168,69 1147,282917 996,25 985,1 135,000,000 1158,74 1136,676,676,776,776,776,776,776,776,776,7					
maig-03					
George		, -		,	
ago-03		1032,03	1058,34875	845,88	
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ago-07 1315,04 1317,633333 1173,59 1185,18125 set-07 1306 1330,767917 1180,67 1202,522917 ott-07 1313,33 1341,499167 1205,28 1221,34875 nov-07 1347,84 1351,815417 1252,41 1243,725 dic-07 1360,84 1364,55875 1286,11 1271,604167 gen-08 1364,44 1378,487917 1277,74 1301,3225 feb-08 1367,6 1391,472083 1271,89 1327,13875 mar-08 1386,16 1402,82875 1332,28 1346,575833 apr-08 1374,79 1409,594167 1345,5 1359,050833 apr-08 1455,25 1405,306667 1443,16 1360,659583 giu-08 1512,13 1389,645 1507,25 1350,209583 lug-08 1522,64 1369,196667 1518,14 1332,728333 ago-08 1458,25 1349,296667 1436,88 1314,332083 set-08 1435,35 1330,532083 1383,87 1292,47125 ott-08 1346,35 1313,321667 1301,48 1266,906667 nov-08 1211,92 1295,81375 1194,82 1238,338333					
set-07 1306 1330,767917 1180,67 1202,522917 ott-07 1313,33 1341,499167 1205,28 1221,34875 nov-07 1347,84 1351,815417 1252,41 1243,725 dic-07 1360,84 1364,55875 1286,11 1271,604167 gen-08 1364,44 1378,487917 1277,74 1301,3225 feb-08 1367,6 1391,472083 1271,89 1327,13875 mar-08 1386,16 1402,82875 1332,28 1346,575833 apr-08 1374,79 1409,594167 1345,5 1359,050833 giu-08 1455,25 1405,306667 1443,16 1360,659583 giu-08 1512,13 1389,645 1507,25 1350,209583 lug-08 1522,64 1369,196667 1518,14 1332,728333 ago-08 1458,25 1349,296667 1436,88 1314,332083 set-08 1435,35 1330,532083 1383,87 1292,47125 ott-08 1346,35 1313,321667			,		
nov-07 1347,84 1351,815417 1252,41 1243,725 dic-07 1360,84 1364,55875 1286,11 1271,604167 gen-08 1364,44 1378,487917 1277,74 1301,3225 feb-08 1367,6 1391,472083 1271,89 1327,13875 mar-08 1386,16 1402,82875 1332,28 1346,575833 apr-08 1374,79 1409,594167 1345,5 1359,050833 mag-08 1455,25 1405,306667 1443,16 1360,659583 giu-08 1512,13 1389,645 1507,25 1350,209583 lug-08 1522,64 1369,196667 1518,14 1332,728333 ago-08 1458,25 1349,296667 1436,88 1314,332083 set-08 1435,35 1330,532083 1383,87 1292,47125 ott-08 1346,35 1313,321667 1301,48 1266,906667 nov-08 1211,92 1295,81375 1194,82 1238,338333	set-07	1306	1330,767917	1180,67	1202,522917
dic-07 1360,84 1364,55875 1286,11 1271,604167 gen-08 1364,44 1378,487917 1277,74 1301,3225 feb-08 1367,6 1391,472083 1271,89 1327,13875 mar-08 1386,16 1402,82875 1332,28 1346,575833 apr-08 1374,79 1409,594167 1345,5 1359,050833 mag-08 1455,25 1405,306667 1443,16 1360,659583 giu-08 1512,13 1389,645 1507,25 1350,209583 lug-08 1522,64 1369,196667 1518,14 1332,728333 ago-08 1458,25 1349,296667 1436,88 1314,332083 set-08 1435,35 1330,532083 1383,87 1292,47125 ott-08 1346,35 1313,321667 1301,48 1266,906667 nov-08 1211,92 1295,81375 1194,82 1238,338333					
gen-08 1364,44 1378,487917 1277,74 1301,3225 feb-08 1367,6 1391,472083 1271,89 1327,13875 mar-08 1386,16 1402,82875 1332,28 1346,575833 apr-08 1374,79 1409,594167 1345,5 1359,950833 mag-08 1455,25 1405,306667 1443,16 1360,659583 giu-08 1512,13 1389,645 1507,25 1350,209583 lug-08 1522,64 1369,196667 1518,14 1332,728333 ago-08 1458,25 1349,296667 1436,88 1314,332083 set-08 1435,35 1330,532083 1383,87 1292,47125 ott-08 1346,35 1313,321667 1301,48 1266,906667 nov-08 1211,92 1295,81375 1194,82 1238,338333					
feb-08 1367,6 1391,472083 1271,89 1327,13875 mar-08 1386,16 1402,82875 1332,28 1346,575833 apr-08 1374,79 1409,594167 1345,5 1359,050833 mag-08 1455,25 1405,306667 1443,16 1360,659583 giu-08 1512,13 1389,645 1507,25 1350,209583 lug-08 1522,64 1369,196667 1518,14 1332,728333 ago-08 1458,25 1349,296667 1436,88 1314,332083 set-08 1435,35 1330,532083 1383,87 1292,47125 ott-08 1346,35 1313,321667 1301,48 1266,996667 nov-08 1211,92 1295,81375 1194,82 1238,338333					
mar-08 1386,16 1402,82875 1332,28 1346,575833 apr-08 1374,79 1409,594167 1345,5 1359,050833 mag-08 1455,25 1405,306667 1443,16 1360,659583 giu-08 1512,13 1389,645 1507,25 1350,209583 lug-08 1522,64 1369,196667 1518,14 1332,728333 ago-08 1458,25 1349,296667 1436,88 1314,332083 set-08 1435,35 1330,532083 1383,87 1292,47125 ott-08 1346,35 1313,321667 1301,48 1266,906667 nov-08 1211,92 1295,81375 1194,82 1238,338333				1271,89	
mag-08 1455,25 1405,306667 1443,16 1360,659583 giu-08 1512,13 1389,645 1507,25 1350,209583 lug-08 1522,64 1369,196667 1518,14 1332,728333 ago-08 1458,25 1349,296667 1436,88 1314,332083 set-08 1435,35 1330,532083 1383,87 1292,47125 ott-08 1346,35 1313,321667 1301,48 1266,906667 nov-08 1211,92 1295,81375 1194,82 1238,338333	mar-08	1386,16	1402,82875	1332,28	1346,575833
giu-08 1512,13 1389,645 1507,25 1350,209583 lug-08 1522,64 1369,196667 1518,14 1332,728333 ago-08 1458,25 1349,296667 1436,88 1314,332083 set-08 1435,35 1330,532083 1383,87 1292,47125 ott-08 1346,35 1313,321667 1301,48 1266,906667 nov-08 1211,92 1295,81375 1194,82 1238,338333					
lug-08 1522,64 1369,196667 1518,14 1332,728333 ago-08 1458,25 1349,296667 1436,88 1314,332083 set-08 1435,35 1330,532083 1383,87 1292,47125 ott-08 1346,35 1313,321667 1301,48 1266,996667 nov-08 1211,92 1295,81375 1194,82 1238,338333					
ago-08 1458,25 1349,296667 1436,88 1314,332083 set-08 1435,35 1330,532083 1383,87 1292,47125 ott-08 1346,35 1313,321667 1301,48 1266,906667 nov-08 1211,92 1295,81375 1194,82 1238,338333					
set-08 1435,35 1330,532083 1383,87 1292,47125 ott-08 1346,35 1313,321667 1301,48 1266,906667 nov-08 1211,92 1295,81375 1194,82 1238,338333					
ott-08 1346,35 1313,321667 1301,48 1266,906667 nov-08 1211,92 1295,81375 1194,82 1238,338333					1292,47125
		1346,35			
1120,88 1277,147917 1092,9 1205,304583					
	aic-08	1120,88	12/7,14/91/	1092,9	1205,304583

Anno	Prezzi benzina	MMt(benzina)	Prezzi Gasolio	MMt(gasolio)
gen-09	1113,64	1257,589167	1051,4	1170,1725
feb-09	1140,8	1240,308333	1056,72	1138,8625
mar-09	1162,61	1226,699167	1022,79	1113,559167
apr-09 mag-09	1185,29 1224,56	1216,116667 1215,5975	1041,44 1061,58	1092,995417 1081,556667
giu-09	1294,84	1225,193333	1096,02	1079,597917
lug-09	1270,52	1239,535833	1086,2	1084,415417
ago-09	1295,63	1254,6825	1117,38	1091,8925
set-09	1271,35	1270,00875	1096,09	1102,40875
ott-09 nov-09	1256,37 1289,44	1286,547083 1301,888333	1095,73 1126,04	1116,624583 1131,375417
dic-09	1273,66	1312,288333	1114,67	1144,705
gen-10	1305,08	1319,9475	1145,25	1155,929583
feb-10	1312,88	1326,959167	1142,32	1165,228333
mar-10 apr-10	1358,36	1333,252083	1189,58	1174,192917
mag-10	1386,46 1391,58	1340,72875 1348,059583	1215,83 1241,21	1184,477083 1194,5825
giu-10	1377,42	1357,1575	1236,3	1206,60375
lug-10	1371,76	1369,046667	1215,31	1221,37875
ago-10	1362,67	1381,722917	1211,44	1237,705
set-10 ott-10	1355,34 1351,82	1395,120417 1408,475417	1217,18 1221,46	1255,875417 1275,01625
nov-10	1369,93	1421,510417	1242,84	1292,277917
dic-10	1411,52	1434,3875	1286,38	1306,789167
gen-11	1452,56	1449,235	1328,14	1323,505417
feb-11	1469,63	1467,057917	1351,26	1343,695833
mar-11 apr-11	1523,15 1542,19	1486,12875 1505,912083	1416,73 1448,06	1364,454583 1385,749167
mag-11	1548,69	1525,17	1423,26	1407,937083
giu-11	1529,36	1544,560833	1402,52	1433,575417
lug-11	1576,16	1565,06	1450,28	1462,277083
ago-11 set-11	1586,02 1589,69	1586,58125 1609,276667	1461,04 1465,79	1490,829167 1517,88
ott-11	1592,27	1633,632917	1483,92	1542,652083
nov-11	1591,67	1657,175	1512,89	1566,26625
dic-11	1655,16	1677,521667	1631,65	1588,535417
gen-12	1700,9	1694,44375	1671,71 1692,94	1607,345833
feb-12 mar-12	1737,8 1799,67	1711,403333 1732,796667	1724,27	1626,200417 1649,292083
apr-12	1850,22	1754,581667	1735,05	1672,632083
mag-12	1805,67	1771,625	1703,01	1691,869167
giu-12	1760,7	1782,40375	1657,23	1703,095
lug-12 ago-12	1750,95 1818,26	1788,250833 1792,094167	1647,02 1716,81	1706,93375 1708,15875
set-12	1870,89	1793,779167	1764,22	1707,175417
ott-12	1833,91	1789,646667	1745,65	1702,414167
nov-12	1759,07	1781,899583	1712,85	1695,1375
dic-12 gen-13	1746,45 1749,94	1777,0475 1776,0325	1701,11 1694,38	1690,07625 1688,669167
feb-13	1749,94	1774,039583	1699,67	1686,095417
mar-13	1796,91	1767,87	1693,94	1679,99875
apr-13	1753,8	1759,420417	1651,11	1672,769167
mag-13	1716,16	1752,70375	1612,31	1666,011667
giu-13 lug-13	1733,76 1753,53	1749,583333 1747,679583	1626,46 1644,02	1660,979583 1657,232083
ago-13	1767,85	1743,770417	1658,04	1652,764167
set-13	1773,23	1737,580417	1676,67	1647,584583
ott-13	1728,78	1733,005	1659,69	1644,041667
nov-13 dic-13	1703 1727,63	1732,720417 1734,035833	1636,63 1656,56	1643,867083 1644,866667
gen-14	1723,07	1734,78	1648,99	1644,751667
feb-14	1714,05	1734,344167	1637,83	1642,884583
mar-14	1715,3	1731,977917	1631,47	1638,787917
apr-14 mag-14	1725,6 1737,53	1729,551667 1726,62875	1628,55 1630,68	1633,440417 1627,205833
giu-14	1743,96	1718,605	1632,08	1616,944583
lug-14	1761,19	1702,229583	1635,64	1599,24375
ago-14	1749,73	1682,41125	1621,61	1578,445
set-14 ott-14	1734,56 1709,22	1666,8275 1654,562083	1614,78 1593,24	1561,50125 1546,91625
nov-14	1652,41	1643,376667	1553,45	1533,111667
dic-14	1585,65	1633,185	1493,47	1520,4025
gen-15	1472,04	1622,524583	1387,26	1506,292917
feb-15	1489,44	1609,33125	1400,39	1489,337083
mar-15 apr-15	1565,9 1580,63	1591,759167 1571,932917	1462,26 1447,72	1469,437083 1448,620833
mag-15	1614,05	1553,971667	1480,2	1429,547083
giu-15	1622,84	1540,220417	1477,54	1412,9825
lug-15	1626,46		1451,55	
ago-15	1567,82 1494,74		1398,76	
set-15 ott-15	1473,21		1360,03 1348,4	
nov-15	1457,35		1340,52	
dic-15	1450,68		1308,85	



Fonte: NS Elaboraz. Dati del Ministero dello Sviluppo Economico (www.mise.gov.it)

Utilizzando l'interpolazione meccanica sfruttando le medie mobili (invece dell'interpolazione analitica, dove si adatta una data funzione alla linea dei dati), si può stimare il trend-ciclo di prima approssimazione della serie storica relativa al prezzo della benzina. Dal grafico che ne ricaviamo possiamo osservare come dal 2002 al 2008 il ciclo mantiene un andamento quasi identico al trend, con l'assenza di forti oscillazioni. Nel 2008, e fino alla fine del 2009, questa linearità si spezza, a causa delle ripercussioni della crisi finanziaria sui mercati, ed il crollo del prezzo della benzina. Dal 2010 al 2012 il ciclo subisce un'impennata verso l'alto che segue un andamento quasi identico al trend, in questo caso crescente. Dal 2013 a metà del 2014 si osserva un trend piatto, mentre tra la fine del 2014 e nel 2015, si verificano nuovamente dei forti crolli nel prezzo della benzina, che portano forti oscillazioni del ciclo intorno al trend. Il comportamento del Trend-Ciclo relativo ai Prezzi del Gasolio è pressoché analogo a quello della benzina.



