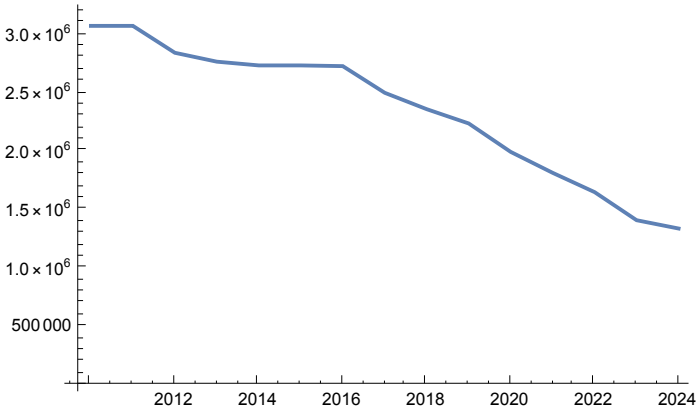
In[1]:=
```
a = {{2010, 3 070 000}, {2011, 3 070 000}, {2012, 2 840 000}, {2013, 2 764 000},
   {2014, 2 732 000}, {2015, 2 732 000}, {2016, 2 726 000}, {2017, 2 498 000},
   {2018, 2 358 000}, {2019, 2 236 000}, {2020, 1 993 000}, {2021, 1 814 000},
   {2022, 1 649 000}, {2023, 1 409 000}, {2024, 1 338 000}};
```

In[ ]:=
```
(* year 2011 has no circulation data,
previous year circulation employed for 2011 *)
```

In[2]:=
```
ListPlot[a, Joined → True]
```

Out[2]=

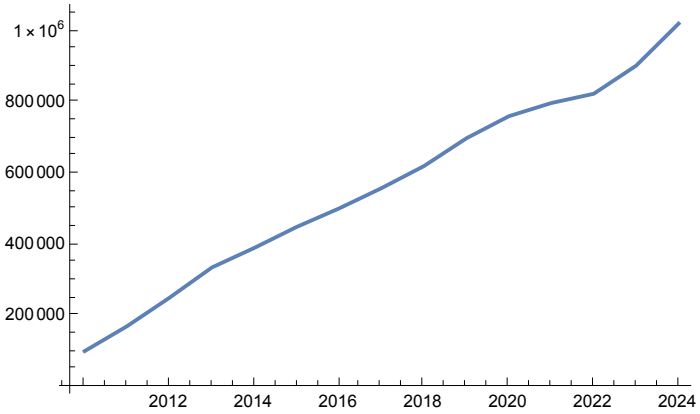


In[3]:=
```
b = {{2010, 100 000}, {2011, 170 000}, {2012, 250 000},
  {2013, 335 000}, {2014, 390 000}, {2015, 449 000}, {2016, 501 000},
  {2017, 558 000}, {2018, 620 000}, {2019, 698 000}, {2020, 760 000},
  {2021, 797 000}, {2022, 823 000}, {2023, 902 000}, {2024, 1 020 000}}
```

Out[3]=
```
{{2010, 100 000}, {2011, 170 000}, {2012, 250 000},
 {2013, 335 000}, {2014, 390 000}, {2015, 449 000}, {2016, 501 000},
 {2017, 558 000}, {2018, 620 000}, {2019, 698 000}, {2020, 760 000},
 {2021, 797 000}, {2022, 823 000}, {2023, 902 000}, {2024, 1 020 000}}
```

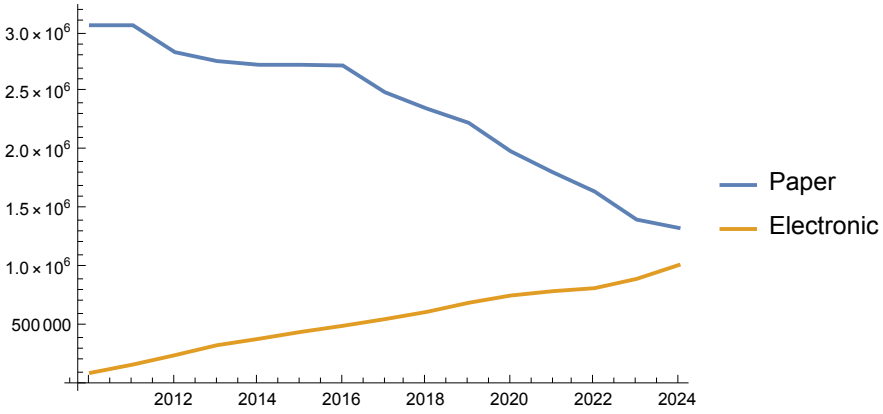
In[4]:=
```
ListPlot[b, Joined → True]
```

