

# GRÁFICOS MARCO CONCEPTUAL GGPLOT

## Ggplot graphs

```
library(readxl)
library(ggplot2)
library(dplyr)
library(tidyr)
mipaleta <- c("#B90073", "#C888E0", "#FF009E", "#59D9FF", "#0027FF", "#E1B6EA", "#A3BFE8", "#C8D9F3")
#plot(1:8, pch = 20, cex = 4, col=mipaleta)
```

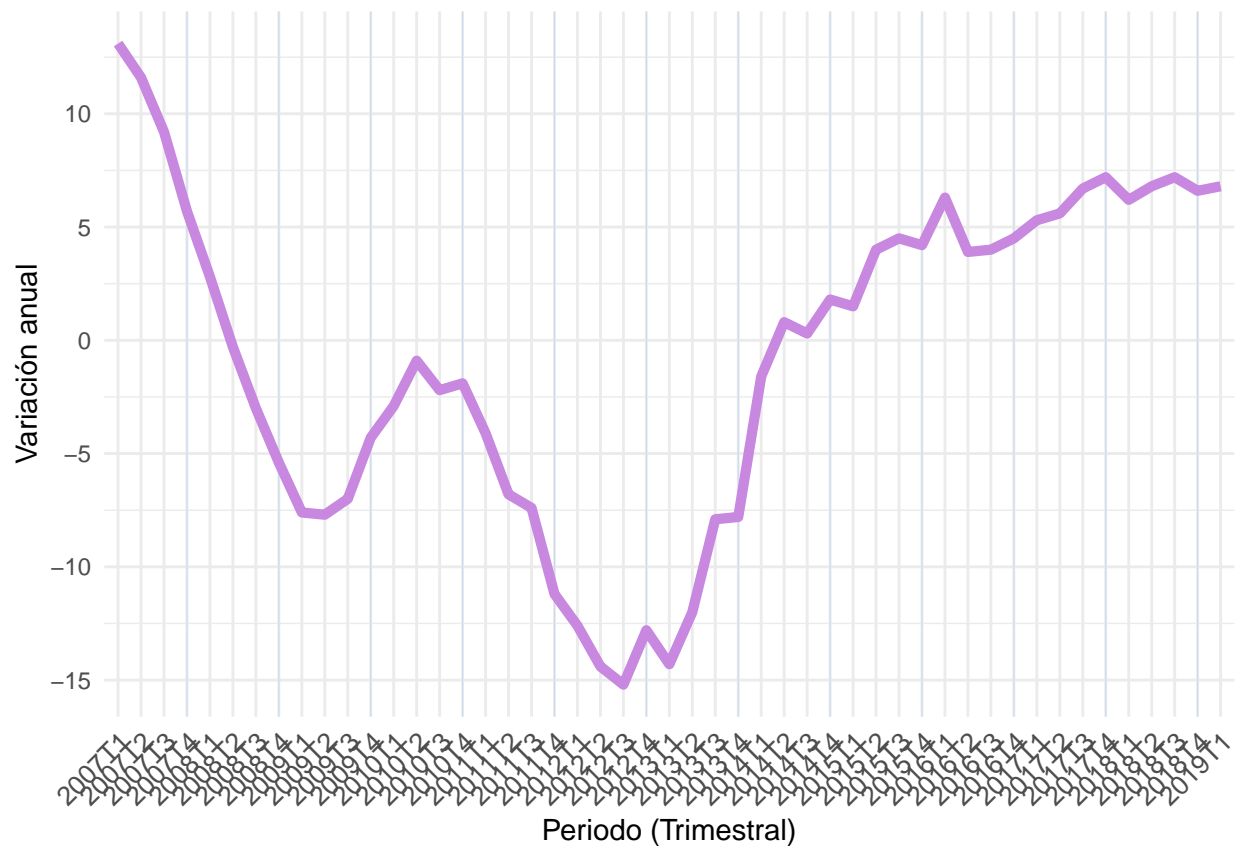
## IPV

```
ipvm <- as.data.frame(read_excel("ipv1.xls"))
ipvm
```

FALSE	Periodo (Trimestral)	IPV
FALSE 1	2019T1	6.8
FALSE 2	2018T4	6.6
FALSE 3	2018T3	7.2
FALSE 4	2018T2	6.8
FALSE 5	2018T1	6.2
FALSE 6	2017T4	7.2
FALSE 7	2017T3	6.7
FALSE 8	2017T2	5.6
FALSE 9	2017T1	5.3
FALSE 10	2016T4	4.5
FALSE 11	2016T3	4.0
FALSE 12	2016T2	3.9
FALSE 13	2016T1	6.3
FALSE 14	2015T4	4.2
FALSE 15	2015T3	4.5
FALSE 16	2015T2	4.0
FALSE 17	2015T1	1.5
FALSE 18	2014T4	1.8
FALSE 19	2014T3	0.3
FALSE 20	2014T2	0.8
FALSE 21	2014T1	-1.6
FALSE 22	2013T4	-7.8
FALSE 23	2013T3	-7.9
FALSE 24	2013T2	-12.0
FALSE 25	2013T1	-14.3
FALSE 26	2012T4	-12.8
FALSE 27	2012T3	-15.2
FALSE 28	2012T2	-14.4
FALSE 29	2012T1	-12.6
FALSE 30	2011T4	-11.2
FALSE 31	2011T3	-7.4
FALSE 32	2011T2	-6.8
FALSE 33	2011T1	-4.1

FALSE 34	2010T4	-1.9
FALSE 35	2010T3	-2.2
FALSE 36	2010T2	-0.9
FALSE 37	2010T1	-2.9
FALSE 38	2009T4	-4.3
FALSE 39	2009T3	-7.0
FALSE 40	2009T2	-7.7
FALSE 41	2009T1	-7.6
FALSE 42	2008T4	-5.4
FALSE 43	2008T3	-3.0
FALSE 44	2008T2	-0.3
FALSE 45	2008T1	2.8
FALSE 46	2007T4	5.7
FALSE 47	2007T3	9.2
FALSE 48	2007T2	11.6
FALSE 49	2007T1	13.1

```
ipvm %>% ggplot(aes(x = `Periodo (Trimestral)`, y = IPV)) +
  geom_vline(xintercept = seq(4,60, by = 4), size = 0.01, col = mipaleta[8]) +
  geom_line(group = "", col = mipaleta[2], size = 1.8) + scale_x_discrete() +
  theme_minimal()+
  labs(y = "Variación anual")+
  labs(x = "Periodo (Trimestral)") +
  theme(axis.text.x = element_text(angle = 45, hjust = 1, size = 10))
```



## IPV SEGÚN TIPO DE VIVIENDA

```
ipv2 <- as.data.frame(read_excel("ipv2.xls"))
ipv2
```

FALSE	Periodo	Vivienda nueva	Vivienda de segunda mano
FALSE 1	2019T1	10.4	6.2
FALSE 2	2018T4	8.0	6.4
FALSE 3	2018T3	6.1	7.3
FALSE 4	2018T2	5.7	7.0
FALSE 5	2018T1	5.7	6.3
FALSE 6	2017T4	7.4	7.2
FALSE 7	2017T3	6.5	6.7
FALSE 8	2017T2	4.4	5.8
FALSE 9	2017T1	5.5	5.3
FALSE 10	2016T4	4.3	4.5
FALSE 11	2016T3	7.3	3.5
FALSE 12	2016T2	8.4	3.2
FALSE 13	2016T1	6.1	6.4
FALSE 14	2015T4	5.8	4.0
FALSE 15	2015T3	4.3	4.5
FALSE 16	2015T2	4.9	3.8
FALSE 17	2015T1	4.0	1.1
FALSE 18	2014T4	1.9	1.7
FALSE 19	2014T3	0.8	0.1
FALSE 20	2014T2	1.9	0.2
FALSE 21	2014T1	-1.1	-1.7
FALSE 22	2013T4	-8.0	-7.7
FALSE 23	2013T3	-7.9	-8.0
FALSE 24	2013T2	-12.7	-12.1
FALSE 25	2013T1	-12.8	-15.3
FALSE 26	2012T4	-10.9	-14.0
FALSE 27	2012T3	-13.6	-16.4
FALSE 28	2012T2	-12.8	-15.7
FALSE 29	2012T1	-11.8	-13.3
FALSE 30	2011T4	-8.5	-13.7
FALSE 31	2011T3	-5.0	-9.6
FALSE 32	2011T2	-5.2	-8.3
FALSE 33	2011T1	-1.9	-6.3
FALSE 34	2010T4	-2.1	-1.6
FALSE 35	2010T3	-2.6	-1.8
FALSE 36	2010T2	-1.7	0.0
FALSE 37	2010T1	-4.2	-1.4
FALSE 38	2009T4	-5.1	-3.5
FALSE 39	2009T3	-5.6	-8.3
FALSE 40	2009T2	-3.9	-11.2
FALSE 41	2009T1	-2.0	-12.5
FALSE 42	2008T4	0.8	-10.7
FALSE 43	2008T3	3.7	-8.6
FALSE 44	2008T2	5.3	-4.9
FALSE 45	2008T1	7.2	-0.7
FALSE 46	2007T4	9.8	2.4
FALSE 47	2007T3	11.4	7.5
FALSE 48	2007T2	13.3	10.3

