

Home Prices in France Over the Long Run

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The analyses and points of view expressed are the author's, and, in particular, not necessarily CGEDD's or the government's.

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Preliminary

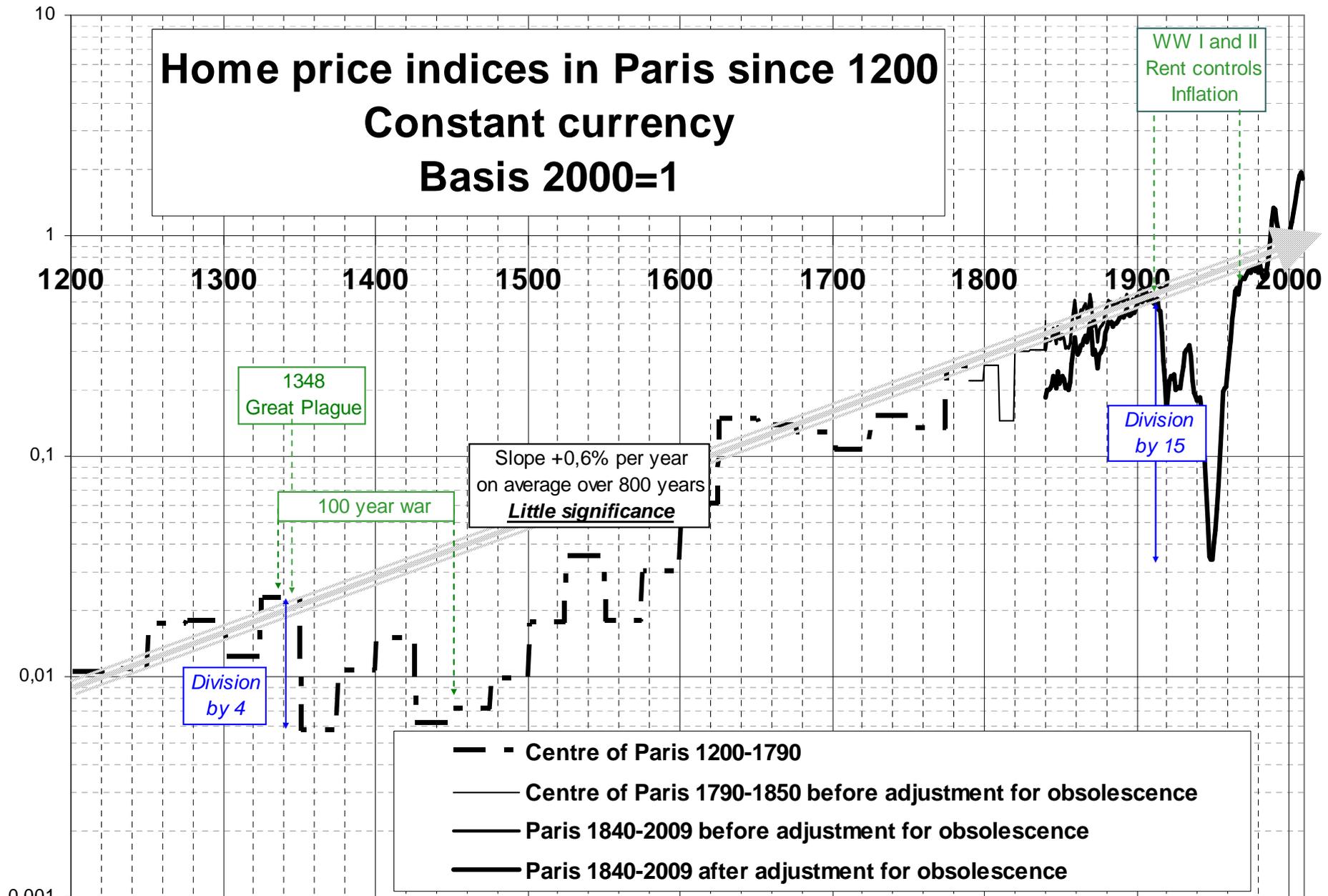
- **« CGEDD » = “Conseil général de l’environnement et du développement durable” = internal audit and prospective department common to the ministries in charge of the environment, sustainable development, energy, transportation, etc. and housing**
- **Accent on long term perspective**
- **Various papers, presentations, data series, sources, monthly updates may be downloaded on**
http://www.cgedd.developpement-durable.gouv.fr/rubrique.php3?id_rubrique=137

