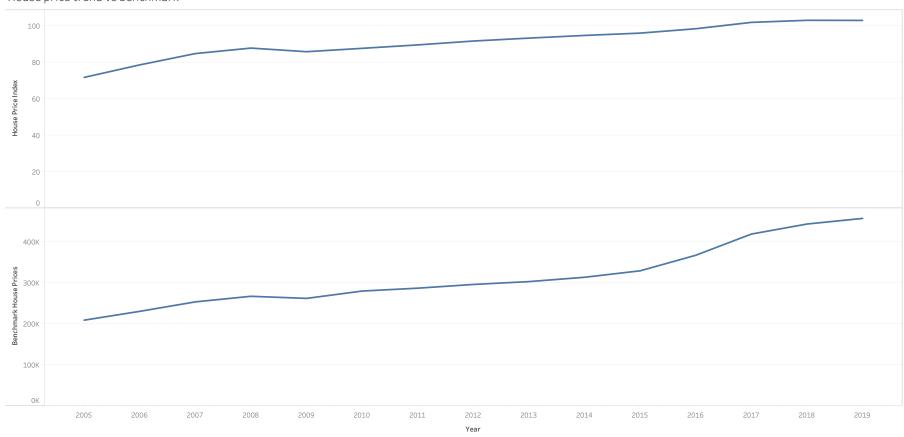


The trend in national House Price Index has been increasing gradually since the end of the 2007-2009 financial crisis, and increasing rapidly in recent years since the start of the pandemic in 2020.



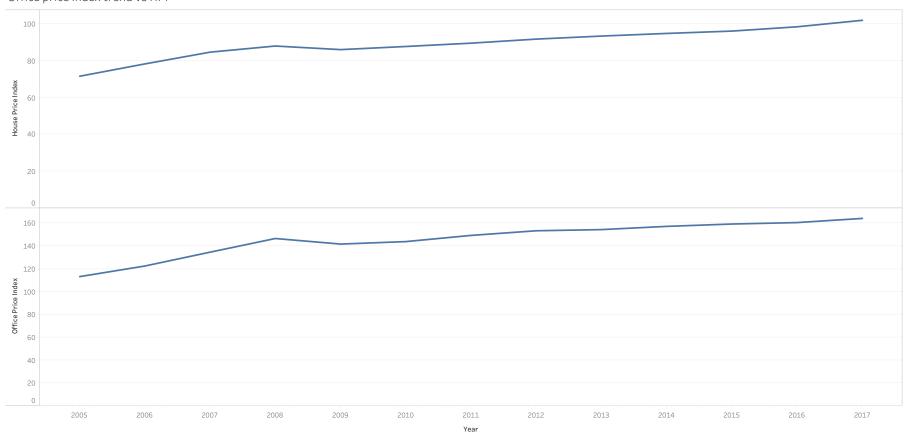
#### House price trend vs benchmark



The trend in national House Price Index is compared with benchmark house prices for the same period. It shows both increasing gradually, with an increase in growth of the benchmark prices in recent years.



### Office price index trend vs HPI



The trend in the national House Price Index is similar to the Office Price Index.

1 2 3 4 5 6 7 8 9 10 11 12 13

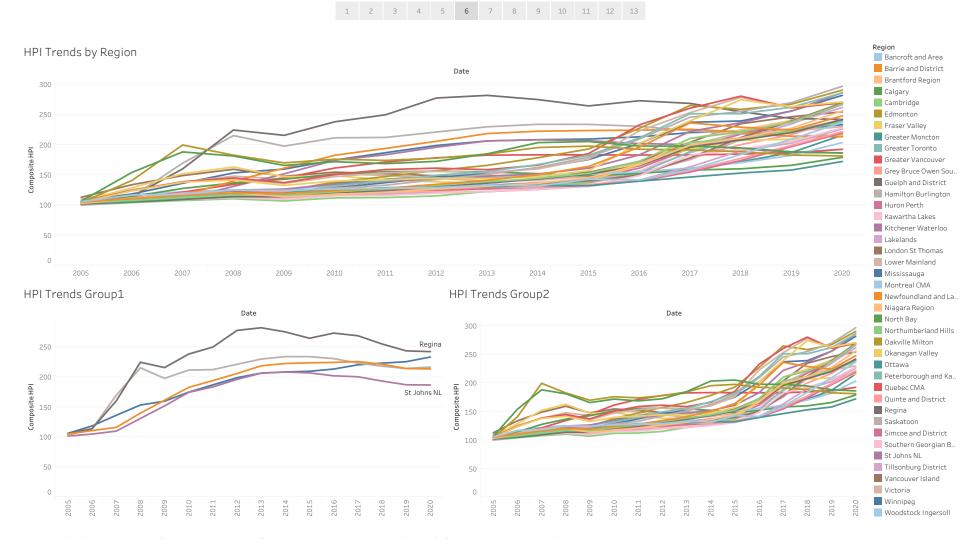
# Canada house price heatmap showing benchmark prices

