

Economic Forecast – Puget Sound



Hebert Research

February 17 2011

HR

Economic Equation

$$1) y = \int \left[\left\{ \sum (c)^3 + I^{\Delta e=0} + G^{\Delta e=0} + F(e > i) \right\} - Tax + \left\{ M^{(1-x)} \right\} \right]^t$$

2) Business Cycles

- Mean Value Theory

3) Balance Sheet

- Investment

Handwritten mathematical derivations on a whiteboard:

$$s(e) \equiv s(sA) - s(sA)^s = sA - sA^s = s^2$$

$$s(sA) = \frac{s^2 A}{sA + A} = \frac{s^2 A}{A(s+1)} = \frac{s^2}{s+1}$$

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National Economic Indicators and Interest Rates

U.S. Economic Indicators

	2004	2005	2006	2007	2008	2009 (p)	2010 (f)	2011 (f)
Real GDP (% change)	3.6	3.1	2.7	2.1	0.4	-2.4	2.0	2.2
Nonfarm Employment (% change)	1.1	1.7	1.8	1.1	-0.6	4.3	-0.4	1.3
Unemployment Rate (%)	5.5	5.1	4.6	4.6	5.8	9.2	9.7	9.2
Consumer Price Index (% change)	2.7	3.4	3.2	2.9	3.8	-0.3	1.6	1.8
Federal Budget Balance (FY, \$billion)	(\$413)	(\$318)	(\$248)	(\$162)	(\$455)	(\$1,416)	(\$1,500)	(\$1,300)

U.S. Interest Rates

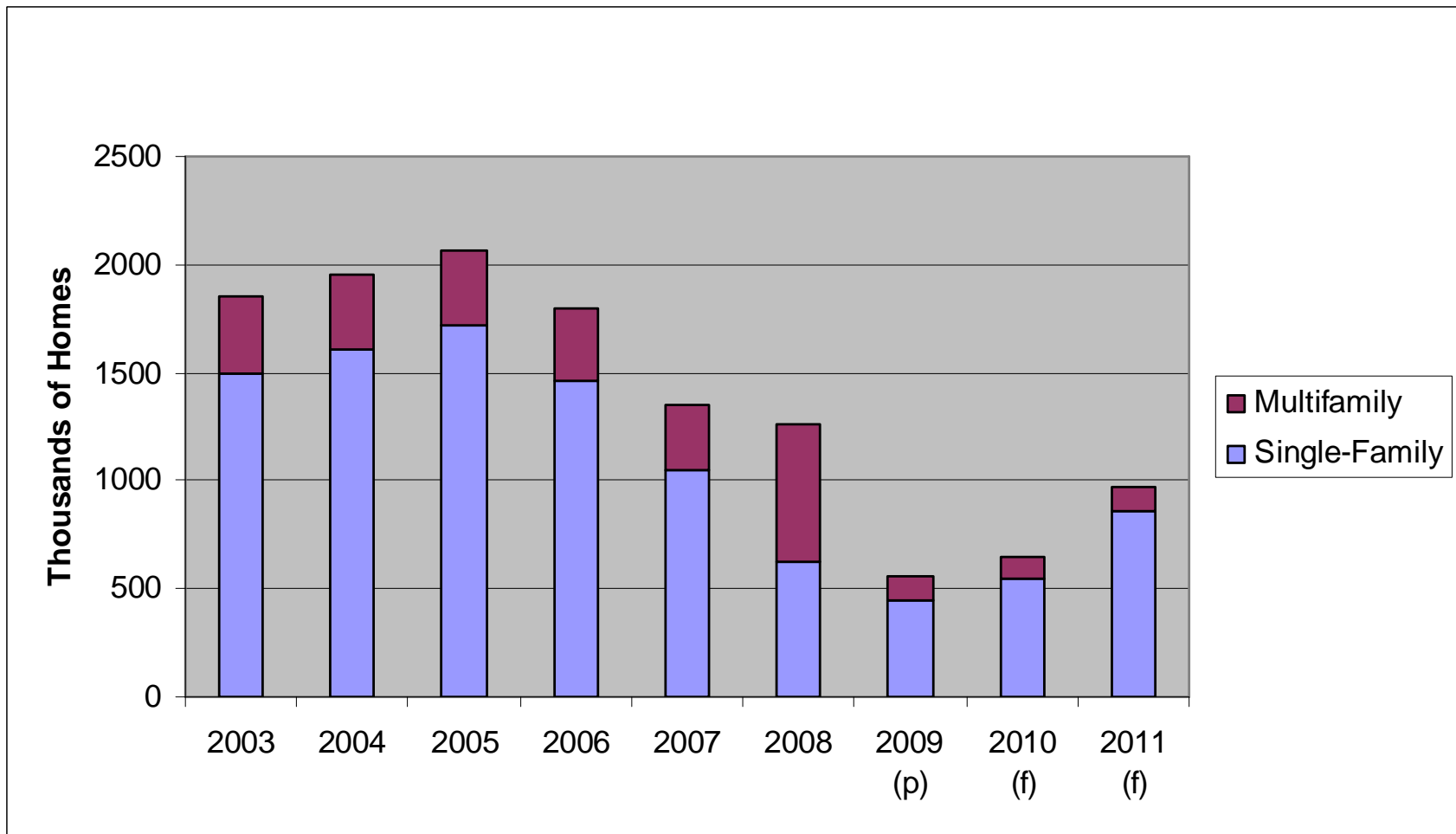
<i>(4th quarter averages, %)</i>	2004	2005	2006	2007	2008	2009 (p)	2010 (f)	2011 (f)
Federal Funds Rate	2.0	7.0	5.3	4.5	1.1	0.2	0.8	2.8
Bank Prime Rate	4.9	7.0	8.3	7.5	4.1	3.3	3.8	5.8
10-Year Treasury Note	4.2	4.5	4.6	4.3	3.3	3.3	4.0	4.5
30-Year Fixed Mortgage	5.7	6.2	6.3	6.2	5.9	5.0	5.5	6.0

Public Debt

- Total GDP \$ 14 trillion
- Total federal dept \$ 1.4 trillion
- Federal debt to GDP 10%

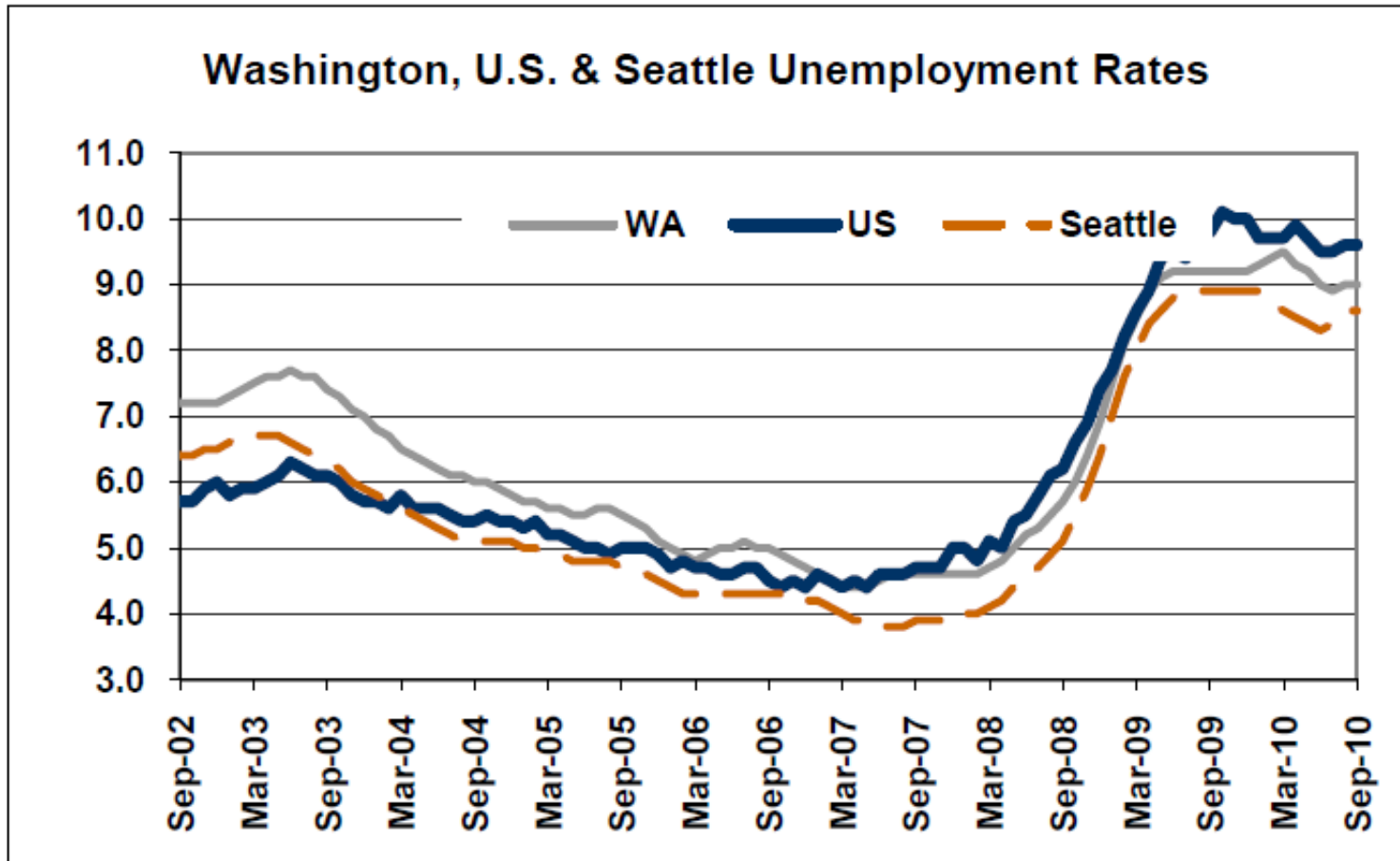
- State and local GDP 11%
- Washington state 39 / 50