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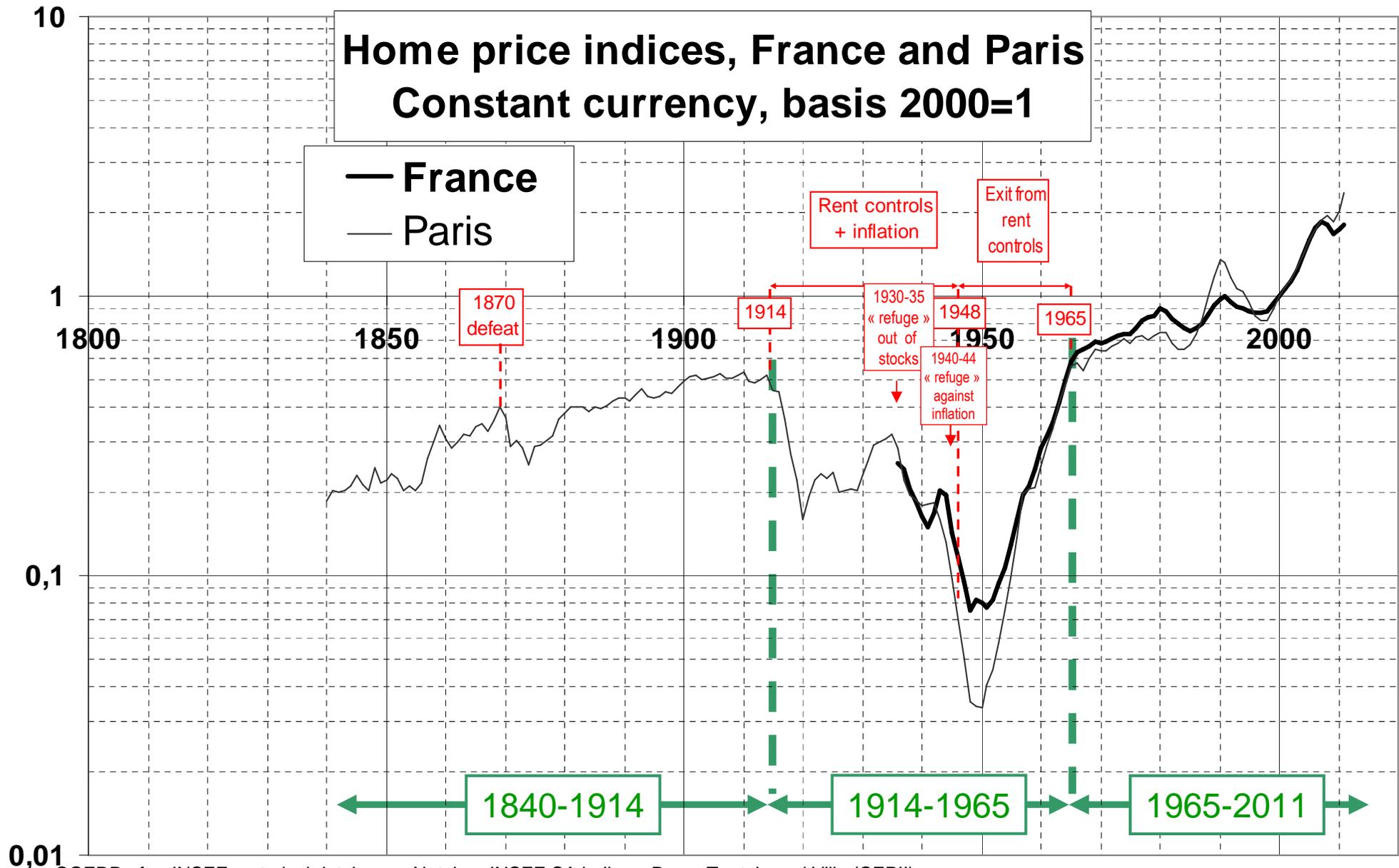
- 1. Home prices in France, a Historical perspective**
- 2. Comparison with Other Assets**
- 3. Several Important Properties of Home Prices**
- 4. How can we Explain the 2000-2010 Rise?**
- 5. Home Price Prospective**

