

**Long Run Economic Effects on
the Housing Market**
Amsterdam, 1550 - 1998

Piet Eichholtz
Marcel Theebe

Agenda

- Basic idea
- Taking pictures
- Some analysis
- Conclusions and further work

Basic idea

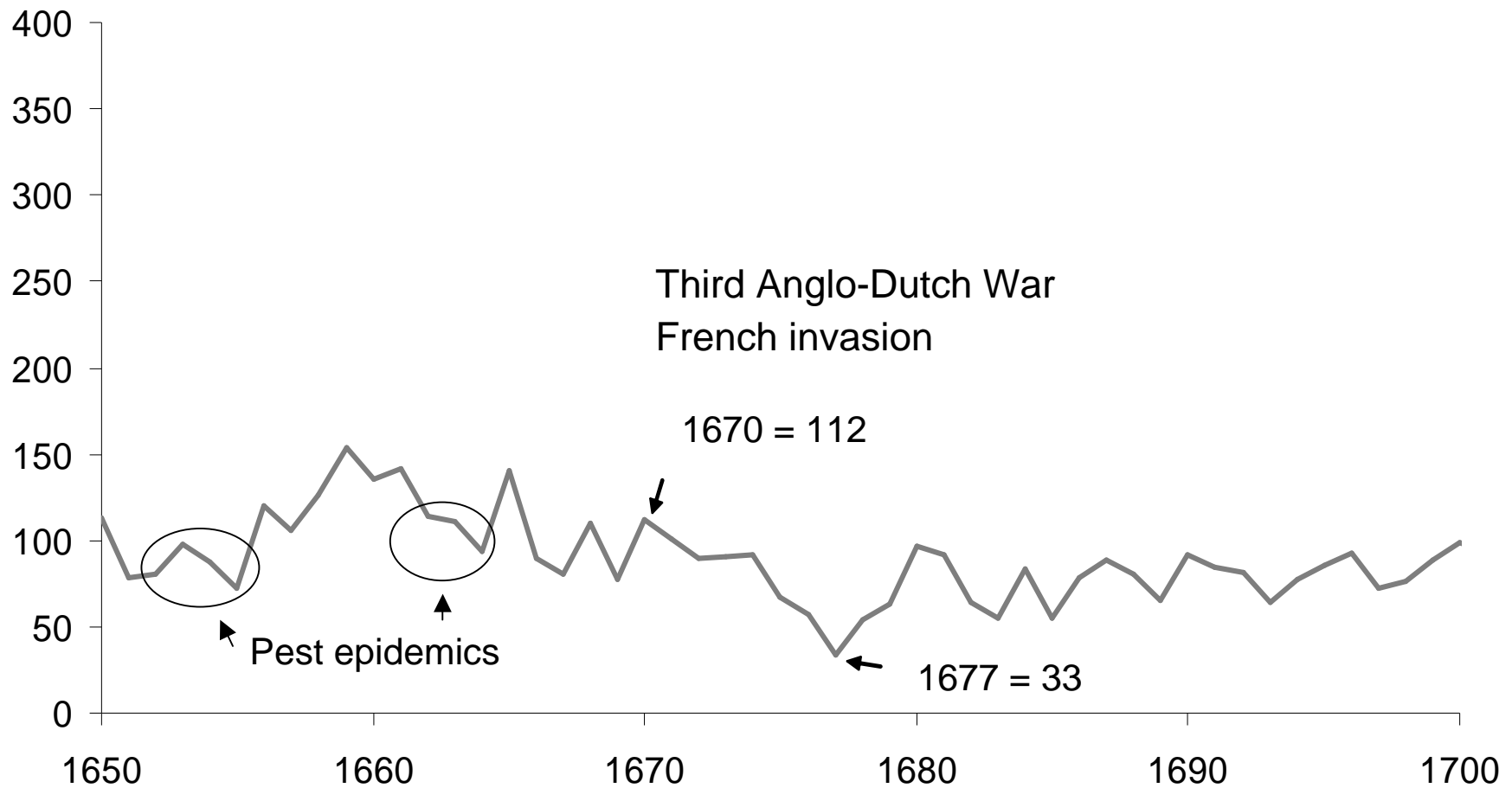
- Empirical research housing market risks and performance usually based on post-WW II data
- Does this time period provide an unbiased look at reality?
- Take a look at housing market performance and performance drivers for very long run
 - Look at house prices and rents
 - Use indicators of business cycle (GDP, tax income)
 - Look at sources of fundamental volatility (wars, financial crises, plagues, famines)