U.S. Housing Starts



Unemployment Rates

- concerns, confidence, credit



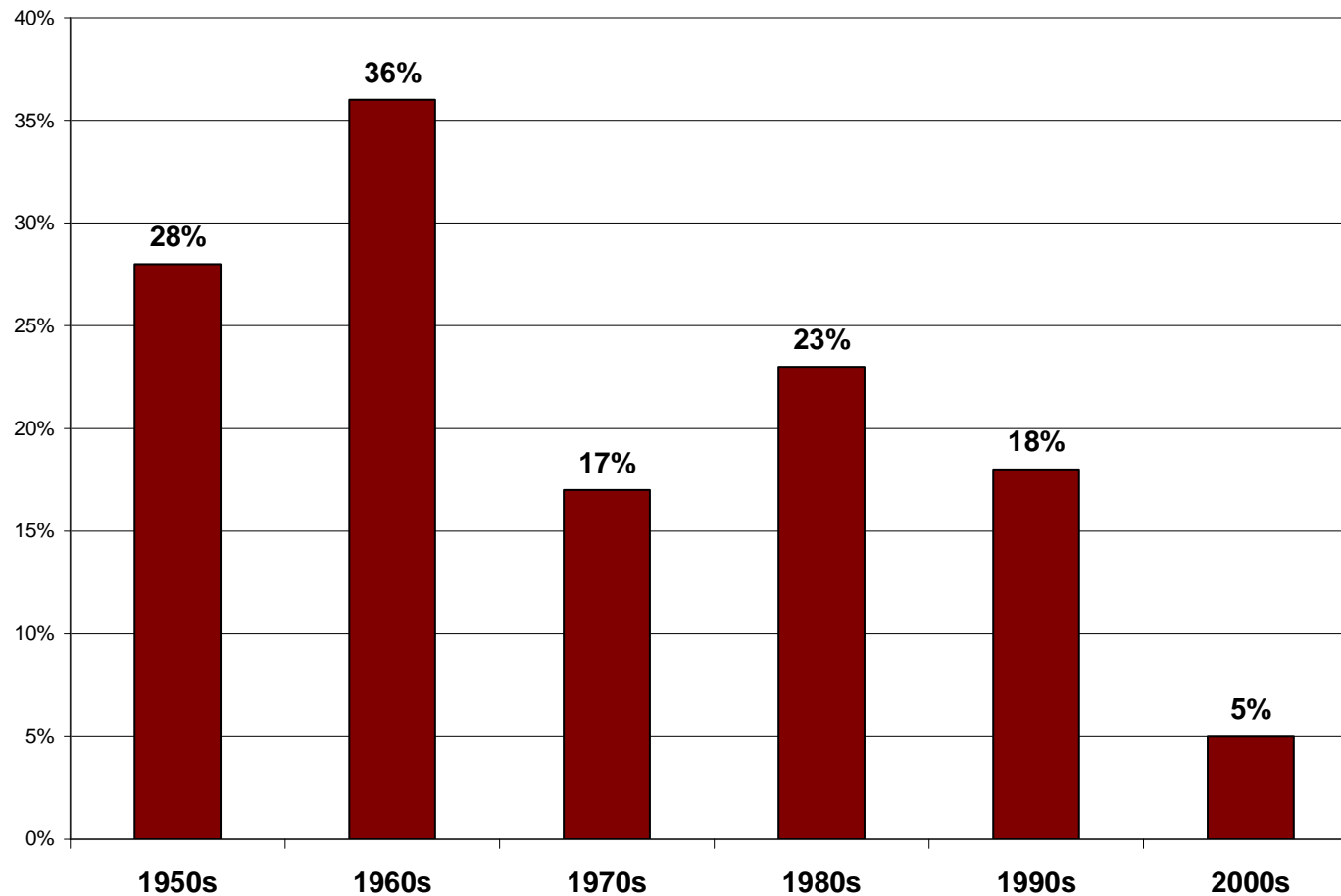
Employment Report

- U3 (Official Unemployment Rate) 9.0%
- U4 (U3 plus discouraged workers) 9.6%
- U5 (U4 plus marginally attached workers) 10.7%
- U6 (U5 plus involuntary part time workers) 16.1%

Industry Sector

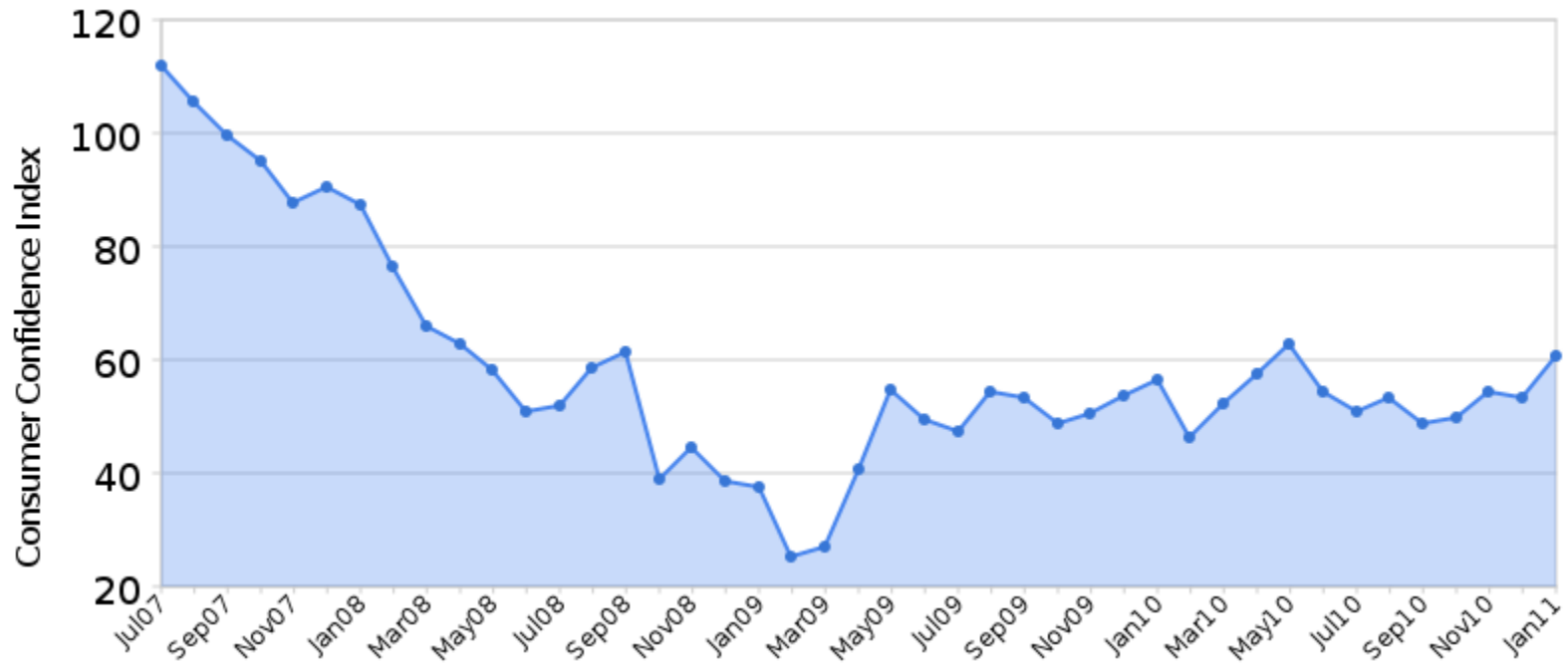
Total non-farm payroll	36,000	
■ Goods producing	18,000	
□ Mining & Logging		1,000
□ Construction	(32,000)	
□ Manufacturing		49,000
■ Service providing	146,000	
□ Wholesale trade		9,200
□ Retail trade		27,500
□ Transportation & warehouse		-38,000
□ Information		-1,000
□ Finance		-10,000
□ Professional & Business	31,000	
□ Education & healthcare	13,000	
□ Leisure & hospitality		-3,000
□ Other		5,000
■ Government	(14,000)	