Home price indices in Paris since 1200



Source: CGEDD after d'Avenel, Duon, INSEE, indices Notaires-INSEE and notaries' databases

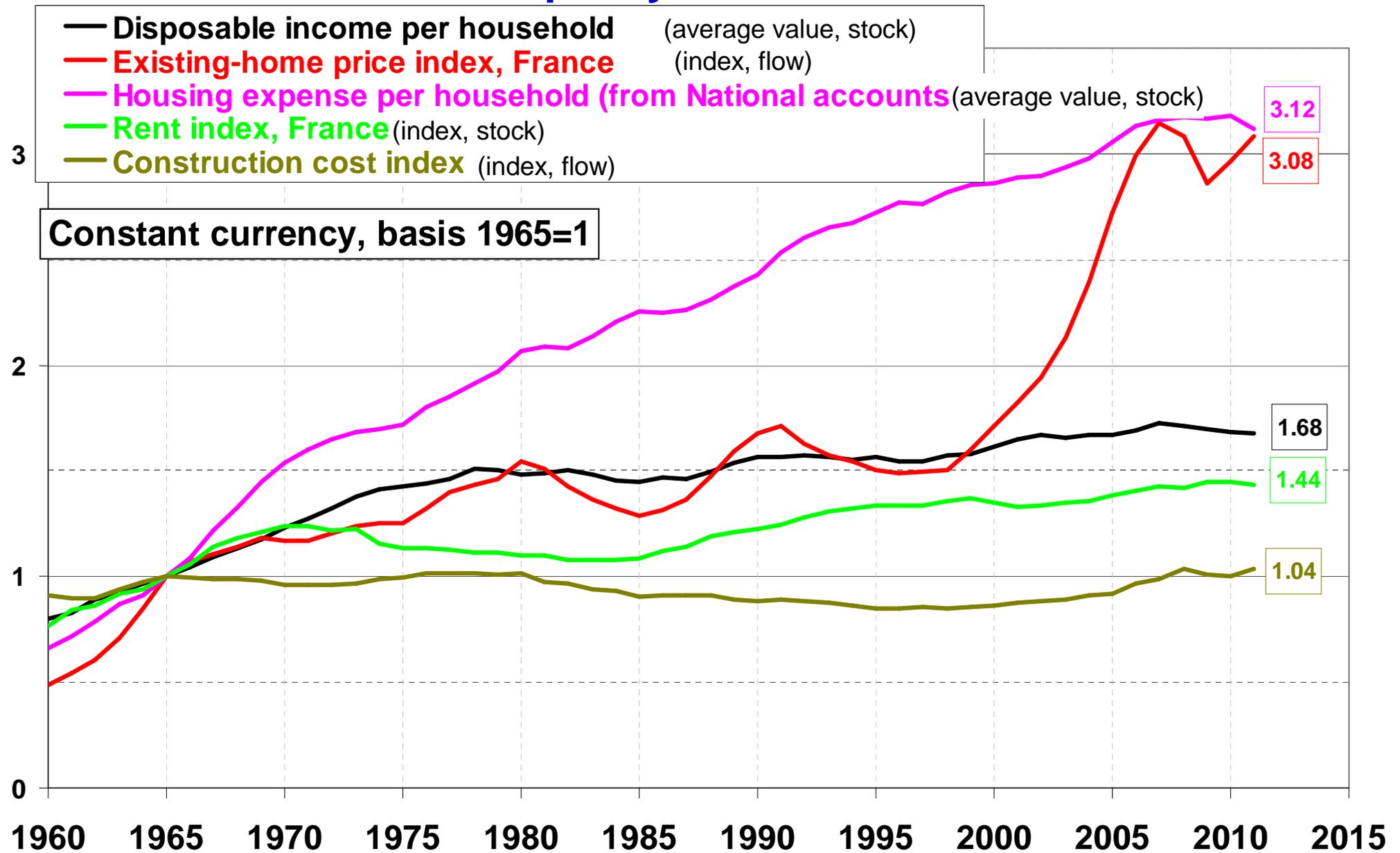
1840-2011: the 1914-1965 depression



