LAMPIRAN-LAMPIRAN

Lampiran 1. Data Garis Kemiskinan di Kota Denpasar Tahun 2003 Sampai 2024

t	Tahun	Garis Gemiskinan (Rp)
1	2003	194.917
2	2004	189.378
3	2005	205.368
4	2006	215.936
5	2007	220.728
6	2008	241.165
7	2009	279.911
8	2010	309.672
9	2011	342.444
10	2012	373.366
11	2013	407.191
12	2014	426.513
13	2015	463.271
14	2016	483.821
15	2017	512.947
16	2018	545.357
17	2019	571.246
18	2020	618.064
19	2021	662.499
20	2022	712.815
21	2023	758.203
22	2024	820.512

Lampiran 2. Uji Stasioneritas Data

Augmented Dickey-Fuller Unit Root Test on DATA

Null Hypothesis: DATA has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		5.553703	1.0000
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

Lampiran 3. Hasil *Differencing* Pertama dan Kedua

Tahun	Y (Garis Kemiskinan)	Y' $(d = 1)$	Y'' $(d = 2)$
2003	194.917	-	-
2004	189.378	-5.539	-
2005	205.368	15.990	21.529
2006	215.936	10.568	-5.422
2007	220.728	4.792	-5.776
2008	241.165	20.437	15.645
2009	279.911	38.746	18.309
2010	309.672	29.761	-8.985
2011	342.444	32.772	3.011
2012	373.366	30.922	-1.850
2013	407.191	33.825	2.903
2014	426.513	19.322	-14.503
2015	463.271	36.758	17.436
2016	483.821	20.550	-16.208
2017	512.947	29.126	8.576
2018	545.357	32.410	3.284
2019	571.246	25.889	-6.521
2020	618.064	46.818	20.929
2021	662.499	44.435	-2.383
2022	712.815	50.316	5.881
2023	758.203	45.388	-4.928
2024	820.512	62.309	16.921

Lampiran 4. Perhitungan Manual Nilai S'_t

- $S'_{2003} = 194.917$
- $S'_{2004} = (0,1)(189.378) + (1 - 0,1)(194.917) = 194.363,1$
- $S'_{2005} = (0,1)(205.368) + (1 - 0,1)(194.363,1) = 195.463,59$
- $S'_{2006} = (0,1)(215.936) + (1 - 0,1)(195.463,59) = 197.510,84$
- $S'_{2007} = (0,1)(220.728) + (1 - 0,1)(197.510,84) = 199.832,56$
- $S'_{2008} = (0,1)(241.165) + (1 - 0,1)(199.832,56) = 203.965,81$
- $S'_{2009} = (0,1)(279.911) + (1 - 0,1)(203.965,81) = 211.560,33$
- $S'_{2010} = (0,1)(309.672) + (1 - 0,1)(211.560,33) = 221.371,50$
- $S'_{2011} = (0,1)(342.444) + (1 - 0,1)(221.371,50) = 233.478,75$
- $S'_{2012} = (0,1)(373.366) + (1 - 0,1)(233.478,75) = 247.467,48$
- $S'_{2013} = (0,1)(407.191) + (1 - 0,1)(247.467,48) = 263.439,84$
- $S'_{2014} = (0,1)(426.513) + (1 - 0,1)(263.439,84) = 279.747,16$
- $S'_{2015} = (0,1)(463.271) + (1 - 0,1)(279.747,16) = 298.099,55$
- $S'_{2016} = (0,1)(483.821) + (1 - 0,1)(298.099,55) = 316.671,7$
- $S'_{2017} = (0,1)(512.947) + (1 - 0,1)(316.671,7) = 336.299,23$
- $S'_{2018} = (0,1)(545.357) + (1 - 0,1)(336.299,23) = 357.205,01$
- $S'_{2019} = (0,1)(571.246) + (1 - 0,1)(357.205,11) = 378.609,11$
- $S'_{2020} = (0,1)(618.064) + (1 - 0,1)(378.609,11) = 402.554,6$
- $S'_{2021} = (0,1)(662.499) + (1 - 0,1)(402.554,6) = 428.549,04$
- $S'_{2022} = (0,1)(712.815) + (1 - 0,1)(428.549,04) = 456.975,64$
- $S'_{2023} = (0,1)(758.203) + (1 - 0,1)(456.975,64) = 487.098,38$
- $S'_{2024} = (0,1)(820.512) + (1 - 0,1)(487.098,38) = 520.439,75$