Stima della componente stagionale

\$\begin{align*}	Δ	D	B884/1	OF (()	0.0	D	BBB4(P-)	OF ((0((
		Prezzi benzina	MMt(benzina)	SE t(benzina)			MMt(gasolio)	SE t(gasolio)	St(gasolio)
map						,			
Beach 1063,38									
Dec 1061,11									
Deg. 02								,	
Bay-Dig 1055_27 1056_447917 6.87791807 132.08181 66.03 66.03 66.03 66.04 6					,				
Section 1661,75									113,4894048
Dec. 1006.08 1006.15017 2,020083333 100,30494 175,07 175,0703333 180,02006 1005.08 1005.0075 110277 73,0703375 200,011 175,0705 175,070				·					112,2618155
									108,5955952
dec-									98,92505952
Dept-00 1096.50 1006.00000 1006.00000 8.083333333 32.40000000 20.2 873.505 29.875 62.2187 1006.00000 1006.00000 33.97041007 70.81127975 938.52 877.4879107 98.12000000 98.12000000000000000000000000000000000000	nov-02	1052,98	1063,90375	-10,92375		864,11	876,2829167	-12,17291667	84,59443452
	dic-02	1045,69			67,26705357	864,37	875,5029167	-11,13291667	79,91133929
margin 1006.00 1061.109588 33.91041007 70.64127270 596.00 877.4679107 591.303833 63.94101 70.6412707 60.05267 74.705 74.7	gen-03	1068,53	1059,866667	8,663333333	32,40895833	891,6	875,2120833	16,38791667	41,26657738
Bernoll 1986.23 1080.525 4.705 88.20191546 900.74 877.04875 79.09125 90.4910 1093.79 1091.97 1091.920 1093.79 1091.97 1091.920 1093.79 1091.920 1093.4877 46.51876 102.034644 846.88 877.479667 3.5.6916667 72.279648 1093.99 10	feb-03	1087,79	1060,132917	27,65708333	50,51276786	906,23	876,355	29,875	42,218125
mag 103 103 79 1068 1075 19.0075 96.53677 80.05 876.891697 15.50816697 72.79169 103 10	mar-03	1095,02	1061,109583	33,91041667	70,84127976	936,62	877,4879167	59,13208333	63,5410119
Burgo 103.003 1056.94 1057.090417 116.004697 136.007221 865.003 877.001667 23.9596667 13.86869 13.8	apr-03	1065,23	1060,525	4,705	85,20181548	906,74	877,04875	29,69125	69,47907738
Bag-03	mag-03	1039,79	1059,11875	-19,32875		860,9	876,8391667	-15,93916667	71,21997024
890-03 1066.9 1065.772917 10.72708333 130.68508218 865.55 874,94416607 4.934166067 10.95060 101.01 1	giu-03	1032,03		-26,31875	102,034494	845,88	877,4791667	-31,59916667	72,67994048
Section 1071.84 1053.007317 18_22003333 12_2209861 863.72 871.4891667 7.749166667 80.250667 80.25066 80.0506 80.	lug-03	1045,49	1057,090417	-11,60041667	143,8097321	850,63	877,0291667	-26,39916667	113,4894048
mm-03	ago-03	1065,9	1055,172917	10,72708333	139,6889881	865,55	874,9441667	-9,394166667	112,2618155
moneyable mone	set-03	1071,84	1053,607917	18,23208333	129,299881	863,72	871,4691667	-7,749166667	108,5955952
moneyable mone	ott-03	1043,94	1054,186667	-10,24666667	105,364494	860,8	869,0916667	-8,291666667	98,92505952
decis 1008.62									84,59443452
General 10472 1078.285833 228.28583338 32.4658633 875.28 885.2586852 9.958686867 41.285676 41.285776 41.									79,91133929
									41,26657738
mar-04 1082,15 1092,17917 -9,967916687 70.34127076 889,94 900,68676 -13,178756 88,3461 890.38 910,73826 -13,178756 88,3461 890.38 910,73826 -13,178756 88,478077 890,478077 113,129 1111,121 20.08 98,58675 904,13 921,4958333 2.534166667 71.219970 114,184 1120,570763 72,74291667 102,034494 937,48 932,6133333 2.534166667 71.219970 102,034494 937,48 932,6133333 2.534166667 71.219970 113,29 1115,62667 72,679340 133,0367681 115,62667 72,679340 133,0367681 134,03646 146,036 147,03676 134,03677 134,03676 134,03676 134,03676 134,03677 134,036776 102,046 134,03776 134,03676 134,036776 134,036776 134,036776 134,036776 134,036776 134,036776 134,036777 134,03677									42,218125
mg-04 1091.99									63,5410119
mag-04 1131_29					- ,				69,47907738
Buy-04 1148,14 1120,9707083 Z7,74291667 102,034494 937,46 932,6133333 4,869666667 72,677944 109,044 1156,74 1131,626607 251,1333333 139,6898961 954,81 956,01375 -1,20375 112,8984 960,01376 -1,20375 -1				·					71,21997024
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nov-07 1347,84 1351,815417 -3,975416667 79,38693452 1252,41 1243,725 8,685 84,594434 dic-07 1360,84 1364,55875 -3,71875 67,26705357 1286,11 1271,604167 14,50583333 79,911339 gen-08 1364,44 1378,487917 -14,04791667 32,40895833 1277,74 1301,3225 -23,5825 41,266577 feb-08 1367,6 1391,472083 -23,87208333 50,51276786 1271,89 1327,13875 -55,24875 42,2181 mar-08 1386,16 1402,82875 -16,66875 70,84127976 1332,28 1346,575833 -14,29583333 63,54101 apr-08 1374,79 1409,594167 -34,80416667 85,20181548 1345,5 1359,050833 -13,55083333 69,479077 mag-08 1455,25 1405,306667 49,94333333 96,836875 1443,16 1360,659583 82,50041667 71,219970 giu-08 1512,13 1389,645 122,485 102,034494 1507,25 1350,209583 157,0404167					-,				108,5955952
dic-07 1360,84 1364,55875 -3,71875 67,26705357 1286,11 1271,604167 14,50583333 79,911339 gen-08 1364,44 1378,487917 -14,04791667 32,40895833 1277,74 1301,3225 -23,5825 41,266577 feb-08 1367,6 1391,472083 -23,87208333 50,51276786 1271,89 1327,13875 -55,24875 42,2181 mar-08 1386,16 1402,82875 -16,66875 70,84127976 1332,28 1346,575833 -14,29583333 63,54101 apr-08 1374,79 1409,594167 -34,80416667 85,20181548 1345,5 1359,950833 -13,55083333 69,479077 mag-08 1455,25 1405,306667 49,94333333 96,836875 1443,16 1360,659583 82,50041667 71,219970 giu-08 1512,13 1389,645 122,485 102,034494 1507,25 1350,209583 157,0404167 72,679940 lug-08 1522,64 1369,196667 153,4433333 143,8097321 1518,14 1332,72833 185,						,			98,92505952
gen-08 1364,44 1378,487917 -14,04791667 32,40895833 1277,74 1301,3225 -23,5825 41,266577 feb-08 1367,6 1391,472083 -23,87208333 50,51276786 1271,89 1327,13875 -55,24875 42,2181 mar-08 1386,16 1402,82875 -16,66875 70,84127976 1332,28 1346,575833 -14,29583333 63,54101 apr-08 1374,79 1409,594167 -34,80416667 85,20181548 1345,5 1359,050833 -13,55083333 69,479077 mag-08 1455,25 1405,306667 49,94333333 96,836875 1443,16 1360,659583 82,50041667 71,219970 giu-08 1512,13 1389,645 122,485 102,034494 1507,25 1350,209583 157,0404167 72,679940 lug-08 1522,64 1369,196667 153,4433333 143,8097321 1518,14 1332,72833 185,4116667 113,48940 ag0-08 1458,25 1349,296667 108,9533333 139,6889881 1436,88 1314,332083									84,59443452
feb-08 1367,6 1391,472083 -23,87208333 50,51276786 1271,89 1327,13875 -55,24875 42,2181 mar-08 1386,16 1402,82875 -16,66875 70,84127976 1332,28 1346,575833 -14,29583333 63,54101 apr-08 1374,79 1409,594167 -34,80416667 85,20181548 1345,5 1359,050833 -13,5508333 69,479077 mag-08 1455,25 1405,306667 49,94333333 96,836875 1443,16 1360,659583 82,50041667 71,219970 giu-08 1512,13 1389,645 122,485 102,034494 1507,25 1350,209583 157,0404167 72,679940 lug-08 1522,64 1369,196667 153,4433333 143,8097321 1518,14 1332,728333 185,4116667 113,48940 ago-08 1458,25 1349,296667 108,9533333 139,6889881 1436,88 1314,332083 122,5479167 112,26181 set-08 1435,35 1330,532083 104,8179167 129,299881 1383,87 1292,47125 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>79,91133929</td></t<>									79,91133929
mar-08 1386,16 1402,82875 -16,66875 70,84127976 1332,28 1346,575833 -14,29583333 63,54101 apr-08 1374,79 1409,594167 -34,80416667 85,20181548 1345,5 1359,050833 -13,55083333 69,479077 mag-08 1455,25 1405,306667 49,94333333 96,836875 1443,16 1360,659583 82,50041667 71,219970 giu-08 1512,13 1389,645 122,485 102,034494 1507,25 1350,209583 157,0404167 72,679940 lug-08 1522,64 1369,196667 153,4433333 143,8097321 1518,14 1332,728333 185,4116667 113,48940 ago-08 1458,25 1349,296667 108,9533333 139,6889881 1436,88 1314,332083 122,5479167 112,26181 set-08 1435,35 1330,532083 104,8179167 129,299881 1383,87 1292,47125 91,39875 108,59559 ott-08 1346,35 1313,321667 33,02833333 105,364494 1301,48 1266,906667	_								41,26657738
apr-08 1374,79 1409,594167 -34,80416667 85,20181548 1345,5 1359,050833 -13,55083333 69,479077 mag-08 1455,25 1405,306667 49,94333333 96,836875 1443,16 1360,659583 82,50041667 71,219970 giu-08 1512,13 1389,645 122,485 102,034494 1507,25 1350,209583 157,0404167 72,679940 lug-08 1522,64 1369,196667 153,4433333 143,8097321 1518,14 1332,728333 185,4116667 113,48940 ago-08 1458,25 1349,296667 108,9533333 139,6889881 1436,88 1314,332083 122,5479167 112,26181 set-08 1435,35 1330,532083 104,8179167 129,299881 1383,87 1292,47125 91,39675 108,59559 ott-08 1346,35 1313,321667 33,02833333 105,364494 1301,48 1266,906667 34,57333333 84,594434 nov-08 1211,92 1295,81375 -83,89375 79,38693452 1194,82 1238,38333 <									42,218125
mag-08 1455,25 1405,306667 49,94333333 96,836875 1443,16 1360,659583 82,50041667 71,219970 giu-08 1512,13 1389,645 122,485 102,034494 1507,25 1350,209583 157,0404167 72,679940 lug-08 1522,64 1369,196667 153,4433333 143,8097321 1518,14 1332,728333 185,4116667 113,48940 ago-08 1455,25 1349,296667 108,9533333 139,6889881 1436,88 1314,332083 122,5479167 112,26181 set-08 1435,35 1330,532083 104,8179167 129,299881 1383,87 1292,47125 91,39875 108,59559 ott-08 1346,35 1313,321667 33,02833333 105,364494 1301,48 1266,906667 34,57333333 98,925059 nov-08 1211,92 1295,81375 -83,89375 79,38693452 1194,82 1238,38333 -43,51833333 84,594434	mar-08								63,5410119
giu-08 1512,13 1389,645 122,485 102,034494 1507,25 1350,209583 157,0404167 72,679940 lug-08 1522,64 1369,196667 153,4433333 143,8097321 1518,14 1332,728333 185,4116667 113,48940 ag0-08 1458,25 1349,296667 108,9533333 139,6889881 1436,88 1314,332083 122,5479167 112,26181 set-08 1435,35 1330,532083 104,8179167 129,299881 1383,87 1292,47125 91,39875 108,59559 ott-08 1346,35 1313,321667 33,0283333 105,364494 1301,48 1266,906667 34,57333333 98,925059 nov-08 1211,92 1295,81375 -83,89375 79,38693452 1194,82 1238,38333 -43,51833333 84,594434	apr-08				85,20181548	1345,5		-13,55083333	69,47907738
lug-08 1522,64 1369,196667 153,4433333 143,8097321 1518,14 1332,728333 185,4116667 113,48940 ago-08 1458,25 1349,296667 108,9533333 139,6889881 1436,88 1314,332083 122,5479167 112,26181 set-08 1435,35 1330,532083 104,8179167 129,299881 1383,87 1292,47125 91,39875 108,59559 ott-08 1346,35 1313,321667 33,0283333 105,364494 1301,48 1266,906667 34,57333333 98,925059 nov-08 1211,92 1295,81375 -83,89375 79,38693452 1194,82 1238,38333 -43,51833333 84,594434	mag-08	1455,25	1405,306667	49,94333333	96,836875	1443,16	1360,659583	82,50041667	71,21997024
ago-08 1458,25 1349,296667 108,9533333 139,6889881 1436,88 1314,332083 122,5479167 112,26181 set-08 1435,35 1330,532083 104,8179167 129,299881 1383,87 1292,47125 91,39875 108,59559 ott-08 1346,35 1313,321667 33,02833333 105,364494 1301,48 1266,906667 34,57333333 98,925059 nov-08 1211,92 1295,81375 -83,89375 79,38693452 1194,82 1238,338333 -43,51833333 84,594434		1512,13						157,0404167	72,67994048
set-08 1435,35 1330,532083 104,8179167 129,299881 1383,87 1292,47125 91,39875 108,59559 ott-08 1346,35 1313,321667 33,02833333 105,364494 1301,48 1266,906667 34,57333333 98,925059 nov-08 1211,92 1295,81375 -83,89375 79,38693452 1194,82 1238,338333 -43,51833333 84,594434									113,4894048
ott-08 1346,35 1313,321667 33,02833333 105,364494 1301,48 1266,906667 34,57333333 98,925059 nov-08 1211,92 1295,81375 -83,89375 79,38693452 1194,82 1238,338333 -43,51833333 84,594434				108,9533333	139,6889881	1436,88	1314,332083	122,5479167	112,2618155
ott-08 1346,35 1313,321667 33,02833333 105,364494 1301,48 1266,906667 34,57333333 98,925059 nov-08 1211,92 1295,81375 -83,89375 79,38693452 1194,82 1238,338333 -43,51833333 84,594434	set-08	1435,35	1330,532083	104,8179167	129,299881		1292,47125		108,5955952
nov-08 1211,92 1295,81375 -83,89375 79,38693452 1194,82 1238,338333 -43,51833333 84,594434	ott-08	1346,35	1313,321667	33,02833333	105,364494	1301,48	1266,906667	34,57333333	98,92505952
	nov-08	1211,92	1295,81375	-83,89375	79,38693452	1194,82	1238,338333	-43,51833333	84,59443452
	dic-08	1120,88	1277,147917	-156,2679167	67,26705357	1092,9	1205,304583	-112,4045833	79,91133929

Anno	Prezzi benzina	MMt(benzina)	SE t(benzina)	St(benzina)	Prezzi Gasolio	MMt(gasolio)	SE t(gasolio)	St(gasolio)
gen-09			-143,9491667	32,40895833	1051,4	1170,1725	-118,7725	41,26657738
feb-09			-99,50833333	50,51276786		1138,8625	-82,1425	42,218125
mar-09		1226,699167 1216,116667	-64,08916667 -30,82666667	70,84127976 85,20181548	1022,79 1041,44	1113,559167 1092,995417	-90,76916667 -51,55541667	63,5410119 69,47907738
apr-09 mag-09			8.9625	96,836875	1041,44	1092,995417	-19,97666667	71,21997024
giu-09			69,64666667	102,034494	1096,02	1079,597917	16,42208333	72,67994048
lug-09	1270,52	1239,535833	30,98416667	143,8097321	1086,2	1084,415417	1,784583333	113,4894048
ago-09			40,9475	139,6889881	1117,38	1091,8925	25,4875	112,2618155
set-09			1,34125	129,299881	1096,09	1102,40875	-6,31875	108,5955952
ott-09 nov-09			-30,17708333 -12,44833333	105,364494 79,38693452	1095,73 1126,04	1116,624583 1131,375417	-20,89458333 -5,335416667	98,92505952 84,59443452
dic-09			-38,62833333	67,26705357	1114,67	1144,705	-30,035	79,91133929
gen-10			-14,8675	32,40895833	1145,25	1155,929583	-10,67958333	41,26657738
feb-10	1312,88		-14,07916667	50,51276786	1142,32	1165,228333	-22,90833333	42,218125
mar-10			25,10791667	70,84127976	1189,58	1174,192917	15,38708333	63,5410119
apr-10			45,73125	85,20181548	1215,83	1184,477083	31,35291667	69,47907738
mag-10 giu-10			43,52041667 20,2625	96,836875 102,034494	1241,21 1236,3	1194,5825 1206,60375	46,6275 29,69625	71,21997024 72,67994048
lug-10	1371,76		2,713333333	143,8097321	1215,31	1221,37875	-6,06875	113,4894048
ago-10			-19,05291667	139,6889881	1211,44	1237,705	-26,265	112,2618155
set-10			-39,78041667	129,299881	1217,18	1255,875417	-38,69541667	108,5955952
ott-10			-56,65541667	105,364494	1221,46	1275,01625	-53,55625	98,92505952
nov-10 dic-10			-51,58041667 -22,8675	79,38693452 67,26705357	1242,84 1286,38	1292,277917 1306,789167	-49,43791667 -20,40916667	84,59443452 79,91133929
gen-11			3,325	32,40895833	1328,14	1323,505417	4,634583333	41,26657738
feb-11	1469,63		2,572083333	50,51276786	1351,26	1343,695833	7,564166667	42,218125
mar-11	1523,15		37,02125	70,84127976	1416,73	1364,454583	52,27541667	63,5410119
apr-11	1542,19		36,27791667	85,20181548	1448,06	1385,749167	62,31083333	69,47907738
mag-11	1548,69	,	23,52 -15,20083333	96,836875 102,034494	1423,26 1402,52	1407,937083	15,32291667	71,21997024 72.67994048
giu-11 lug-11		· '	11,1	143,8097321	1402,52	1433,575417 1462,277083	-31,05541667 -11,99708333	113,4894048
ago-11			-0,56125	139,6889881	1461,04	1490,829167	-29,78916667	112,2618155
set-11	1589,69	1609,276667	-19,58666667	129,299881	1465,79	1517,88	-52,09	108,5955952
ott-11	1592,27		-41,36291667	105,364494	1483,92	1542,652083	-58,73208333	98,92505952
nov-11			-65,505	79,38693452	1512,89	1566,26625	-53,37625	84,59443452
dic-11 gen-12	1655,16 1700,9		-22,36166667 6,45625	67,26705357 32,40895833	1631,65 1671,71	1588,535417 1607,345833	43,11458333 64,36416667	79,91133929 41,26657738
feb-12			26,39666667	50,51276786	1692,94	1626,200417	66,73958333	42,218125
mar-12	·	1732,796667	66,87333333	70,84127976	1724,27	1649,292083	74,97791667	63,5410119
apr-12			95,63833333	85,20181548	1735,05	1672,632083	62,41791667	69,47907738
mag-12			34,045	96,836875	1703,01	1691,869167	11,14083333	71,21997024
giu-12 lug-12		1782,40375 1788,250833	-21,70375 -37,30083333	102,034494 143,8097321	1657,23 1647,02	1703,095 1706,93375	-45,865 -59,91375	72,67994048 113,4894048
ago-12	1818,26		26,16583333	139,6889881	1716,81	1708,15875	8,65125	112,2618155
set-12			77,11083333	129,299881	1764,22	1707,175417	57,04458333	108,5955952
ott-12		1789,646667	44,26333333	105,364494	1745,65	1702,414167	43,23583333	98,92505952
nov-12 dic-12		1781,899583 1777,0475	-22,82958333 -30,5975	79,38693452 67,26705357	1712,85 1701,11	1695,1375 1690,07625	17,7125 11,03375	84,59443452 79,91133929
gen-13			-26,0925	32,40895833	1694,38	1688,669167	5,710833333	41,26657738
feb-13		1774,039583	6,960416667	50,51276786	1699,67	1686,095417	13,57458333	42,218125
mar-13		1767,87	29,04	70,84127976	1693,94	1679,99875	13,94125	63,5410119
apr-13	,.	· '	-5,620416667	85,20181548		1672,769167	-21,65916667	69,47907738
mag-13 giu-13			-36,54375 -15,82333333	96,836875 102,034494	1612,31 1626,46	1666,011667 1660,979583	-53,70166667 -34,51958333	71,21997024 72,67994048
lug-13			5,850416667	143,8097321	1644,02	1657,232083	-13,21208333	113,4894048
ago-13			24,07958333	139,6889881	1658,04	1652,764167	5,275833333	112,2618155
set-13			35,64958333	129,299881	1676,67	1647,584583	29,08541667	108,5955952
ott-13			-4,225	105,364494	1659,69	1644,041667	15,64833333	98,92505952
nov-13 dic-13		1732,720417 1734,035833	-29,72041667 -6,405833333	79,38693452 67,26705357	1636,63 1656,56	1643,867083 1644,866667	-7,237083333 11,69333333	84,59443452 79,91133929
gen-14			-0,403633333	32,40895833	1648,99	1644,751667	4,2383333333	41,26657738
feb-14	1714,05	1734,344167	-20,29416667	50,51276786	1637,83	1642,884583	-5,054583333	42,218125
mar-14			-16,67791667	70,84127976	1631,47	1638,787917	-7,317916667	63,5410119
apr-14			-3,951666667	85,20181548	1628,55	1633,440417	-4,890416667	69,47907738
mag-14 giu-14			10,90125 25,355	96,836875 102,034494	1630,68 1632,08	1627,205833 1616,944583	3,474166667 15,13541667	71,21997024 72,67994048
lug-14			58,96041667	143,8097321	1635,64	1599,24375	36,39625	113,4894048
ago-14	1749,73	1682,41125	67,31875	139,6889881	1621,61	1578,445	43,165	112,2618155
set-14			67,7325	129,299881	1614,78	1561,50125	53,27875	108,5955952
ott-14			54,65791667	105,364494	1593,24	1546,91625	46,32375	98,92505952
nov-14 dic-14			9,033333333 -47,535	79,38693452 67,26705357	1553,45 1493,47	1533,111667 1520,4025	20,33833333 -26,9325	84,59443452 79,91133929
gen-15			-150,4845833	32,40895833	1387,26	1506,292917	-119,0329167	41,26657738
feb-15	1489,44	1609,33125	-119,89125	50,51276786	1400,39	1489,337083	-88,94708333	42,218125
mar-15			-25,85916667	70,84127976	1462,26	1469,437083	-7,177083333	63,5410119
apr-15			8,697083333	85,20181548		1448,620833	-0,900833333	69,47907738
mag-15 giu-15			60,07833333 82,61958333	96,836875 102,034494	1480,2 1477,54	1429,547083 1412,9825	50,65291667 64,5575	71,21997024 72,67994048
lug-15			1626,46	143,8097321	1477,54	1412,9025	1451,55	113,4894048
ago-15			1567,82	139,6889881	1398,76		1398,76	112,2618155
set-15	1494,74		1494,74	129,299881	1360,03		1360,03	108,5955952
ott-15			1473,21	105,364494	1348,4		1348,4	98,92505952
nov-15 dic-15			1457,35 1450,68	79,38693452 67,26705357	1340,52 1308,85		1340,52 1308,85	84,59443452 79,91133929
uic-15	1400,00		1400,00	01,20100001	1300,03		1300,03	10,01100020