Source: CGEDD after INSEE, notaries' databases, Notaires-INSEE SA indices, Duon, Toutain and Villa (CEPII).

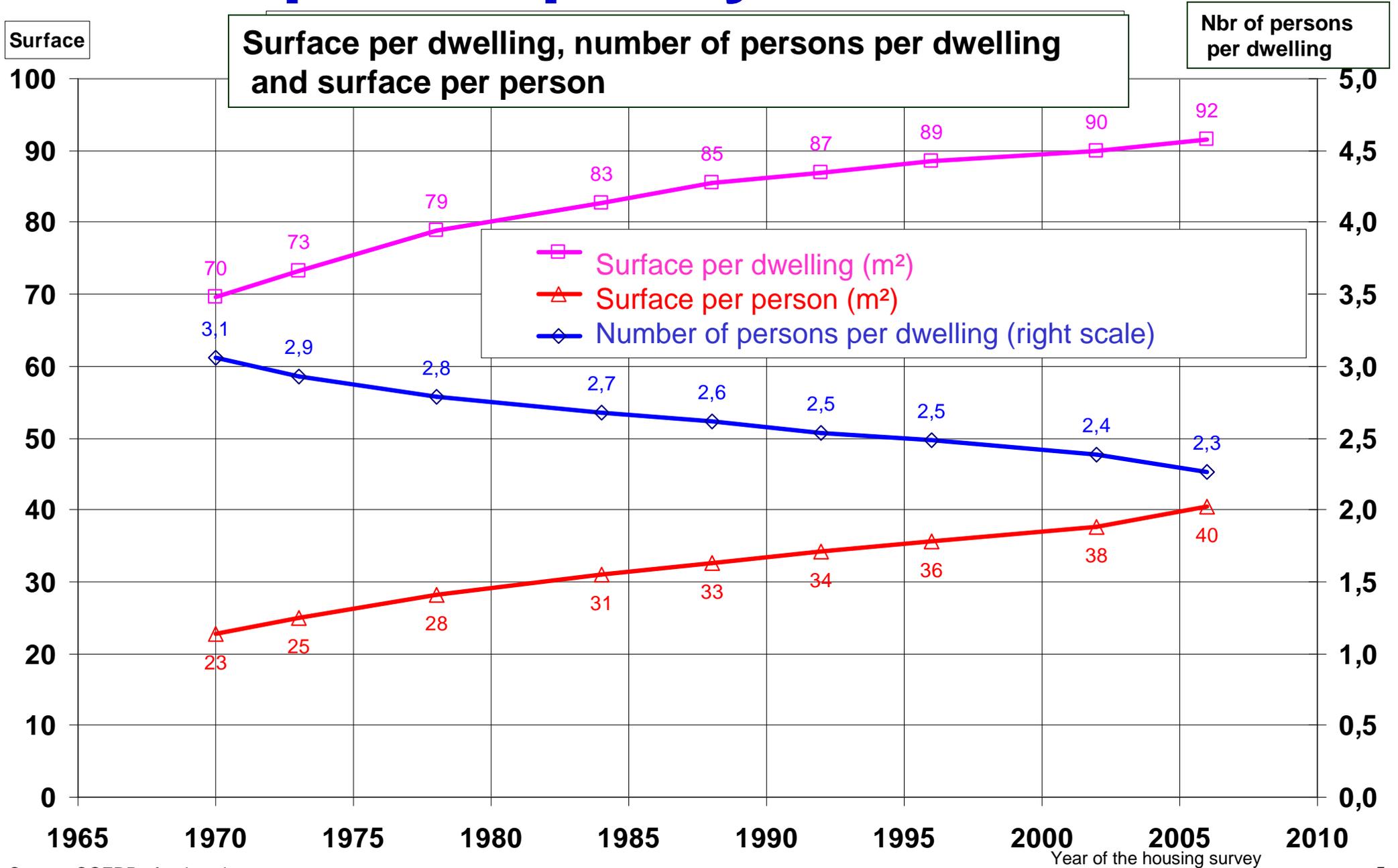
What are we talking about?