The housing indices

- Price index
 - Repeat sales methodology (Case, Shiller, AER 1989)
 - Index based on all known house sales prices at Herengracht, Amsterdam, mostly privately held
 - Approximately 600 dwellings, 5,500 sales pairs, healthy index estimation stats
 - Herengracht is limited sample, but constant quality
 - Source: Herengracht book
- Rent index
 - Repeated rent index, based on new rental contracts (market rents)
 - Cross section of institutionally held Amsterdam houses, 1550-1850
 - 1,055 dwellings, 5,687 new contract pairs, healthy index estimation stats
 - Source: Lesger (1986)

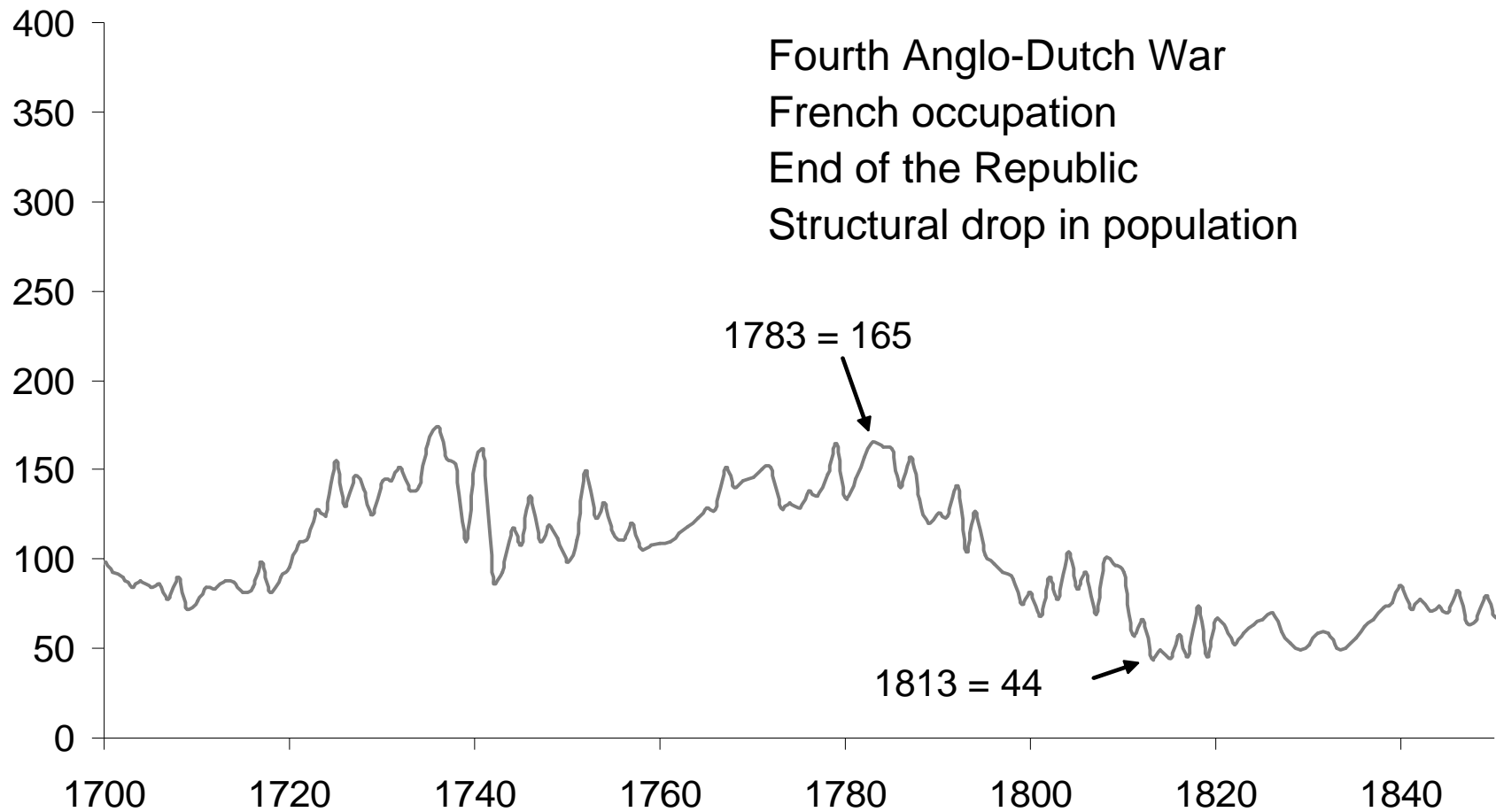
Housing market with flexible demographics