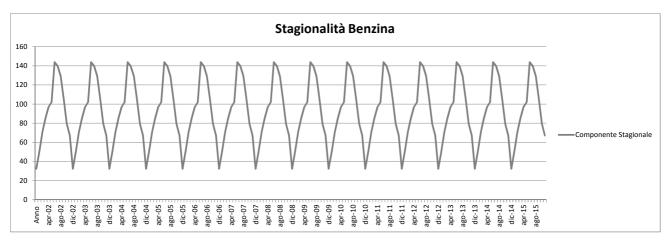
SEt = È il risultato preliminare della componente di stagionalità mista ad errore.

Essa viene calcolata sottraendo alla serie originaria i valori ottenuti con le medie mobili.

St = Coefficiente di stagionalità

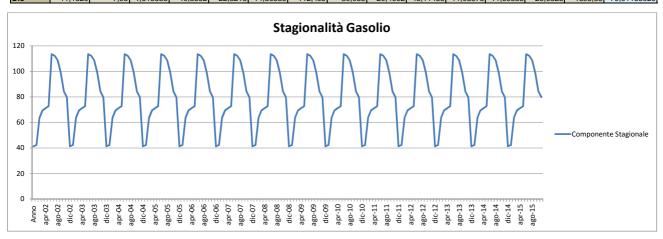
I due grafici sottostanti mostrano le stagionalità delle serie, ossia l'insieme delle variazioni che si ripetono a cadenza annuale. Per prima cosa abbiamo calcolato il valore della componente erratica (SEt) della serie, ottenuta dalla differenza dei valori della serie storica iniziale e quelli del trend di prima approssimazione, successivamente abbiamo preso tutti i valori di un singolo mese per i vari anni (tabelle sotto) ed attraverso la media di essi, ci siamo ricavati il coefficiente di stagionalità (St)

Benzina	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	St(benzina)
Gen	992,39	8,663333	-29,6258	-70,1446	-33,2992	-62,8879	-14,0479	-143,949	-14,8675	3,325	6,45625	-26,0925	-11,71	-150,485	32,40895833
Feb	1095	27,65708	-21,7342	-41,3083	-43,4783	-67,2417	-23,8721	-99,5083	-14,0792	2,572083	26,39667	6,960417	-20,2942	-119,891	50,51276786
Mar	1023,92	33,91042	-9,96792	-16,5658	-43,1058	-31,1604	-16,6687	-64,0892	25,10792	37,02125	66,87333	29,04	-16,6779	-25,8592	70,84127976
Apr	1063,36	4,705	-8,82458	20,48458	6,386667	-4,42792	-34,8042	-30,8267	45,73125	36,27792	95,63833	-5,62042	-3,95167	8,697083	85,20181548
Mag	1071,58	-19,3287	20,08	-0,01	54,37458	34,59333	49,94333	8,9625	43,52042	23,52	34,045	-36,5437	10,90125	60,07833	96,836875
Giu	1061,11	-26,3188	27,74292	-6,54667	50,5725	54,28208	122,485	69,64667	20,2625	-15,2008	-21,7038	-15,8233	25,355	82,61958	102,034494
Lug	-4,14583	-11,6004	20,34375	19,40917	87,1925	49,92625	153,4433	30,98417	2,713333	11,1	-37,3008	5,850417	58,96042	1626,46	143,8097321
Ago	-6,87792	10,72708	25,11333	19,43042	94,17542	-2,59333	108,9533	40,9475	-19,0529	-0,56125	26,16583	24,07958	67,31875	1567,82	139,6889881
Set	-0,38	18,23208	17,51583	58,97208	18,60125	-24,7679	104,8179	1,34125	-39,7804	-19,5867	77,11083	35,64958	67,7325	1494,74	129,299881
Ott	2,929583	-10,2467	21,40708	70,00958	-53,5667	-28,1692	33,02833	-30,1771	-56,6554	-41,3629	44,26333	-4,225	54,65792	1473,21	105,364494
Nov	-10,9238	-15,7442	12,27792	-16,4096	-54,2138	-3,97542	-83,8938	-12,4483	-51,5804	-65,505	-22,8296	-29,7204	9,033333	1457,35	79,38693452
Dic	-15,6775	-30,9446	-29,025	-50,9892	-53,9225	-3,71875	-156,268	-38,6283	-22,8675	-22,3617	-30,5975	-6,40583	-47,535	1450,68	67,26705357



Fonte: NS Elaboraz. Dati del Ministero dello Sviluppo Economico (www.mise.gov.it)

Gasolio	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	St(gasolio)
Gen	836,14	16,38792	-9,95667	-17,8213	-20,2704	-33,6279	-23,5825	-118,773	-10,6796	4,634583	64,36417	5,710833	4,238333	-119,033	41,26657738
Feb	837,04	29,875	-19,9958	-20,0567	-22,0942	-47,2917	-55,2487	-82,1425	-22,9083	7,564167	66,73958	13,57458	-5,05458	-88,9471	42,218125
Mar	844,64	59,13208	-13,7187	-1,84333	-11,94	-23,7175	-14,2958	-90,7692	15,38708	52,27542	74,97792	13,94125	-7,31792	-7,17708	63,5410119
Apr	866,36	29,69125	-11,3762	29,21875	7,768333	-12,48	-13,5508	-51,5554	31,35292	62,31083	62,41792	-21,6592	-4,89042	-0,90083	69,47907738
Mag	868,07	-15,9392	2,634167	-21,4458	39,09958	-11,3796	82,50042	-19,9767	46,6275	15,32292	11,14083	-53,7017	3,474167	50,65292	71,21997024
Giu	857,43	-31,5992	4,866667	-12,3142	32,67167	-4,9475	157,0404	16,42208	29,69625	-31,0554	-45,865	-34,5196	15,13542	64,5575	72,67994048
Lug	-11,415	-26,3992	-8,35667	18,14083	40,95583	-8,025	185,4117	1,784583	-6,06875	-11,9971	-59,9137	-13,2121	36,39625	1451,55	113,4894048
Ago	-19,9788	-9,39417	-1,20375	16,61875	49,38125	-11,5913	122,5479	25,4875	-26,265	-29,7892	8,65125	5,275833	43,165	1398,76	112,2618155
Set	-9,99417	-7,74917	0,756667	48,66708	16,7775	-21,8529	91,39875	-6,31875	-38,6954	-52,09	57,04458	29,08542	53,27875	1360,03	108,5955952
Ott	0,770833	-8,29167	11,15	69,95833	-27,5662	-16,0688	34,57333	-20,8946	-53,5562	-58,7321	43,23583	15,64833	46,32375	1348,4	98,92505952
Nov	-12,1729	2,53125	-3,10167	-5,15083	-26,1346	8,685	-43,5183	-5,33542	-49,4379	-53,3763	17,7125	-7,23708	20,33833	1340,52	84,59443452
Dic	-11.1329	-7.98	1.615833	-40.3392	-22.8213	14.50583	-112.405	-30.035	-20,4092	43,11458	11.03375	11.69333	-26.9325	1308.85	79.91133929



Fonte: NS Elaboraz. Dati del Ministero dello Sviluppo Economico (www.mise.gov.it)

Stima del trend-ciclo

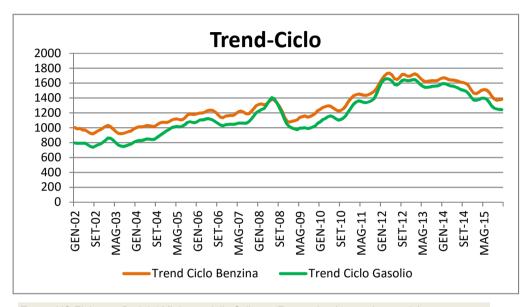
Anno	Prezzi benzina	St(benzina)	Dt(benzina)		Prezzi Gasolio	St(gasolio)	Dt(gasolio)	Tt(gasolio)
gen-02	992,39	32,40895833	959,9810417	1002,234137	836,14	41,26657738	794,8734226	794,8476488
feb-02	1095	50,51276786	1044,487232	985,848998	837,04	42,218125	794,821875	790,2647619
mar-02	1023,92	70,84127976	953,0787202	991,9080456	844,64	63,5410119	781,0989881	790,9339286
apr-02	1063,36	85,20181548	978,1581845	968,6600099	866,36	69,47907738	796,8809226	791,6099802
mag-02	1071,58	96,836875	974,743125	970,6589385	868,07	71,21997024	796,8500298	792,827004
giu-02	1061,11	102,034494	959,075506	947,4796329	857,43	72,67994048	784,7500595	771,3902282
lug-02	1052,43	143,8097321	908,6202679	926,8589286	846,06	113,4894048	732,5705952	749,2496131
ago-02	1052,57	139,6889881	912,8810119	917,9771329	842,69	112,2618155	730,4281845	737,9310615
set-02	1061,73	129,299881	932,430119	936,008879	859,39	108,5955952	750,7944048	752,6558433
ott-02	1068,08	105,364494	962,715506	956,2462302	875,67	98,92505952	776,7449405	769,0183036
nov-02	1052,98	79,38693452	973,5930655	971,5771726	864,11	84,59443452	779,5155655	780,2397222
dic-02	1045,69	67,26705357	978,4229464	996,0456845	864,37	79,91133929	784,4586607	804,7692163
gen-03	1068,53	32,40895833	1036,121042	1017,27374	891,6	41,26657738	850,3334226	832,9346528
feb-03	1087,79	50,51276786	1037,277232	1032,525665	906,23	42,218125	864,011875	862,4747619
mar-03	1095,02	70,84127976	1024,17872	1013,828046	936,62	63,5410119	873,0789881	858,1172619
apr-03	1065,23	85,20181548	980,0281845	982,3866766	906,74	69,47907738	837,2609226	833,3399802
mag-03	1039,79	96,836875	942,953125	950,9922718	860,9	71,21997024	789,6800298	800,047004
giu-03	1032,03	102,034494	929,995506	924,8762996	845,88	72,67994048	773,2000595	766,6735615
lug-03	1045,49	143,8097321	901,6802679	919,2955952	850,63	113,4894048	737,1405952	754,5429464
ago-03	1065,9	139,6889881	926,2110119	923,4771329	865,55	112,2618155	753,2881845	748,5177282
set-03	1071,84	129,299881	942,540119	935,7755456	863,72	108,5955952	755,1244048	756,7625099
ott-03	1043,94	105,364494	938,575506	948,3662302	860,8	98,92505952	761,8749405	768,7849702
nov-03	1043,37	79,38693452	963,9830655	957,370506	873,95	84,59443452	789,3555655	780,4030556
dic-03	1036,82	67,26705357	969,5529464	982,7756845	869,89	79,91133929	789,9786607	804,4492163
gen-04	1036,62	32,40895833	1014,791042	998,9770734	875,28	41,26657738	834,0134226	818,0946528
feb-04	1063,1	50,51276786	1014,791042		875,28 872,51	42,218125		829,2347619
mar-04	1063,1	70,84127976		1012,895665 1010,228046	872,51 886,94	63,5410119	830,291875	
		· · · · · · · · · · · · · · · · · · ·	1011,30872			,	823,3989881 829,8809226	827,8572619
apr-04	1091,99	85,20181548	1006,788185	1017,516677	899,36	69,47907738	, , , , , , , , , , , , , , , , , , , ,	835,3966468
mag-04	1131,29	96,836875	1034,453125	1029,115605	924,13	71,21997024	852,9100298	849,197004
giu-04	1148,14	102,034494	1046,105506	1027,8663	937,48	72,67994048	864,8000595	846,6835615
lug-04	1146,85	143,8097321	1003,040268	1022,065595	935,83	113,4894048	822,3405952	843,2296131
ago-04	1156,74	139,6889881	1017,051012	1015,5338	954,81	112,2618155	842,5481845	842,1410615
set-04	1155,81	129,299881	1026,510119	1035,628879	970,13	108,5955952	861,5344048	867,1358433
ott-04	1168,69	105,364494	1063,325506	1059,519563	996,25	98,92505952	897,3249405	890,3316369
nov-04	1168,11	79,38693452	1088,723065	1072,450506	996,73	84,59443452	912,1355655	914,4930556
dic-04	1132,57	67,26705357	1065,302946	1073,229018	1013,93	79,91133929	934,0186607	937,9625496
gen-05	1098,07	32,40895833	1065,661042	1071,857073	1009	41,26657738	967,7334226	960,7246528
feb-05	1135,12	50,51276786	1084,607232	1083,192331	1022,64	42,218125	980,421875	980,6847619
mar-05	1170,15	70,84127976	1099,30872	1106,144712	1057,44	63,5410119	993,8989881	1003,713929
apr-05	1219,72	85,20181548	1134,518185	1115,243343	1106,3	69,47907738	1036,820923	1010,083313
mag-05	1208,74	96,836875	1111,903125	1117,795605	1070,75	71,21997024	999,5300298	1018,037004
giu-05	1209	102,034494	1106,965506	1106,639633	1090,44	72,67994048	1017,76006	1011,613562
lug-05	1244,86	143,8097321	1101,050268	1108,062262	1131,04	113,4894048	1017,550595	1021,219613
ago-05	1255,86	139,6889881	1116,171012	1130,5038	1140,61	112,2618155	1028,348185	1039,904395
set-05	1303,59	129,299881	1174,290119	1168,825546	1182,41	108,5955952	1073,814405	1071,45251
ott-05	1321,38	105,364494	1216,015506	1184,89623	1211,12	98,92505952	1112,19494	1082,008304
nov-05	1243,77	79,38693452	1164,383065	1177,720506	1144,61	84,59443452	1060,015565	1070,583056
dic-05	1220,03	67,26705357	1152,762946	1177,682351	1119,45	79,91133929	1039,538661	1068,415883
gen-06	1248,31	32,40895833	1215,901042	1188,840407	1146,96	41,26657738	1105,693423	1084,634653
feb-06	1248,37	50,51276786	1197,857232	1198,778998	1150,89	42,218125	1108,671875	1104,684762
mar-06	1253,42	70,84127976	1182,57872	1197,914712	1163,23	63,5410119	1099,688988	1105,813929
apr-06	1298,51	85,20181548	1213,308185	1213,473343	1178,56	69,47907738	1109,080923	1114,13998
mag-06	1341,37	96,836875	1244,533125	1230,775605	1204,87	71,21997024	1133,65003	1122,350337
giu-06		102,034494	1234,485506	1235,569633		72,67994048	1124,32006	1115,850228
lug-06	1371,5	143,8097321	1227,690268	1232,482262	1203,07	113,4894048	1089,580595	1102,769613
ago-06	1374,96	139,6889881	1235,271012	1210,137133	1206,67	112,2618155	1094,408185	1081,401062
set-06	1296,75	129,299881	1167,450119	1173,305546		108,5955952	1060,214405	1058,445843
ott-06		105,364494	1117,195506	1141,592897	1119,64	98,92505952	1020,71494	1037,30497
nov-06	1219,52	79,38693452	1140,133065	1136,397173	1115,58	84.59443452	1030,985565	1028,553056
dic-06	1219,13	67,26705357	1151,862946	1156,479018		79,91133929	1033,958661	1041,025883
gen-07	1209,85	32,40895833	1177,441042	1160,357073		41,26657738	1058,133423	1044,171319
feb-07	1202,28	50,51276786	1151,767232	1164,872331	1082,64	42,218125	1040,421875	1046,781429
mar-07	1236,25	70,84127976	1165,40872	1166,374712		63,5410119	1041,788988	1044,453929
apr-07	1267,15	85,20181548	1181,948185	1188,606677	1120,63	69,47907738	1051,150923	1050,906647
mag-07	1315,3	96,836875	1218,463125	1214,872272	1131	71,21997024	1059,78003	1062,853671
giu-07	1346,24	102,034494	1244,205506	1224,362966		72,67994048	1077,63006	1061,920228
lug-07	1354,23	143,8097321	1210,420268	1209,992262	1161,84	113,4894048	1048,350595	1062,43628
ago-07	1315,04	139,6889881	1175,351012	1187,490466	1173,59	112,2618155	1061,328185	1060,584395
set-07	1306	129,299881	1176,700119	1186,672212	1180,67	108,5955952	1072,074405	1079,919177
ott-07	1313,33	105,364494	1207,965506	1217,70623	1205,28	98,92505952	1106,35494	1115,41497
nov-07	1347,84	79,38693452	1268,453065	1256,663839	1252,41	84,59443452	1167,815565	1160,123056
dic-07	1360,84	67,26705357	1293,572946	1298,019018		79,91133929	1206,198661	1203,495883
gen-08	1364,44	32,40895833	1332,031042	1314,230407	1277,74	41,26657738	1236,473423	1224,114653
feb-08	1367,6	50,51276786	1317,087232	1321,478998	1271,74	42,218125	1229,671875	1244,961429
		70,84127976	1317,087232	1307,331379		63,5410119	1268,738988	1258,143929
mar-08								
apr-08	1374,79	85,20181548	1289,588185	1321,106677	1345,5	69,47907738	1276,020923	1305,566647
mag-08	1455,25	96,836875	1358,413125	1352,698938	1443,16	71,21997024	1371,94003	1360,843671
giu-08	1512,13	102,034494	1410,095506	1382,4463	1507,25	72,67994048	1434,57006	1403,720228
lug-08	1522,64	143,8097321	1378,830268	1369,162262	1518,14	113,4894048	1404,650595	1387,94628
ago-08	1458,25	139,6889881	1318,561012	1334,480466	1436,88	112,2618155	1324,618185	1334,847728
set-08	1435,35	129,299881	1306,050119	1288,532212	1383,87	108,5955952	1275,274405	1267,48251
ott-08	1346,35	105,364494	1240,985506	1226,522897	1301,48	98,92505952	1202,55494	1196,018304
nov-08	1211,92	79,38693452	1132,533065	1142,377173		84,59443452	1110,225565	1108,589722
dic-08	1120,88	67,26705357	1053,612946	1093,073006	1092,9	79,91133929	1012,988661	1061,607113