Composite Benchmark

114,975 1,101,700

			Date														
Province	Region	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
AB	Calgary	234,592	339,108	413,808	398,883	364,633	378,142	371,142	379,425	406,750	447,658	451,633	435,192	435,025	428,392	414,350	409,622
	Edmonton	182,383	246,567	349,367	319,900	297,442	308,175	304,642	311,208	322,983	342,042	346,050	337,108	334,950	329,933	320,100	317,556
BC	Fraser Valley	327,858	387,192	432,350	443,983	415,642	438,467	445,117	453,575	451,467	460,358	492,408	634,342	750,667	860,117	824,033	848,956
	Greater Vancouver	403,267	473,017	528,842	552,317	523,083	574,317	605,400	614,400	604,533	633,050	706,383	887,667	992,883	1,068,792	995,142	1,026,333
	Lower Mainland	376,200	442,258	494,242	513,242	484,467	525,392	547,992	556,517	549,167	570,475	629,217	795,375	903,708	993,075	934,275	963,167
	Okanagan Valley	254,825	308,192	363,958	390,292	351,808	355,558	340,017	331,450	327,750	343,300	361,983	403,467	461,350	495,925	500,658	516,144
	Vancouver Island	224,850	266,417	296,475	317,225	294,183	307,833	303,017	295,525	290,100	295,908	307,367	343,317	406,242	467,383	490,492	506,800
	Victoria	342,042	390,192	429,317	459,900	444,792	472,642	463,642	449,017	434,683	438,983	459,542	530,342	620,683	683,517	692,000	715,133
MB	Winnipeg	126,733	141,408	162,500	182,833	190,442	208,425	222,883	237,133	246,108	248,475	249,792	254,233	262,592	265,942	268,767	278,067
NB	Greater Moncton	122,358	126,358	132,633	138,300	142,575	149,108	153,283	154,292	154,808	157,192	157,142	166,017	174,067	182,108	187,942	204,744
NL	Newfoundland and Labra	132,567	139,800	146,608	176,333	203,558	230,467	244,717	259,542	275,717	280,633	282,050	282,842	284,717	279,008	269,983	269,167
	St Johns NL	141,842	146,450	153,317	182,617	211,808	243,275	255,892	273,308	287,792	290,542	288,325	281,658	279,408	269,500	260,817	260,400
ON	Bancroft and Area	126,667	139,708	141,625	149,675	149,008	151,817	153,367	154,425	159,575	157,500	171,050	169,692	190,158	220,133	250,633	283,844
	Barrie and District	219,217	231,550	242,292	251,083	249,108	259,250	267,183	280,758	294,850	314,025	342,817	409,650	493,375	478,608	468,517	517,911
	Brantford Region	180,792	196,842	205,233	212,092	200,267	207,042	213,550	222,567	231,017	239,250	255,750	293,067	350,750	371,167	399,900	450,511
	Cambridge	216,442	225,517	235,375	244,567	242,992	255,633	265,367	278,825	290,450	302,200	319,750	361,667	440,683	463,367	498,050	560,822
	Greater Toronto	314,025	329,625	348,508	361,583	362,408	399,342	424,675	453,525	471,858	507,392	554,067	641,242	762,475	762,558	795,433	867,556
	Grey Bruce Owen Sound	161,958	173,967	187,417	194,450	190,683	198,958	198,942	198,842	202,467	202,283	208,892	220,500	245,567	276,900	310,342	345,633
	Guelph and District	253,258	261,183	271,758	282,942	283,033	300,900	305,658	322,775	339,042	355,600	376,217	410,567	486,908	516,275	547,150	600,922
	Hamilton Burlington	231,183	245,017	259,208	269,117	269,825	288,200	299,633	320,700	339,750	365,867	404,450	471,592	553,250	574,892	607,783	668,756
	Huron Perth	166,033	173,708	186,033	189,792	189,167	199,400	201,917	203,450	207,150	211,767	215,767	228,042	252,292	283,533	321,133	357,567