FALSE 49 2007T1

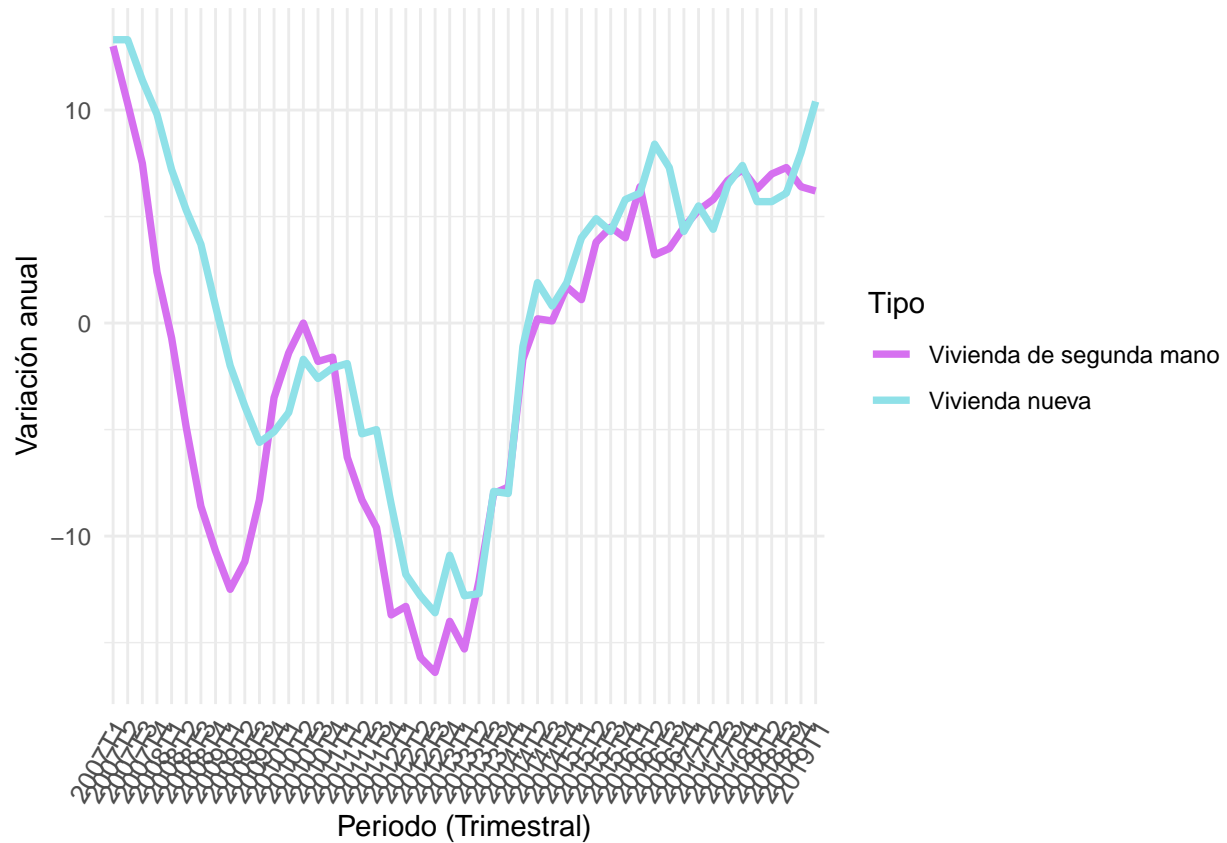
13.3

13.0

```

ipv2 %>%
  gather(key = "Tipo", value = "IPV", -Periodo) %>%
  ggplot(aes(x = Periodo, y = IPV, group = Tipo)) +
  geom_line(aes(color = Tipo), size = 1.3) +
  scale_color_manual(values = c("#D670F0", "#8FE1E8")) +
  theme_minimal()+
  theme(axis.text.x = element_text(angle = 60, hjust = 1, size = 10)) +
  labs(y = "Variación anual")+
  labs(x = "Periodo (Trimestral)")

```



## MEDIA ANUAL IPV

```

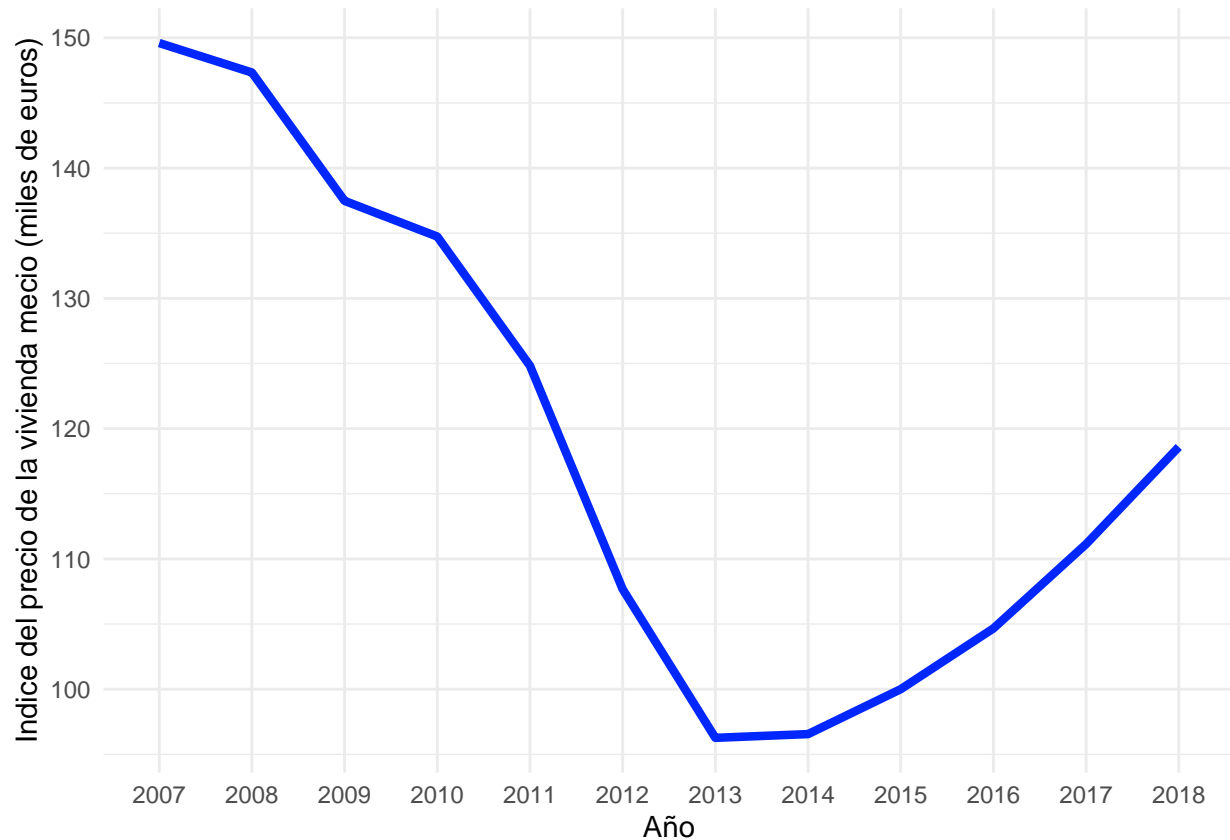
ipvm <- as.data.frame(read_excel("media_ipv.xlsx"))
ipvm