Herengracht Index, 1650-1700, real terms



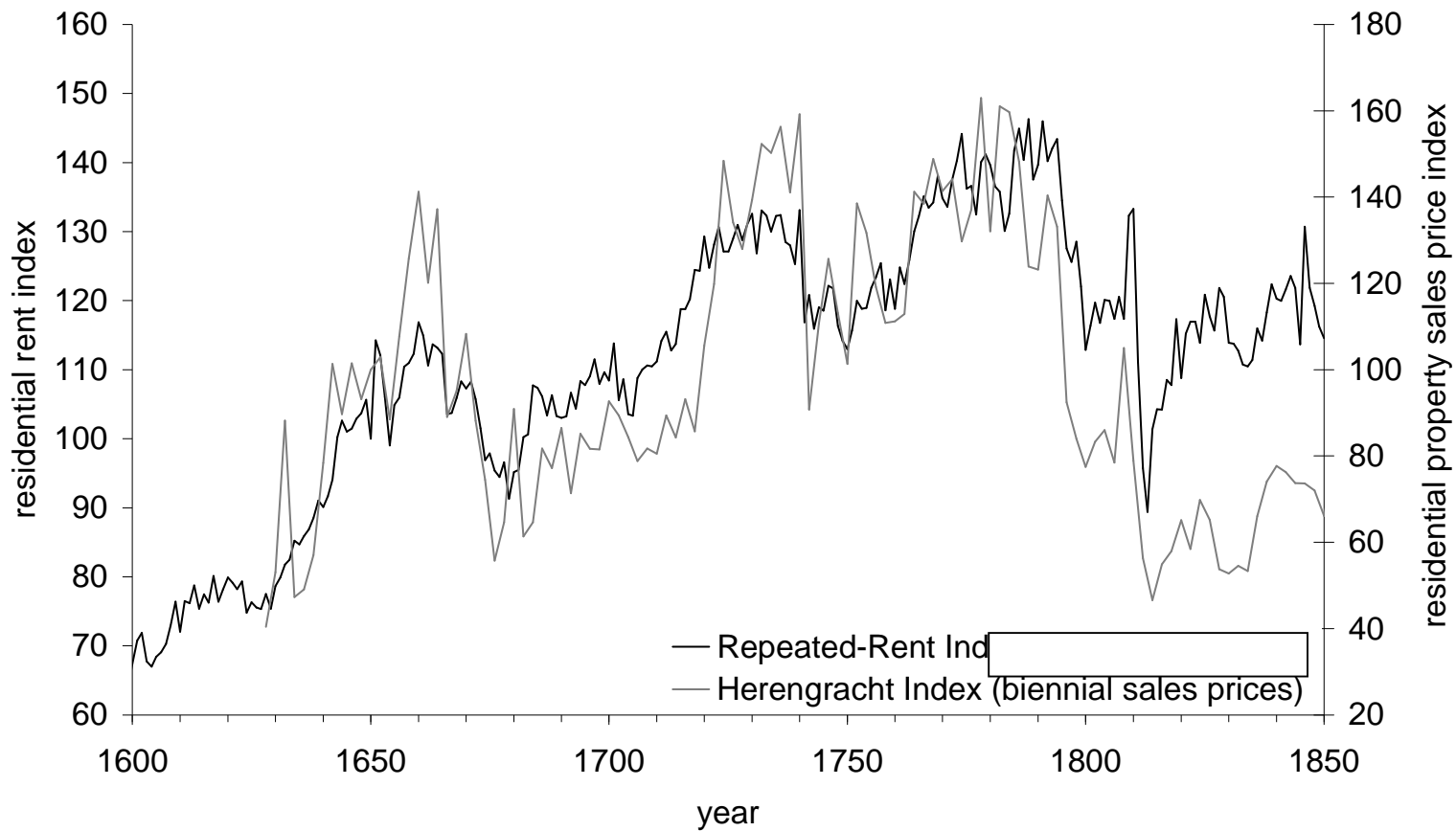
Housing and a structural crisis

Herengracht Index, 1700-1850, real terms

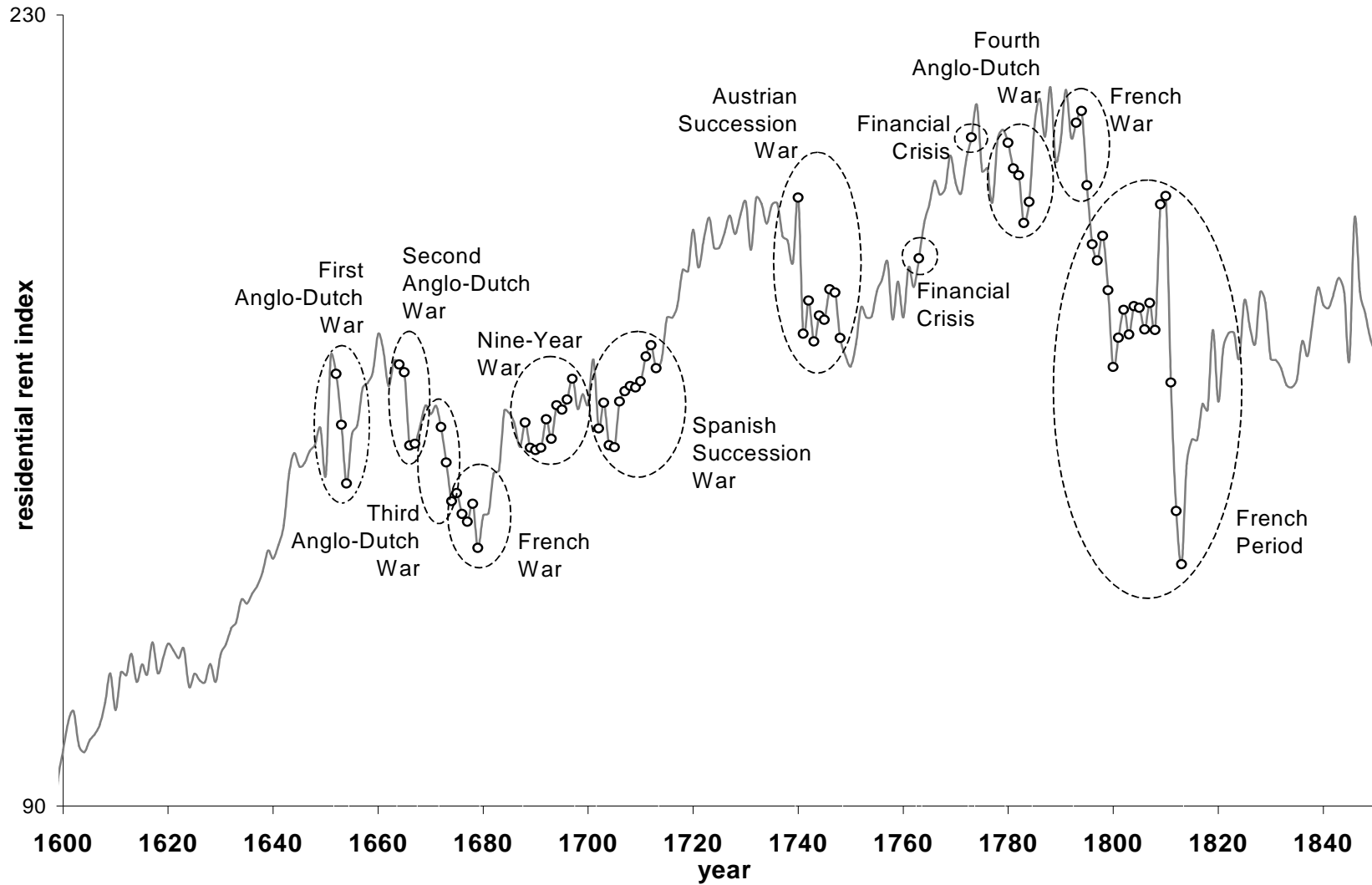


Housing rents and sales prices

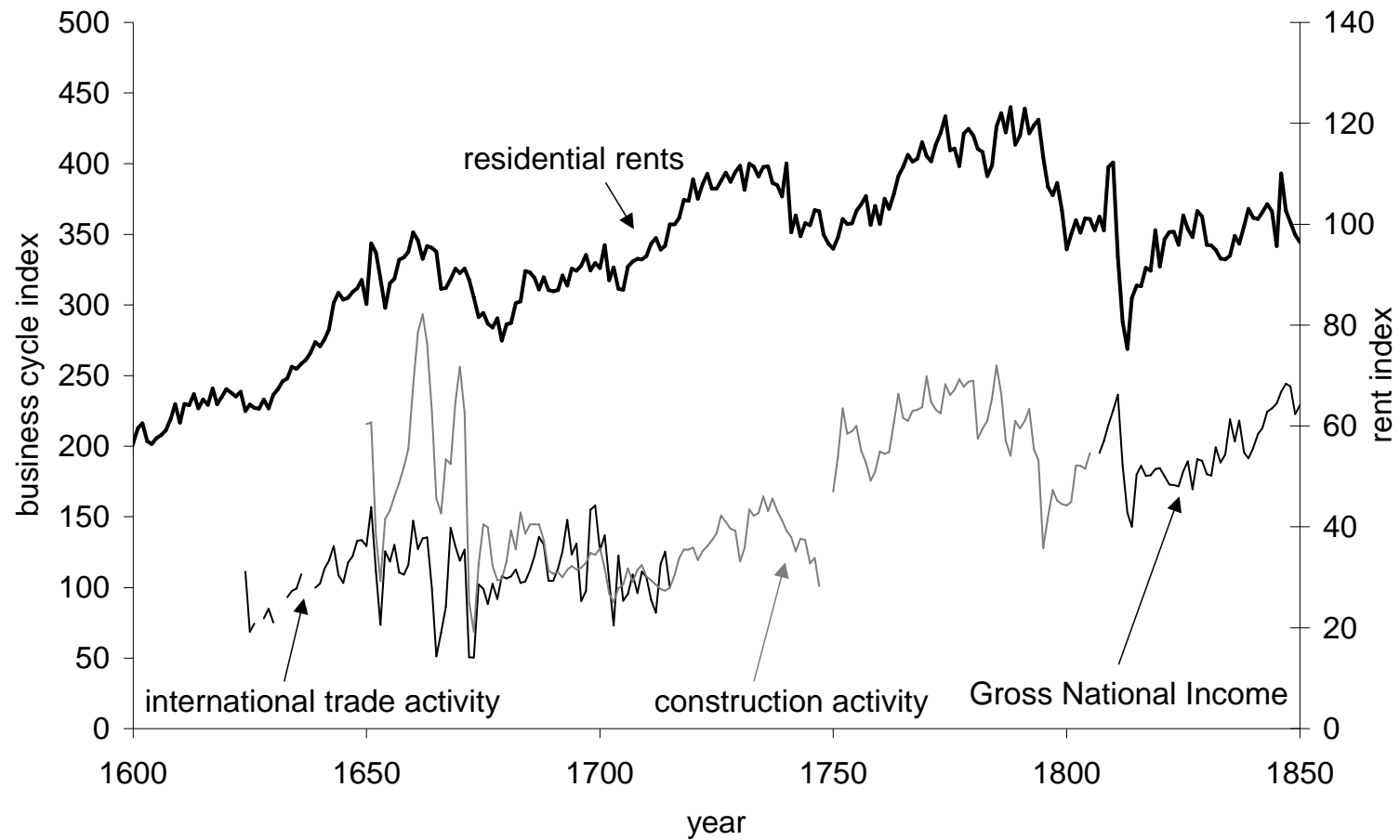
Nominal series, 1600-1850



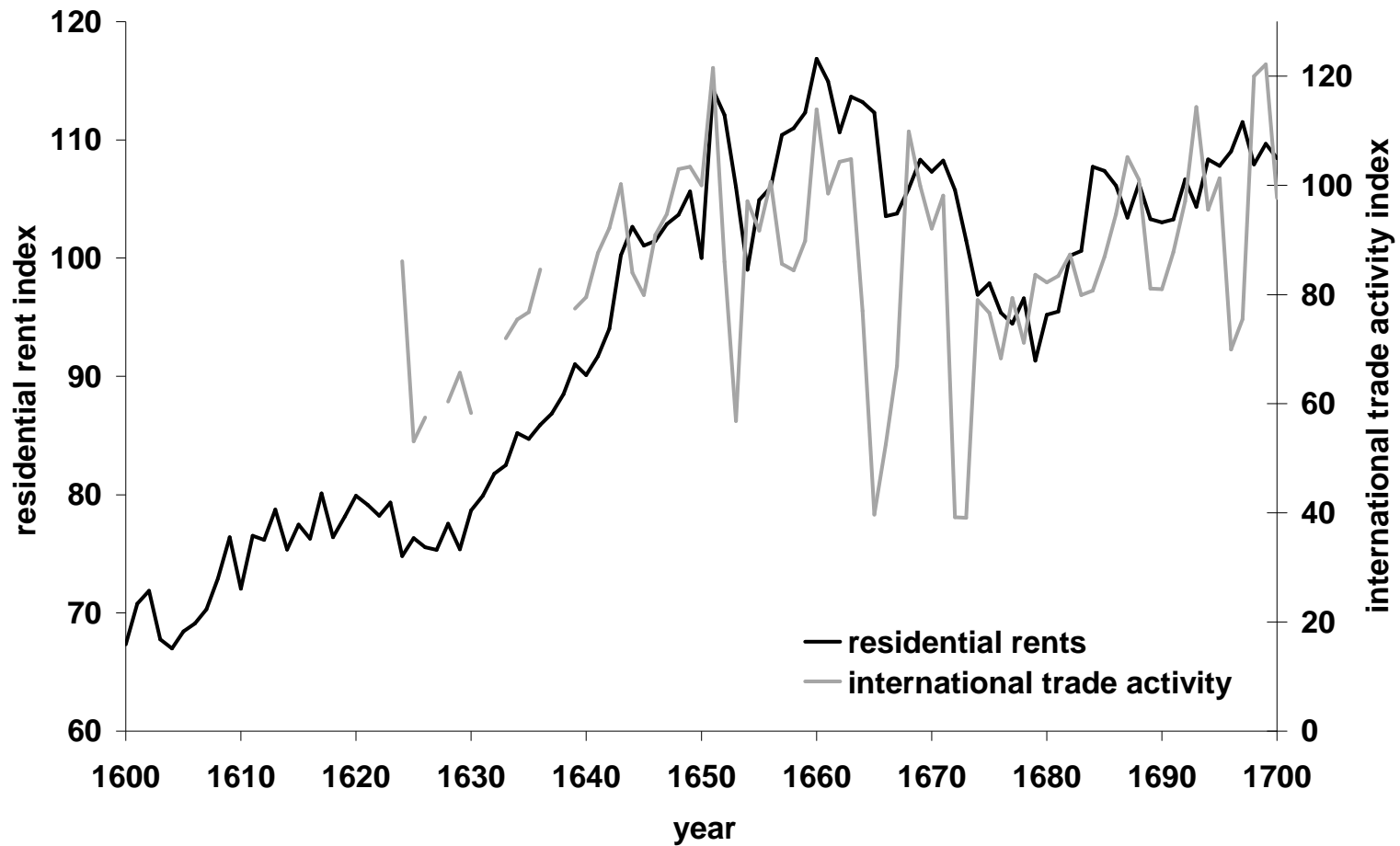
Rents, wars and crises



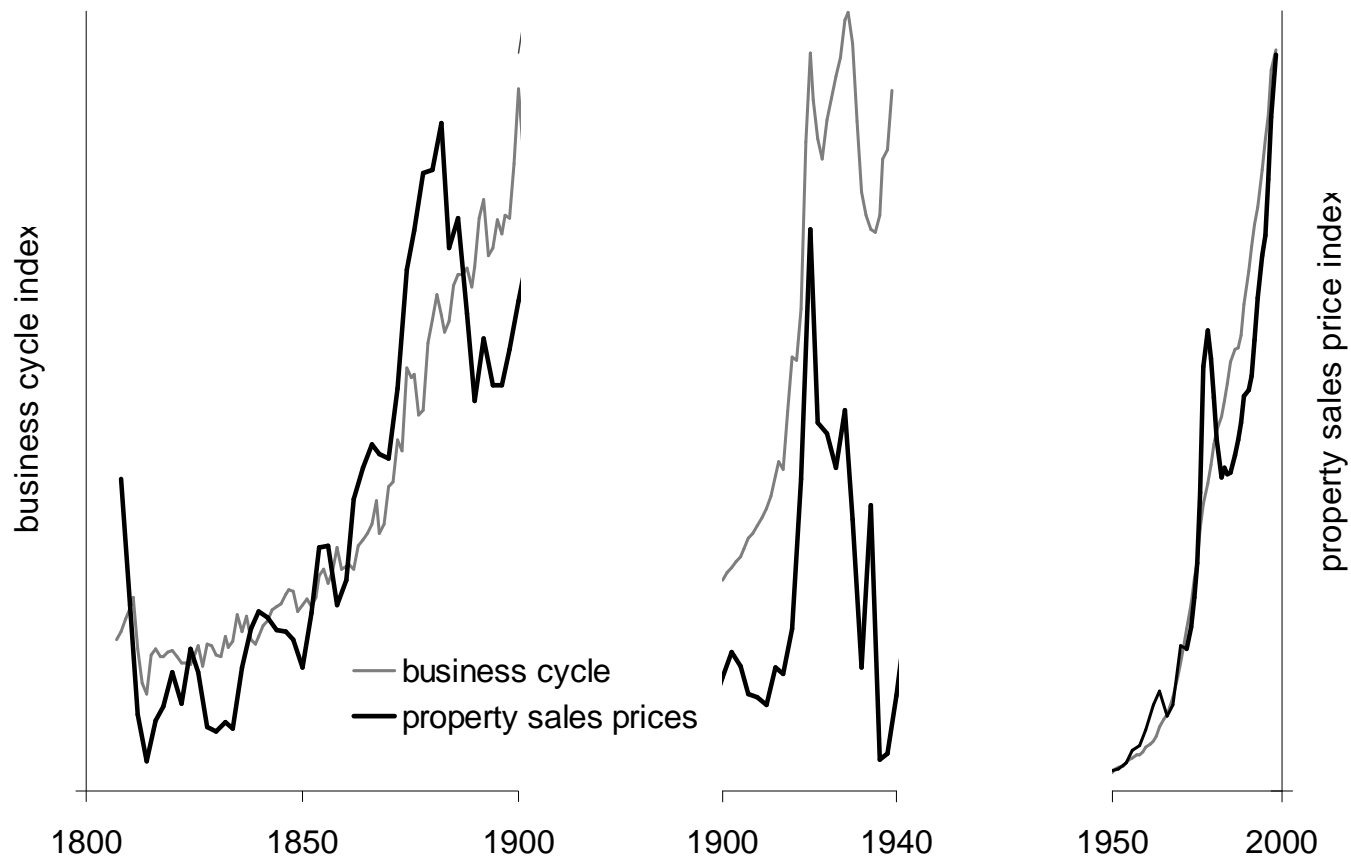
Rents and economic indicators



Rents and economic indicator, Golden Age



House prices and economic indicators



Correlations housing market and economic indicators