Lampiran 5. Perhitungan Manual Nilai S_t''

- $S''_{2003} = 194.917$
- $S''_{2004} = (0{,}1)(194.363{,}1) + (1 - 0{,}1)(194.917) = 194.861{,}61$
- $S''_{2005} = (0{,}1)(195.463{,}59) + (1 - 0{,}1)(194.861{,}61) = 194.921{,}81$
- $S''_{2006} = (0{,}1)(197.510{,}84) + (1 - 0{,}1)(194.921{,}81) = 195.180{,}72$
- $S''_{2007} = (0{,}1)(199.832{,}56) + (1 - 0{,}1)(195.180{,}72) = 195.645{,}91$
- $S''_{2008} = (0{,}1)(203.965{,}81) + (1 - 0{,}1)(195.645{,}91) = 196.477{,}9$
- $S''_{2009} = (0{,}1)(211.560{,}33) + (1 - 0{,}1)(196.477{,}9) = 197.986{,}15$
- $S''_{2010} = (0{,}1)(221.371{,}50) + (1 - 0{,}1)(197.986{,}15) = 200.324{,}69$
- $S''_{2011} = (0{,}1)(233.478{,}75) + (1 - 0{,}1)(200.324{,}69) = 203.640{,}1$
- $S''_{2012} = (0{,}1)(247.467{,}48) + (1 - 0{,}1)(203.640{,}1) = 208.022{,}84$
- $S''_{2013} = (0{,}1)(263.439{,}84) + (1 - 0{,}1)(208.022{,}84) = 213.564{,}54$
- $S''_{2014} = (0{,}1)(279.747{,}16) + (1 - 0{,}1)(213.564{,}54) = 220.182{,}81$
- $S''_{2015} = (0{,}1)(298.099{,}55) + (1 - 0{,}1)(220.182{,}81) = 227.974{,}49$
- $S''_{2016} = (0{,}1)(316.671{,}7) + (1 - 0{,}1)(227.974{,}49) = 236.844{,}22$
- $S''_{2017} = (0{,}1)(336.299{,}23) + (1 - 0{,}1)(236.844{,}22) = 246.789{,}73$
- $S''_{2018} = (0{,}1)(357.205{,}01) + (1 - 0{,}1)(246.789{,}73) = 257.831{,}26$
- $S''_{2019} = (0{,}1)(378.609{,}11) + (1 - 0{,}1)(257.831{,}26) = 269.909{,}05$
- $S''_{2020} = (0{,}1)(402.554{,}6) + (1 - 0{,}1)(269.909{,}05) = 283.173{,}61$
- $S''_{2021} = (0{,}1)(428.549{,}04) + (1 - 0{,}1)(283.173{,}61) = 297.711{,}16$
- $S''_{2022} = (0{,}1)(456.975{,}64) + (1 - 0{,}1)(297.711{,}16) = 313.637{,}61$
- $S''_{2023} = (0{,}1)(487.098{,}38) + (1 - 0{,}1)(313.637{,}61) = 330.983{,}69$
- $S''_{2024} = (0{,}1)(520.439{,}75) + (1 - 0{,}1)(330.983{,}69) = 349.929{,}3$