Change In Personal Income

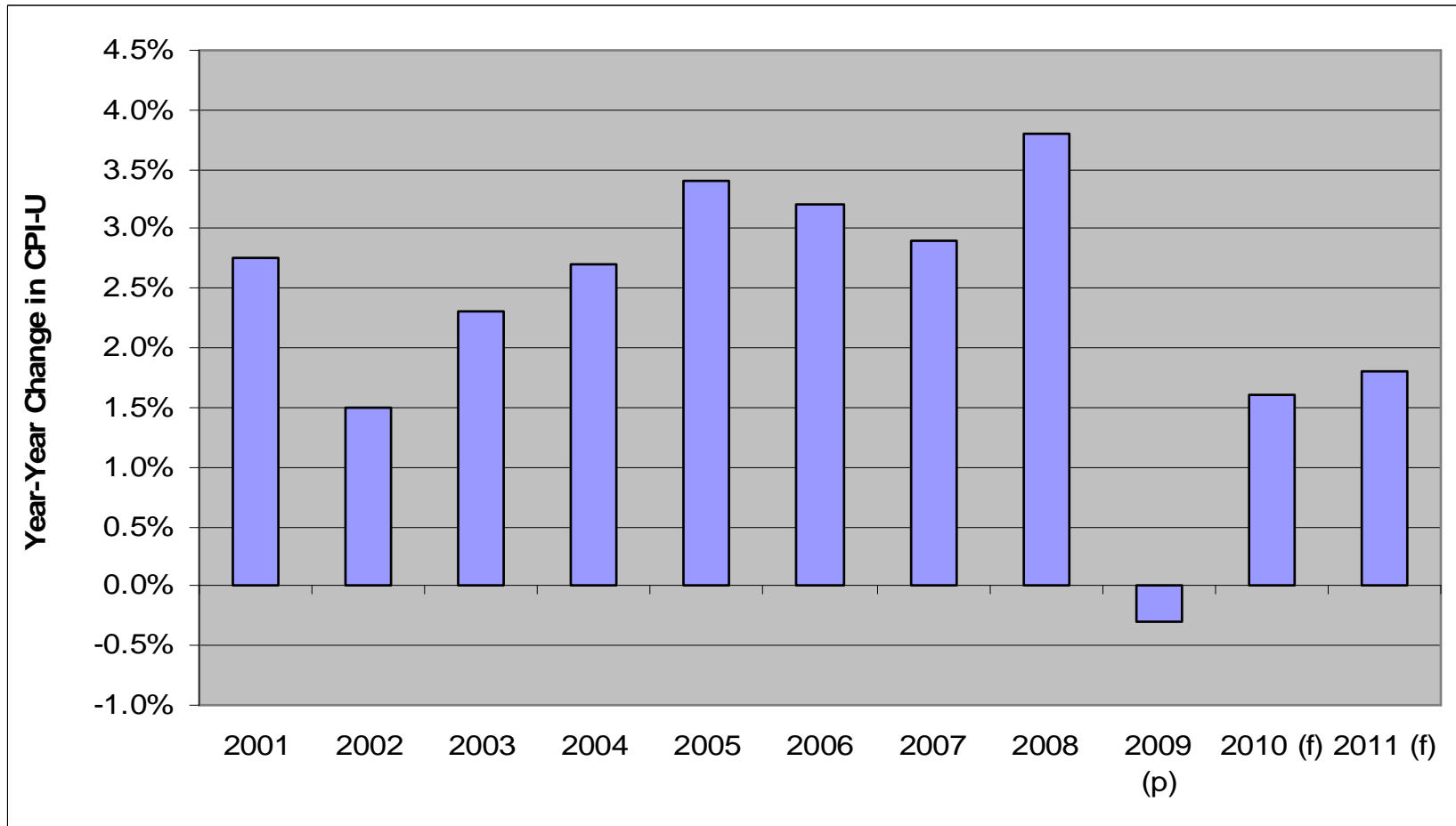


Source: Bureau of Economic Analysis

Consumer Confidence



Consumer Inflation



Manufacturing January 2011

Index	Series Index January	Series Index December	Percentage Point Change	Direction	Rate of Change	Trend* (Months)
PMI	60.8	58.5	+2.3	Growing	Faster	18
New Orders	67.8	62.0	+5.8	Growing	Faster	19
Production	63.5	63.0	+0.5	Growing	Faster	20
Employment	61.7	58.9	+2.8	Growing	Faster	16
Supplier Deliveries	58.6	56.7	+1.9	Slowing	Faster	20
Inventories	52.4	51.8	+0.6	Growing	Faster	7
Customers' Inventories	45.5	40.0	+5.5	Too Low	Slower	22
Prices	81.5	72.5	+9.0	Increasing	Faster	19
Backlog of Orders	58.0	47.0	+11.0	Growing	From Contracting	1
Exports	62.0	54.5	+7.5	Growing	Faster	19
Imports	55.0	50.5	+4.5	Growing	Faster	17
OVERALL ECONOMY				Growing	Faster	20
Manufacturing Sector				Growing	Faster	18

Customer Inventories & Prices

Customers' Inventories	% Reporting	%Too High	%About Right	%Too Low	Net	Index
Jan 2011	63	11	69	20	-9	45.5
Dec 2010	67	8	64	28	-20	40.0
Nov 2010	77	13	65	22	-9	45.5
Oct 2010	72	15	58	27	-12	44.0

Prices	% Higher	% Same	% Lower	Net	Index
Jan 2011	64	35	1	+63	81.5
Dec 2010	48	49	3	+45	72.5
Nov 2010	48	43	9	+39	69.5
Oct 2010	49	44	7	+42	71.0