Beware quality/structural effects!



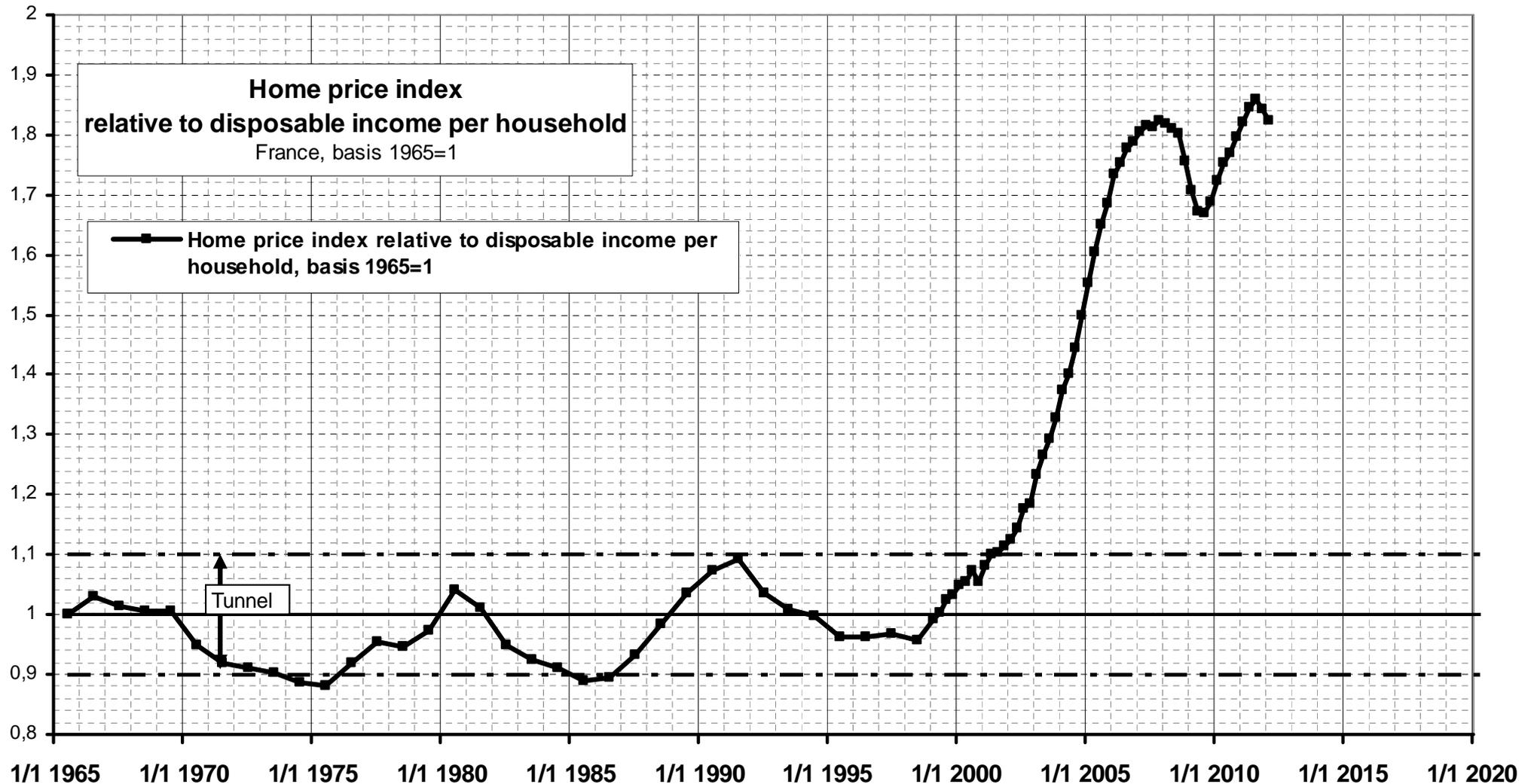
Source: CGEDD after INSEE and notaries' databases