```

##	Año	Media_IPV
## 1	2007	149.599
## 2	2008	147.336
## 3	2009	137.483
## 4	2010	134.745
## 5	2011	124.829
## 6	2012	107.678
## 7	2013	96.266
## 8	2014	96.553

```
## 9 2015 100.000
## 10 2016 104.664
## 11 2017 111.137
## 12 2018 118.595
```

```
ipvm %>% ggplot(aes(x = Año, y = Media_IPV)) +
  geom_line(group = "", col = mipaleta[5], size = 1.5) + scale_x_discrete() +
  theme_minimal() +
  labs(y = "Índice del precio de la vivienda medio (miles de euros)")
```



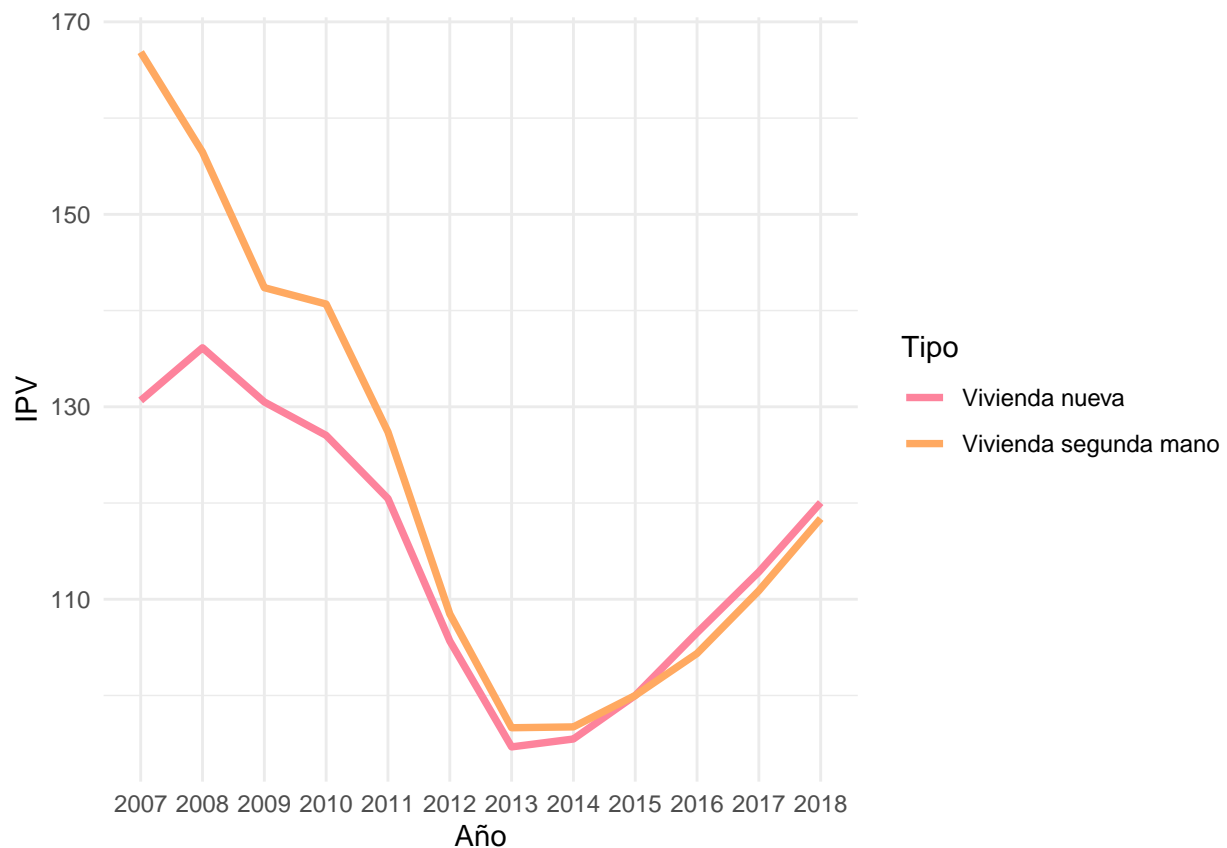
## VARIACION ANUAL IPV SEGUN TIPO DE VIVIENDA

```
ipv2 <- as.data.frame(read_excel("var_ipv2.xlsx"))
ipv2
```

##	Año	Vivienda nueva	Vivienda segunda mano
## 1	2007	130.657	166.859
## 2	2008	136.132	156.457
## 3	2009	130.501	142.379
## 4	2010	127.030	140.677
## 5	2011	120.465	127.383
## 6	2012	105.662	108.477
## 7	2013	94.657	96.648
## 8	2014	95.477	96.737
## 9	2015	100.000	100.000
## 10	2016	106.523	104.367

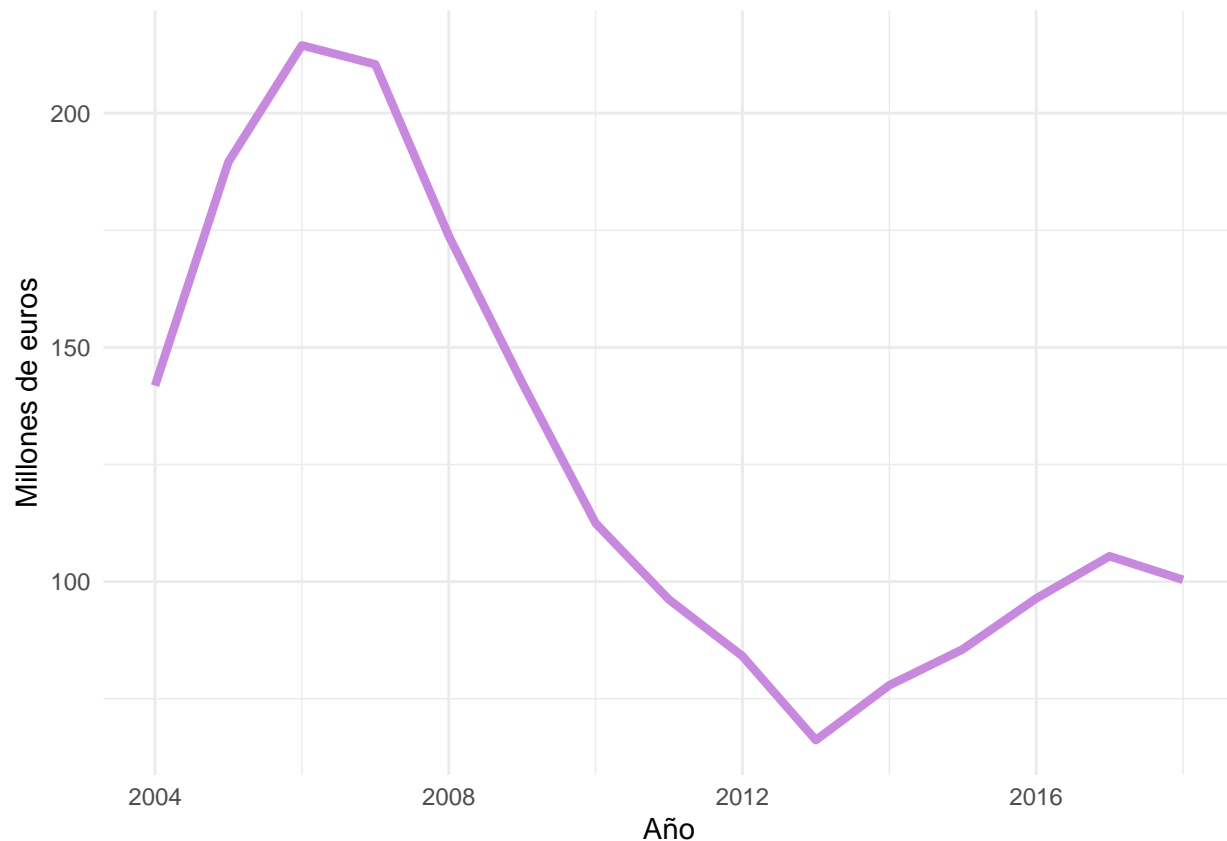
```
## 11 2017      112.843      110.891
## 12 2018      120.043      118.385
```

```
ipv2 %>%
  gather(key = "Tipo", value = "IPV", -Año) %>%
  ggplot(aes(x = Año, y = IPV, group = Tipo)) +
  geom_line(aes(color = Tipo), size = 1.3) +
  scale_color_manual(values = c("#FD839C", "#FFA961")) +
  theme_minimal()
```