Anno	Drozzi honzina	St(benzina)	Dt(benzina)	Tt/honzina)	Prezzi Gasolio	St(gasolio)	Dt(gasolio)	Tt(gasolio)
gen-09	Prezzi benzina 1113,64	32,40895833	1081,231042	1053,612946	1051,4	41,26657738	1010,133423	1012,988661
feb-09	1140,8	50,51276786	1090,287232	1087,762331	1056,72	42,218125	1014,501875	994,6280952
mar-09	1162,61	70,84127976	1091,76872	1094,048046	1022,79	63,5410119	959,2489881	981,9039286
apr-09	1185,29	85,20181548	1100,088185	1106,526677	1041,44	69,47907738	971,9609226	973,8566468
mag-09	1224,56	96,836875	1127,723125	1140,205605	1061,58	71,21997024	990,3600298	995,2203373
giu-09	1294,84	102,034494	1192,805506	1149,079633	1096,02	72,67994048	1023,34006	995,4702282
lug-09	1270,52	143,8097321	1126,710268	1158,485595	1086,2	113,4894048	972,7105952	1000,389613
ago-09	1295,63	139,6889881	1155,941012	1141,567133	1117,38	112,2618155	1005,118185	988,4410615
set-09	1271,35	129,299881	1142,050119	1149,665546	1096,09	108,5955952	987,4944048	996,4725099
ott-09	1256,37	105,364494	1151,005506 1210,053065	1167,702897	1095,73	98,92505952	996,8049405	1008,581637
nov-09 dic-09	1289,44 1273,66	79,38693452 67,26705357	1206,392946	1189,150506 1229,705685	1126,04 1114,67	84,59443452 79,91133929	1041,445565 1034,758661	1024,336389 1060,06255
gen-10	1305,08	32,40895833	1272,671042	1247,14374	1145,25	41,26657738	1103,983423	1079,614653
feb-10	1312,88	50,51276786	1262,367232	1274,185665	1142,32	42,218125	1100,101875	1110,041429
mar-10	1358,36	70,84127976	1287,51872	1283,714712	1189,58	63,5410119	1126,038988	1124,163929
apr-10	1386,46	85,20181548	1301,258185	1294,506677	1215,83	69,47907738	1146,350923	1147,45998
mag-10	1391,58	96,836875	1294,743125	1290,462272	1241,21	71,21997024	1169,99003	1159,987004
giu-10	1377,42	102,034494	1275,385506	1266,0263	1236,3	72,67994048	1163,62006	1145,143562
lug-10	1371,76	143,8097321	1227,950268	1242,105595	1215,31	113,4894048	1101,820595	1121,539613
ago-10	1362,67	139,6889881	1222,981012	1225,657133	1211,44	112,2618155	1099,178185	1103,194395
set-10	1355,34	129,299881	1226,040119	1231,825546	1217,18	108,5955952	1108,584405	1110,099177
ott-10	1351,82	105,364494	1246,455506	1254,34623	1221,46	98,92505952	1122,53494	1129,788304
nov-10 dic-10	1369,93 1411,52	79,38693452 67,26705357	1290,543065 1344,252946	1293,750506 1351,649018	1242,84 1286,38	84,59443452 79,91133929	1158,245565 1206,468661	1162,416389 1217,195883
gen-11	1452,56	32,40895833	1420,151042	1394,507073	1328,14	41,26657738	1286,873423	1267,461319
feb-11	1469,63	50,51276786	1419,117232	1430,525665	1351,26	42,218125	1309,041875	1316,368095
mar-11	1523,15	70,84127976	1452,30872	1442,804712	1416,73	63,5410119	1353,188988	1346,937262
apr-11	1542,19	85,20181548	1456,988185	1453,716677	1448,06	69,47907738	1378,580923	1361,26998
mag-11	1548,69	96,836875	1451,853125	1445,388938	1423,26	71,21997024	1352,04003	1353,487004
giu-11	1529,36	102,034494	1427,325506	1437,1763	1402,52	72,67994048	1329,84006	1339,556895
lug-11	1576,16	143,8097321	1432,350268	1435,335595	1450,28	113,4894048	1336,790595	1338,469613
ago-11	1586,02	139,6889881	1446,331012	1446,357133	1461,04	112,2618155	1348,778185	1347,587728
set-11	1589,69	129,299881	1460,390119	1464,542212	1465,79	108,5955952	1357,194405	1363,655843
ott-11	1592,27	105,364494	1486,905506	1486,52623	1483,92	98,92505952	1384,99494	1390,161637
nov-11	1591,67	79,38693452	1512,283065	1529,027173	1512,89	84,59443452	1428,295565	1455,009722
dic-11	1655,16	67,26705357	1587,892946	1589,555685	1631,65	79,91133929	1551,738661	1536,825883
gen-12	1700,9	32,40895833	1668,491042	1647,890407	1671,71	41,26657738	1630,443423	1610,967986
feb-12 mar-12	1737,8 1799,67	50,51276786 70,84127976	1687,287232 1728,82872	1694,868998 1727,044712	1692,94 1724,27	42,218125 63,5410119	1650,721875 1660,728988	1647,298095 1659,007262
apr-12	1850,22	85,20181548	1765,018185	1734,226677	1735,05	69,47907738	1665,570923	1652,696647
mag-12	1805,67	96,836875	1708,833125	1710,838938	1703,01	71,21997024	1631,79003	1627,303671
giu-12	1760,7	102,034494	1658,665506	1658,212966	1657,23	72,67994048	1584,55006	1583,290228
lug-12	1750,95	143,8097321	1607,140268	1648,125595	1647,02	113,4894048	1533,530595	1574,209613
ago-12	1818,26	139,6889881	1678,571012	1675,767133	1716,81	112,2618155	1604,548185	1597,901062
set-12	1870,89	129,299881	1741,590119	1716,235546	1764,22	108,5955952	1655,624405	1635,63251
ott-12	1833,91	105,364494	1728,545506	1716,60623	1745,65	98,92505952	1646,72494	1643,53497
nov-12	1759,07	79,38693452	1679,683065	1695,803839	1712,85	84,59443452	1628,255565	1632,059722
dic-12	1746,45	67,26705357	1679,182946	1692,132351	1701,11	79,91133929	1621,198661	1634,189216
gen-13	1749,94	32,40895833	1717,531042	1709,067073	1694,38	41,26657738	1653,113423	1643,921319
feb-13	1781	50,51276786	1730,487232	1724,695665	1699,67	42,218125	1657,451875	1646,988095
mar-13	1796,91 1753.8	70,84127976 85.20181548	1726,06872 1668.598185	1708,384712 1671.33001	1693,94 1651,11	63,5410119 69.47907738	1630,398988 1581.630923	1623,160595 1584.373313
mag-13	1716,16	96,836875	1619,323125	1639,882272	1612,31	71,21997024	1541,09003	1558,833671
giu-13	1710,16	102,034494	1631,725506	1620,2563	1626,46	72,67994048	1553,78006	1541,800228
lug-13	1753,53	143.8097321	1609,720268	1623,202262	1644,02	113,4894048	1530,530595	1543,362946
ago-13	1767,85	139,6889881	1628,161012	1627,270466	1658,04	112,2618155	1545,778185	1548,127728
set-13	1773,23	129,299881	1643,930119	1631,835546		108,5955952	1568,074405	1558,205843
ott-13	1728,78	105,364494	1623,415506	1630,319563	1659,69	98,92505952	1560,76494	1560,291637
nov-13	1703	79,38693452	1623,613065	1635,797173		84,59443452	1552,035565	1563,149722
dic-13	1727,63	67,26705357	1660,362946	1658,212351	1656,56	79,91133929	1576,648661	1578,80255
gen-14	1723,07	32,40895833	1690,661042	1671,520407	1648,99	41,26657738	1607,723423	1593,327986
feb-14	1714,05	50,51276786	1663,537232	1666,218998	1637,83	42,218125	1595,611875	1590,421429
mar-14	1715,3 1725,6	70,84127976 85,20181548	1644,45872 1640,398185	1649,464712 1641,85001	1631,47	63,5410119 69,47907738	1567,928988	1574,203929 1562,153313
apr-14 mag-14	1725,6	96,836875	1640,398185	1641,85001	1628,55 1630,68	71,21997024	1559,070923 1559,46003	1559,310337
giu-14	1743,96	102,034494	1641,925506	1633,332966	1632,08	72,67994048	1559,40006	1547,003562
lug-14	1761,19	143,8097321	1617,380268	1623,115595	1635,64	113,4894048	1522,150595	1530,299613
ago-14	1749,73	139,6889881	1610,041012	1610,8938	1621,61	112,2618155	1509,348185	1512,561062
set-14	1734,56	129,299881	1605,260119	1606,385546	1614,78	108,5955952	1506,184405	1503,28251
ott-14	1709,22	105,364494	1603,855506	1594,04623	1593,24	98,92505952	1494,31494	1489,78497
nov-14	1652,41	79,38693452	1573,023065	1565,087173	1553,45	84,59443452	1468,855565	1458,909722
dic-14	1585,65	67,26705357	1518,382946	1510,345685	1493,47	79,91133929	1413,558661	1409,469216
gen-15	1472,04	32,40895833	1439,631042	1465,647073	1387,26	41,26657738	1345,993423	1372,574653
feb-15	1489,44	50,51276786	1438,927232	1457,872331	1400,39	42,218125	1358,171875	1367,628095
mar-15	1565,9	70,84127976	1495,05872	1476,471379	1462,26	63,5410119	1398,718988	1378,377262
apr-15	1580,63	85,20181548	1495,428185	1502,566677	1447,72	69,47907738	1378,240923	1395,313313
mag-15 giu-15	1614,05 1622,84	96,836875 102,034494	1517,213125 1520,805506	1511,148938 1506,889633	1480,2 1477,54	71,21997024 72,67994048	1408,98003 1404,86006	1397,360337 1383,966895
lug-15	1622,84	143,8097321	1482,650268	1477,195595	1477,54	113,4894048	1338,060595	1343,139613
ago-15	1567,82	139,6889881	1428,131012	1425,407133	1398,76	112,2618155	1286,498185	1291,997728
set-15	1494,74	129,299881	1365,440119	1387,138879	1360,03	108,5955952	1251,434405	1262,469177
ott-15	1473,21	105,364494	1367,845506	1370,41623	1348,4	98,92505952	1249,47494	1252,278304
nov-15	1457,35	79,38693452	1377,963065	1376,407173	1340,52	84,59443452	1255,925565	1244,779722
dic-15	1450,68	67,26705357	1383,412946	1380,688006	1308,85	79,91133929	1228,938661	1242,432113
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Dt = È la destagionalizzazione, ossia la differenza tra i valori originali e il coefficiente di stagionalità.

Tt = Rappresenta la media mobile centrata a 3 termini della serie destagionalizzata.

Nel grafico sotto notiamo come il Trend-Ciclo sia relativo al prezzo della benzina, sia relativo al prezzo del gasolio, come ad esempio il picco a metà 2008) seguano più o meno le stesse fasi, alternando momenti di sbalzi (più evidenti nell'andamento del prezzo del gasolio) a momenti discendenti e di stabilità.