Out[4]=



In[5]:=
```
ListPlot[{a, b}, Joined → True,
 PlotLegends → LineLegend[{"Paper", "Electronic"}]]
```

Out[5]=



In[6]:=
```
pc = 5500
```

Out[6]=
```
5500
```

In[7]:=
```
ec = 4277
```

Out[7]=
```
4277
```

In[8]:=
```
a2 = Transpose[a]
```

Out[8]=
```
{{2010, 2011, 2012, 2013, 2014, 2015,
  2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024},
 {3 070 000, 3 070 000, 2 840 000, 2 764 000, 2 732 000, 2 732 000, 2 726 000,
  2 498 000, 2 358 000, 2 236 000, 1 993 000, 1 814 000, 1 649 000, 1 409 000, 1 338 000}}
```

In[9]:=
```
a3 = {a2[[1]], 12 * pc * a2[[2]]}
```

Out[9]=
```
{{2010, 2011, 2012, 2013, 2014, 2015,
  2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024},
 {202 620 000 000, 202 620 000 000, 187 440 000 000, 182 424 000 000, 180 312 000 000,
  180 312 000 000, 179 916 000 000, 164 868 000 000, 155 628 000 000, 147 576 000 000,
  131 538 000 000, 119 724 000 000, 108 834 000 000, 92 994 000 000, 88 308 000 000}}
```

In[10]:=
```
a4 = Transpose[a3]
```

Out[10]=
```
{{2010, 202 620 000 000}, {2011, 202 620 000 000}, {2012, 187 440 000 000},
 {2013, 182 424 000 000}, {2014, 180 312 000 000}, {2015, 180 312 000 000},
 {2016, 179 916 000 000}, {2017, 164 868 000 000}, {2018, 155 628 000 000},
 {2019, 147 576 000 000}, {2020, 131 538 000 000}, {2021, 119 724 000 000},
 {2022, 108 834 000 000}, {2023, 92 994 000 000}, {2024, 88 308 000 000}}
```

In[11]:=
```
b2 = Transpose[b]
```

Out[11]=
```
{{2010, 2011, 2012, 2013, 2014, 2015,
  2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024},
 {100 000, 170 000, 250 000, 335 000, 390 000, 449 000, 501 000, 558 000,
  620 000, 698 000, 760 000, 797 000, 823 000, 902 000, 1 020 000}}
```

In[12]:=
```
b3 = {b2[[1]], 12 * ec * b2[[2]]}
```

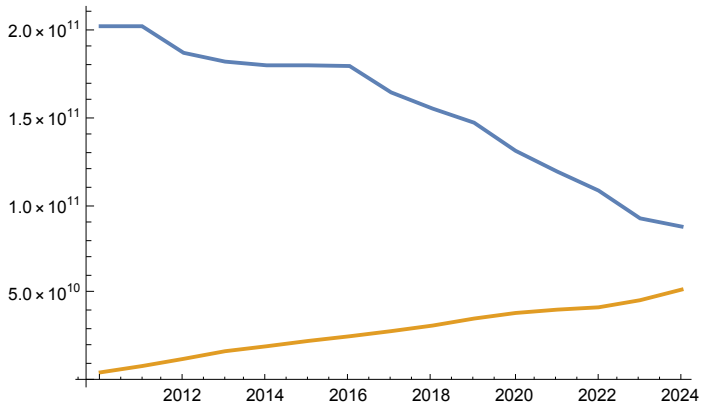
Out[12]=
```
{{2010, 2011, 2012, 2013, 2014, 2015,
  2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024},
 {5 132 400 000, 8 725 080 000, 12 831 000 000, 17 193 540 000, 20 016 360 000,
  23 044 476 000, 25 713 324 000, 28 638 792 000, 31 820 880 000, 35 824 152 000,
  39 006 240 000, 40 905 228 000, 42 239 652 000, 46 294 248 000, 52 350 480 000}}
```