## IMPORTE MEDIO DE LAS TASACIONES EN ESPAÑA

```
imp2 <- as.data.frame(read_excel("importe_tas2.xls"))
imp2 %>% ggplot(aes(x = Año, y = Valor_total_tasaciones)) +
  geom_line(group = "", col = mpaleta[2], size = 1.5) +
  theme_minimal() +
  labs(y = "Millones de euros") +
  labs(x = "Año")
```



```
mipaleta <- c("#59D9FF" , "#E1B6EA")
#plot(1:17, pch = 20, cex = 4, col=mipaleta)
```

## IMPORTE MEDIO DE TASACIÓN POR VIVIENDA Y COMUNIDADES AUTÓNOMAS

```
pmtv <- as.data.frame(read_excel("importe_tas_ccaa.xlsx"))
pmtv
```

FALSE	Año	Andalucía	Aragón	Principado de Asturias	Islas Baleares	Canarias
FALSE 1	2008	17484703	2081102.0	1472188.0	4517697	3755479
FALSE 2	2009	14647433	1856290.0	1155913.0	3775306	2907293
FALSE 3	2011	8627118	1006499.5	669777.0	2590446	1772803
FALSE 4	2012	7488214	788333.5	549513.0	1968262	1580469
FALSE 5	2013	5530600	611805.0	490169.0	1824034	1399161
FALSE 6	2014	9309814	735358.5	494733.0	1965669	1455189
FALSE 7	2015	7032035	858949.5	569619.0	2656995	1592176
FALSE 8	2016	9149134	944056.0	677735.5	3175382	2036682
FALSE 9	2017	10703756	1153823.5	925588.5	4049160	2284644
FALSE 10	2018	11398136	1215397.0	958790.0	4116694	2436464
FALSE		Cantabria	Castilla-La Mancha	Castilla y León	Cataluña	Extremadura
FALSE 1		1209777.5	3661946	3467144	20926214	1101326.5
FALSE 2		1020039.5	2716515	3176226	16748233	952768.0
FALSE 3		664498.0	1733068	1824711	9986884	563336.0
FALSE 4		446637.0	1356042	1461710	8283486	416962.5

FALSE 5	372355.0	1099373	1077658	7314716	333584.5
FALSE 6	413130.5	1050888	1120668	7502070	350381.5
FALSE 7	499220.5	1268124	1319744	9249481	438349.5
FALSE 8	559527.0	1665823	1687662	11136220	503857.0
FALSE 9	716727.5	1793412	1881293	15052879	546252.0
FALSE 10	704398.0	1911063	1930301	15466888	606690.0
FALSE	Galicia	La Rioja	Comunidad de Madrid	Región de Murcia	
FALSE 1	3079018	544882.0	17349840	3026019.0	
FALSE 2	2742953	631742.0	16039852	2596337.5	
FALSE 3	1670666	239325.5	9206891	1445572.5	
FALSE 4	1501753	207644.5	7228683	1156015.0	
FALSE 5	1132278	147409.0	5855516	1034334.5	
FALSE 6	1259843	165616.0	6848902	941272.5	
FALSE 7	1283894	186135.5	8654000	1176167.0	
FALSE 8	1782945	238732.0	9715723	1397493.0	
FALSE 9	1970097	251126.0	12407359	1870825.0	
FALSE 10	1863820	296509.0	14399848	1565874.0	
FALSE	Comunidad Foral	deNavarra	País Vasco	Valencia	
FALSE 1		1344101.5	4679945	12059288	
FALSE 2		1186122.0	4308238	10046632	
FALSE 3		716603.0	3156387	5706260	
FALSE 4		633124.5	2098182	4475539	
FALSE 5		412660.0	1567823	3715831	
FALSE 6		437890.5	1771672	3494173	
FALSE 7		450306.0	2015197	4189552	
FALSE 8		510355.5	2343733	4930874	
FALSE 9		597313.5	2657910	6487603	
FALSE 10		675000.0	3204610	6278507	

```
library(dplyr)
```

```
pmtv %>%
```

```
  gather(key = "CCAA", value = "Importe_medio_tasación", -Año) %>%
```

```
  mutate(Importe_medio_tasacion_miles = Importe_medio_tasación/1000) %>%
```

```
  ggplot(aes(x = Año, y = Importe_medio_tasacion_miles , group = CCAA)) +
```

```
  geom_line(aes(color = CCAA), size = 1.3) +
```

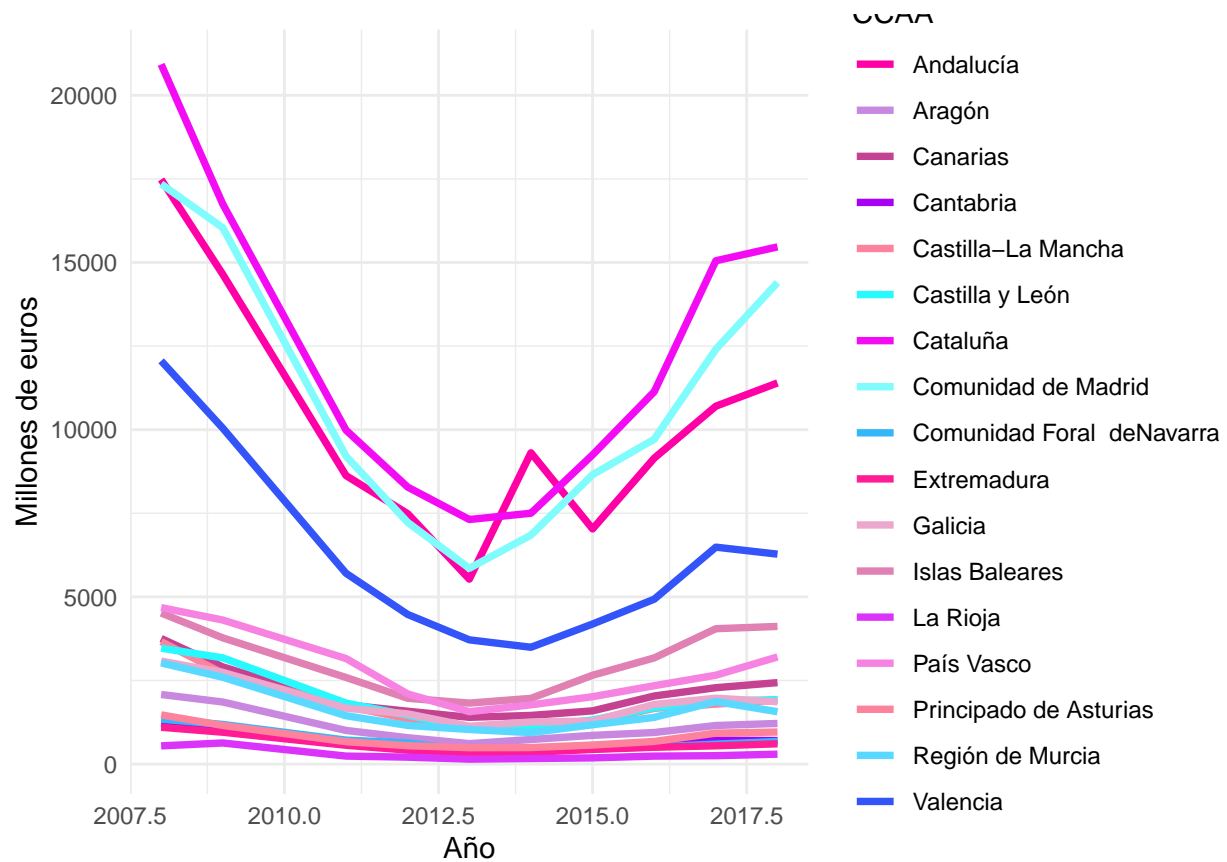
```
  scale_color_manual(values = c("#FF00A6", "#C888E0", "#C54293", "#A700F5", "#FD839C", "#27F9FF" , "#F30C"))
```

```
  theme_minimal() +
```

```
  labs(y = "Millones de euros")+
```

```
  theme_minimal()
```