Stima dell'intera componente sistematica della serie

						= ,		
Anno	Prezzi benzina	St(benzina)	Tt(benzina)		Prezzi Gasolio	St(gasolio)	Tt(gasolio)	yt(gasolio)
gen-02	992,39	32,40895833	1002,234137	1034,643095	836,14	41,26657738	794,8476488	836,1142262
feb-02	1095	50,51276786	985,848998	1036,361766	837,04	42,218125	790,2647619	832,4828869
mar-02	1023,92	70,84127976	991,9080456	1062,749325		63,5410119	790,9339286	854,4749405
apr-02	1063,36	85,20181548	968,6600099	1053,861825		69,47907738	791,6099802	861,0890575
mag-02	1071,58	96,836875	970,6589385	1067,495813	868,07	71,21997024	792,827004	864,0469742
giu-02	1061,11	102,034494	947,4796329	1049,514127	857,43	72,67994048	771,3902282	844,0701687
lug-02	1052,43	143,8097321	926,8589286	1070,668661	846,06	113,4894048	749,2496131	862,7390179
ago-02	1052,57	139,6889881	917,9771329	1057,666121	842,69	112,2618155	737,9310615	850,192877
set-02	1061,73	129,299881	936,008879	1065,30876		108,5955952	752,6558433	861,2514385
ott-02	1068,08	105,364494	956,2462302	1061,610724	875,67	98,92505952	769,0183036	867,9433631
nov-02	1052,98	79,38693452	971,5771726	1050,964107	864,11	84,59443452	780,2397222	864,8341567
dic-02	1045,69	67,26705357	996,0456845	1063,312738	864,37	79,91133929	804,7692163	884,6805556
gen-03	1068,53	32,40895833	1017,27374	1049,682698	891,6	41,26657738	832,9346528	874,2012302
feb-03	1087,79	50,51276786	1032,525665	1083,038433	906,23	42,218125	862,4747619	904,6928869
mar-03	1095,02	70,84127976	1013,828046	1084,669325	936,62	63,5410119	858,1172619	921,6582738
apr-03	1065,23	85,20181548	982,3866766	1067,588492	906,74	69,47907738	833,3399802	902,8190575
mag-03	1039,79	96,836875	950,9922718	1047,829147	860,9	71,21997024	800,047004	871,2669742
giu-03	1032,03	102,034494	924,8762996	1026,910794	845,88	72,67994048	766,6735615	839,353502
lug-03	1045,49	143,8097321	919,2955952	1063,105327	850,63	113,4894048	754,5429464	868,0323512
ago-03	1065,9	139,6889881	923,4771329	1063,166121	865,55	112,2618155	748,5177282	860,7795437
set-03	1071,84	129,299881	935,7755456	1065,075427	863,72	108,5955952	756,7625099	865,3581052
ott-03	1043,94	105,364494	948,3662302	1053,730724		98,92505952	768,7849702	867,7100298
nov-03	1043,37	79,38693452	957,370506	1036,75744	873,95	84,59443452	780,4030556	864,9974901
dic-03	1036,82	67,26705357	982,7756845	1050,042738	869,89	79,91133929	804,4492163	884,3605556
gen-04	1047,2	32,40895833	998,9770734	1031,386032	875,28	41,26657738	818,0946528	859,3612302
feb-04	1063,1	50,51276786	1012,895665	1063,408433	872,51	42,218125	829,2347619	871,4528869
mar-04	1082,15	70,84127976	1010,228046	1081,069325	886,94	63,5410119	827,8572619	891,3982738
apr-04	1091,99	85,20181548	1017,516677	1102,718492	899,36	69,47907738	835,3966468	904,8757242
mag-04	1131,29	96,836875	1029,115605	1125,95248	924,13	71,21997024	849,197004	920,4169742
giu-04	1148,14	102,034494	1027,8663	1129,900794	937,48	72,67994048	846,6835615	919,363502
lug-04	1146,85	143,8097321	1022,065595	1165,875327	935,83	113,4894048	843,2296131	956,7190179
ago-04	1156,74	139,6889881	1015,5338	1155,222788	954,81	112,2618155	842,1410615	954,402877
set-04	1155,81	129,299881	1035,628879	1164,92876		108,5955952	867,1358433	975,7314385
ott-04	1168,69	105,364494	1059,519563	1164,884058		98,92505952	890,3316369	989,2566964
nov-04	1168,11	79,38693452	1072,450506	1151,83744	996,73	84,59443452	914,4930556	999,0874901
dic-04	1132,57	67,26705357	1073,229018	1140,496071	1013,93	79,91133929	937,9625496	1017,873889
gen-05	1098,07	32,40895833	1071,857073	1104,266032	1009	41,26657738	960,7246528	1001,99123
feb-05	1135,12	50,51276786	1083,192331	1133,705099	1022,64	42,218125	980,6847619	1022,902887
mar-05	1170,15	70,84127976	1106,144712	1176,985992	1057,44	63,5410119	1003,713929	1067,25494
apr-05	1219,72	85,20181548 96,836875	1115,243343	1200,445159	1106,3 1070,75	69,47907738 71,21997024	1010,083313 1018,037004	1079,562391
mag-05	1208,74	102,034494	1117,795605	1214,63248 1208,674127	1070,75	71,21997024	_	1089,256974 1084,293502
giu-05	1209 1244,86	143,8097321	1106,639633 1108,062262	1251,871994	1131,04	113,4894048	1011,613562 1021,219613	1134,709018
lug-05 ago-05	1255,86	139,6889881	1130,5038	1270,192788	1140,61	112,2618155	1039,904395	1152,16621
set-05	1303,59	129,299881	1168,825546	1298,125427	1182,41	108,5955952	1071,45251	1180,048105
ott-05	1321,38	105,364494	1184,89623	1290,260724	1211,12	98,92505952	1082,008304	1180,933363
nov-05	1243,77	79,38693452	1177,720506	1257,10744	1144,61	84,59443452	1070,583056	1155,17749
dic-05	1220,03	67,26705357	1177,682351	1244,949405	1119,45	79,91133929	1068,415883	1148,327222
gen-06	1248,31	32,40895833	1188,840407	1221,249365	1146,96	41,26657738	1084,634653	1125,90123
feb-06	1248,37	50,51276786	1198,778998	1249,291766	1150,89	42,218125	1104,684762	1146,902887
mar-06		70,84127976	1197,914712	1268,755992	1163,23	63,5410119	1105,813929	1169,35494
apr-06	1298,51	85,20181548	1213,473343	1298,675159	1178,56	69,47907738	1114,13998	1183,619058
mag-06		96,836875	1230,775605	1327,61248		71,21997024	1122,350337	1193,570308
giu-06		102,034494	1235,569633	1337,604127		72,67994048	1115,850228	1188,530169
lug-06		143.8097321	1232,482262	1376,291994		113,4894048	1102,769613	1216,259018
ago-06		139,6889881	1210,137133	1349,826121	1206,67	112,2618155	1081,401062	1193,662877
set-06		129,299881	1173,305546	1302,605427		108,5955952	1058,445843	1167,041438
ott-06		105,364494	1141,592897	1246,957391	1119,64	98,92505952	1037,30497	1136,23003
nov-06		79,38693452	1136,397173	1215,784107	1115,58	84,59443452	1028,553056	1113,14749
dic-06	,	67,26705357	1156,479018	1223,746071	1113,87	79,91133929	1041,025883	1120,937222
gen-07	1209,85	32,40895833	1160,357073	1192,766032	1099,4	41,26657738	1044,171319	1085,437897
feb-07	1202,28	50,51276786	1164,872331	1215,385099	1082,64	42,218125	1046,781429	1088,999554
mar-07	1236,25	70,84127976	1166,374712	1237,215992	1105,33	63,5410119	1044,453929	1107,99494
apr-07	1267,15	85,20181548	1188,606677	1273,808492	1120,63	69,47907738	1050,906647	1120,385724
mag-07	1315,3	96,836875	1214,872272	1311,709147	1131	71,21997024	1062,853671	1134,073641
giu-07	1346,24	102,034494	1224,362966	1326,39746		72,67994048	1061,920228	1134,600169
lug-07	1354,23	143,8097321	1209,992262	1353,801994	1161,84	113,4894048	1062,43628	1175,925685
ago-07	1315,04	139,6889881	1187,490466	1327,179454	1173,59	112,2618155	1060,584395	1172,84621
set-07	1306	129,299881	1186,672212	1315,972093	1180,67	108,5955952	1079,919177	1188,514772
ott-07	1313,33	105,364494	1217,70623	1323,070724	1205,28	98,92505952	1115,41497	1214,34003
nov-07	1347,84	79,38693452	1256,663839	1336,050774		84,59443452	1160,123056	1244,71749
dic-07	1360,84	67,26705357	1298,019018	1365,286071	1286,11	79,91133929	1203,495883	1283,407222
gen-08		32,40895833	1314,230407	1346,639365	1277,74	41,26657738	1224,114653	1265,38123
feb-08	1367,6	50,51276786	1321,478998	1371,991766	1271,89	42,218125	1244,961429	1287,179554
mar-08		70,84127976	1307,331379	1378,172659		63,5410119	1258,143929	1321,68494
apr-08		85,20181548	1321,106677	1406,308492	1345,5	69,47907738	1305,566647	1375,045724
mag-08		96,836875	1352,698938	1449,535813	1443,16	71,21997024	1360,843671	1432,063641
-: 00	1510 10	102,034494	1382,4463	1484,480794		72,67994048	1403,720228	1476,400169
giu-08					1518,14	113,4894048	1387,94628	1501,435685
lug-08	1522,64	143,8097321	1369,162262	1512,971994				
lug-08 ago-08	1522,64 1458,25	139,6889881	1334,480466	1474,169454	1436,88	112,2618155	1334,847728	1447,109544
lug-08 ago-08 set-08	1522,64 1458,25 1435,35	139,6889881 129,299881	1334,480466 1288,532212	1474,169454 1417,832093	1436,88 1383,87	112,2618155 108,5955952	1334,847728 1267,48251	1376,078105
lug-08 ago-08 set-08 ott-08	1522,64 1458,25 1435,35 1346,35	139,6889881 129,299881 105,364494	1334,480466 1288,532212 1226,522897	1474,169454 1417,832093 1331,887391	1436,88 1383,87 1301,48	112,2618155 108,5955952 98,92505952	1334,847728 1267,48251 1196,018304	1376,078105 1294,943363
lug-08 ago-08 set-08	1522,64 1458,25 1435,35 1346,35 1211,92	139,6889881 129,299881	1334,480466 1288,532212	1474,169454 1417,832093	1436,88 1383,87 1301,48 1194,82	112,2618155 108,5955952	1334,847728 1267,48251	1376,078105

Anno	Prezzi benzina	St(benzina)	Tt(benzina)	v#/honzina)	Prezzi Gasolio	St(gasolio)	Tt(gasolio)	yt(gasolio)
gen-09	1113,64	32,40895833	1053,612946	1086,021905	1051,4	41,26657738	1012,988661	1054,255238
feb-09		50,51276786	1087,762331	1138,275099	1056,72	42,218125	994,6280952	1036,84622
mar-09	1162,61	70,84127976	1094,048046	1164,889325	1022,79	63,5410119	981.9039286	1045,44494
apr-09	1185,29	85,20181548	1106,526677	1191,728492	1041,44	69,47907738	973,8566468	1043,335724
mag-09	1224,56	96,836875	1140,205605	1237,04248	1061,58	71,21997024	995,2203373	1066,440308
giu-09	1294,84	102,034494	1149,079633	1251,114127	1096,02	72,67994048	995,4702282	1068,150169
lug-09	1270,52	143,8097321	1158,485595	1302,295327	1086,2	113,4894048	1000,389613	1113,879018
ago-09	1295,63	139,6889881	1141,567133	1281,256121	1117,38	112,2618155	988,4410615	1100,702877
set-09	1271,35	129,299881	1149,665546	1278,965427	1096,09	108,5955952	996,4725099	1105,068105
ott-09	1256,37	105,364494	1167,702897	1273,067391	1095,73	98,92505952	1008,581637	1107,506696
nov-09	1289,44	79,38693452	1189,150506	1268,53744	1126,04	84,59443452	1024,336389	1108,930823
dic-09	1273,66	67,26705357	1229,705685	1296,972738	1114,67	79,91133929	1060,06255	1139,973889
gen-10 feb-10		32,40895833 50,51276786	1247,14374 1274,185665	1279,552698 1324,698433	1145,25 1142,32	41,26657738 42,218125	1079,614653 1110,041429	1120,88123 1152,259554
mar-10		70,84127976	1283,714712	1354,555992	1189,58	63,5410119	1124,163929	1187,70494
apr-10		85,20181548	1294,506677	1379,708492	1215,83	69,47907738	1147,45998	1216,939058
mag-10		96,836875	1290,462272	1387,299147	1241,21	71,21997024	1159,987004	1231,206974
giu-10		102,034494	1266,0263	1368,060794	1236,3	72,67994048	1145,143562	1217,823502
lug-10	1371,76	143,8097321	1242,105595	1385,915327	1215,31	113,4894048	1121,539613	1235,029018
ago-10	1362,67	139,6889881	1225,657133	1365,346121	1211,44	112,2618155	1103,194395	1215,45621
set-10		129,299881	1231,825546	1361,125427	1217,18	108,5955952	1110,099177	1218,694772
ott-10		105,364494	1254,34623	1359,710724	1221,46	98,92505952	1129,788304	1228,713363
nov-10		79,38693452	1293,750506	1373,13744	1242,84	84,59443452	1162,416389	1247,010823
dic-10		67,26705357	1351,649018	1418,916071	1286,38	79,91133929	1217,195883	1297,107222
gen-11	1452,56	32,40895833 50,51276786	1394,507073	1426,916032	1328,14	41,26657738	1267,461319 1316,368095	1308,727897 1358,58622
feb-11 mar-11	1469,63 1523,15	50,51276786 70,84127976	1430,525665 1442,804712	1481,038433 1513,645992	1351,26 1416,73	42,218125 63,5410119	1316,368095	1358,58622
apr-11	1542,19	85,20181548	1453,716677	1513,645992	1448,06	69,47907738	1361,26998	1430,749058
mag-11	1548,69	96,836875	1445,388938	1542,225813	1423,26	71,21997024	1353,487004	1424,706974
giu-11		102,034494	1437,1763	1539,210794	1402,52	72,67994048	1339,556895	1412,236835
lug-11	1576,16	143,8097321	1435,335595	1579,145327	1450,28	113,4894048	1338,469613	1451,959018
ago-11	1586,02	139,6889881	1446,357133	1586,046121	1461,04	112,2618155	1347,587728	1459,849544
set-11	1589,69	129,299881	1464,542212	1593,842093	1465,79	108,5955952	1363,655843	1472,251438
ott-11	1592,27	105,364494	1486,52623	1591,890724	1483,92	98,92505952	1390,161637	1489,086696
nov-11		79,38693452	1529,027173	1608,414107	1512,89	84,59443452	1455,009722	1539,604157
dic-11	1655,16	67,26705357	1589,555685	1656,822738	1631,65	79,91133929	1536,825883	1616,737222
gen-12		32,40895833	1647,890407	1680,299365	1671,71	41,26657738	1610,967986	1652,234563
feb-12	1737,8	50,51276786	1694,868998	1745,381766	1692,94 1724,27	42,218125 63,5410119	1647,298095	1689,51622
mar-12 apr-12	1799,67 1850,22	70,84127976 85,20181548	1727,044712 1734,226677	1797,885992 1819,428492	1724,27	69,47907738	1659,007262 1652,696647	1722,548274 1722,175724
mag-12		96,836875	1710,838938	1807,675813	1703,03	71,21997024	1627,303671	1698,523641
giu-12		102,034494	1658,212966	1760,24746		72,67994048	1583,290228	1655,970169
lug-12	1750,95	143,8097321	1648,125595	1791,935327	1647,02	113,4894048	1574,209613	1687,699018
ago-12	1818,26	139,6889881	1675,767133	1815,456121	1716,81	112,2618155	1597,901062	1710,162877
set-12	1870,89	129,299881	1716,235546	1845,535427	1764,22	108,5955952	1635,63251	1744,228105
ott-12		105,364494	1716,60623	1821,970724	1745,65	98,92505952	1643,53497	1742,46003
nov-12		79,38693452	1695,803839	1775,190774		84,59443452	1632,059722	1716,654157
dic-12	1746,45	67,26705357	1692,132351	1759,399405	1701,11	79,91133929	1634,189216	1714,100556
gen-13		32,40895833	1709,067073	1741,476032	1694,38	41,26657738	1643,921319	1685,187897
feb-13		50,51276786	1724,695665 1708,384712	1775,208433 1779,225992	1699,67	42,218125	1646,988095	1689,20622 1686,701607
mar-13 apr-13		70,84127976 85,20181548	1671.33001	1756.531825	1693,94 1651.11	63,5410119 69.47907738	1623,160595 1584.373313	1653.852391
mag-13	, -	96,836875	1639,882272	1736,719147	1612,31	71,21997024	1558,833671	1630,053641
giu-13		102,034494	1620,2563	1722,290794	1626,46	72,67994048	1541,800228	1614,480169
lug-13		143,8097321	1623,202262	1767,011994	1644,02	113,4894048	1543,362946	1656,852351
ago-13		139,6889881	1627,270466	1766,959454	1658,04	112,2618155	1548,127728	1660,389544
set-13		129,299881	1631,835546	1761,135427	1676,67	108,5955952	1558,205843	1666,801438
ott-13		105,364494	1630,319563	1735,684058		98,92505952	1560,291637	1659,216696
nov-13		79,38693452	1635,797173	1715,184107	1636,63	84,59443452	1563,149722	1647,744157
dic-13		67,26705357	1658,212351	1725,479405	1656,56	79,91133929	1578,80255	1658,713889
gen-14 feb-14		32,40895833	1671,520407 1666,218998	1703,929365	1648,99 1637,83	41,26657738 42,218125	1593,327986 1590,421429	1634,594563
mar-14		50,51276786 70,84127976	1649,464712	1716,731766 1720,305992	1637,83	63,5410119	1590,421429	1632,639554 1637,74494
apr-14		85,20181548	1641,85001	1720,303992	1628,55	69,47907738	1562,153313	1631,632391
mag-14		96,836875	1641,005605	1737,84248		71,21997024	1559,310337	1630,530308
giu-14		102,034494	1633,332966	1735,36746		72,67994048	1547,003562	1619,683502
lug-14		143,8097321	1623,115595	1766,925327	1635,64	113,4894048	1530,299613	1643,789018
ago-14		139,6889881	1610,8938	1750,582788	1621,61	112,2618155	1512,561062	1624,822877
set-14		129,299881	1606,385546	1735,685427	1614,78	108,5955952	1503,28251	1611,878105
ott-14		105,364494	1594,04623	1699,410724	1593,24	98,92505952	1489,78497	1588,71003
nov-14		79,38693452	1565,087173	1644,474107	1553,45	84,59443452	1458,909722	1543,504157
dic-14		67,26705357 32,40895833	1510,345685 1465,647073	1577,612738 1498,056032	1493,47 1387,26	79,91133929 41,26657738	1409,469216 1372,574653	1489,380556 1413,84123
gen-15 feb-15		50,51276786	1457,872331	1508,385099	1400,39	42,218125	1367,628095	1409,84622
mar-15		70,84127976	1476,471379	1547,312659		63,5410119	1378,377262	1441,918274
apr-15		85,20181548	1502,566677	1587,768492	1447,72	69,47907738	1395,313313	1464,792391
mag-15		96,836875	1511,148938	1607,985813	1480,2	71,21997024	1397,360337	1468,580308
giu-15	1622,84	102,034494	1506,889633	1608,924127	1477,54	72,67994048	1383,966895	1456,646835
lug-15		143,8097321	1477,195595	1621,005327	1451,55	113,4894048	1343,139613	1456,629018
ago-15		139,6889881	1425,407133	1565,096121	1398,76	112,2618155	1291,997728	1404,259544
set-15		129,299881	1387,138879	1516,43876	1360,03	108,5955952	1262,469177	1371,064772
ott-15		105,364494	1370,41623	1475,780724		98,92505952	1252,278304	1351,203363
nov-15 dic-15		79,38693452 67,26705357	1376,407173 1380,688006	1455,794107 1447,95506	1340,52 1308,85	84,59443452 79,91133929	1244,779722 1242,432113	1329,374157 1322,343452
ulo-13	1-100,00	01,20100001	1000,000000	1747,30000	1300,65	10,01100029	1272,732113	1022,040402

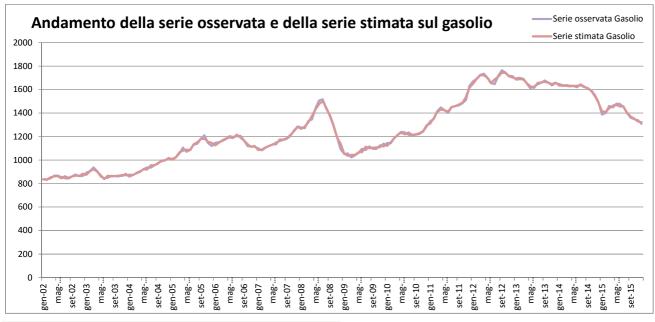
Yt = Rappresenta la serie stimata, ricavata dalla somma tra i coefficienti di stagionalità e i valori del trend-ciclo ricavati in precedenza.

Facendo ciò, possiamo osservare nei grafici come l'andamento segua più o meno il medesimo percorso sia per la quanto riguarda il prezzo della benzina sia per quello del gasolio.

La differenza tra le due serie (osservata e stimata) altro non è che la nostra componente erratica.