Economic and Financial indicators

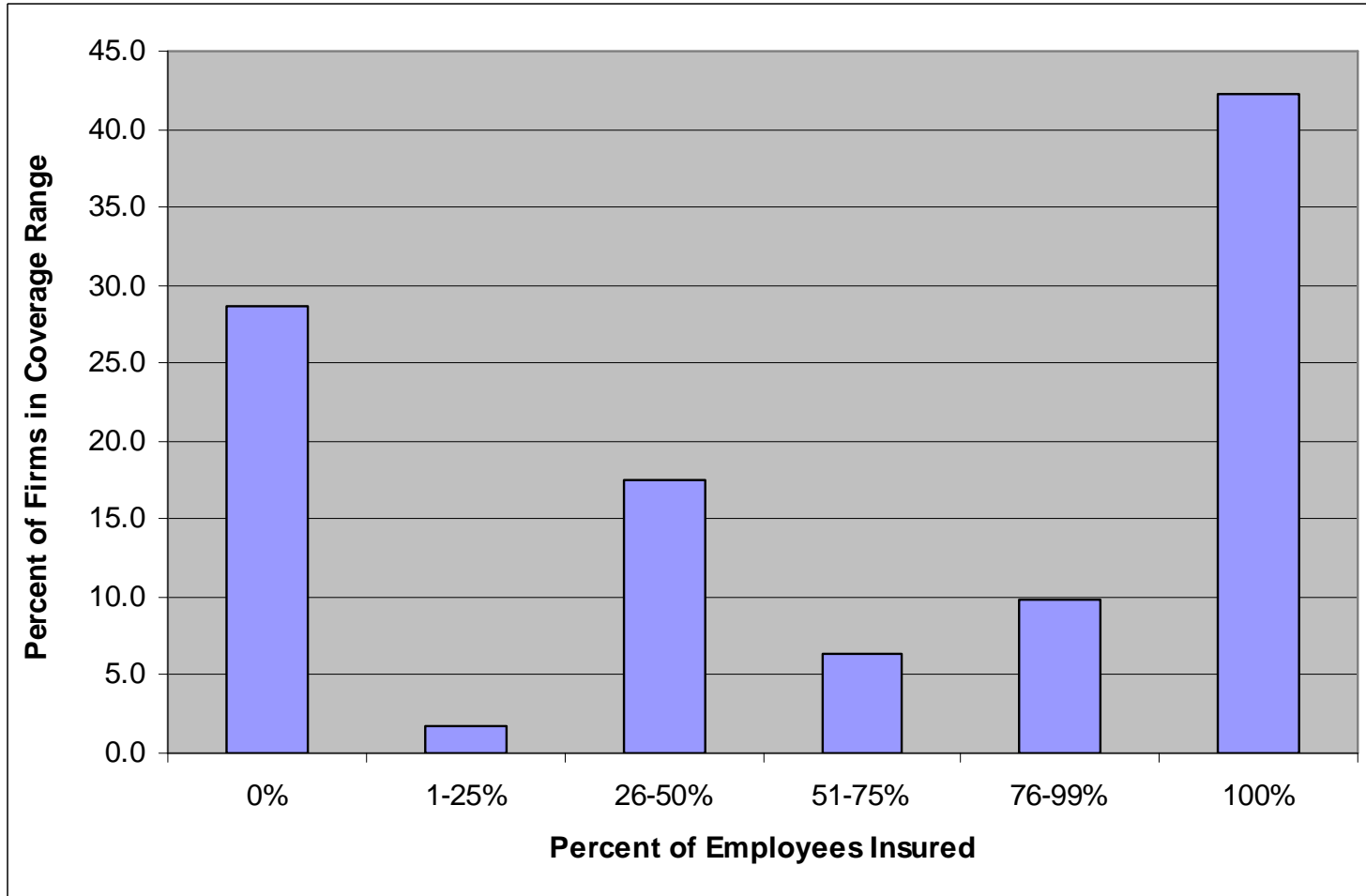
- commodity-price index

	Jan 4th	Jan 11th*	% change on	
			one month	one year
Dollar index				
All itmes	219.0	218.4	+ 4.5	+ 34.1
Food	223.8	223.8	+ 4.6	+ 31.0
Industrials				
All	214.0	212.9	+ 4.4	+ 37.7
Nfa [†]	257.1	206.7	+ 6.0	+ 80.1
Metals	195.5	192.4	+ 3.6	+ 21.1
Sterling index				
All items	255.3	255.2	+ 6.0	+ 39.5
Euro index				
All items	205.9	210.1	+ 8.2	+ 50.8
Gold				
\$ per oz	1384.25	1377.63	- 1.4	+ 20.0
West Texas Intermediate				
\$ per barrel	89.24	91.18	+ 3.5	+ 12.9