Period	Business cycle indicators				Other economic series		
	DUTY 1624- 1715	CONSTR 1650- 1805	GNI 1807- 1913	NNI 1900- 1998	CPI 1550- 1998	INTEREST 1723- 1998	WAGE 1550- 1820
RENT	-0.16 (83)	0.07 (152)	0.23 (43)	. (0)	0.02 (300)	-0.05 (124)	0.24 ^{***} (269)
RENT(t+1)	0.27 ^{**} (83)	0.33 ^{***} (152)	-0.19 (42)	. (0)	0.01 (299)	-0.06 (123)	0.27 ^{***} (269)
SALES	-0.09 (66)	0.04 (152)	0.05 (106)	0.16 (91)	0.07 (349)	-0.08 (272)	0.11 (170)

War and the housing market

OUTBREAK	Period	const	β_{-1}	β_0	β_1	β_2	β_3	β_4	β_5
INTEREST	1724	0.051 [*]	0.188	0.437 ^{**}	-0.206	-0.113	-0.156	-0.047	-0.289
(%)	1998	(1.67)	(0.99)	(2.31)	(-1.09)	(-0.60)	(-0.83)	(-0.29)	(-1.53)
RENT	1551	0.008	0.036	-0.018	-0.022	-0.011	0.005	-0.023	-0.013
(% change)	1850	(1.00)	(0.98)	(-0.48)	(-0.59)	(-0.30)	(0.13)	(-0.61)	(-0.34)
SALES	1650	0.031 ^{**}	0.079	-0.191 ^{***}	0.002	-0.040	-0.103	0.053	-0.068
(% change)	1998	(2.40)	(1.21)	(-2.92)	(0.03)	(-0.61)	(-1.57)	(0.81)	(-1.04)
END	Period	const	β_{-1}	β_0	β_1	β_2	β_3	β_4	β_5
INTEREST	1724	0.051 [*]	-0.158	-0.050	-0.193	-0.224	0.070	0.110	0.042