Fonte: NS Elaboraz. Dati del Ministero dello Sviluppo Economico (www.mise.gov.it)



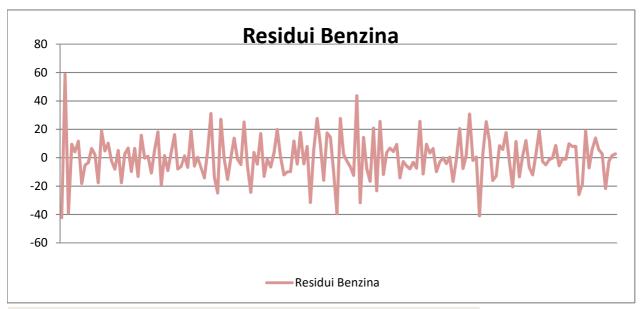
Calcolo dei residui

Anno	Prezzi benzina	yt(benzina)	Rt/henzina)	Prezzi Gasolio	yt(gasolio)	Rt(gasolio)
gen-02	992,39	1034,643095	-42,25309524	836,14	836,1142262	0,02577381
feb-02	1095	1034,043093	58,63823413	837,04	832,4828869	4,557113095
	1023.92		-38.8293254	844.64		-9,834940476
mar-02	,-	1062,749325	,	- ,-	854,4749405	
apr-02	1063,36	1053,861825	9,498174603	866,36	861,0890575	5,27094246
mag-02	1071,58	1067,495813	4,084186508	868,07	864,0469742	4,023025794
giu-02	1061,11	1049,514127	11,59587302	857,43	844,0701687	13,35983135
lug-02	1052,43	1070,668661	-18,23866071	846,06	862,7390179	-16,67901786
ago-02	1052,57	1057,666121	-5,096121032	842,69	850,192877	-7,502876984
set-02	1061,73	1065,30876	-3,578759921	859,39	861,2514385	-1,861438492
ott-02	1068,08	1061,610724	6,469275794	875,67	867,9433631	7,726636905
nov-02	1052,98	1050,964107	2,015892857	864,11	864,8341567	-0,724156746
dic-02	1045,69	1063,312738	-17,6227381	864,37	884,6805556	-20,31055556
gen-03	1068,53	1049,682698	18,84730159	891,6	874,2012302	17,39876984
feb-03	1087,79	1083,038433	4,75156746	906,23	904,6928869	1,537113095
mar-03	1095,02	1084,669325	10,3506746	936,62	921,6582738	14,96172619
apr-03	1065,23	1067,588492	-2,358492063	906,74	902,8190575	3,92094246
mag-03	1039,79	1047,829147	-8,039146825	860,9	871,2669742	-10,36697421
giu-03	1032,03	1026,910794	5,119206349	845,88	839,353502	6,526498016
lug-03	1045,49	1063,105327	-17,61532738	850,63	868,0323512	-17,40235119
ago-03	1065,9	1063,166121	2,733878968	865,55	860,7795437	4,770456349
set-03	1071,84	1065,075427	6,764573413	863,72	865,3581052	-1,638105159
ott-03	1043,94	1053,730724	-9,790724206	860,8	867,7100298	-6,910029762
nov-03	1043,37	1036,75744	6,612559524	873,95	864,9974901	8,952509921
			-13.2227381	869,89	884,3605556	-14,47055556
dic-03 gen-04	1036,82 1047,2	1050,042738 1031,386032	15,81396825			
		,	,	875,28	859,3612302	15,91876984
feb-04	1063,1	1063,408433	-0,30843254	872,51	871,4528869	1,057113095
mar-04	1082,15	1081,069325	1,080674603	886,94	891,3982738	-4,45827381
apr-04	1091,99	1102,718492	-10,72849206	899,36	904,8757242	-5,515724206
mag-04	1131,29	1125,95248	5,337519841	924,13	920,4169742	3,713025794
giu-04	1148,14	1129,900794	18,23920635	937,48	919,363502	18,11649802
lug-04	1146,85	1165,875327	-19,02532738	935,83	956,7190179	-20,88901786
ago-04	1156,74	1155,222788	1,517212302	954,81	954,402877	0,407123016
set-04	1155,81	1164,92876	-9,118759921	970,13	975,7314385	-5,601438492
ott-04	1168,69	1164,884058	3,80594246	996,25	989,2566964	6,993303571
nov-04	1168,11	1151,83744	16,27255952	996,73	999,0874901	-2,357490079
dic-04	1132,57	1140,496071	-7,926071429	1013,93	1017,873889	-3,943888889
gen-05	1098,07	1104,266032	-6,196031746	1009	1001,99123	7,008769841
feb-05	1135,12	1133,705099	1,414900794	1022,64	1022,902887	-0,262886905
mar-05	1170,15	1176,985992	-6,835992063	1057,44	1067,25494	-9,814940476
apr-05	1219,72	1200,445159	19,27484127	1106,3	1079,562391	26,73760913
mag-05	1208,74	1214,63248	-5,892480159	1070,75	1089,256974	-18,50697421
giu-05	1200,74	1208,674127	0,325873016	1090,44	1084,293502	6,146498016
lug-05	1244,86	1251,871994	-7,011994048	1131,04	1134,709018	-3,669017857
ago-05	1255,86	1270,192788	-14,3327877	1140,61	1152,16621	-11,55621032
set-05	1303,59	1298,125427	5,464573413	1182,41	1180,048105	2,361894841
ott-05	1321,38	1290,260724	31,11927579	1211,12	1180,933363	30,1866369
nov-05	1243,77	1257,10744	-13,33744048	1144,61	1155,17749	-10,56749008
dic-05	1220,03	1244,949405	-24,91940476	1119,45	1148,327222	-28,87722222
gen-06	1248,31	1221,249365	27,06063492	1146,96	1125,90123	21,05876984
feb-06	1248,37	1249,291766	-0,921765873	1150,89	1146,902887	3,987113095
mar-06	1253,42	1268,755992	-15,33599206	1163,23	1169,35494	-6,124940476
apr-06	1298,51	1298,675159	-0,16515873	1178,56	1183,619058	-5,05905754
mag-06	1341,37	1327,61248	13,75751984	1204,87	1193,570308	11,29969246
giu-06	1336,52	1337,604127	-1,084126984	1197	1188,530169	8,469831349
lug-06	1371,5	1376,291994	-4,791994048	1203,07	1216,259018	-13,18901786
ago-06		1349,826121	25,13387897	1206,67	1193,662877	13,00712302
set-06	1296,75	1302,605427	-5,855426587	1168,81	1167,041438	1,768561508
ott-06	1222,56	1246,957391	-24,39739087	1119,64	1136,23003	-16,59002976
nov-06		1215,784107	3,735892857	1115,58	1113,14749	2,432509921
dic-06		1223,746071	-4,616071429	1113,87	1120,937222	-7,067222222
gen-07	1209,85	1192,766032	17,08396825	1099,4	1085,437897	13,96210317
feb-07	1202,28	1215,385099	-13,10509921	1082,64	1088,999554	-6,359553571
mar-07	1236,25	1237,215992	-0,965992063		1107,99494	-2,664940476
apr-07	1267,15	1273,808492	-6,658492063		1120,385724	0,244275794
mag-07	1315,3	1311,709147	3,590853175	,	1134,073641	-3,073640873
giu-07	1346,24	1326,39746	19,84253968		1134,600169	15,70983135
lug-07	1354,23	1353,801994	0,428005952	1161,84	1175,925685	-14,08568452
ago-07	1315,04	1327,179454	-12,13945437	1173,59	1172,84621	0,743789683
set-07	1306	1315,972093	-9,972093254	1180,67	1188,514772	-7,844771825
ott-07	1313,33	1323,070724	-9,740724206		1214,34003	-9,060029762
nov-07	1347,84	1336,050774	11,78922619	1252,41	1244,71749	7,692509921
dic-07	1360,84	1365,286071	-4,446071429		1283,407222	2,702777778
gen-08		1346,639365	17,80063492		1265,38123	12,35876984
feb-08		1371,991766	-4,391765873		1287,179554	-15,28955357
mar-08	1386,16	1378,172659	7,98734127	1332,28	1321,68494	10,59505952
apr-08		1406,308492	-31,51849206		1375,045724	-29,54572421
mag-08		1449,535813	5,714186508		1432,063641	11,09635913
giu-08	1512,13	1484,480794	27,64920635	1507,25	1476,400169	30,84983135
lug-08		1512,971994	9,668005952	1518,14	1501,435685	16,70431548
ago-08		1474,169454	-15,91945437	1436,88	1447,109544	-10,22954365
set-08	1435,35	1417,832093	17,51790675	1383,87	1376,078105	7,791894841
ott-08		1331,887391	14,46260913		1294,943363	6,536636905
nov-08	1211,92	1221,764107	-9,844107143	1194,82	1193,184157	1,635843254
dic-08	1120,88	1160,34006	-39,46005952	1092,9	1141,518452	-48,61845238

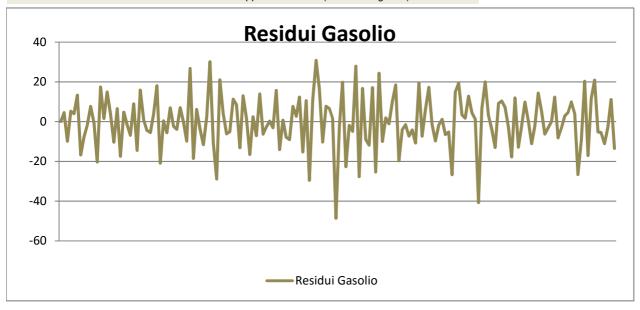
A	Daniel Lauria	(/	D(//: \	D: O!'-		D((-)
Anno	Prezzi benzina	yt(benzina)	27,61809524	Prezzi Gasolio 1051,4	yt(gasolio)	Rt(gasolio)
gen-09 feb-09	1113,64 1140,8	1086,021905 1138,275099	2,524900794	1056,72	1054,255238 1036,84622	-2,855238095 19,87377976
mar-09	1162,61	1164,889325	-2,279325397	1022,79	1045,44494	-22,65494048
apr-09	1185,29	1191,728492	-6,438492063	1041,44	1043,335724	-1,895724206
mag-09	1224,56	1237,04248	-12,48248016	1061,58	1066,440308	-4,86030754
giu-09	1294,84	1251,114127	43,72587302	1096,02	1068,150169	27,86983135
lug-09	1270,52	1302,295327	-31,77532738	1086,2	1113,879018	-27,67901786
ago-09	1295,63	1281,256121	14,37387897	1117,38	1100,702877	16,67712302
set-09	1271,35	1278,965427	-7,615426587	1096,09	1105,068105	-8,978105159
ott-09 nov-09	1256,37 1289,44	1273,067391 1268,53744	-16,69739087 20,90255952	1095,73 1126,04	1107,506696 1108,930823	-11,77669643 17,10917659
dic-09	1273,66	1296,972738	-23,3127381	1114,67	1139,973889	-25,30388889
gen-10	1305,08	1279,552698	25,52730159	1145,25	1120,88123	24,36876984
feb-10	1312,88	1324,698433	-11,81843254	1142,32	1152,259554	-9,939553571
mar-10	1358,36	1354,555992	3,804007937	1189,58	1187,70494	1,875059524
apr-10	1386,46	1379,708492	6,751507937	1215,83	1216,939058	-1,10905754
mag-10	1391,58	1387,299147	4,280853175	1241,21	1231,206974	10,00302579
giu-10	1377,42	1368,060794	9,359206349	1236,3	1217,823502	18,47649802
lug-10	1371,76 1362,67	1385,915327	-14,15532738	1215,31 1211,44	1235,029018 1215,45621	-19,71901786
ago-10 set-10	1355,34	1365,346121 1361,125427	-2,676121032 -5,785426587	1217,44	1218,694772	-4,016210317 -1,514771825
ott-10	1351,82	1359,710724	-7,890724206	1221,46	1228,713363	-7,253363095
nov-10	1369,93	1373,13744	-3,207440476	1242,84	1247,010823	-4,170823413
dic-10	1411,52	1418,916071	-7,396071429	1286,38	1297,107222	-10,72722222
gen-11	1452,56	1426,916032	25,64396825	1328,14	1308,727897	19,41210317
feb-11	1469,63	1481,038433	-11,40843254	1351,26	1358,58622	-7,326220238
mar-11	1523,15	1513,645992	9,504007937	1416,73	1410,478274	6,25172619
apr-11	1542,19	1538,918492	3,271507937	1448,06	1430,749058	17,31094246
mag-11	1548,69	1542,225813	6,464186508	1423,26	1424,706974	-1,446974206
giu-11 lug-11	1529,36 1576,16	1539,210794 1579,145327	-9,850793651 -2,985327381	1402,52 1450,28	1412,236835 1451,959018	-9,716835317 -1,679017857
ago-11	1586,02	1586,046121	-0,026121032	1461,04	1451,959016	1,190456349
set-11	1589,69	1593,842093	-4,152093254	1465,79	1472,251438	-6,461438492
ott-11	1592,27	1591,890724	0,379275794	1483,92	1489,086696	-5,166696429
nov-11	1591,67	1608,414107	-16,74410714	1512,89	1539,604157	-26,71415675
dic-11	1655,16	1656,822738	-1,662738095	1631,65	1616,737222	14,91277778
gen-12	1700,9	1680,299365	20,60063492	1671,71	1652,234563	19,47543651
feb-12	1737,8	1745,381766	-7,581765873	1692,94	1689,51622	3,423779762
mar-12	1799,67	1797,885992	1,784007937 30,79150794	1724,27	1722,548274	1,72172619
apr-12 mag-12	1850,22 1805,67	1819,428492 1807,675813	-2,005813492	1735,05 1703,01	1722,175724 1698,523641	12,87427579 4,486359127
giu-12	1760,7	1760,24746	0,452539683	1657,23	1655,970169	1,259831349
lug-12	1750,95	1791,935327	-40,98532738	1647,02	1687,699018	-40,67901786
ago-12	1818,26	1815,456121	2,803878968	1716,81	1710,162877	6,647123016
set-12	1870,89	1845,535427	25,35457341	1764,22	1744,228105	19,99189484
ott-12	1833,91	1821,970724	11,93927579	1745,65	1742,46003	3,189970238
nov-12	1759,07	1775,190774	-16,12077381	1712,85	1716,654157	-3,804156746
dic-12	1746,45 1749,94	1759,399405 1741,476032	-12,94940476	1701,11 1694,38	1714,100556	-12,99055556 9,192103175
gen-13 feb-13	1749,94	1775,208433	8,463968254 5,79156746	1699,67	1685,187897 1689,20622	10,46377976
mar-13	1796,91	1779,225992	17,68400794	1693,94	1686,701607	7,238392857
apr-13	1753,8	1756,531825	-2,731825397	1651,11		-2,742390873
mag-13		1736,719147		1612,31	1630,053641	
giu-13	1733,76	1722,290794	11,46920635	1626,46	1614,480169	11,97983135
lug-13		1767,011994	-13,48199405	1644,02	1656,852351	-12,83235119
ago-13		1766,959454	0,890545635	1658,04	1660,389544	-2,349543651
set-13		1761,135427	12,09457341	1676,67	1666,801438	9,868561508
ott-13		1735,684058	-6,90405754 -12,18410714	1659,69	1659,216696	0,473303571
nov-13 dic-13	1703 1727,63	1715,184107 1725,479405	2,150595238	1636,63 1656,56	1647,744157 1658,713889	-11,11415675 -2,153888889
gen-14	1723,07	1703,929365	19,14063492	1648,99	1634,594563	14,39543651
feb-14	1714,05	1716,731766	-2,681765873	1637,83	1632,639554	5,190446429
mar-14	1715,3	1720,305992	-5,005992063	1631,47	1637,74494	-6,274940476
apr-14	1725,6	1727,051825	-1,451825397	1628,55	1631,632391	-3,082390873
mag-14	1737,53	1737,84248	-0,312480159	1630,68	1630,530308	0,14969246
giu-14	1743,96	1735,36746	8,592539683	1632,08	1619,683502	12,39649802
lug-14 ago-14	1761,19	1766,925327	-5,735327381	1635,64	1643,789018	-8,149017857
set-14	1749,73 1734,56	1750,582788 1735,685427	-0,852787698 -1,125426587	1621,61 1614,78	1624,822877 1611,878105	-3,212876984 2,901894841
ott-14	1709,22	1699,410724	9,809275794	1593,24	1588,71003	4,529970238
nov-14	1652,41	1644,474107	7,935892857	1553,45	1543,504157	9,945843254
dic-14	1585,65	1577,612738	8,037261905	1493,47	1489,380556	4,089444444
gen-15	1472,04	1498,056032	-26,01603175	1387,26	1413,84123	-26,58123016
feb-15	1489,44	1508,385099	-18,94509921	1400,39	1409,84622	-9,456220238
mar-15	1565,9	1547,312659	18,58734127	1462,26	1441,918274	20,34172619
apr-15	1580,63	1587,768492	-7,138492063 6,064186508	1447,72	1464,792391	-17,07239087
mag-15 giu-15	1614,05 1622,84	1607,985813 1608,924127	6,064186508 13,91587302	1480,2 1477,54	1468,580308 1456,646835	11,61969246 20,89316468
lug-15	1626,46	1621,005327	5,454672619	1451,55	1456,629018	-5,079017857
ago-15	1567,82	1565,096121	2,723878968	1398,76	1404,259544	-5,499543651
set-15	1494,74	1516,43876	-21,69875992	1360,03	1371,064772	-11,03477183
ott-15		1475,780724	-2,570724206	1348,4	1351,203363	-2,803363095
nov-15		1455,794107	1,555892857	1340,52	1329,374157	11,14584325
dic-15	1450,68	1447,95506	2,724940476	1308,85	1322,343452	-13,49345238

Rt = Sono i Residui, cioè la differenza tra il Valore Osservato e quello Stimato (Yt). Ricavandone i grafici, vediamo come essi si distribuiscono nel tempo. I residui dovranno essere valori completamente <u>casuali</u>, cioè:

- dovranno avere media nulla;
- dovranno avere varianza costante;
- ciascun residuo sarà non correlato con gli altri.