In[13]:=
```
b4 = Transpose[b3]
```

Out[13]=
```
{{2010, 5 132 400 000}, {2011, 8 725 080 000}, {2012, 12 831 000 000},
 {2013, 17 193 540 000}, {2014, 20 016 360 000}, {2015, 23 044 476 000},
 {2016, 25 713 324 000}, {2017, 28 638 792 000}, {2018, 31 820 880 000},
 {2019, 35 824 152 000}, {2020, 39 006 240 000}, {2021, 40 905 228 000},
 {2022, 42 239 652 000}, {2023, 46 294 248 000}, {2024, 52 350 480 000}}
```

In[14]:=
```
ListPlot[{a4, b4}, Joined → True]
```

Out[14]=



In[15]:=
```
c = {a2[[1]], a3[[2]] + b3[[2]]}
```

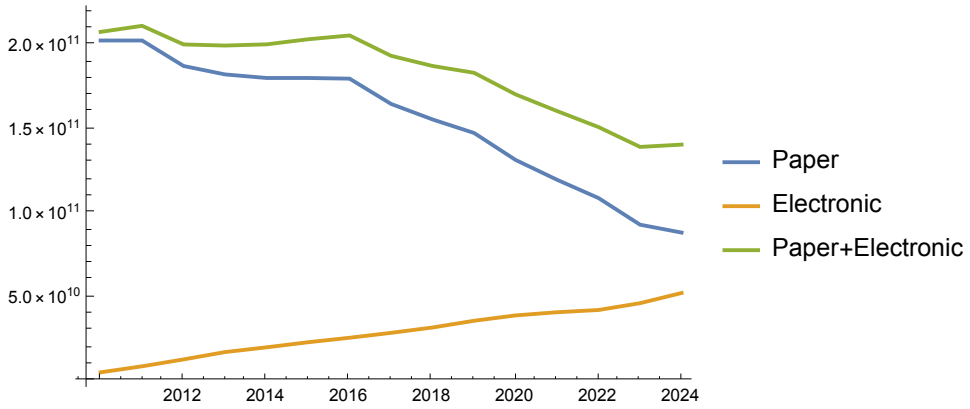
Out[15]=
```
{{2010, 2011, 2012, 2013, 2014, 2015,
  2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024},
 {207 752 400 000, 211 345 080 000, 200 271 000 000, 199 617 540 000, 200 328 360 000,
  203 356 476 000, 205 629 324 000, 193 506 792 000, 187 448 880 000, 183 400 152 000,
  170 544 240 000, 160 629 228 000, 151 073 652 000, 139 288 248 000, 140 658 480 000}}
```

In[16]:=
```
c4 = Transpose[c]
```

Out[16]=
```
{{2010, 207 752 400 000}, {2011, 211 345 080 000}, {2012, 200 271 000 000},
 {2013, 199 617 540 000}, {2014, 200 328 360 000}, {2015, 203 356 476 000},
 {2016, 205 629 324 000}, {2017, 193 506 792 000}, {2018, 187 448 880 000},
 {2019, 183 400 152 000}, {2020, 170 544 240 000}, {2021, 160 629 228 000},
 {2022, 151 073 652 000}, {2023, 139 288 248 000}, {2024, 140 658 480 000}}
```

In[17]:=
```
ListPlot[{a4, b4, c4}, Joined → True,
 PlotLegends → LineLegend[{"Paper", "Electronic", "Paper+Electronic"}]]
```

Out[17]=



In[18]:=
```
MatrixForm[a]
```

Out[18]//MatrixForm=

2010	3 070 000
2011	3 070 000
2012	2 840 000
2013	2 764 000
2014	2 732 000
2015	2 732 000
2016	2 726 000
2017	2 498 000
2018	2 358 000
2019	2 236 000
2020	1 993 000
2021	1 814 000
2022	1 649 000
2023	1 409 000
2024	1 338 000

In[19]:=
```
MatrixForm[b]
```

Out[19]//MatrixForm=

2010	100 000
2011	170 000
2012	250 000
2013	335 000
2014	390 000
2015	449 000
2016	501 000
2017	558 000
2018	620 000
2019	698 000
2020	760 000
2021	797 000
2022	823 000
2023	902 000
2024	1 020 000

In[20]:=
```
? Export
```

Out[20]=

Symbol

Export["*dest.ext*", *expr*] exports data to a file,
converting it to the format corresponding to the file extension *ext*.
Export[*dest*, *expr*, "*fmt*"] exports data in the specified format "*fmt*".
Export[*dest*, *exprs*, *elements*] exports data by treating *exprs* as *elements*.
Export[*dest*, *exprs*, *elements*, *options*] uses the specified options.