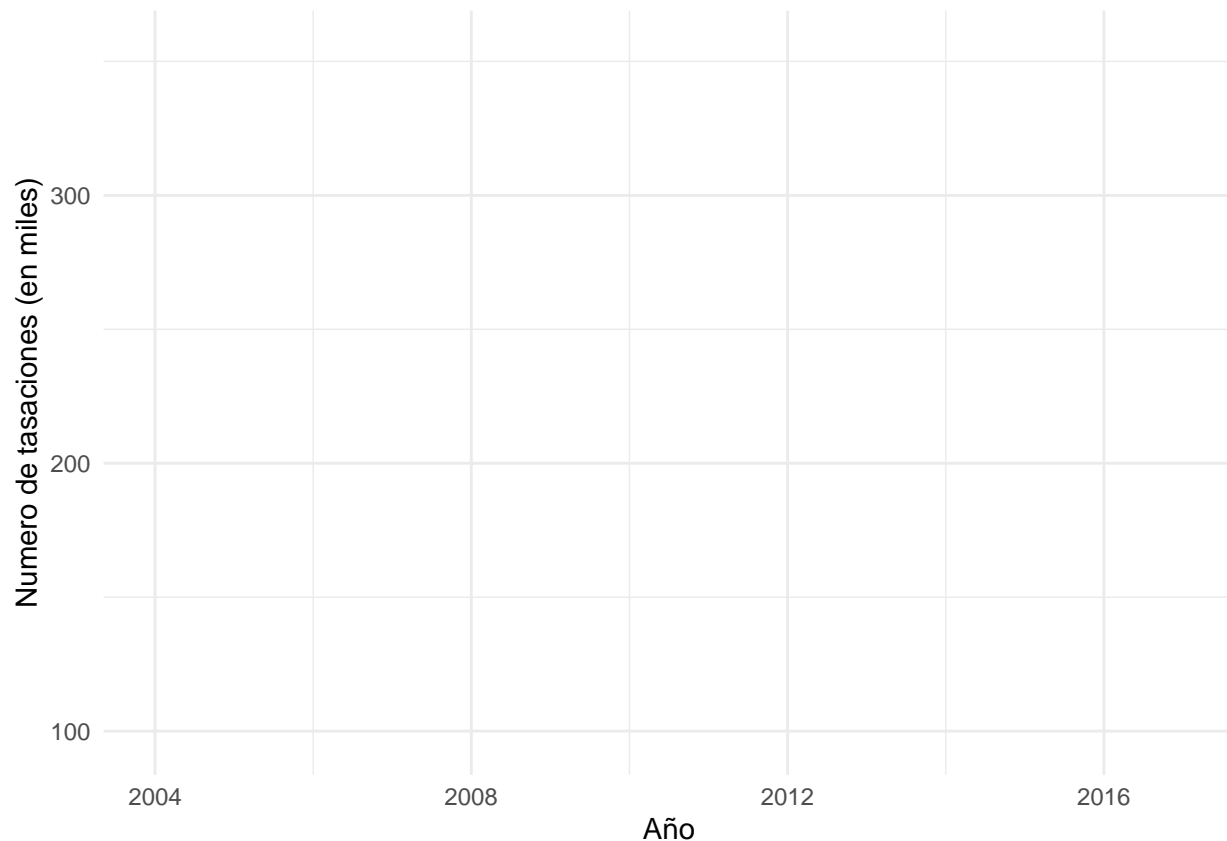




## NÚMERO DE TASACIONES REALIZADAS EN ESPAÑA SEGÚN EL PERIODO

```
nts <- as.data.frame(read_excel("num_tas_es.xlsx"))

nts %>% ggplot(aes(x = Año, y = num_tas/1000)) +
  geom_line(group = "", col = mipaleta[3], size = 1.5) +
  theme_minimal() +
  labs(y = "Numero de tasaciones (en miles)")
```



## NÚMERO DE TASACIONES DE VIVIENDAS POR CCAA

```
it <- as.data.frame(read_excel("num_tas_ccaa.xlsx"))
it
```

FALSE	Año	Andalucía	Aragón	Principado de Asturias	Islas Baleares	Canarias
FALSE 1	2008	74975.0	9009.0	7069.0	11297.0	17529.0
FALSE 2	2009	67055.0	8729.5	5986.0	10363.5	14594.0
FALSE 3	2011	45794.5	5933.5	3698.0	7489.5	10428.0
FALSE 4	2012	42111.0	5120.0	3152.0	6185.0	9654.0
FALSE 5	2013	34670.0	4437.5	2641.0	5782.0	9033.5
FALSE 6	2014	53886.5	5458.5	3144.0	6187.0	10318.5
FALSE 7	2015	46262.5	6566.5	3876.0	7836.5	11528.0
FALSE 8	2016	64644.0	7395.5	4627.0	9341.5	14492.5
FALSE 9	2017	71866.5	8818.0	6321.5	11550.5	15570.0
FALSE 10	2018	76324.0	9364.0	6541.0	10597.0	16076.0