Example of quality effect: surface



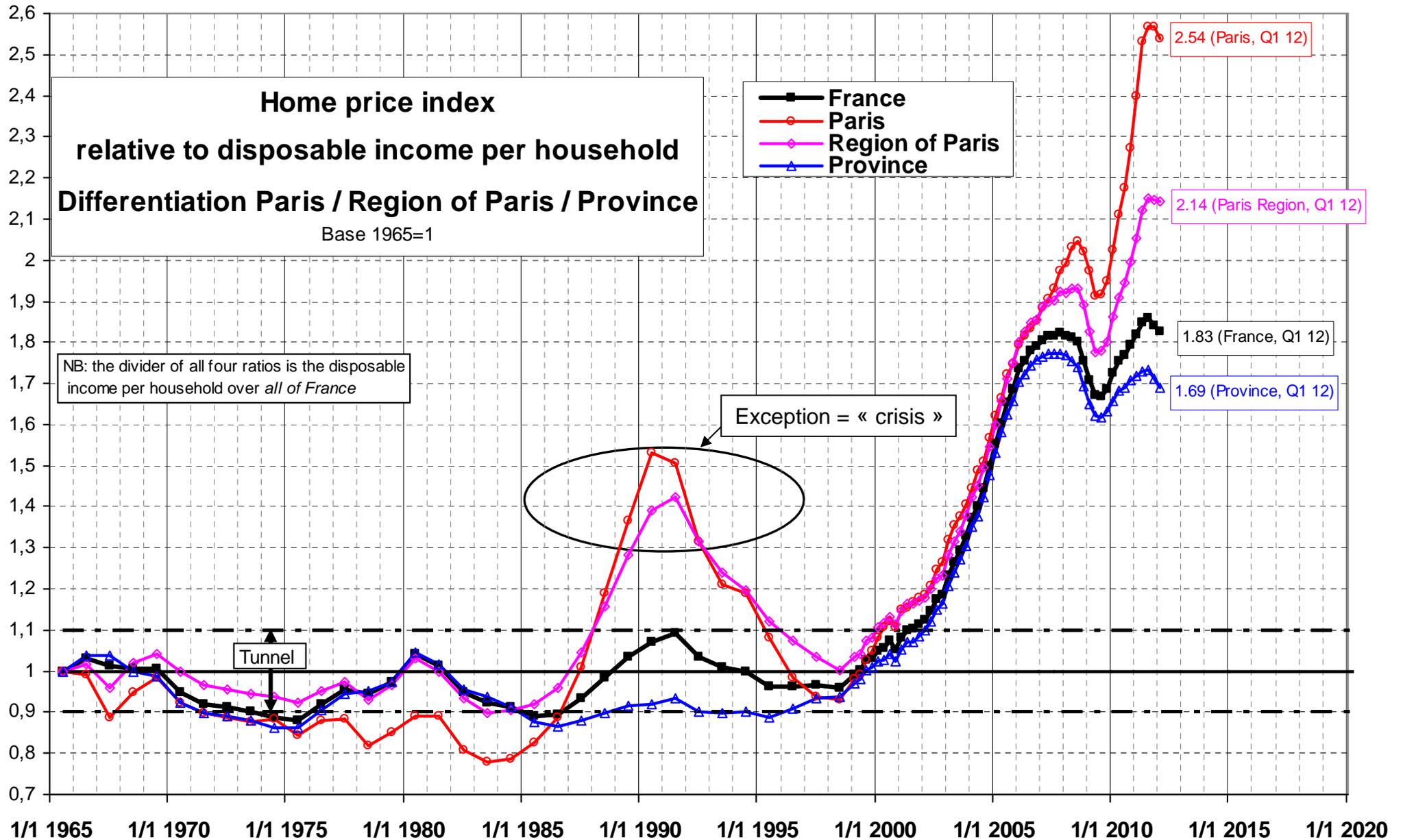
Source: CGEDD after housing surveys

Stability from 1965 to 2000 then take off of the home price index relative to income per household



Source: CGEDD after INSEE, notaries' databases, Notaires-INSEE indices.

Local differentiation



2000-2010: heterogeneity of home price growth in the various « departments »

The extremes (growth from 2000 to 2010 in the existing-home price indices):

- The 3 smallest increases: Territoire de Belfort: +59%; Haut-Rhin (deptt of Colmar): +64%, Moselle +70%