Fonte: NS Elaboraz. Dati del Ministero dello Sviluppo Economico (www.mise.gov.it)



Analisi dei Residui

Anno	Anna	D4/hon=ino\	Dot/honzina\	Dt/goodie)	Dot/goodie)
mar-02					
map-02 9,488174603 0,6259684 5,27094246 0,409246078 mag-02 1,59587302 0,764589465 13,35983135 1,021994311 up-02 -18,2386071 -1,205949628 -16,67801786 -1,255503846 set-02 -3,578759921 -0,238187564 -1,86133492 -0,13104916 -1,005949628 -1,8617891786 -1,255503846 nov-02 -2,015892857 0,338485814 -7,766359690 .0595269466 nov-02 -2,015892857 0,131520338 -0,724156746 -0,044893729 dic-02 -1,6227381 -1,66248149 -2,031055569 -1,228599518 gen-03 18,84730159 1,243781682 17,38676984 1,32785138 gen-03 18,84730159 1,243781682 17,38676984 1,32785138 gen-03 18,84730159 1,243781682 17,38676984 1,32785138 gen-03 18,94730159 1,243781682 17,38676984 1,32785138 gen-03 1,537130395 0,126401627 mar-03 0,33046825 -0,53240499 -1,036697421 -0,775354915 gen-03 -2,358492063 -0,157549266 3,92094246 0,306991092 mag-03 -8,039146825 -0,53240499 -1,036697421 -0,775354913 gen-03 -1,75749735491 -0,53240499 -1,03697421 -0,775354913 gen-03 -1,76532738 -1,165758243 -1,740235119 -1,308297678 ago-03 -2,733678968 0,778967124 4,770456349 0,37133334 set-03 6,764573413 0,445325517 -1,638105159 -0,114127005 -0,00007403 dic-03 -7,90724266 0,46889427 -4,70456349 0,37133334 set-03 6,764573413 0,4753256724 0,470726549 0,57138500 -0,00007403 gen-04 1,080674603 0,668719318 -4,45827381 -0,327759974 gen-04 1,080674603 0,668719318 -4,45827381 -3,2277381 -0,000074603 gen-04 1,080674603 0,66869427 -1,470456549 0,09067669 -0,00007669 -0,0					
map-02	mar-02	-38,8293254	-2,567631542	-9,834940476	-0,735052378
December		9,498174603	0,6259684	5,27094246	
Lig-Q-2					
sel-02					
set-02 3.578759921 -0.238187564 -1.861438492 -0.13104916 nov-02 2.015892857 0.131520838 -0.724156746 -0.044893729 dic-02 -1.7.6227381 -1.166248148 -20.31055556 -1.5285981516 gen-03 4.75156746 0.312300397 1.373173095 0.128401627 mar-03 -0.3566746 0.382303955 1.3617313095 0.128401627 mar-03 -2.3588492083 -0.157549266 3.92094246 0.306981092 mar-03 -2.3588492083 -0.157549266 3.92094246 0.306981092 mar-03 -2.35889368 -0.53284088 -1.036697421 0.753549313 giu-03 -5.119206349 0.336595418 6.526949016 0.504356724 ug-03 -1.7.61532738 -1.16575643 -1.03697624 0.70735549313 ug-03 -7.61532738 -1.16575643 -1.03697634 0.703356724 ug-03 -7.61532738 -1.16575643 -1.038105159 -0.114127005 ott-03 -6.764573413 0.445325317 -1.638105159 -0.114127005 ott-03 -7.7072406 -0.648698427 -6.910029762 -0.51348634 0.371333334 set-03 -6.764573413 0.445325317 -1.638105159 -0.114127005 ott-03 -1.3.2227381 -0.876845337 -1.1638105159 -0.114127005 ott-03 -1.3.2227381 -0.876845337 -1.1638105159 -0.168208759 gen-04 -1.0.72849206 -0.710659431 -5.515724206 -0.40786379 apr-04 -1.72849206 -0.7					
Oct					
December					
dic-02					
mar-03					
mar-03	gen-03	18,84730159	1,243781682	17,39876984	
mag-03					
mag-03					
Bigu-03					
Bug-03					
ago-03	_				
Set-03 6.764573413 0.445325317 1.638105159 0.114127005 0.101437005 0.612559524 0.435279665 8.952509921 0.688131595 dic-03 -13,2227381 0.957485337 14.47055566 1.086208759 gen-04 1.681396825 1.0433131662 15,91876994 1.215838615 feb-04 -0.30843254 -0.022076295 1.057113095 0.090040742 mar-04 1.026074603 0.090719318 -4.45827381 -0.327759974 0.291231021 apr-04 -10,72849206 -0.710693431 5.515724206 -0.40786379 mag-04 5.337519841 0.35102211 3.713025794 0.291231021 giu-04 18.23920635 1.255934694 20.8901786 -1.5724191 ago-04 1.51721302 0.098566802 0.407123016 0.040802797 set-04 9.118759921 -0.604284376 5.601438492 -0.441356805 ott-04 3.60594246 0.249811714 6.993303571 0.539718105 ott-04 3.60594246 -0.249811714 6.993303571 0.539718105 ott-04 3.60594246 -0.2498117714 6.993303571 0.539718105 ott-04 3.60594246 -0.2498117714 0.993303571 0.539718105 ott-04 3.60594246 -0.249813777 0.70569841 0.540889703 ott-05 6.196031746 -0.411143317 7.008769841 0.540889703 ott-05 6.835992063 -0.453433467 9.81494076 0.733567341 opt-05 0.262886905 0.00995165859 3.94388889 0.288773367341 opt-05 19.27484127 1.272034555 26.73760913 2.035385618 opt-05 0.325873016 0.091804014 0.146498016 0.475571024 opt-05 0.325873016 0.091804014 0.146498016 0.475571024 opt-05 0.325873016 0.091805006 0.091805006 0.091805006 0.091805006 0.091805006 0.091805006 0.091805006 0.091805006 0.091805006 0.091805006 0.091805006 0.091805006	_				
ott-03 9,789724206 -0,648689427 6,910029762 -0,6134850902 nov-03 -13,2227381 -0,875485337 -14,47055556 -1,086208759 gen-04 15,81396825 1,043331562 15,91876984 1,215838615 feb-04 -0,30843254 -0,022076295 1,057113095 0,090040742 mar-04 1,080674603 0,069719318 -4,45827381 -0,327759974 apr-04 -1,072849206 -0,710659431 -5,515724206 -0,40786379 mag-04 1,5823920635 1,203597255 18,11649802 1,382320572 lug-04 1,902532738 -1,255934694 20,88901786 -1,5724191 ago-04 1,517212302 0,09856802 0,407123016 0,040802797 set-04 -9,118759921 -0,604284376 -5,601438492 -0,414356805 ott-04 3,80594246 0,249811714 -9,93303571 0,539718105 dic-04 -7,926071429 -0,52546859 3,943888899 0,282879489 gen-05 -6,186031746 -0,411430496 -0,22686905					
dic-03	ott-03				
gen-04 15,81396825 1,043331562 15,01876984 1,21583615 feb-04 -0.30843254 0,02076295 1,057713095 0,090040742 mar-04 1,080674603 0,069719318 -4,45827381 0,327759974 apr-04 -10,72849206 -0.710659431 5,515724206 -0.40786379 apr-04 15,337519841 0,35102211 3,713025794 0,291231021 giu-04 18,23920635 1,203597255 18,11649802 1,3823205725 lug-04 1,517212302 0,098566802 0,407123016 0,040802797 set-04 -9.118759921 -0.604284376 5,601438492 -0,414356805 ott-04 3,80594246 0,2498117714 6,993303571 0,539718105 nov-04 16,27255952 1,0736364 -2,357490079 -0,168621737 dic-04 -7,926071429 -0,52546859 3,943888889 -0,288794369 gen-05 -6,196031746 -0,411143317 7,008769841 0,540889703 ep-05 19,27484127 1,272034555 26,73760913 2,035385618 mag-05 5,892480159 -0,39108382 -18,50697421 -1,391974906 giu-05 0,325873016 0,019840174 (1,1646498016 0,47557124) lug-05 -7,011994048 -0,48506411 3,669017857 -0,267972382 ago-05 -14,3327877 -0,948840142 -11,55621032 -0,865441739 set-05 5,464573413 0,359418123 2,361894841 0,18888036 ott-05 13,11927579 2,05474389 30,1866369 2,296655825 nov-05 -13,33744046 -0,83065152 -10,56749008 -0,79054436 dic-05 -24,91940476 -1,648429809 28,87722222 -2,177540294 gen-06 27,06063492 1,766538929 21,05676984 1,605203082 feb-06 -0,921765873 -0,0063669 3,87113095 0,371939689 giu-06 -1,081126984 -0,07333609 8,469831349 0,651567804 lug-06 -4,791994048 -0,0183065152 -10,56749008 -0,79054436 giu-06 -1,084126984 -0,07333609 8,469831349 0,651567804 lug-06 -4,791994048 -0,0183065152 -10,56749008 -0,79054436 giu-06 -1,084126984 -0,07333609 8,469831349 0,651567804 lug-06 -4,791994048 -0,0183065152 -1,056749008 -0,7905436 giu-06 -1,084126984 -0,07333609 3,469831349 0,651567804 lug-06 -4,66071429 -0,36635652 -1,06593056 -1,0719396246 0,985593076 -1,015134352 -6,124940476 -0,454013044 gp-06 -4,791994048 -0,0383065152 -1,056749008 -0,7905436 gp-06 -1,084126984 -0,07333609 3,469831349 0,651567804 lug-06 -4,66071429 -0,366356527 -1,066529444 -2,664940476 -0,454013044 gp-07 -4,66064737 -0,065529444 -2,664940476 -0,191911671 gp-07 -6,6554920	nov-03	6,612559524	0,435279865	8,952509921	0,688131595
Teb-04					
mar-04					
apr-04					
mag-04					
giu-04		,			
Table					
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mar-09	70619099 33642122 335821477 21153537 886774107 273285265 67014552 88214396 80601411 906653713 555941679 742977012 5520169 907405067 67771010 909591235 883789448 99427285 904784277 33949313 905985077
apr-09	33642122 ,35821477 ,2115353 ,86774107 ,73285265 ,7014552 ,82143968 ,906014115 ,906853713 ,55594167 ,74050673 ,740506
mag-09	,35821477, 21153537, 386774101, 273285265, 370145524, 382143966, 3906014115, 3906853713, 355941677, 42977012, 52001691, 374050673, 3740506743, 3740506743, 3740506743, 3740506743, 3740506743, 3740506743, 3740506743, 3740506743, 3740506743, 3740506744, 3740506744, 3740506744, 3740506744, 3740506744, 3740506744, 3740506744, 3740506744, 3740506744, 3740506744, 3740506744, 3740506744, 3740506744, 3
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ago-09	273285265 273285265 27014552 282143968 2806014111 206653713 255941679 242977012 5520169 277405067 267771010 209591235 283789444 29427285 204784277 203949313 205985077
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gen-10	55941679 742977012 52001691 774050673 767710107 769591235 83789445 894272851 04784277 7639493136 765985077
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mag-10	767710107 109591235 183789445 294272851 04784277 339493136 305985077
giu-10	109591235 183789445 294272851 04784277 539493136 805985077
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Analisi dei Residui

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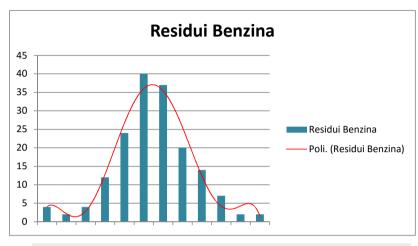
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-1	-0,5	24
-0,5	0	40
0	0,5	37
0,5	1	20
1	1,5	14
1,5	2	7
2	2,5	2
2,5	3	2
Totale		168

Notiamo una maggiore distribuzione dei residui nei valori compresi tra -1,5 e 1,5.

MINIMO (Gasolio) -3,67297 MASSIMO (Gasolio) 0,011915

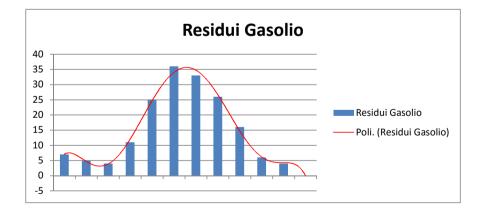
Xinf	Xsup	Υ
<	-2,5	7
-2,5	-2	5
-2	-1,5	4
-1,5	-1	11
-1	-0,5	25
-0,5	0	36
0	0,5	33
0,5	1	26
1	1,5	16
1,5	2	6
2	2,5	4
2,5	3	0
Totale		173

Notiamo una maggiore distribuzione dei residui nei valori compresi tra -1,5 e 1,5.



Fonte: NS Elaboraz. Dati del Ministero dello Sviluppo Economico (www.mise.gov.it)

In entrambi i casi dalla distribuzione dei residui la linea di tendenza si mostra come una normale (o Gaussiana), deducibile anche dal valore della media pari a 0 e della varianza 1, e dunque la distribuzione dei residui è casuale. Possiamo quindi definire la componente deterministica come buona ed affermare che i residui sono realmente stocastici.



Livellamento esponenziale

Anno	Prezzi benzina	λ= 0,2	λ= 0,8		λ= 0,2	λ= 0,8
gen-02	992,39	992,39	992,39	836,14	836,14	836,14
feb-02 mar-02	1095 1023,92	1074,478 1034,0316	1012,912 1015,1136	837,04 844,64	836,86 843,084	836,32 838,416
apr-02	1063,36	1057,49432	1024,76288	866,36	861,7048	847,7392
mag-02	1071,58	1068,762864	1034,126304	868,07	866,79696	862,97784
giu-02	1061,11	1062,640573	1039,523043	857,43	859,303392	864,923568
lug-02	1052,43	1054,472115	1042,104435	846,06	848,7086784	856,6547136
ago-02	1052,57	1052,950423	1044,197548	842,69	843,8937357	847,5049427
set-02	1061,73	1059,974085	1047,704038	859,39	856,2907471	846,9929885
ott-02	1068,08	1066,458817	1051,77923	875,67	871,7941494	860,1665977
nov-02	1052,98	1055,675763	1052,019384	864,11	865,6468299	870,2573195
dic-02	1045,69	1047,687153	1050,753508	864,37	864,625366	865,3914639
gen-03 feb-03	1068,53 1087,79	1064,361431 1083,104286	1054,308806 1061,005045	891,6 906,23	886,2050732 902,2250146	870,0202928 890,2100586
mar-03	1095,02	1092,636857	1067,808036	936,62	929,7410029	909,1040117
apr-03	1065,23	1070,711371	1067,292429	906,74	911,3402006	925,1408023
mag-03	1039,79	1045,974274	1061,791943	860,9	870,9880401	901,2521605
giu-03	1032,03	1034,818855	1055,839554	845,88	850,901608	865,9664321
lug-03	1045,49	1043,355771	1053,769643	850,63	850,6843216	850,8472864
ago-03	1065,9	1061,391154	1056,195715	865,55	862,5768643	853,6574573
set-03	1071,84	1069,750231	1059,324572	863,72	863,4913729	862,8054915
ott-03	1043,94	1049,102046	1056,247657	860,8	861,3382746	862,9530983
nov-03	1043,37	1044,516409	1053,672126	873,95	871,4276549	863,8606197
dic-03	1036,82	1038,359282	1050,301701	869,89	870,197531	871,1201239
gen-04	1047,2	1045,431856	1049,681361	875,28 973,51	874,2635062	871,2140248
feb-04 mar-04	1063,1 1082,15	1059,566371 1077,633274	1052,365088 1058,322071	872,51 886,94	872,8607012 884,1241402	873,912805 875,676561
apr-04	1091,99	1077,633274	1056,322071	899,36	896,312828	887,1713122
mag-04	1131,29	1122,855731	1078,302525	924,13	918,5665656	901,8762624
giu-04	1148,14	1143,083146	1092,27002	937,48	933,6973131	922,3492525
lug-04	1146,85	1146,096629	1103,186016	935,83	935,4034626	934,1238505
ago-04	1156,74	1154,611326	1113,896813	954,81	950,9286925	939,2847701
set-04	1155,81	1155,570265	1122,27945	970,13	966,2897385	954,768954
ott-04	1168,69	1166,066053	1131,56156	996,25	990,2579477	972,2817908
nov-04	1168,11	1167,701211	1138,871248	996,73	995,4355895	991,5523582
dic-04	1132,57	1139,596242	1137,610999	1013,93	1010,231118	999,1344716
gen-05	1098,07	1106,375248	1129,702799	1009	1009,246224	1009,984894
feb-05	1135,12	1129,37105	1130,786239	1022,64	1019,961245	1011,924979
mar-05	1170,15	1161,99421	1138,658991	1057,44	1049,944249	1027,456996
apr-05 mag-05	1219,72 1208,74	1208,174842 1208,626968	1154,871193 1165,644954	1106,3 1070,75	1095,02885 1075,60577	1061,215399 1090,17308
giu-05	1209	1208,925394	1174,315964	1090,44	1087,473154	1078,572616
lug-05	1244,86	1237,673079	1188,424771	1131,04	1122,326631	1096,186523
ago-05	1255,86	1252,222616	1201,911817	1140,61	1136,953326	1125,983305
set-05	1303,59	1293,316523	1222,247453	1182,41	1173,318665	1146,044661
ott-05	1321,38	1315,767305	1242,073963	1211,12	1203,559733	1180,878932
nov-05	1243,77	1258,169461	1242,41317	1144,61	1156,399947	1191,769786
dic-05	1220,03	1227,657892	1237,936536	1119,45	1126,839989	1149,009957
gen-06	1248,31	1244,179578	1240,011229	1146,96	1142,935998	1130,863991
feb-06 mar-06	1248,37 1253,42	1247,531916 1252,242383	1241,682983	1150,89	1149,2992 1160,44384	1144,526798
apr-06	1298,51	1289,256477	1244,030386 1254,926309	1163,23 1178,56	1174,936768	1152,08536 1164,067072
mag-06	1341,37	1330,947295	1272,215047	1204,87	1198,883354	1180,923414
giu-06		1335,405459			1197,376671	1198,506683
lug-06	1371,5	1364,281092	1302,36083	1203,07	1201,931334	1198,515337
ago-06	1374,96	1372,824218		1206,67	1205,722267	1202,879067
set-06	1296,75	1311,964844		1168,81	1176,192453	1198,339813
ott-06	1222,56	1240,440969	1294,795625	1119,64	1130,950491	1164,881963
nov-06	1219,52	1223,704194			1118,654098	1127,876393
dic-06	1219,13	1220,044839	1267,6184		1114,82682 1102,485364	1117,697279
gen-07 feb-07	1209,85 1202,28	1211,888968 1204,201794		1099,4 1082,64	1086,609073	1111,741456 1098,516291
mar-07	1236,25	1229,840359	1243,496221	1105,33	1101,585815	1090,353258
apr-07	1267,15	1259,688072	1248,226977	1120,63	1116,821163	1105,394652
mag-07	1315,3	1304,177614		1131	1128,164233	1119,65693
giu-07	1346,24	1337,827523			1145,880847	1132,593386
lug-07	1354,23	1350,949505	1293,695012	1161,84	1158,648169	1149,072677
ago-07	1315,04	1322,221901	1297,96401	1173,59	1170,601634	1161,636535
set-07	1306	1309,24438			1178,656327	1172,615307
ott-07	1313,33	1312,512876		1205,28	1199,955265	1183,981061
nov-07 dic-07	1347,84 1360,84	1340,774575 1356,826915	1311,426373 1321,309098	1252,41 1286,11	1241,919053 1277,271811	1210,446212 1250,757242
gen-08	1364,44	1362,917383	1329,935279	1277,74	1277,646362	1277,365448
feb-08	1367,6	1366,663477	1337,468223	1271,89	1273,041272	1276,49509
mar-08	1386,16	1382,260695	1347,206578		1320,432254	1284,889018
apr-08	1374,79	1376,284139	1352,723263	1345,5	1340,486451	1325,445804
mag-08	1455,25	1439,456828	1373,22861	1443,16	1422,62529	1361,021161
giu-08	1512,13	1497,595366			1490,325058	1439,550232
lug-08	1522,64	1517,631073		1518,14	1512,577012	1495,888046
ago-08	1458,25	1470,126215	1431,918088	1436,88	1452,019402	1497,437609
set-08	1435,35	1442,305243	1432,604471	1383,87	1397,49988	1438,389522
ott-08 nov-08	1346,35 1211,92	1365,541049 1242,64421	1415,353577 1374,666861	1301,48 1194,82	1320,683976 1219,992795	1378,295904 1295,511181
dic-08	1211,92	1242,64421			1219,992795	
aio 00	1120,00		.520,555405	1002,0	0,0 10000	