Lampiran 6. Perhitungan Manual Nilai a_t

- $a_{2003} = 2(194.917) - (194.917) = 194.917$
- $a_{2004} = 2(194.363{,}1) - (194.861{,}61) = 193.864{,}59$
- $a_{2005} = 2(195.463{,}59) - (194.921{,}81) = 196.005{,}37$
- $a_{2006} = 2(197.510{,}84) - (195.180{,}72) = 199.840{,}96$
- $a_{2007} = 2(199.832{,}56) - (195.645{,}91) = 204.019{,}21$
- $a_{2008} = 2(203.965{,}81) - (196.477{,}9) = 211.453{,}72$
- $a_{2009} = 2(211.560{,}33) - (197.986{,}15) = 225.134{,}51$
- $a_{2010} = 2(221.371{,}50) - (200.324{,}69) = 242{,}418{,}31$
- $a_{2011} = 2(233.478{,}75) - (203.640{,}1) = 263.317{,}4$
- $a_{2012} = 2(247.467{,}48) - (208.022{,}84) = 286.912{,}12$
- $a_{2013} = 2(263.439{,}84) - (213.564{,}54) = 313.315{,}14$
- $a_{2014} = 2(279.747{,}16) - (220.182{,}81) = 339.311{,}51$
- $a_{2015} = 2(298.099{,}55) - (227.974{,}49) = 368.224{,}61$
- $a_{2016} = 2(316.671{,}7) - (236.844{,}22) = 396.499{,}18$
- $a_{2017} = 2(336.299{,}23) - (246.789{,}73) = 425.808{,}73$
- $a_{2018} = 2(357.205{,}01) - (257.831{,}26) = 456.578{,}76$
- $a_{2019} = 2(378.609{,}11) - (269.909{,}05) = 487.309{,}17$
- $a_{2020} = 2(402.554{,}6) - (283.173{,}61) = 521.935{,}59$
- $a_{2021} = 2(428.549{,}04) - (297.711{,}16) = 559.386{,}92$
- $a_{2022} = 2(456.975{,}64) - (313.637{,}61) = 600.313{,}67$
- $a_{2023} = 2(487.098{,}38) - (330.983{,}69) = 643.213{,}07$

Lampiran 7. Perhitungan Manual Nilai b_t

- $b_{2003} = \frac{0,1}{1-0,1}(194.917 - 194.917) = 0$
- $b_{2004} = \frac{0,1}{1-0,1}(194.363,1 - 194.861,61) = -55,39$
- $b_{2005} = \frac{0,1}{1-0,1}(195.463,59 - 194.921,81) = 60,2$
- $b_{2006} = \frac{0,1}{1-0,1}(197.510,84 - 195.180,72) = 258,91$
- $b_{2007} = \frac{0,1}{1-0,1}(199.832,56 - 195.645,91) = 465,19$
- $b_{2008} = \frac{0,1}{1-0,1}(203.965,81 - 196.477,9) = 831,99$
- $b_{2009} = \frac{0,1}{1-0,1}(211.560,33 - 197.986,15) = 1.508,25$
- $b_{2010} = \frac{0,1}{1-0,1}(221.371,50 - 200.324,69) = 2.338,54$
- $b_{2011} = \frac{0,1}{1-0,1}(233.478,75 - 203.640,1) = 3.315,41$
- $b_{2012} = \frac{0,1}{1-0,1}(247.467,48 - 208.022,84) = 4.382,74$
- $b_{2013} = \frac{0,1}{1-0,1}(263.439,84 - 220.182,81) = 5.541,7$
- $b_{2014} = \frac{0,1}{1-0,1}(279.747,16 - 220.182,81) = 6.618,27$
- $b_{2015} = \frac{0,1}{1-0,1}(298.099,55 - 227.974,49) = 7.791,68$
- $b_{2016} = \frac{0,1}{1-0,1}(316.671,7 - 236.844,22) = 8.869,72$
- $b_{2017} = \frac{0,1}{1-0,1}(336.299,23 - 246.789,73) = 9.945,5$
- $b_{2018} = \frac{0,1}{1-0,1}(357.205,01 - 257.831,26) = 11.041,53$
- $b_{2019} = \frac{0,1}{1-0,1}(378.609,11 - 269.909,05) = 12.077,79$
- $b_{2020} = \frac{0,1}{1-0,1}(402.554,6 - 283.173,61) = 13.264,56$
- $b_{2021} = \frac{0,1}{1-0,1}(428.549,04 - 297.711,16) = 14.537,55$
- $b_{2022} = \frac{0,1}{1-0,1}(456.975,64 - 313.637,61) = 15.926,45$
- $b_{2023} = \frac{0,1}{1-0,1}(487.098,38 - 330.983,69) = 17.346,08$