	Kawartha Lakes	188,467	198,058	200,458	205,975	201,692	211,908	213,242	220,108	225,208	230,833	241,342	273,600	335,742	353,442	377,317	418,411
	Kitchener Waterloo	204,500	217,517	229,317	243,650	246,900	263,092	271,775	280,158	289,017	296,000	314,600	357,542	433,758	461,867	499,350	558,922
	Lakelands	197,883	208,692	219,875	225,533	219,308	229,625	234,442	238,408	241,408	248,675	258,908	279,383	322,392	375,292	399,808	446,422
	London St Thomas	165,742	176,533	186,550	191,967	191,542	198,792	200,750	204,067	208,242	213,925	220,058	235,750	280,242	333,425	376,250	423,822
	Mississauga	330,150	345,250	365,342	376,258	380,550	416,250	443,708	472,367	492,725	521,800	567,550	653,783	767,142	774,017	827,625	911,744
	Niagara Region	177,350	186,050	194,667	198,633	197,042	203,933	208,525	212,767	218,617	228,400	244,183	285,450	363,225	387,317	414,708	461,411
	North Bay	145,083	158,792	177,267	189,950	198,517	210,025	215,892	216,958	215,325	211,417	206,242	212,175	219,533	222,492	230,583	248,922
	Northumberland Hills	191,367	199,383	206,008	211,317	204,417	214,192	215,292	220,675	234,475	241,308	264,442	318,400	389,817	404,067	426,300	454,267
	Oakville Milton	397,917	423,308	448,500	462,142	468,942	523,658	558,367	596,275	629,025	676,483	731,825	861,642	1,005,183	980,392	1,013,375	1,101,700
	Ottawa	230,542	239,333	254,683	272,425	283,050	308,217	324,133	332,808	335,917	336,433	337,808	345,175	362,683	389,117	424,267	489,389
	Peterborough and Kawart	194,092	203,742	212,267	216,642	213,317	227,392	230,467	235,408	241,992	249,475	258,058	287,633	354,300	396,517	419,108	449,900
	Quinte and District	152,500	161,842	173,592	180,267	177,375	187,083	189,892	192,183	191,408	194,608	203,050	221,850	263,675	296,533	321,067	359,278
	Simcoe and District	152,383	163,908	175,975	182,858	178,650	186,008	186,100	186,833	192,792	200,067	211,425	238,550	286,933	321,742	352,558	394,411
	Southern Georgian Bay	187,258	198,917	208,925	212,975	209,217	215,425	217,908	226,275	230,008	233,517	248,475	283,550	354,842	384,733	408,642	438,944
	Tillsonburg District	142,242	151,792	160,333	165,725	162,375	167,667	168,783	176,775	183,258	189,075	196,275	210,575	241,442	287,067	324,075	360,567
	Woodstock Ingersoll	160,650	176,942	184,675	189,442	181,875	187,967	189,958	198,075	202,025	205,608	213,717	236,592	282,092	319,067	354,075	403,878
QC	Montreal CMA	196,058	204,125	218,075	231,417	239,292	257,467	270,158	280,325	283,667	286,783	290,525	297,883	310,458	327,500	350,750	391,678
	Quebec CMA	136,342	146,342	160,292	177,325	191,442	213,117	226,117	235,492	241,217	241,900	241,825	241,500	241,592	243,708	246,342	253,989
SK	Regina	114,975	123,933	174,175	244,067	234,483	258,942	271,567	301,733	306,483	298,900	287,492	296,817	292,050	277,125	264,708	263,278
	Saskatoon	139,033	153,125	228,275	289,775	266,208	284,750	285,617	297,692	309,375	314,875	314,750	310,392	300,400	293,383	288,250	291,378

The heatmap of benchmark house prices shows relative differences between regions and over the years. Darker shading shows the gap between metropolitan centres and other areas is growing.