(%)	1998	(1.73)	(-0.67)	(-0.19)	(-0.72)	(-0.96)	(0.30)	(0.47)	(0.18)
RENT	1551	0.005	-0.002	-0.010	0.033	-0.002	0.040	-0.021	0.003
(% change)	1850	(0.68)	(-0.06)	(-0.24)	(0.79)	(-0.04)	(0.98)	(-0.52)	(0.07)
SALES	1650	0.017	0.018	-0.016	0.048	0.066	0.064	-0.006	0.029
(% change)	1998	(1.30)	(0.24)	(-0.21)	(0.65)	(0.95)	(0.93)	(-0.09)	(0.42)

Effect of shocks on real rent and house price changes

	RENT (% change)	SALES (% change)
Period	1551-1850	1650-1998
War eruptions	10	11
War endings	8	9
Plague epidemics	5	2
Financial crises	2	2
Famines	3	3
Constant	0.004	0.021 [*]
War eruption (t)	-0.015	-0.178 ^{***}
War eruption (t+1)	-0.018	-0.034
War end (t)	-0.015	-0.021
War end (t+1)	0.033	0.048
Plague (t)	0.004	-0.040
Plague (t+1)	-0.002	0.478 ^{***}
Financial crisis (t)	0.109	-0.001
Financial crisis (t+1)	0.101	0.081
Famine (t)	-0.162 ^{**}	-0.347 ^{***}
Famine (t+1)	0.152 ^{**}	0.413 ^{***}

Some preliminary conclusions

- Long-run development in rents and prices in Amsterdam housing market show similar patterns
- Housing market is volatile and prone to crises
- Housing market does not provide protection against business cycle movements
- Financial crises do not seem to have a big effect on the housing market
- Fundamental shocks seem to influence values more than rents, interest rate is transmission mechanism
- Markets bounce back after shocks are absorbed

Further work

- The rent index is being updated
 - Extend rent analysis to 20th century
 - Create total return index for housing
- Formal relationships need to be established in a multifactor model
- Does the rent/price ratio mean revert, and how long would that take?
- What does all this mean for household portfolio construction?