Lampiran 8. Perhitungan Manual Nilai F_{t+m}

- $F_{2003+1} = 194.917 + 0(1)$

  $F_{2004} = 194.917$
- $F_{2004+1} = 193.864{,}59 + -55{,}39(1)$

  $F_{2005} = 193.809{,}2$
- $F_{2005+1} = 196.005{,}37 + 60{,}2(1)$

  $F_{2006} = 196.065{,}57$
- $F_{2006+1} = 199.840{,}96 + 258{,}91(1)$

  $F_{2007} = 200.099{,}87$
- $F_{2007+1} = 204.019{,}21 + 465{,}19(1)$

  $F_{2008} = 204.484{,}4$
- $F_{2008+1} = 211.453{,}72 + 831{,}99(1)$

  $F_{2009} = 212.285{,}71$
- $F_{2009+1} = 225.134{,}51 + 1.508{,}25(1)$

  $F_{2010} = 226.642{,}76$
- $F_{2010+1} = 242{,}418{,}31 + 2.338{,}54(1)$

  $F_{2011} = 244.756{,}85$
- $F_{2011+1} = 263.317{,}4 + 3.315{,}41(1)$

  $F_{2012} = 266.632{,}81$
- $F_{2012+1} = 286.912{,}12 + 4.382{,}74(1)$

  $F_{2013} = 291.294{,}86$
- $F_{2013+1} = 313.315{,}14 + 5.541{,}7(1)$

  $F_{2014} = 318.856{,}84$
- $F_{2014+1} = 339.311{,}51 + 6.618{,}27(1)$

  $F_{2015} = 345.929{,}78$
- $F_{2015+1} = 368.224{,}61 + 7.791{,}68(1)$

  $F_{2016} = 376.016{,}29$
- $F_{2016+1} = 396.499{,}18 + 8.869{,}72(1)$

  $F_{2017} = 405.368{,}9$
- $F_{2017+1} = 425.808{,}73 + 9.945{,}5(1)$

  $F_{2018} = 435.754{,}23$

- $F_{2018+1} = 456.578{,}76 + 11.041{,}53(1)$

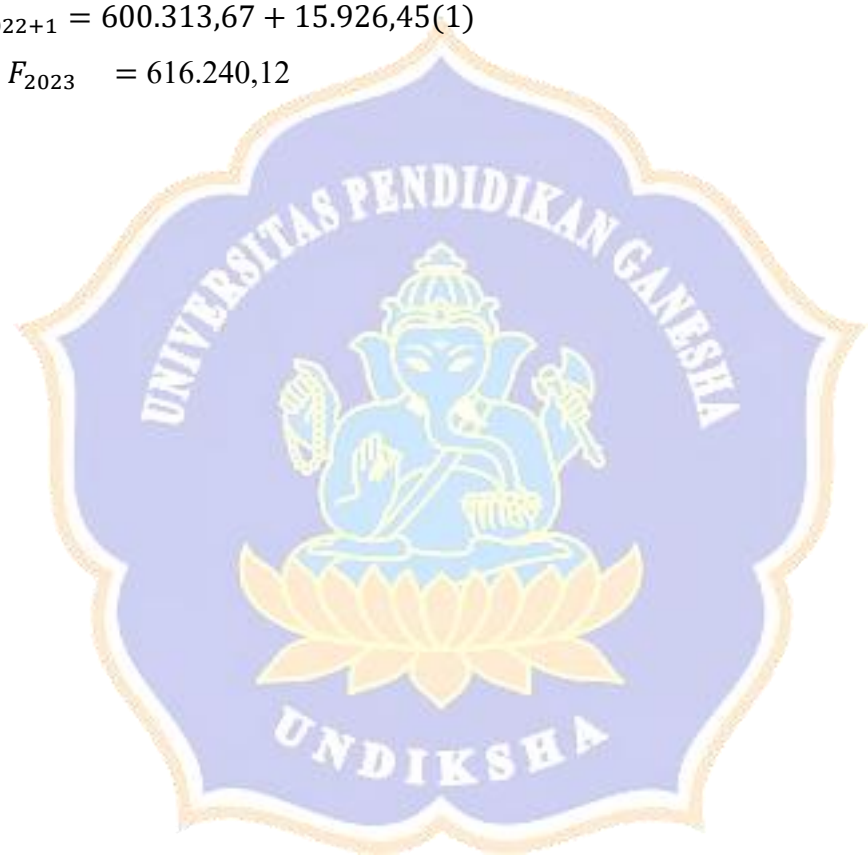
  $F_{2019} = 467.620{,}29$
- $F_{2019+1} = 487.309{,}17 + 12.077{,}79(1)$