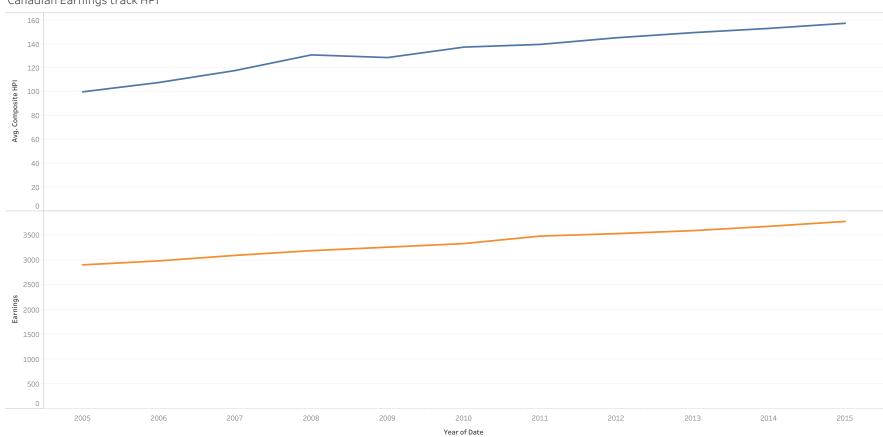


 $Regional \, trends \, in \, house \, prices \, shows \, a \, difference \, between \, some \, regions \, (Regina, Saskatoon, \, Winnipeg, St \, Johns \, and \, the \, rest \, of \, NL) \, and \, mostly \, GTA, \, Ontario, \, BC \, and \, major \, metropolises.$ 

The former group, group 1 on the lower left, increases dramatically 2009-2013, then drops off in recent years. In contrast, the latter group 2, on the lower right, shows slower growth for the same time period and a rapid increase starting around 2015.



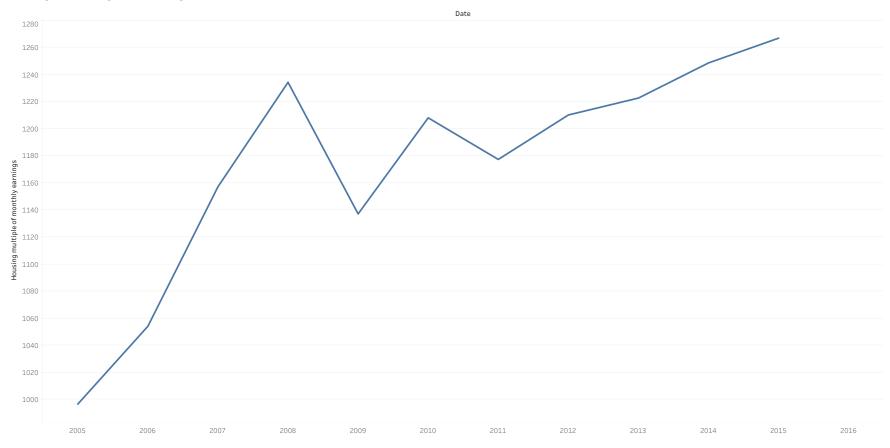
#### Canadian Earnings track HPI



 $Average\ earnings\ track\ the\ House\ Price\ Index\ surprisingly\ closely,\ apart\ from\ a\ slowing\ in\ HPI\ growth\ during\ the\ financial\ crisis\ around\ 2008.$ 