September 14,006 1186,631714 1253,644473 1056,7 1056,832742 1063,170000 1186,29 1179,714869 1225,6400693 1041,44 1039,13171 1032,026839 1049,009 1224,46 1276,850974 1225,6400693 1041,44 1039,13171 1032,026839 1049,009 1224,46 1276,850974 1225,8406,003 1041,44 1039,13171 1032,026839 1049,009 1224,44 1278,9801998 1239,15876 1096,002 1086,234068 1044,02734 1049,009 1294,44 1278,9801998 1239,15876 1096,002 1086,234068 1044,02734 1049,009 1295,63 1220,946008 1235,470860 1117,38 1111,225363 1092,761451 1096,009 1296,53 1220,946008 1255,470860 1117,38 1111,225363 1092,761451 1096,009 1296,57 1260,148922 1258,191316 1055,73 1066,00741 1088,43663 1069,009 1276,13 1049,409 1295,44 1285,5091574 1266,444053 1220,009 1200,1148 1102,339363 1090,009 1296,44 1285,5091574 1266,444053 1220,009 1200,1148 1102,339363 1096,009 1276,009 1296,44 1285,5091574 1266,444053 1220,009 1200,1148 1102,339363 1069,44 1285,5091574 1266,444053 1220,44004 1200,1148 1102,339363 1069,44 1285,5091574 1266,444053 1220,44004 1200,1148 1102,33936 1269,44 1285,5091574 1266,444053 1260,44004 1200,1148 1200,44004 1200,440	gon 00	1112 64	1110 050560	1201 055501	1051.4	1064 702712	1104 024947
mar-06	gen-09	1113,64 1140.8	1119,958568 1136 631714	1281,855591	1051,4 1056.72	1064,783712	1104,934847
apr-09							,
mag-09							
Jug-09							
1909-09	giu-09	1294,84	1278,990195	1239,15876	1096,02	1088,234068	1064,876274
1981-09			1272,214039	1245,431008	1086,2		1087,827255
cm-09							
120,113,483 1120,113,483 1120,114 1120,113,483 1102,031,483 1102,031,483 1102,031,483 1102,031,483 1102,031,483 1102,031,483 1102,031,483 1102,031,483 1104,045,676 1281,140,031,471 1145,25 1133,351,739 1181,089 1181,080,0827 1181,180,180 113,183 131,184 131,142,567 1281,180,99 1185,88 1180,00927 1185,180 1181,180 1181,180 1							
display disp							
Internation 1905.08 1299, 192879 1274, 043874 1143, 25 1139, 351739 1121, 1656897 1149.08 1149.09 1149.08 1149.09 1149.08 1149.09 1149.08 1149.09 1149.08 1149.09 1149.08 1149.09 1149.08 1149.09 1149.08 1149.09 1149.08 1149.09 1149.08 1149.09 1149.08 1149.09 1149.08 1149.09 1149.08 1149.09 1149.08 1149.09 1149.08 1149.09 1149.08 1149.09 1149.08 1149.09 1149.08 1149.09 1149.08 1149.09 1149.08							
mar-10	_						
Bapt-10							
mag-10						,	
1987-10 1377.42 1379,74522 1399,72907 1256,3 1225,890244 1235,020937 190-10 1362,67 1364,80741 1349,442555 1211,44 1213,040809 1217,84327 1365,24 1355,24	•	,					
1971 1971 1973,1976 1973,19705 1346,138686 1215,31 1219,444047 1231,446187 1980,000 1980,0							
set-10 1355,34 1357,233482 1350,62202 1217,18 1216,352162 1213,373720 nov-10 1369,93 1366,524539 1350,681616 1221,46 1220,438432 1217,373720 nov-10 1369,93 1366,524539 1354,675,233 1242,84 1238,359686 1224,918746 dic-10 1411,52 1402,52098 1366,042457 1286,38 1276,775997 1247,963734 pen-11 1452,56 1442,528182 1383,347387 1328,14 1317,867187 128,04875 mar-11 1523,15 1511,362887 1425,151138 1416,73 1402,300287 1325,04875 mar-11 1523,15 1511,362887 1425,151138 1416,73 1402,300287 1359,01115 apr-11 1542,19 1566,024657 1448,525502 1448,06 1448,90857 1359,01115 pen-11 1542,19 1566,024657 1448,525502 1448,06 1448,080557 1459,01115 pen-11 1542,19 1566,024657 1448,525502 1448,06 1446,02481 1455,01134 pen-11 1569,06 1566,024657 1448,525502 1448,06 1446,02 1448,02 1448,04 1448,02 1448,04 1448,04 1457,04 145							
out-10 1361,82 1352,902686 1350,861616 1221,46 1220,438432 1271,737279 (nov-10 1369,93 1366,24453) 1246,875,475293 1242,881,428,4361 1248,1452,6182 1248,18746 1248,1452,6182 1356,675293 1242,881437 1226,1487,6181 1462,65 1442,552182 1383,347387 1328,14 1371,687187 1287,04875 16b-11 1462,65 1444,552182 1383,347387 1328,148 1371,867187 1287,04875 16b-11 1469,63 1464,21436 1400,60391 1351,26 1344,581437 1324,54575 18pr-11 1522,15 1513,62887 1425,113128 1416,73 1402,300287 1359,01115 18pr-11 1522,19 1536,024577 1448,52502 1448,06 1438,90057 1411,4523 18pr-11 1522,19 1536,024577 1448,52502 1442,026 1423,26 1426,389611 1435,770446 19pr-11 1576,16 1567,471677 1499,805613 1450,22 1407,283922 1421,615684 19pr-11 1576,16 1567,471677 1499,805613 1450,22 1407,283922 1421,615684 19pr-11 1598,60 1582,310375 1517,505811 1461,04 1457,186557 1445,554223 1451,891138 ago-11 1598,60 1582,310375 1517,505811 1461,04 1457,186557 1445,554223 1451,891138 ago-11 1592,73 1591,458915 1533,75648 1445,579 1464,056711 1458,92246 1501,111 1591,67 1591,627763 1553,307555 1512,89 1500,301928 1486,307314 1610-11 1591,67 1591,627763 1553,307555 1512,89 1500,301928 1486,307314 1619,1002,98 1683,157,1468,146,146,146,146,146,146,146,146,146,146	ago-10		1364,80741	1349,442525	1211,44	1213,040809	
out-10 1361,82 1352,902686 1350,861616 1221,46 1220,438432 1271,737279 (nov-10 1369,93 1366,24453) 1246,875,475293 1242,881,428,4361 1248,1452,6182 1248,18746 1248,1452,6182 1356,675293 1242,881437 1226,1487,6181 1462,65 1442,552182 1383,347387 1328,14 1371,687187 1287,04875 16b-11 1462,65 1444,552182 1383,347387 1328,148 1371,867187 1287,04875 16b-11 1469,63 1464,21436 1400,60391 1351,26 1344,581437 1324,54575 18pr-11 1522,15 1513,62887 1425,113128 1416,73 1402,300287 1359,01115 18pr-11 1522,19 1536,024577 1448,52502 1448,06 1438,90057 1411,4523 18pr-11 1522,19 1536,024577 1448,52502 1442,026 1423,26 1426,389611 1435,770446 19pr-11 1576,16 1567,471677 1499,805613 1450,22 1407,283922 1421,615684 19pr-11 1576,16 1567,471677 1499,805613 1450,22 1407,283922 1421,615684 19pr-11 1598,60 1582,310375 1517,505811 1461,04 1457,186557 1445,554223 1451,891138 ago-11 1598,60 1582,310375 1517,505811 1461,04 1457,186557 1445,554223 1451,891138 ago-11 1592,73 1591,458915 1533,75648 1445,579 1464,056711 1458,92246 1501,111 1591,67 1591,627763 1553,307555 1512,89 1500,301928 1486,307314 1610-11 1591,67 1591,627763 1553,307555 1512,89 1500,301928 1486,307314 1619,1002,98 1683,157,1468,146,146,146,146,146,146,146,146,146,146	set-10	1355,34	1357,233482	1350,62202	1217,18	1216,352162	1213,868647
	ott-10		1352,902696	1350,861616	1221,46	1220,438432	1217,373729
gen-11		1369,93	1366,524539	1354,675293	1242,84		1224,918746
mar-11	_						
mg-r11							
mag-11							
giu-11 1529_36 1532_719383 1480_720641 1402_52 1407_293922 1421_615689 1ug-11 1576_16 1567_471877 1499_809513 1450_28 1441_682784 411_5811689 age-11 1586_02 1582_41075 1551_570648 1465_79 1464_06571 1455_892846 1451_158_892846 1581_158_892846 1591_1697 1591_627763 1593_07555 1512_89 1646_06571 1455_892846 1611_1655_16 1642_453553 1573_678028 1631_85 1606_580366 1531_37144 1460_0671 1460_071 1591_67 1591_627763 1553_907535 1512_89 1606_5806_68 1531_37144 1460_071_1691_1691_1691_1691_1691_1691_1691_16							
1971 1576.16 1567.471877 1499.00513 1450.28 1441.682784 1415.891138 ago-11 1586.02 1582.310375 1517.050811 1461.04 1457.168557 1445.554228 sel-11 1589.69 1588.214075 1531.578648 1465.79 1484.065711 1458.892846 1457.168597 1455.892846 1457.168597 1455.892846 1611.11 1592.27 1591.62776 1593.7169763 1543.97593 1483.92 1479.949142 1468.036569 160-11 1655.16 1642.453553 1553.307535 1512.89 1506.80368 1531.371463 166-11 1655.16 1642.453553 1573.678028 1631.65 1606.580366 1531.371463 169-12 1770.9 1689.210711 1599.122722 1671.71 1658.6804073 1619.606293 169-12 1737.8 1728.082142 1626.857938 1692.94 1686.088815 1665.535259 1661.2035 1724.27 1716.633763 1723.37101 1699.12717 1709.57695 1729.27629 1657.23 1667.23 1667.2027 1698.39108 1739.67 1709.57695 1729.522579 1657.23 1667.2027 1698.39108 1999.12 1750.95 1754.951412 1733.008063 1647.02 1651.120054 1663.420216 1699.122 1818.26 1805.598282 1750.058451 1716.81 1703.672011 1664.258043 1661.2031 1759.09 1749.99466 1789.749447 1712.65 1746.94208 1750.818322 1760.0714 1769.97 1774.994506 1789.49447 1712.85 1719.684133 1719.68413 1789.69431 1786.161809 1745.65 1746.94208 1750.818322 1769.058060 1669.43 1669.43331 1716.13664 1769.1373.16 1789.91 1792.503352 1776.663316 1693.94 1699.26967 1697.103669 1897.103669 1897.103669 1899.325793 1680.011734 1691.33664 1772.256134 1766.65 1693.376964 1693.422579 1667.67 1769.273347 1650.365669 1774.24474 1712.85 1719.68463331 1719.6863331 1716.66 1789.43447 1712.85 1719.68463331 1719.6863331 1719.686331 1789.43447 1712.85 1719.68646 1699.67 1699.02667 1699.02667 1699.02667 1699.02667 1699.02667 1699.02667 1699.02667 1699.02667 1699.02667 1699.02667 1699.02667 1699.02667 1699.02667 1699.02667 1699.02667 1699.02667							
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	dic-15	1450,68	1452,955888	1521,302295	1308,85	1315,672716	1336,140866

$Y*t = (1-\lambda)Yt + \lambda Y*t-1$

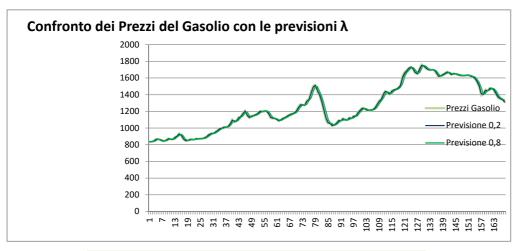
λ= 0,2 λ= 0,8 Con λ =0,2, quindi molto vicino ad 0, l'obiettivo è quello di evidenziare le tendenze nel <u>lungo periodo</u>. In questo modo la serie viene smussata, eliminando le variazioni cicliche ed irregolari, e dunque viene più semplice evidenziare **l'andamento medio** del fenomeno osservato. Con λ =0,8, quindi molto vicino ad 1, l'obiettivo è quello effettuare una previsione nel <u>breve periodo</u>. Ciò infatti comporta una maggiore previsione relativa agli ultimi dati osservati.



Fonte: NS Elaboraz. Dati del Ministero dello Sviluppo Economico (www.mise.gov.it)

Il <u>livellamento esponenziale</u> è un metodo statistico usato per smussare una serie temporale di dati con lo scopo di fornire informazioni sulla **tendenza di fondo dei dati osservati**, ossia sui movimenti di lungo termine della serie. Lo scopo di tale espediente è quello di eliminare le fluttuazione casuali e mantenere la struttura consolidata della serie. Tutto ciò attribuisce un maggiore peso alle osservazioni più recenti, ed uno minore a quelle più lontane nel tempo. Questa tecnica può essere rappresentata da una serie **Yt** che, ad ogni intervallo di tempo **t**, può essere scomposta in una componente di segnale imputabile al trend- ciclo **Y*t** ed alla **componente erratica** ɛt .

 $Yt = Y^*t + \varepsilon t$



Previsione livellamento esponenziale

Previsioni sull'andamento futuro del prezzo della benzina

Saggio medio Variazione= 0,23%

Variazione	Ipotizzata	λ = 0,2	λ=0,8
dic-15	1450,68	1452,9559	1521,302
gen-16	1453,982	1456,2629	1524,765
feb-16	1457,291	1459,5775	1528,235
mar-16	1460,608	1462,8996	1531,714
apr-16	1463,933	1466,2292	1535,2
mag-16	1467,265	1469,5665	1538,694
giu-16	1470,604	1472,9113	1542,196
lug-16	1473,951	1476,2637	1545,707
ago-16	1477,306	1479,6238	1549,225
set-16	1480,669	1482,9915	1552,751
ott-16	1484,039	1486,3669	1556,285
nov-16	1487,416	1489,75	1559,827
dic-16	1490,802	1493,1408	1563,377

Previsioni sull'andamento futuro del prezzo del gasolio

Saggio medio Variazione= 0,27%

Variazione	Ipotizzata	λ = 0,2	λ=0,8
dic-15	1308,85	1315,6727	1336,141
gen-16	1312,367	1319,2078	1339,731
feb-16	1315,893	1322,7523	1343,331
mar-16	1319,429	1326,3064	1346,94
apr-16	1322,974	1329,8701	1350,559
mag-16	1326,528	1333,4433	1354,188
giu-16	1330,093	1337,0261	1357,826
lug-16	1333,666	1340,6185	1361,475
ago-16	1337,25	1344,2206	1365,133
set-16	1340,843	1347,8324	1368,801
ott-16	1344,446	1351,4538	1372,479
nov-16	1348,058	1355,085	1376,166
dic-16	1351,68	1358,726	1379,864