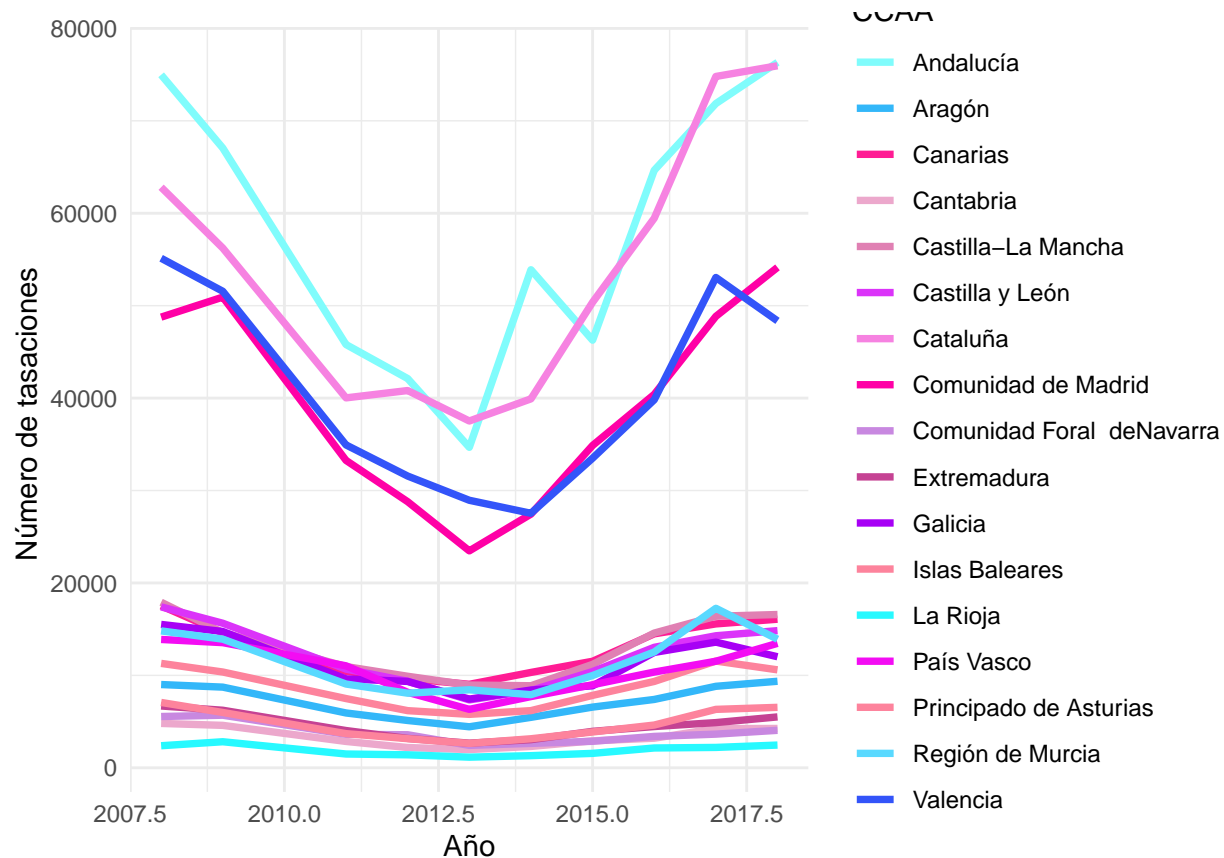
  

FALSE	Cantabria	Castilla-La Mancha	Castilla y León	Cataluña	Extremadura
FALSE 1	4800.5	17914.5	17408.5	62816.0	6688.5
FALSE 2	4592.0	14639.5	15642.0	56233.5	6225.5
FALSE 3	2852.0	10954.0	10674.5	40023.0	4031.5
FALSE 4	2193.5	9903.0	9360.0	40816.5	3176.5
FALSE 5	1974.0	8956.0	7346.5	37521.5	2667.0
FALSE 6	2310.5	8879.0	8357.0	39917.0	3044.0
FALSE 7	2918.0	11191.5	10412.5	50369.5	3945.0
FALSE 8	3202.0	14576.5	13035.5	59455.0	4465.0

FALSE 9	4240.0	16398.0	14284.0	74797.5	4891.0
FALSE 10	4257.0	16585.0	14840.0	75955.0	5505.0
FALSE	Galicia	La Rioja	Comunidad de Madrid	Región de Murcia	
FALSE 1	15512.0	2387.5	48759.5	14812.0	
FALSE 2	14746.0	2820.5	50922.5	13914.5	
FALSE 3	9616.0	1493.0	33258.5	9063.0	
FALSE 4	9346.5	1406.0	28789.0	8074.5	
FALSE 5	7435.5	1151.5	23471.5	8439.0	
FALSE 6	8413.5	1314.0	27447.5	7912.5	
FALSE 7	8871.0	1562.5	34875.5	9982.0	
FALSE 8	12481.5	2145.0	40399.5	12526.0	
FALSE 9	13598.0	2204.5	48843.0	17256.5	
FALSE 10	12013.0	2458.0	54143.0	13910.0	
FALSE	Comunidad Foral	deNavarra	País Vasco	Valencia	
FALSE 1		5549.5	13887.5	55130.0	
FALSE 2		5689.0	13540.0	51557.5	
FALSE 3		3628.5	11032.0	34929.5	
FALSE 4		3576.5	8169.0	31564.0	
FALSE 5		2428.0	6324.5	28943.0	
FALSE 6		2640.5	7703.0	27536.5	
FALSE 7		2868.0	8984.5	33498.0	
FALSE 8		3396.0	10358.5	39814.0	
FALSE 9		3642.5	11528.5	53050.5	
FALSE 10		4055.0	13465.0	48353.0	

it %>%

```
gather(key = "CCAA", value = "Numero_medio_tasación", -Año) %>%
mutate(Numero_medio_tasacion_miles = Numero_medio_tasación) %>%
ggplot(aes(x = Año, y = Numero_medio_tasacion_miles , group = CCAA)) +
geom_line(aes(color = CCAA), size = 1.3) +
scale_color_manual(values = c("#80FCFC", "#33B7F9", "#FF1C94", "#ECA8CC", "#E080B3", "#DB33F9", "#F68B8B"))
theme_minimal() +
labs(y = "Número de tasaciones ")
```



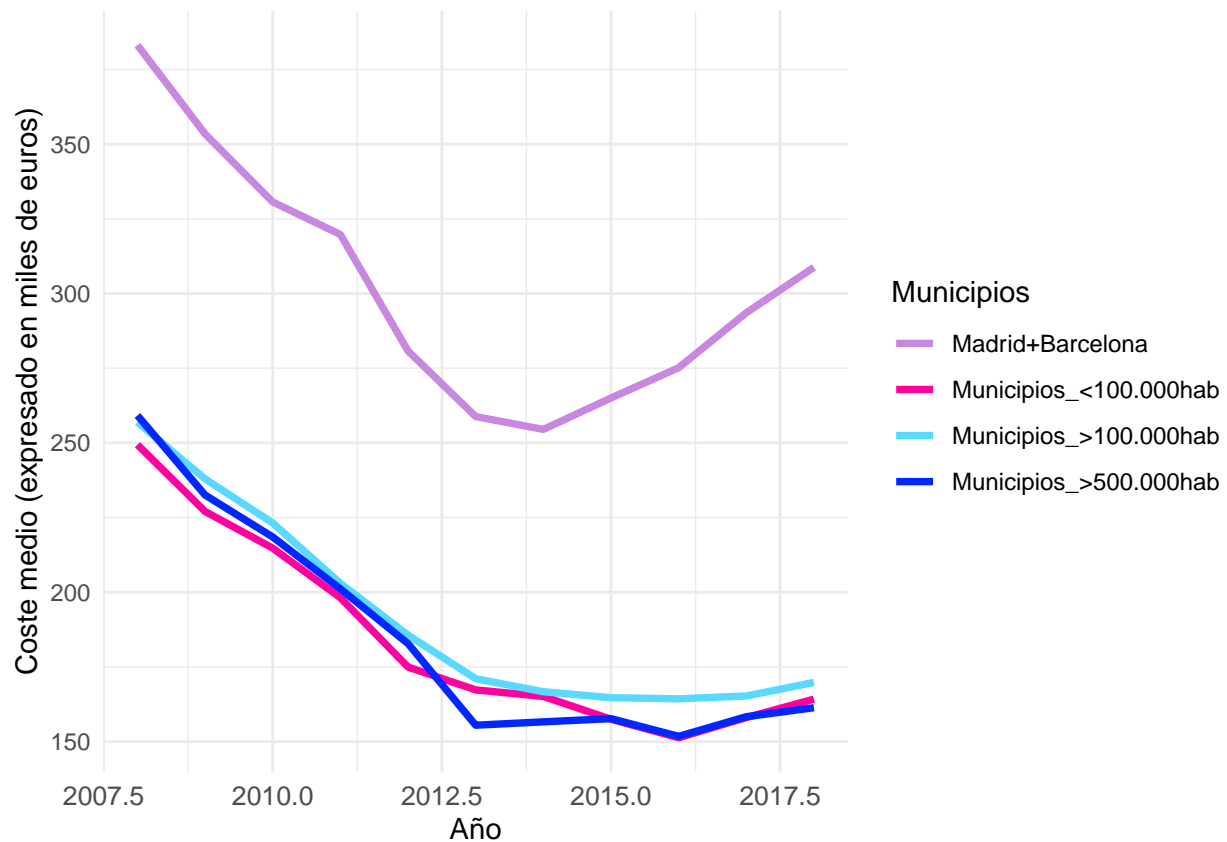
## COSTE MEDIO DE TASACIÓN POR MUNICIPIOS

```
pmtv2 <- as.data.frame(read_excel("Tasaciones_pormun.xlsx"))
pmtv2
```

FALSE	Año	Madrid+Barcelona	Municipios_>500.000hab	Municipios_>100.000hab
FALSE 1	2008	383.1297	259.1715	256.9467
FALSE 2	2009	353.4194	232.5371	237.9465
FALSE 3	2010	330.6398	218.4895	223.1595
FALSE 4	2011	319.7413	201.1243	203.0012
FALSE 5	2012	280.7550	182.7876	185.6519
FALSE 6	2013	258.7947	155.4795	171.0363
FALSE 7	2014	254.4965	156.6118	166.6984
FALSE 8	2015	265.0248	157.6882	164.6883
FALSE 9	2016	275.1522	151.7491	164.3168
FALSE 10	2017	293.5316	158.3299	165.2511
FALSE 11	2018	308.7715	161.3383	169.8137
FALSE	Municipios_<100.000hab			
FALSE 1		249.3932		
FALSE 2		227.0292		
FALSE 3		214.7512		
FALSE 4		198.1516		
FALSE 5		174.9459		
FALSE 6		167.2985		
FALSE 7		165.1246		

```
FALSE 8          157.4702
FALSE 9          151.2967
FALSE 10         158.0413
FALSE 11         164.2142
```

```
pmtv2 %>%
  gather(key = "Municipios", value = "Importe_medio_tasación", -Año) %>%
  ggplot(aes(x = Año, y = Importe_medio_tasación, group = Municipios)) +
  geom_line(aes(color = Municipios), size = 1.3) +
  scale_color_manual(values = c("#C888E0", "#FF009E", "#59D9FF", "#0027FF")) +
  theme_minimal() +
  theme(axis.text.x = element_text(angle = 0, hjust = 0.5, size = 10)) +
  labs(y = "Coste medio (expresado en miles de euros)")
```