  $F_{2020} = 499.386{,}96$
- $F_{2020+1} = 521.935{,}59 + 13.264{,}56(1)$

  $F_{2021} = 535.200{,}15$
- $F_{2021+1} = 559.386{,}92 + 14.537{,}55(1)$

  $F_{2022} = 573.924{,}47$
- $F_{2022+1} = 600.313{,}67 + 15.926{,}45(1)$

  $F_{2023} = 616.240{,}12$



Lampiran 9. Perhitungan Manual Nilai MAE

- $MAE = \frac{1}{n}\sum_{t=1}^{n}|X_t - F_t| = \frac{2.100.555,79}{22} = 95.479,81$
- $MAE = \frac{1}{n}\sum_{t=1}^{n}|X_t - F_t| = \frac{1.034.608,12}{22} = 47.027,65$
- $MAE = \frac{1}{n}\sum_{t=1}^{n}|X_t - F_t| = \frac{652.427,92}{22} = 29.655,82$
- $MAE = \frac{1}{n}\sum_{t=1}^{n}|X_t - F_t| = \frac{504.808,03}{22} = 22.945,82$
- $MAE = \frac{1}{n}\sum_{t=1}^{n}|X_t - F_t| = \frac{439.014,69}{22} = 19.955,22$
- $MAE = \frac{1}{n}\sum_{t=1}^{n}|X_t - F_t| = \frac{397.506,12}{22} = 18.068,46$
- $MAE = \frac{1}{n}\sum_{t=1}^{n}|X_t - F_t| = \frac{375.712,34}{22} = 17.077,84$
- $MAE = \frac{1}{n}\sum_{t=1}^{n}|X_t - F_t| = \frac{369.905,18}{22} = 16.813,88$
- $MAE = \frac{1}{n}\sum_{t=1}^{n}|X_t - F_t| = \frac{879.803,7}{22} = 17.263,81$

Lampiran 10. Perhitungan Manual Nilai PE_t

- $PE_{2004} = \left(\frac{189.378 - 194.917}{189.378}\right) 100\%$

  $PE_{2004} = -2{,}93$
- $PE_{2005} = \left(\frac{205.368 - 193.809{,}2}{205.368}\right) 100\%$

  $PE_{2005} = 5{,}63$
- $PE_{2006} = \left(\frac{215.936 - 196.065{,}57}{215.936}\right) 100\%$

  $PE_{2006} = 9{,}21$
- $PE_{2007} = \left(\frac{220.728 - 200.099{,}87}{220.728}\right) 100\%$

  $PE_{2007} = 9{,}35$
- $PE_{2008} = \left(\frac{241.165 - 204.484{,}4}{241.165}\right) 100\%$

  $PE_{2008} = 15{,}21$
- $PE_{2009} = \left(\frac{279.911 - 212.285{,}71}{279.911}\right) 100\%$

  $PE_{2009} = 24{,}16$
- $PE_{2010} = \left(\frac{309.672 - 226.642{,}76}{309.672}\right) 100\%$

  $PE_{2010} = 26{,}82$
- $PE_{2011} = \left(\frac{342.444 - 244.756{,}85}{342.444}\right) 100\%$

  $PE_{2011} = 28{,}53$
- $PE_{2012} = \left(\frac{373.366 - 266.632{,}81}{373.366}\right) 100\%$

  $PE_{2012} = 28{,}59$
- $PE_{2013} = \left(\frac{407.191 - 291.294{,}86}{407.191}\right) 100\%$

  $PE_{2013} = 28{,}47$
- $PE_{2014} = \left(\frac{426.513 - 318.856{,}84}{426.513}\right) 100\%$

  $PE_{2014} = 25{,}25$
- $PE_{2015} = \left(\frac{463.271 - 345.929{,}78}{463.271}\right) 100\%$

  $PE_{2015} = 25{,}33$
- $PE_{2016} = \left(\frac{483.821 - 376.016{,}29}{483.821}\right) 100\%$