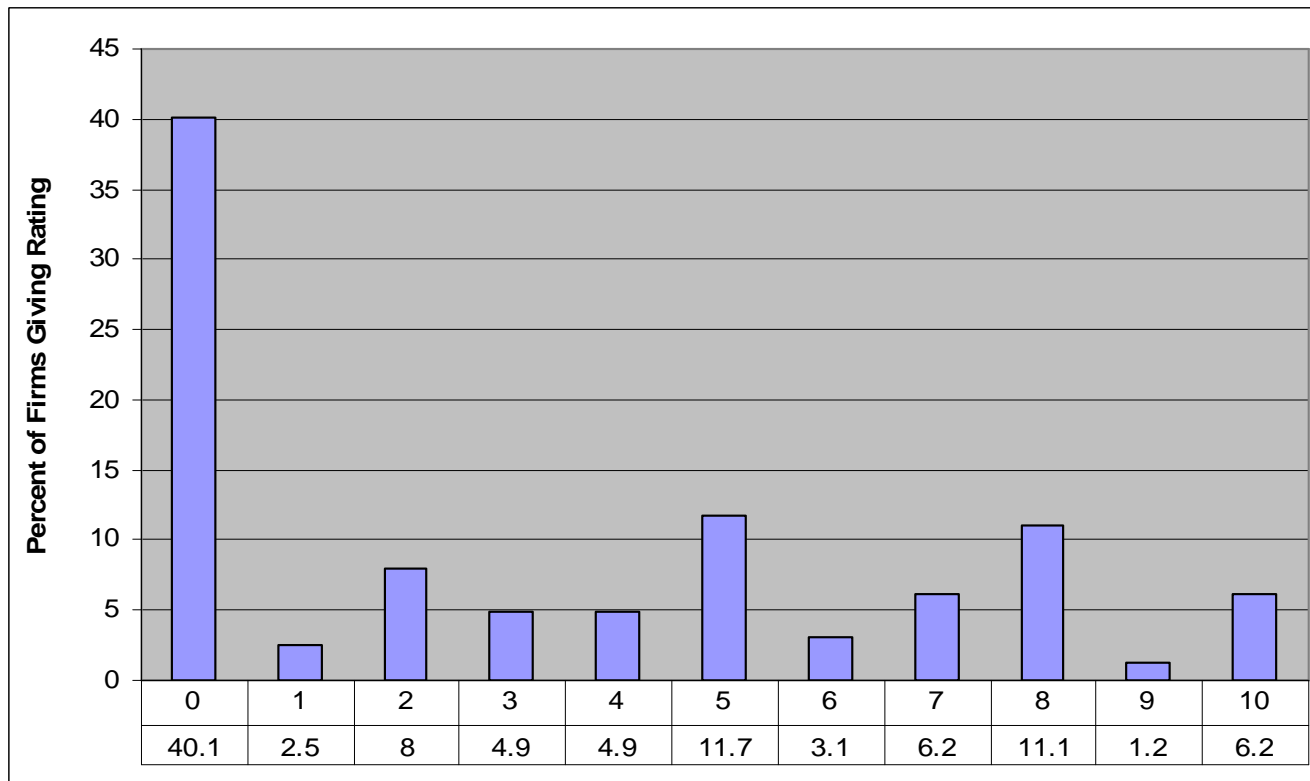
* Provisional

† Non-food agriculturals

Rate of Insured Employees Among Local Businesses

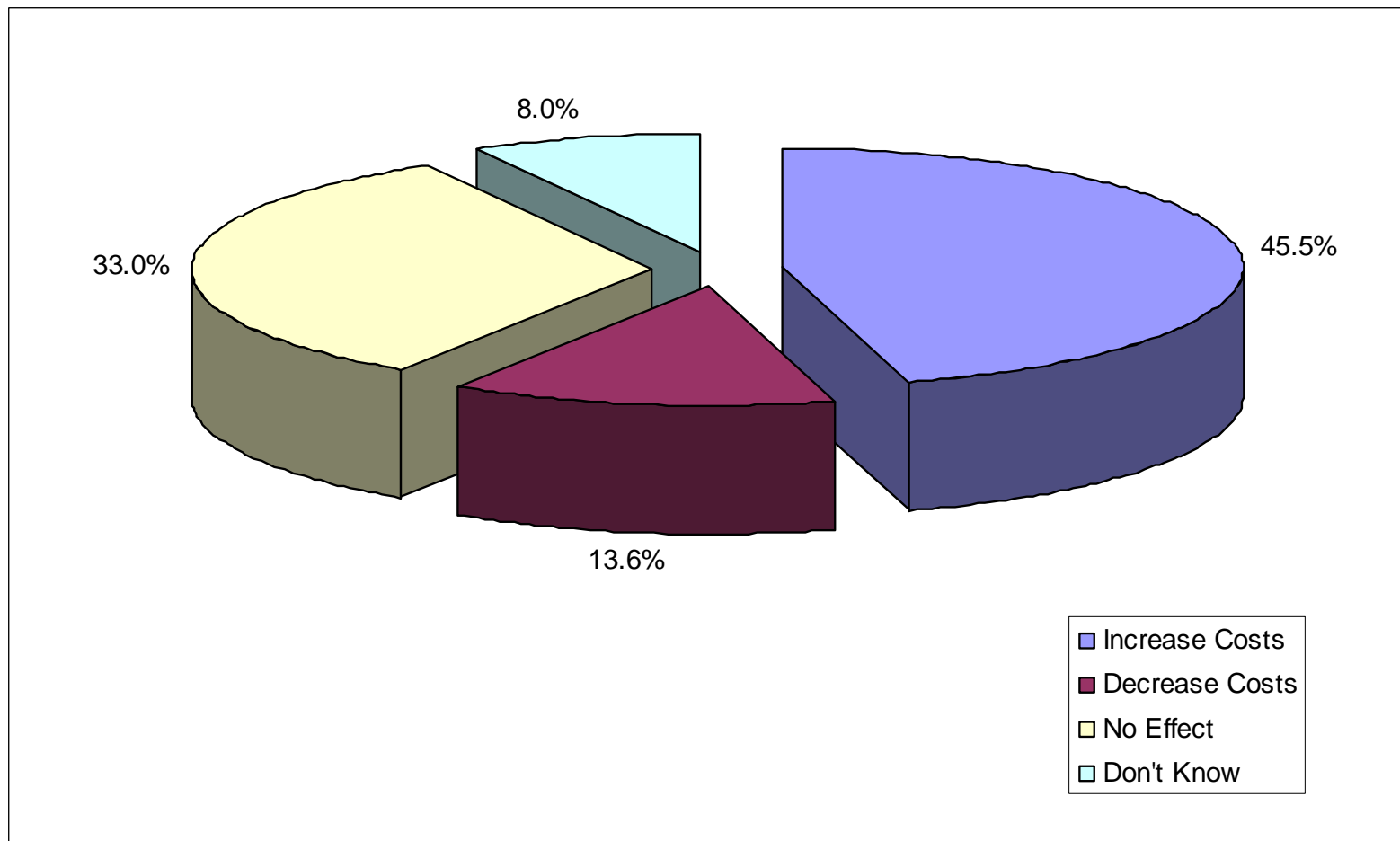


Confidence that Healthcare Exchanges will Provide Better Coverage and Lower Rates

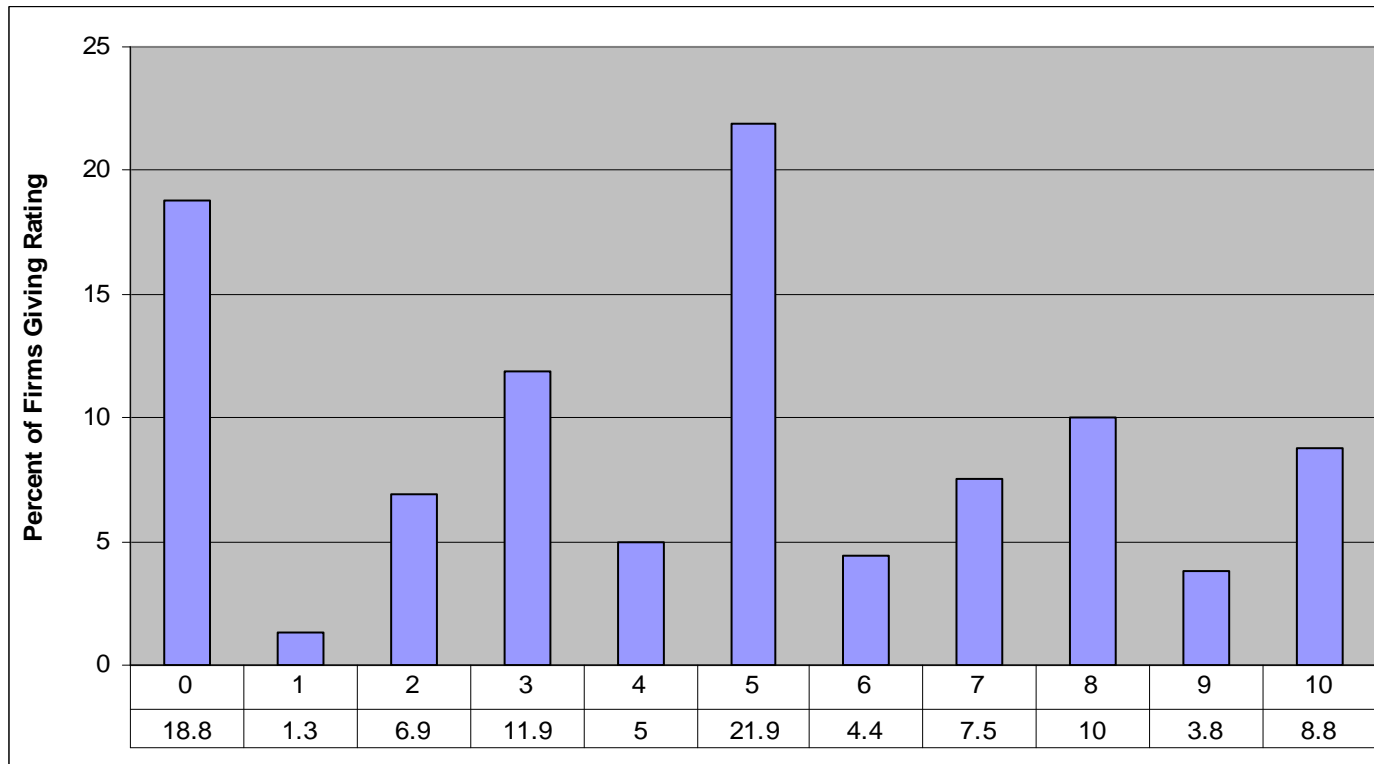


Mean	4.60
St. Dev	3.16

Expected Effect of Healthcare Exchanges on Company Costs

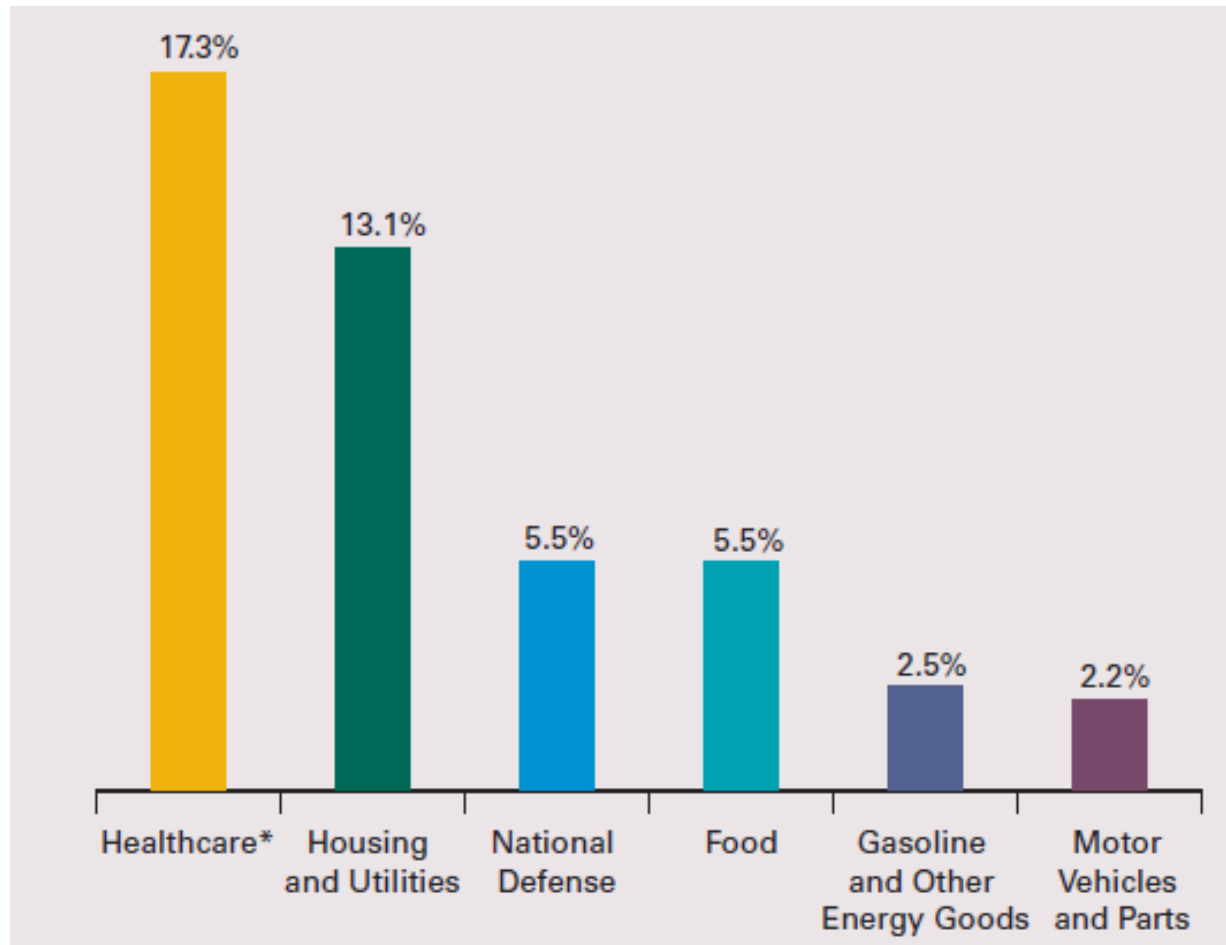


Confidence that Patient Protection and Care Act will be Implemented



Mean	4.60
St. Dev	3.16

The whole healthcare sector represents a significant portion of the U.S. economy.