In[21]:=
```
Export["~/nikkei-pc.csv", a, "CSV"]
```

Out[21]=
```
~/nikkei-pc.csv
```

In[22]:=
```
Export["~/nikkei-ec.csv", b, "CSV"]
```

Out[22]=
```
~/nikkei-ec.csv
```

In[23]:=
```
Export["~/nikkei-ps.csv", a4, "CSV"]
```

Out[23]=
```
~/nikkei-ps.csv
```

In[24]:=
```
Export["~/nikkei-es.csv", b4, "CSV"]
```

Out[24]=
```
~/nikkei-es.csv
```

In[25]:=
```
Export["~/nikkei-pes.csv", c4, "CSV"]
```

Out[25]=
```
~/nikkei-pes.csv
```

In[26]:=
```
? LeastSquares
```

Out[26]=

Symbol

LeastSquares[*m*, *b*] finds an *x* that solves
the linear least−squares problem for the matrix equation *m*.*x* == *b*.

In[27]:=
```
a[[1]]
```

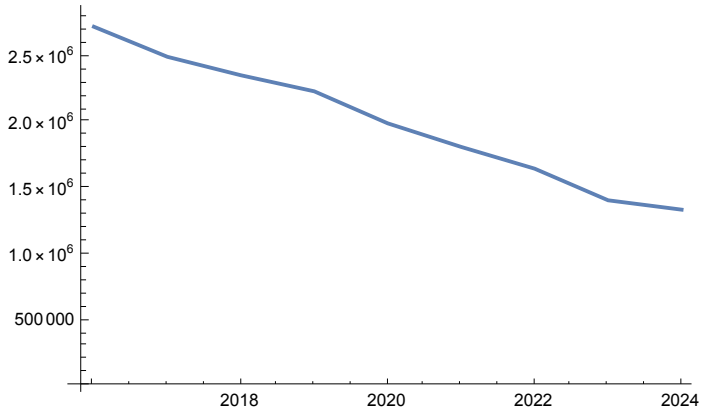
Out[27]=
```
{2010, 3 070 000}
```

In[28]:=
```
as = Table[a[[i]], {i, 7, Length[a]}]
```

Out[28]=
```
{{2016, 2 726 000}, {2017, 2 498 000}, {2018, 2 358 000},
 {2019, 2 236 000}, {2020, 1 993 000}, {2021, 1 814 000},
 {2022, 1 649 000}, {2023, 1 409 000}, {2024, 1 338 000}}
```

In[29]:=
```
g1 = ListPlot[as, Joined → True]
```

Out[29]=



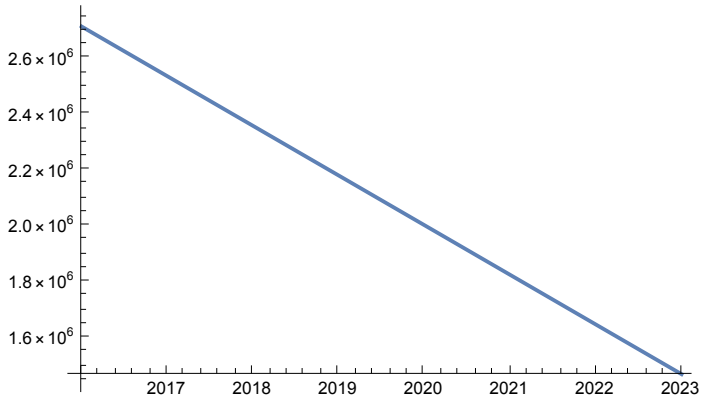
In[30]:=
```
f[t_] = Fit[as, {1, t}, t]
```