  $PE_{2016} = 22{,}29$

- $PE_{2017} = \left(\frac{512.947 - 405.368,9}{512.947}\right) 100\%$

  $PE_{2017} = 20,98$
- $PE_{2018} = \left(\frac{545.357 - 435.754,23}{545.357}\right) 100\%$

  $PE_{2018} = 20,1$
- $PE_{2019} = \left(\frac{571.246 - 467.620,29}{571.246}\right) 100\%$

  $PE_{2019} = 18,15$
- $PE_{2020} = \left(\frac{618.064 - 499.386,96}{618.064}\right) 100\%$

  $PE_{2020} = 19,21$
- $PE_{2021} = \left(\frac{662.499 - 535.200,15}{662.499}\right) 100\%$

  $PE_{2021} = 19,22$
- $PE_{2022} = \left(\frac{712.815 - 573.924,47}{712.815}\right) 100\%$

  $PE_{2022} = 19,49$
- $PE_{2023} = \left(\frac{758.203 - 616.240,12}{758.203}\right) 100\%$

  $PE_{2023} = 18,73$

Lampiran 11. Perhitungan Manual Nilai MAPE

- $MAPE = \frac{1}{n}\sum_{t=1}^{n}|PE_t| = \frac{407{,}15\%}{22} = 19{,}39\%$
- $MAPE = \frac{1}{n}\sum_{t=1}^{n}|PE_t| = \frac{203{,}15\%}{22} = 9{,}68\%$
- $MAPE = \frac{1}{n}\sum_{t=1}^{n}|PE_t| = \frac{120{,}65\%}{22} = 5{,}75\%$
- $MAPE = \frac{1}{n}\sum_{t=1}^{n}|PE_t| = \frac{85\%}{22} = 4{,}05\%$
- $MAPE = \frac{1}{n}\sum_{t=1}^{n}|PE_t| = \frac{67{,}6\%}{22} = 3{,}22\%$
- $MAPE = \frac{1}{n}\sum_{t=1}^{n}|PE_t| = \frac{56{,}79\%}{22} = 2{,}71\%$
- $MAPE = \frac{1}{n}\sum_{t=1}^{n}|PE_t| = \frac{51{,}41\%}{22} = 2{,}45\%$
- $MAPE = \frac{1}{n}\sum_{t=1}^{n}|PE_t| = \frac{49{,}2\%}{22} = 2{,}35\%$
- $MAPE = \frac{1}{n}\sum_{t=1}^{n}|PE_t| = \frac{51{,}95\%}{22} = 2{,}48\%$

RIWAYAT HIDUP

Ni Putu Leni Aprita Swari adalah nama penulis skripsi ini. Penulis lahir dari pasangan Bapak I Nyoman Winarta dan Ibu I Nyoman Swadiani, serta merupakan anak pertama dari 3 bersaudara. Penulis dilahirkan di Peteluan pada 09 April 2002. Penulis beralamat di Banjar Peteluan, Desa Temesi, Kecamatan Gianyar, Kabupaten Gianyar, Provinsi Bali. Penulis dapat dihubungi melalui email leni.aprita@undiksha.ac.id. Pada tahun 2011 penulis memulai pendidikan formal di SD Negeri 1 Temesi (2011-2014), SMP Negeri 3 Gianyar (2014-2017), SMA Negeri 1 Banjarangkan (2017-2020). Setelah selesai menempuh pendidikan menengah atas, penulis melanjutkan Pendidikan Strata (S1) Program Studi Matematika Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Pendidikan Ganesha mulai dari tahun 2021 sampai saat ini. Dengan ketekunan, motivasi tinggi untuk terus belajar, berusaha dan berdo'a untuk menyelesaikan pendidikan Strata 1 (S1). Pada semester akhir tahun 2025, penulis menyelesaikan Tugas Akhir yang berjudul "Perbandingan Metode *Autoregressive Integrated Moving Average* dan *Double Exponential Smoothing Brown* dalam Peramalan Garis Kemiskinan di Kota Denpasar". Semoga dengan penulisan tugas akhir skripsi ini mampu memberikan kontribusi positif bagi dunia pendidikan dan pemerintah Kota Denpasar serta bermanfaat dan berguna bagi sesama.