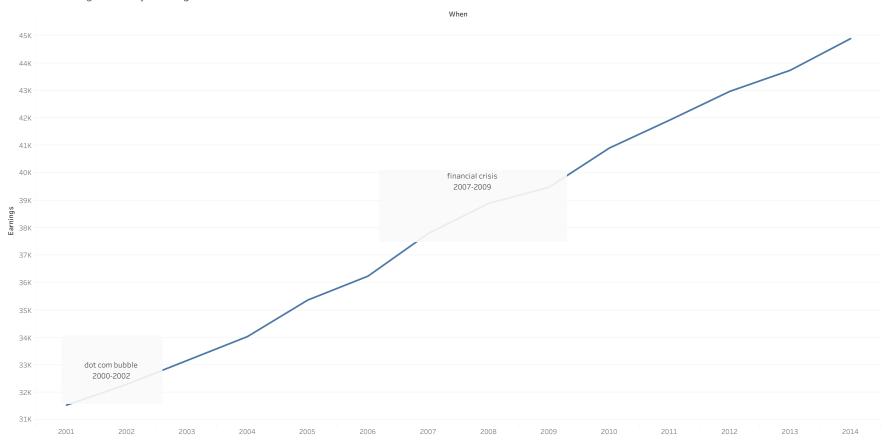
### Housing cost taking from earnings



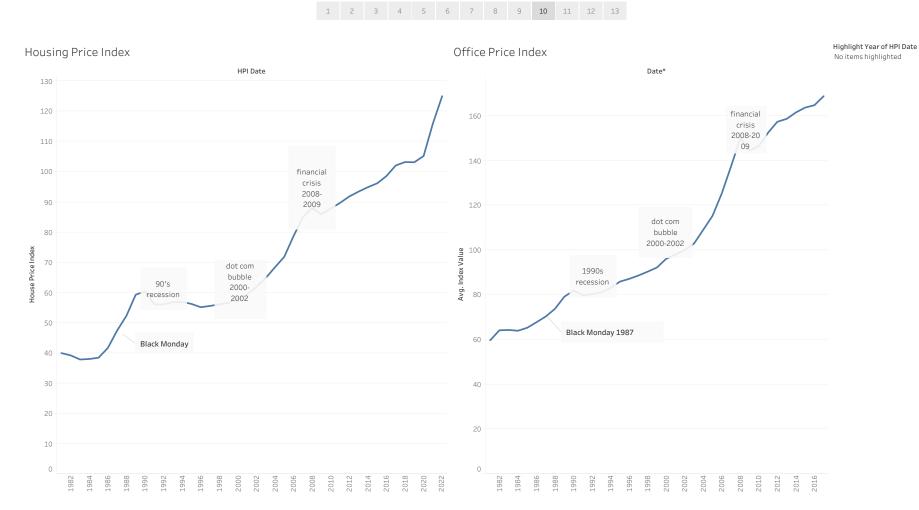
The benchmark cost of a house is shown as a multiple of average earnings. There was a steep increase in housing as a multiple of earnings from 2005-2008, dropping dramatically around the financial crisis. The trend steepens again from 2011-2016.



### Canadian average monthly earnings

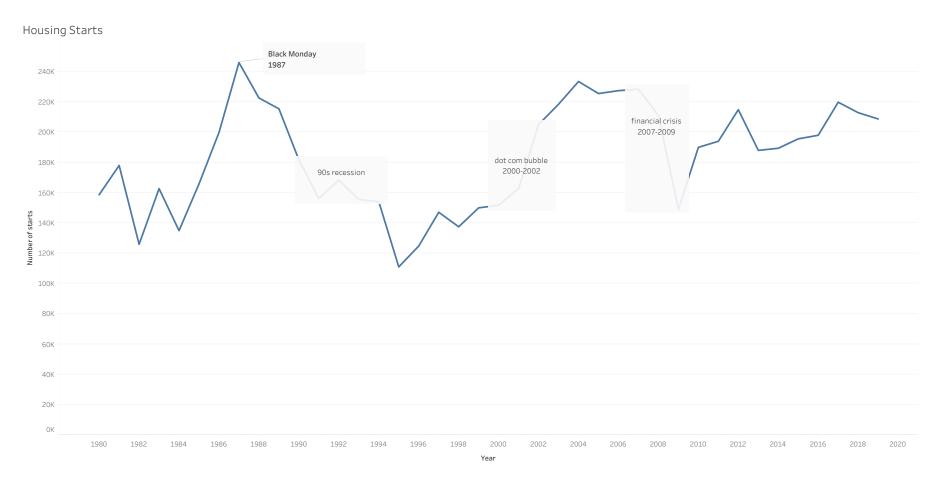


I only have data for two of the financial crises mentioned, but they seem to have little effect on average earnings. Later slides show a contrasting larger effect on other economic indicators.