Active Listings & Closed Sales – Single Family Residential

Active Listings:	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11	% Change vs yr ago
King	8,869	8,218	6,918	7,523	8,115	8,794	9,206	11,780	9,873	10,470	11,720	12,611	11,509	10,674	9,170	10,179	35%
Snohomish	4,168	4,024	3,533	3,935	4,149	4,318	4,279	4,635	4,694	4,770	5,052	5,313	4,726	4,671	4,009	4,842	23%
Pierce	5,027	4,921	4,611	4,902	5,053	5,199	5,340	5,197	5,775	5,943	6,051	6,290	5,772	5,521	5,233	5,718	17%
Skagit	1,147	1,095	986	1,018	1,041	1,111	1,135	1,121	1,192	1,226	986	1,024	903	801	773	841	-17%
Thurston	1,656	1,600	1,447	1,466	1,612	1,736	1,582	1,480	1,895	2,026	2,002	2,016	1,805	1,626	1,415	1,592	9%
Kittitas	501	462	410	384	414	463	491	501	572	613	424	397	364	335	278	318	-17%
Whatcom	1,414	1,317	1,174	1,296	1,376	1,571	1,625	1,645	1,787	1,835	1,580	1,590	1,362	1,213	1,049	1,164	-10%
Total	22,782	21,637	19,079	20,524	21,760	23,192	23,658	26,359	25,788	26,883	27,815	29,241	26,441	24,841	21,927	24,654	20%

Closed Sales:	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11	% Change vs yr ago
King	1,758	1,574	1,462	956	997	1,596	1,642	1,696	1,879	1,474	1,278	1,185	1,321	1,163	1,540	1,099	15%
Snohomish	674	680	654	411	472	686	749	549	751	628	539	551	497	562	590	459	12%
Pierce	807	757	732	480	455	709	739	631	868	631	613	604	653	771	718	544	13%
Skagit	97	113	73	56	57	87	110	92	117	81	86	78	69	81	96	81	45%
Thurston	280	273	220	139	178	279	255	250	287	242	241	239	228	263	219	163	17%
Kittitas	32	36	40	23	28	40	34	38	42	27	25	45	30	36	43	25	9%
Whatcom	182	201	175	96	120	177	171	152	175	168	161	147	160	129	154	104	8%
Total	3,830	3,634	3,356	2,161	2,307	3,574	3,700	3,408	4,119	3,251	2,943	2,849	2,958	3,005	3,360	2,475	15%

Months Supply & Median Sale Price – Single Family Residential

Months Supply:	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11	% Change vs yr ago
King	5.04	5.22	4.73	7.87	8.14	5.51	5.61	6.95	5.25	7.10	9.17	10.64	8.71	9.18	5.95	9.26	18%
Snohomish	6.18	5.92	5.40	9.57	8.79	6.29	5.71	8.44	6.25	7.60	9.37	9.64	8.51	6.79	10.55	10.55	10%
Pierce	6.23	6.50	6.30	10.21	11.11	7.33	7.23	8.24	6.65	9.42	9.87	10.41	8.84	7.16	7.29	10.51	3%
Skagit	11.82	9.69	13.51	18.18	18.26	12.77	10.32	12.18	10.19	15.14	11.47	13.13	13.09	9.89	8.05	10.38	-43%
Thurston	5.91	5.86	6.58	10.55	9.06	6.22	6.20	5.92	6.60	8.37	8.31	8.44	7.92	6.18	6.46	9.77	-7%
Kittitas	15.66	12.83	10.25	16.70	14.79	11.58	14.44	13.18	13.62	22.70	16.96	8.82	12.13	9.31	6.47	12.72	-24%
Whatcom	7.77	6.55	6.71	13.50	11.47	8.88	9.50	10.82	10.21	10.92	9.81	10.82	8.51	9.40	6.81	11.19	-17%
Total	5.95	5.95	5.69	9.50	9.43	6.49	6.39	7.73	6.26	8.27	9.45	10.26	8.94	8.27	6.53	9.96	5%

Median Sale Price:	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11	Avg. 12months	% Change vs yr ago
King	\$ 377,500	\$ 370,000	\$ 380,000	\$ 375,000	\$ 373,010	\$ 367,250	\$ 375,000	\$ 372,250	\$ 383,000	\$ 399,950	\$ 379,000	\$ 380,000	\$ 345,000	\$ 324,950	\$ 367,250	\$ 356,250	\$ 368,576	-5%
Snohomish	\$ 292,725	\$ 283,129	\$ 287,000	\$ 279,995	\$ 280,000	\$ 279,950	\$ 280,000	\$ 276,850	\$ 265,000	\$ 285,000	\$ 247,960	\$ 274,950	\$ 259,995	\$ 233,750	\$ 260,000	\$ 252,000	\$ 266,288	-10%
Pierce	\$ 223,350	\$ 222,500	\$ 215,650	\$ 207,250	\$ 219,000	\$ 219,900	\$ 217,500	\$ 215,000	\$ 222,751	\$ 225,000	\$ 225,950	\$ 221,975	\$ 210,000	\$ 181,475	\$ 220,000	\$ 200,000	\$ 214,879	-3%
Skagit	\$ 235,000	\$ 212,200	\$ 223,810	\$ 203,823	\$ 229,999	\$ 220,000	\$ 221,000	\$ 220,750	\$ 244,000	\$ 215,000	\$ 245,000	\$ 200,300	\$ 220,000	\$ 179,900	\$ 230,250	\$ 197,000	\$ 218,600	-3%
Thurston	\$ 229,450	\$ 225,000	\$ 229,468	\$ 225,000	\$ 223,440	\$ 227,000	\$ 226,850	\$ 224,500	\$ 235,000	\$ 235,000	\$ 240,900	\$ 234,950	\$ 216,500	\$ 193,250	\$ 229,000	\$ 216,500	\$ 225,241	-4%
Kittitas	\$ 219,450	\$ 231,000	\$ 226,720	\$ 220,000	\$ 212,000	\$ 194,912	\$ 241,000	\$ 225,350	\$ 180,495	\$ 277,000	\$ 189,500	\$ 235,000	\$ 260,000	\$ 194,400	\$ 205,000	\$ 168,000	\$ 215,221	-24%
Whatcom	\$ 258,500	\$ 254,000	\$ 245,500	\$ 244,000	\$ 250,000	\$ 232,500	\$ 253,000	\$ 247,150	\$ 246,500	\$ 262,000	\$ 255,110	\$ 259,950	\$ 230,000	\$ 230,000	\$ 255,750	\$ 244,900	\$ 247,238	0%

Single Family Residential Mortgage Rates – Conforming and Jumbo – Building Permits

Interest Rates	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11
Conforming	5.42%	5.14%	5.04%	5.31%	5.19%	5.49%	5.22%	5.19%	5.24%	5.07%	4.89%	4.70%	4.56%	4.59%	4.50%	4.51%	4.58%	5.02%	5.02%
Non-conforming	6.60%	6.46%	6.45%	6.28%	6.06%	6.29%	6.10%	6.09%	6.08%	6.10%	5.98%	5.49%	5.46%	5.22%	5.16%	5.10%	5.18%	5.58%	5.54%

Building Permits - Single Family:																				
	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Month Change	% Change vs yr ago
King	221	184	232	167	147	197	195	202	259	225	219	257	208	173	195	149	136	142	4%	-28%
Snohomish	199	107	150	199	113	180	207	168	231	161	114	172	125	99	139	166	147	148	1%	-18%
Pierce	119	121	116	100	105	94	80	123	170	219	148	182	148	148	106	112	129	137	6%	46%
Thurston	72	123	98	72	67	78	56	50	91	101	74	75	85	67	49	84	75	47	-37%	-40%
Total-4 County	611	535	596	538	432	549	538	543	751	698	555	686	566	487	489	511	487	474	-3%	-14%