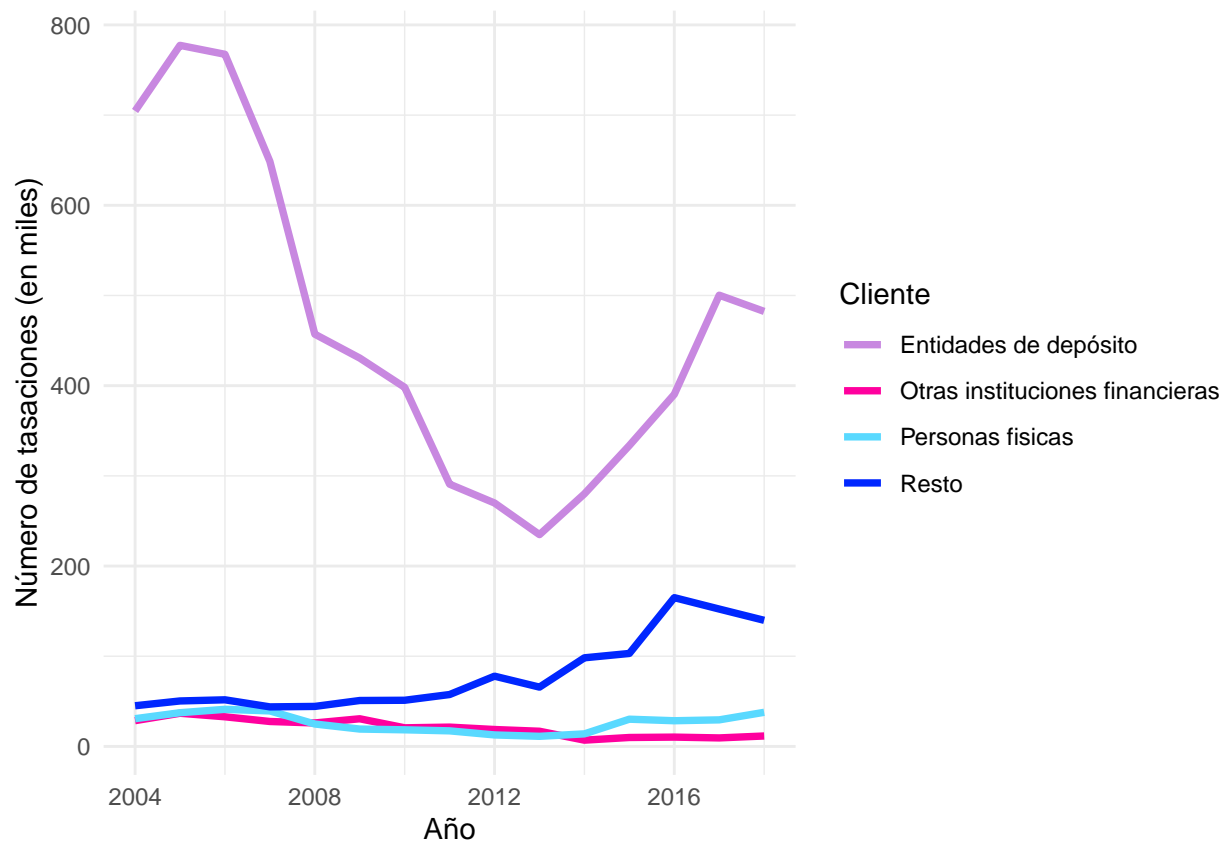
## TASACION POR TIPO DE CLIENTE

```
tc <- as.data.frame(read_excel("num_tas_cli.xlsx"))
tc
```

FALSE	Año	Entidades de depósito	Otras instituciones financieras
FALSE 1	2004	704581.0	28570.5
FALSE 2	2005	777344.5	36774.5
FALSE 3	2006	767431.5	32844.5
FALSE 4	2007	648638.5	27636.5
FALSE 5	2008	457092.0	26027.5
FALSE 6	2009	430607.0	30662.5

FALSE 7	2010	398139.5	20636.5
FALSE 8	2011	290786.5	21389.5
FALSE 9	2012	269897.5	18742.0
FALSE 10	2013	234811.5	16808.0
FALSE 11	2014	280073.0	6939.0
FALSE 12	2015	333676.5	9909.0
FALSE 13	2016	390341.0	10317.5
FALSE 14	2017	500306.5	9429.5
FALSE 15	2018	482330.0	11561.0
FALSE	Personas físicas	Resto	
FALSE 1		30749.5	45100.5
FALSE 2		37370.5	50411.5
FALSE 3		41121.0	51672.5
FALSE 4		39354.5	43833.5
FALSE 5		24853.0	44345.0
FALSE 6		19248.5	50926.0
FALSE 7		18417.0	51188.5
FALSE 8		17267.5	57534.0
FALSE 9		12748.5	77877.0
FALSE 10		11214.5	65763.0
FALSE 11		13922.0	98258.0
FALSE 12		30169.5	103054.5
FALSE 13		28466.5	164941.0
FALSE 14		29451.0	152299.0
FALSE 15		37805.0	139833.0

```
tc %>%
  gather(key = "Cliente", value = "num_tasación", -Año) %>%
  mutate(num_tasación_miles = num_tasación/1000) %>%
  ggplot(aes(x = Año, y = num_tasación_miles , group = Cliente)) +
  geom_line(aes(color = Cliente), size = 1.3) +
  scale_color_manual(values = c("#C888E0", "#FF009E", "#59D9FF" , "#0027FF")) +
  theme_minimal() +
  labs(y = "Número de tasaciones (en miles)")
```



## FINALIDAD TASACIÓN

```
ft <- as.data.frame(read_excel("finalidad_tas.xlsx"))
ft
```

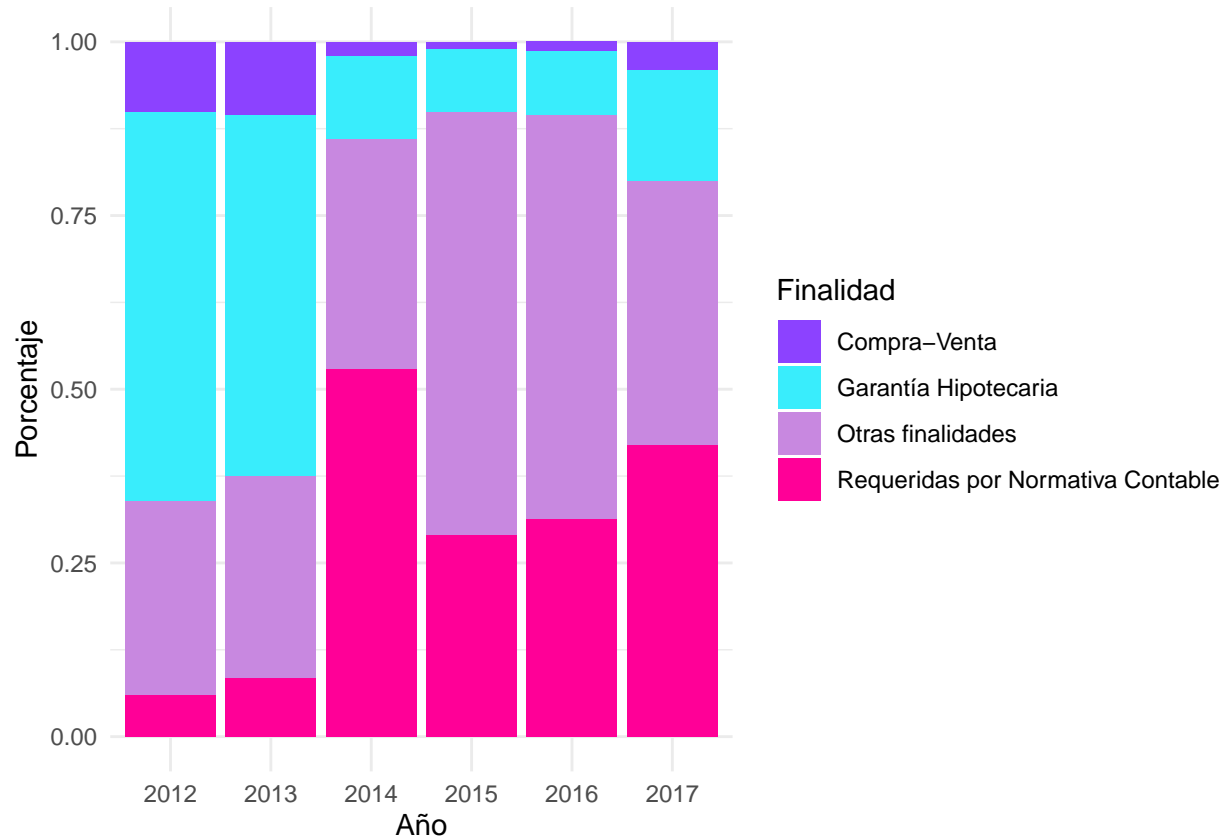
FALSE	Año	Garantía Hipotecaria	Requeridas por Normativa Contable	Compra-Venta
FALSE 1	2012	56.0	6.0	10.0
FALSE 2	2013	52.0	8.5	10.5
FALSE 3	2014	12.0	53.0	2.0
FALSE 4	2015	9.0	29.0	1.0
FALSE 5	2016	9.2	31.4	1.3
FALSE 6	2017	16.0	42.0	4.0