The impact of finacial crises on housing and office market price indexes is similar. Both are affected by the 90's recession and the 2008-2009 financial crises. They are less affected by Black Monday in 1987 and the dot com bubble 2000-2002.

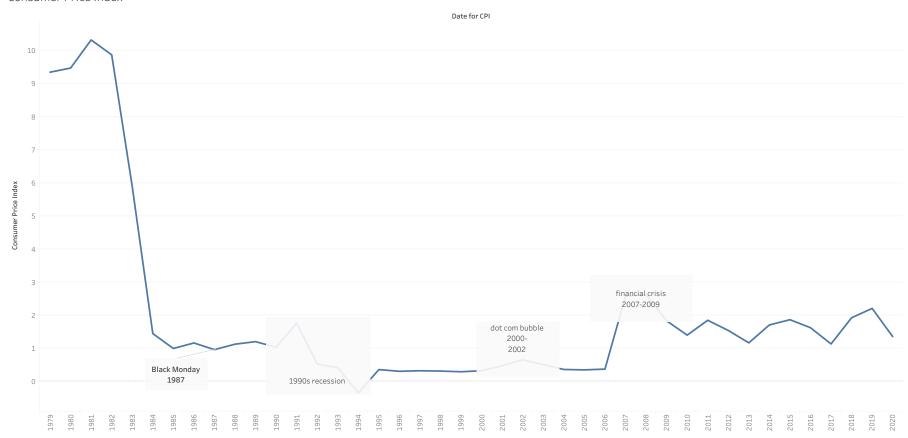




The impact of crises on house construction appears to be the most dramatic, compared to other economic indicators.



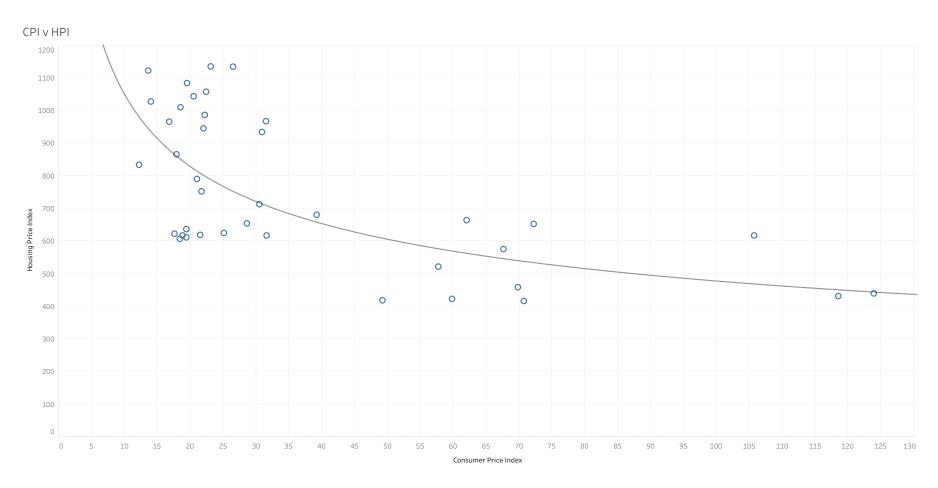
#### Consumer Price Index



Major financial crises have a measurable impact on the Consumer Price Index, a measure of inflation that excludes housing costs.

Notable: The apparently high inflation at the start of the graph is not an error. Canada experienced high inflation in the seventies and early eighties. Anti-inflationary measures, like interest rate increases, controlled inflation but also triggered a recession.





There is a relationship between the Housing Price Index and the Consumer Price Index, with an r-value of 0.47.