Out[30]=

$$3.60855 \times 10^8 - 177650.\, t$$

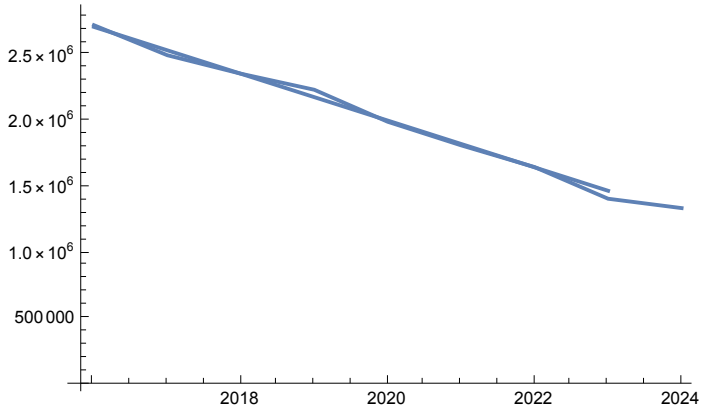
In[31]:=
```
g2 = Plot[f[t], {t, 2016, 2023}]
```

Out[31]=



In[32]:=
```
Show[g1, g2,
 PlotLegends → LineLegend[{"Paper data", "approximation with line"}]]
```

Out[32]=



In[33]:=
```
Solve[f[t] == 1000000, t]
```

Out[33]=

$$\{\{t \to 2025.64\}\}$$

In[34]:=
```
Solve[f[t] == 800 000, t]
```
Out[34]=
```
{{t → 2026.77}}
```

In[35]:=
```
Solve[f[t] == 500 000, t]
```
Out[35]=
```
{{t → 2028.46}}
```

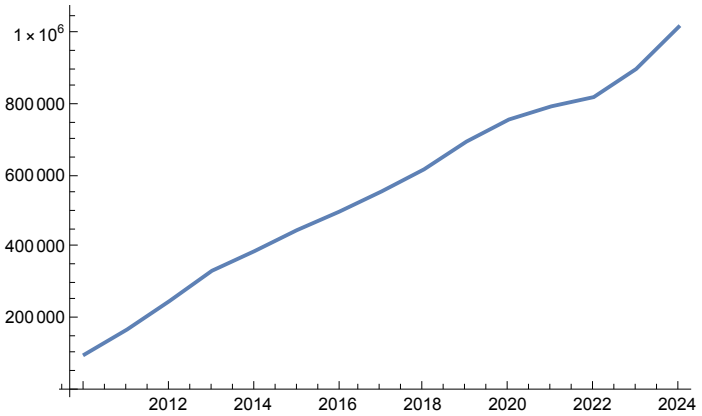
In[36]:=
```
Solve[f[t] == 0, t]
```
Out[36]=
```
{{t → 2031.27}}
```

In[37]:=
```
b
```
Out[37]=
```
{{2010, 100 000}, {2011, 170 000}, {2012, 250 000},
 {2013, 335 000}, {2014, 390 000}, {2015, 449 000}, {2016, 501 000},
 {2017, 558 000}, {2018, 620 000}, {2019, 698 000}, {2020, 760 000},
 {2021, 797 000}, {2022, 823 000}, {2023, 902 000}, {2024, 1 020 000}}
```

In[38]:=
```
g[t_] = Fit[b, {1, t}, t]
```
Out[38]=
$$-1.23862 \times 10^8 + 61\,685.7\ t$$

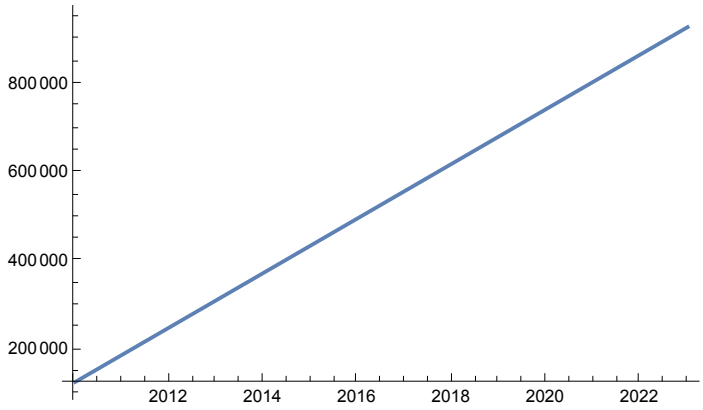
In[39]:=
```
-1.2186968791208708`*^8 + 60696.70329670291` t
```
Out[39]=
$$-1.2187 \times 10^8 + 60\,696.7\ t$$