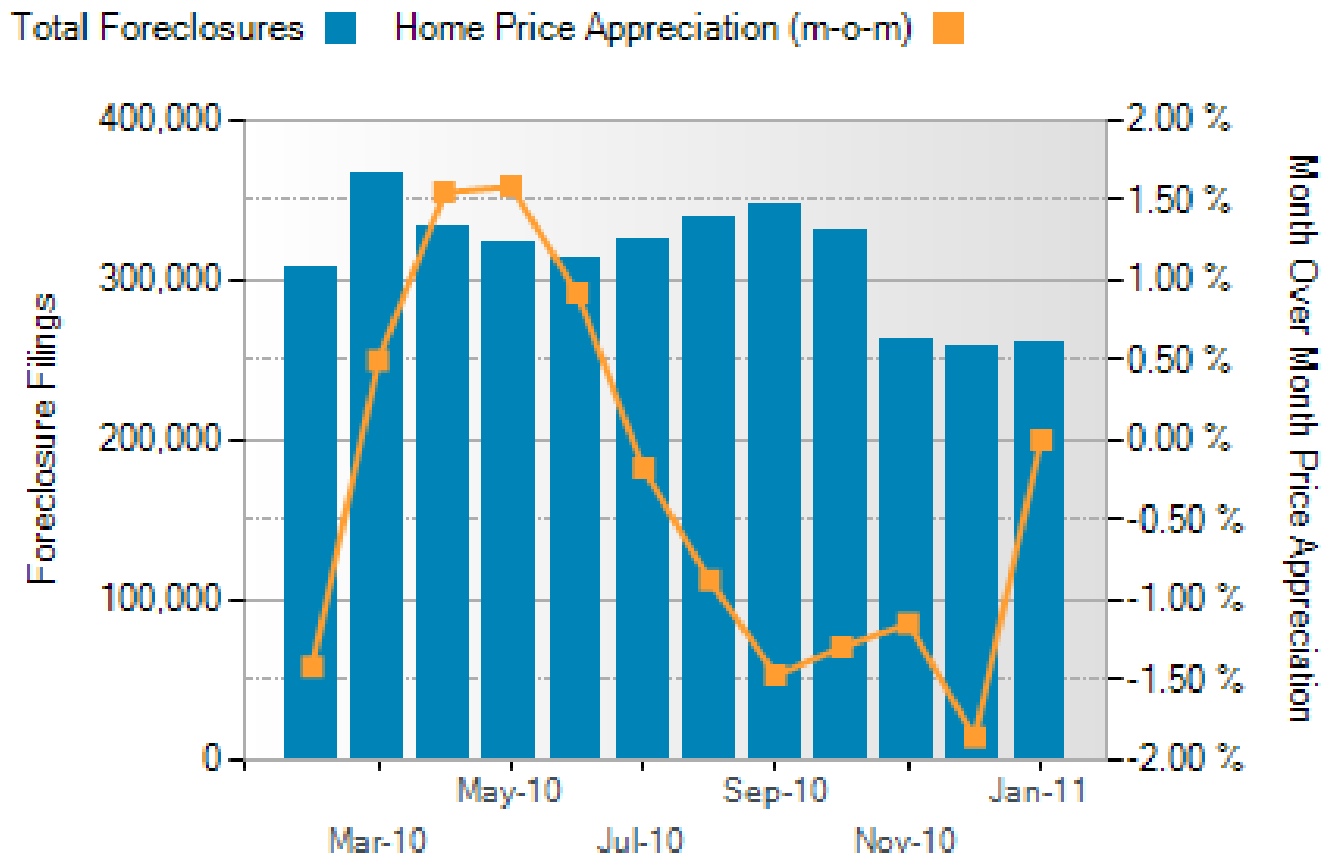
Correlation Analysis

Correlation Analysis								
	Permits	Months supply	Price change	Monthly listings	Monthly sales	Unemployment	Avg. Price	Mortgage Rates
Permits	1.00	-0.05	-0.09	0.55	0.21	-0.68	0.67	0.58
Months supply	-0.05	1.00	-0.36	0.08	-0.90	-0.11	0.00	-0.11
Price change	-0.09	-0.36	1.00	-0.24	0.21	0.03	0.27	-0.08
Monthly listings	0.55	0.08	-0.24	1.00	0.30	-0.58	0.52	0.40
Monthly sales	0.21	-0.90	0.21	0.30	1.00	-0.12	0.22	0.26
Unemployment	-0.68	-0.11	0.03	-0.58	-0.12	1.00	-0.82	-0.83
Avg. price	0.67	0.00	0.27	0.52	0.22	-0.82	1.00	0.66
Mortgage rates	0.58	-0.11	-0.08	0.40	0.26	-0.83	0.66	1.00

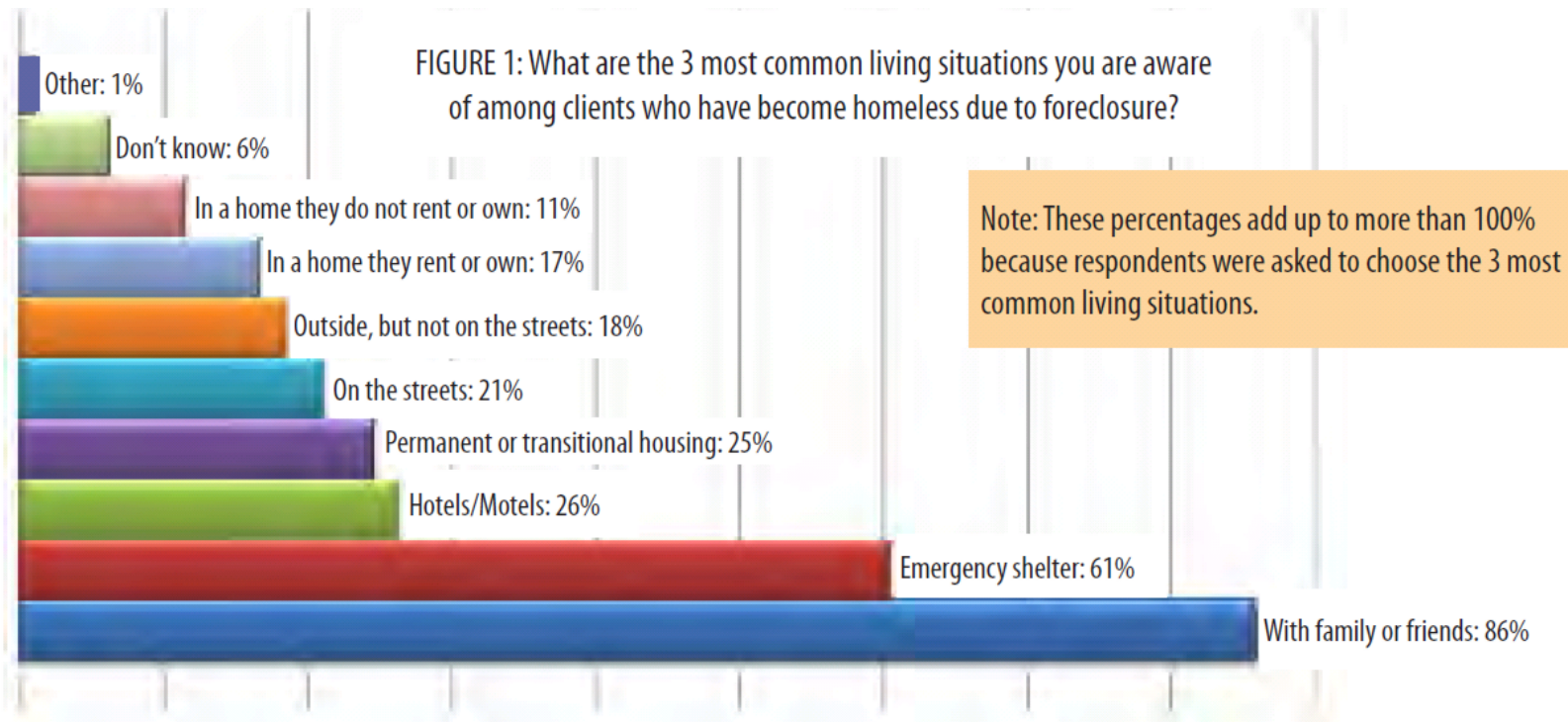
Very High Correlation (> 0.8)

Moderately High Correlation (0.6 to 0.79)

Foreclosure Activity and Home Price Index - WA



Where do people go after foreclosure?