FALSE	Otras finalidades
FALSE 1	28.0
FALSE 2	29.0
FALSE 3	33.0
FALSE 4	61.0
FALSE 5	58.1
FALSE 6	38.0

```
ft2 <- ft %>%
  gather("Finalidad", "Porcentaje", -Año)
mipaleta <- c("#B90073", "#C888E0", "#FF009E", "#59D9FF", "#0027FF", "#E1B6EA", "#A3BFE8", "#C8D9F3")
#plot(1:8, pch = 20, cex = 4, col=mipaleta)
library(ggplot2)
```

```
ggplot(ft2, aes(x = Año, y = Porcentaje, fill = Finalidad)) +
  geom_bar(position = "fill", stat="identity")+
  scale_fill_manual(values=c("Compra-Venta" = "#8C42FF", "Otras finalidades" = "#C888E0", "Garantía Hipotecaria" = "#00FFFF", "Requeridas por Normativa Contable" = "#FF00FF")) +
  theme_minimal()
```



## EVOLUCIÓN HIPOTECAS EN ESPAÑA

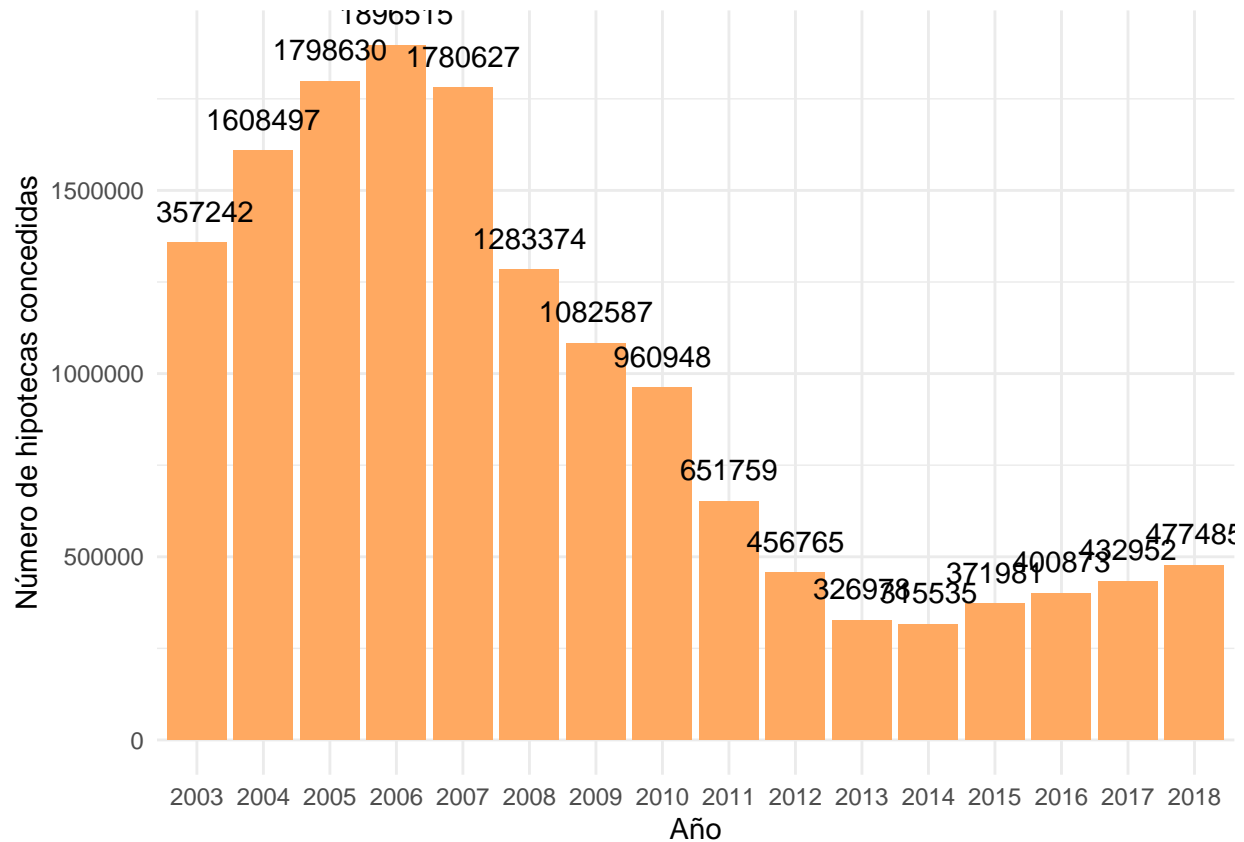
```
nh <- as.data.frame(read_excel("num_hipotecas.xlsx"))
nh
```

FALSE	Año	Num_hipotecas
FALSE 1	2003	1357242
FALSE 2	2004	1608497
FALSE 3	2005	1798630
FALSE 4	2006	1896515
FALSE 5	2007	1780627
FALSE 6	2008	1283374
FALSE 7	2009	1082587
FALSE 8	2010	960948
FALSE 9	2011	651759
FALSE 10	2012	456765
FALSE 11	2013	326978
FALSE 12	2014	315535
FALSE 13	2015	371981
FALSE 14	2016	400873



```
FALSE 15 2017      432952
FALSE 16 2018      477485
```

```
ggplot(data = nh) +
  geom_bar(mapping = aes(x = Año, y = Num_hipotecas), stat = "identity", fill = "#FFA961") +
  theme_minimal() +
  geom_text(aes(x = Año, y = Num_hipotecas, label = Num_hipotecas), vjust = -1) +
  labs(y = "Número de hipotecas concedidas")
```



## NÚMERO DE COMPRAVENTAS REALIZADAS

```
ncm <- as.data.frame(read_excel("num_compraventa.xlsx"))
ncm
```

FALSE	Año	Num_compraventas
FALSE 1	2007	775300
FALSE 2	2008	552080
FALSE 3	2009	413393
FALSE 4	2010	439591
FALSE 5	2011	359824
FALSE 6	2012	318534
FALSE 7	2013	312593
FALSE 8	2014	318830
FALSE 9	2015	355556
FALSE 10	2016	405385
FALSE 11	2017	467644

```
ggplot(data = ncm, as.numeric = FALSE) +
  geom_bar(mapping = aes(x = Año, y = Num_compraventas), stat = "identity", fill = mipaleta[3]) +
  theme_minimal() +
  geom_text(aes(x = Año, y = Num_compraventas, label = Num_compraventas), vjust = -1) +
  labs(y = "Número de compraventas realizadas")
```