In[40]:=
```
g3 = ListPlot[b, Joined → True]
```
Out[40]=



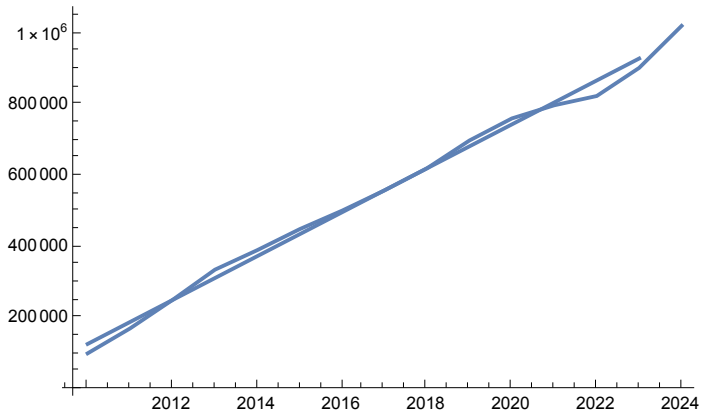
In[41]:=
```
g4 = Plot[g[t], {t, 2010, 2023}]
```

Out[41]=



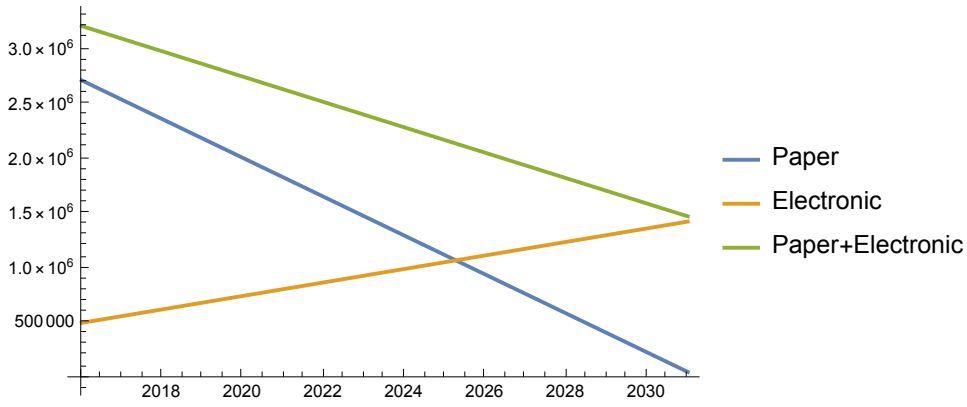
In[42]:=
```
Show[g3, g4]
```

Out[42]=



In[43]:=
```
Plot[{f[t], g[t], f[t] + g[t]}, {t, 2016, 2031},
 PlotLegends → LineLegend[{"Paper", "Electronic", "Paper+Electronic"}]]
```

Out[43]=



In[44]:=
```
Solve[f[t] + g[t] == 0, t]
```

Out[44]=

```
{{t → 2043.68}}
```

In[45]:=
```
at = Transpose[a]
```

Out[45]=
```
{{2010, 2011, 2012, 2013, 2014, 2015,
  2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024},
 {3 070 000, 3 070 000, 2 840 000, 2 764 000, 2 732 000, 2 732 000, 2 726 000,
  2 498 000, 2 358 000, 2 236 000, 1 993 000, 1 814 000, 1 649 000, 1 409 000, 1 338 000}}
```

In[46]:=
```
da = Table[at[[2, i + 1]] - at[[2, i]], {i, 2, Length[at[[2]]] - 1}]
```

Out[46]=
```
{-230 000, -76 000, -32 000, 0, -6000, -228 000, -140 000,
 -122 000, -243 000, -179 000, -165 000, -240 000, -71 000}
```

In[47]:=
```
tt = Table[at[[1, i]], {i, 3, Length[at[[1]]]}]
```

Out[47]=
```
{2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024}
```

In[48]:=
```
ListPlot[da, Joined → True]
```

Out[48]=