Housing Crisis

- Duration of unemployment
- 1973 - 2.2m housing starts
- 2011 – 419,000 housing starts
- Household formation declining
- True unemployment rate 16%
- 18m foreclosure filings by 2011 Q4
- 24% housing units in foreclosure

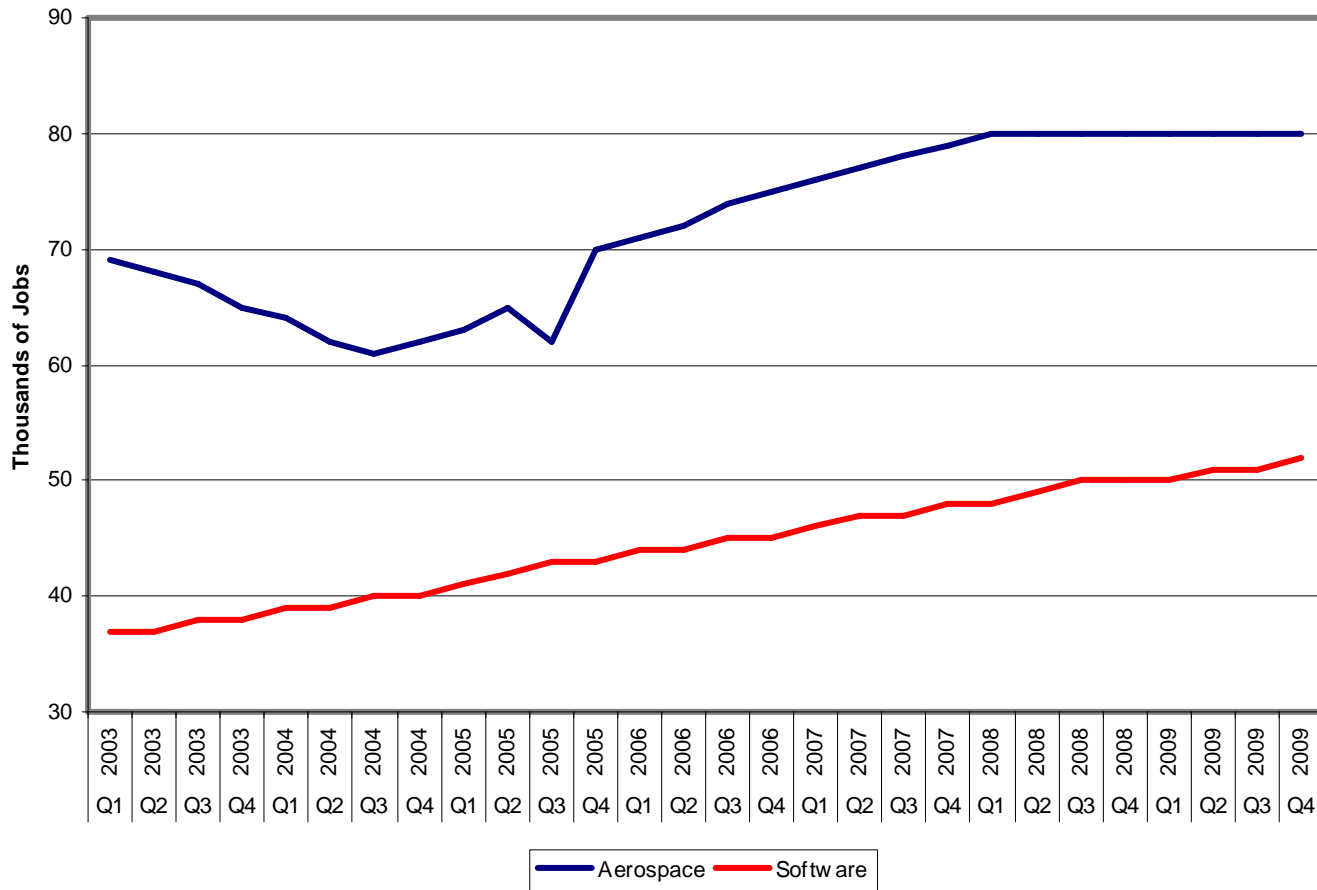
Summary Apartment Market Statistics

Market (County)	Average Size (sq. ft.)	Average Rent	Number of Units	Number Vacant	Vacancy Rate
Benton/Franklin (Tri-Cities)	855	\$722	6,006	72	1.2%
Chelan/Douglas (Wenatchee)	846	\$725	913	45	4.9%
Clark (Vancouver)	910	\$739	13,125	604	4.6%
Cowlitz (Longview/Kelso)	730	\$595	1,128	37	3.3%
King (Seattle/Bellevue)	n/a	\$1,017	121,360	7,282	6.0%
Kitsap (Bremerton)	n/a	\$848	6,686	501	7.5%
Kittitas (Ellensburg)	793	\$624	1,733	107	6.2%
Pierce (Tacoma)	n/a	\$811	35,039	2,663	7.6%
Skagit (Mt. Vernon/Anacortes)	827	\$753	1,307	90	6.9%
Snohomish (Everett)	n/a	\$876	29,833	1,700	5.7%
Spokane	844	\$627	10,025	782	7.8%
Thurston (Olympia)	n/a	\$805	9,124	593	6.5%
Walla Walla	730	\$545	464	22	4.7%
Whatcom (Bellingham)	786	\$733	3,169	110	3.5%
Whitman (Pullman)	773	\$694	4,279	338	7.9%
Yakima	718	\$537	1,954	63	3.2%
STATEWIDE	n/a	\$899	246,145	15,010	6.1%

Vacancy Rate and Average Rent Comparisons: 2009 / 2010

Counties	2009		2010	
	Vacancy Rate	Average Rent	Vacancy Rate	Average Rent
Benton/Franklin	2.9%	\$656	1.2%	\$722
Chelan/Douglas	4.4%	\$712	4.9%	\$725
Clark	4.8%	\$741	4.6%	\$739
Cowlitz	2.8%	\$573	3.3%	\$595
King	6.8%	\$1,065	6.0%	\$1,017
Kitsap	8.6%	\$851	7.5%	\$848
Kittitas	5.4%	\$704	6.2%	\$624
Pierce	6.0%	\$829	7.6%	\$811
Skagit	6.8%	\$728	6.9%	\$753
Snohomish	6.8%	\$949	5.7%	\$876
Spokane	5.5%	\$639	7.8%	\$627
Thurston	5.3%	\$826	6.5%	\$805
Walla Walla	2.9%	\$624	4.7%	\$545
Whatcom	3.2%	\$742	3.5%	\$733
Whitman	4.4%	\$629	7.9%	\$694
Yakima	4.7%	\$506	3.2%	\$537
STATEWIDE	6.3%	\$930	6.1%	\$899

Twin Economic Engines of Washington State



Photovoltaic $\sum (x_i)$ Solutions

1. Market conditions

- Costs
- Energy diversification
- International independence
- Employment
- Federal and local tax policies

Photovoltaic $\sum (x_i)$ Solutions

2. Market development

- Research and Development
- Design and engineering
- Supply chain capability
- Manufacturing
- Maintenance
- Replacement

Photovoltaic $\sum (x_i)$ Solutions

3. Demand function

$$d\int = \int |\sum P_i + \Delta P_e + GP + \Lambda_c|$$

where:

$\sum P_i$ product quality performance

$$\Delta P_e \quad PEd = \frac{\Delta Q}{\Delta P} + \sum (v_i)$$

GP public policy of tax incentives, regulatory

Λ_c the distribution and supply chain channels

Photovoltaic $\sum_{(x_i)}$ Solutions

4. Supply chain value differential

$$D\left\{\int(g(x))\right\} = \int'(g(x))g'(x)$$

- Lower marginal cost
- Higher marginal revenue
- Higher quality and performance

Photovoltaic $\sum (x_i)$ Solutions

5. Convergence

$$\lim_{n \rightarrow \infty} \frac{1}{\sqrt{n}} = 0$$

- CAMPS
- Supply chain integration
- Business Climate
- Investment and tax policy
- Financing
- Intellectual property

6. Divergence

$$\lim_{n \rightarrow \infty} (-1)^n$$

- Product export to domestic market

Need for Leadership

- Inspiration
- Rights
- Business Cycles
- Who?