- The 3 biggest increases: Bouches-du-Rhône (=departt of Marseilles), Paris, Alpes-Maritimes (departt of Nice): (in a draw) +138%
- (France: + 107%)

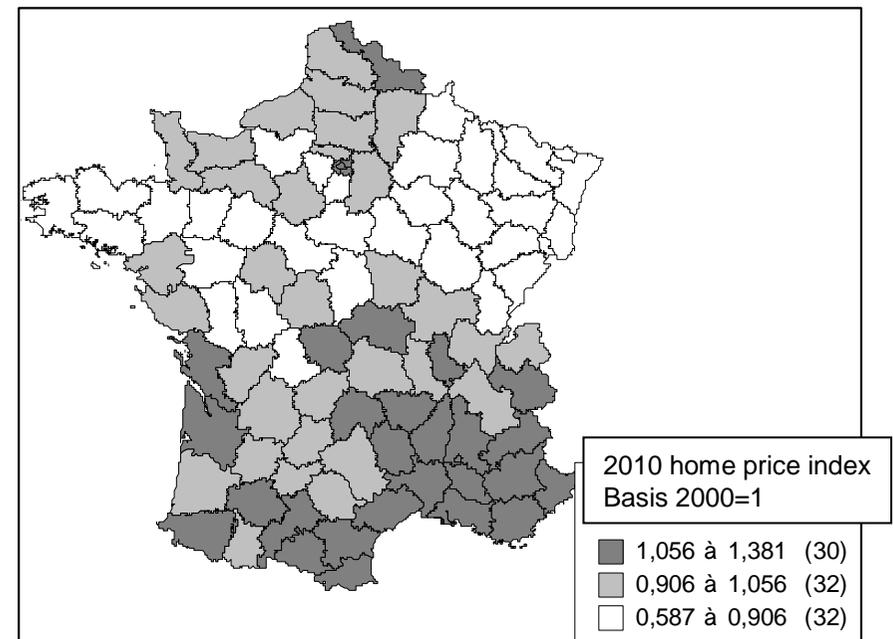
(Source: Notaires-INSEE indices and Perval)

Higher 2000-2010 growth if:

- More secondary residences
- More private rented principal residences
- Fewer owner-occupied principal residences
- Lower construction rate (elasticity ~ -1 or -2)
- Higher population growth (elasticity ~ 1 or 2)
- Higher income growth (elasticity ~ 1)
- Lower unemployment growth
- Results not robust with respect to the period studied

Details in the paper:

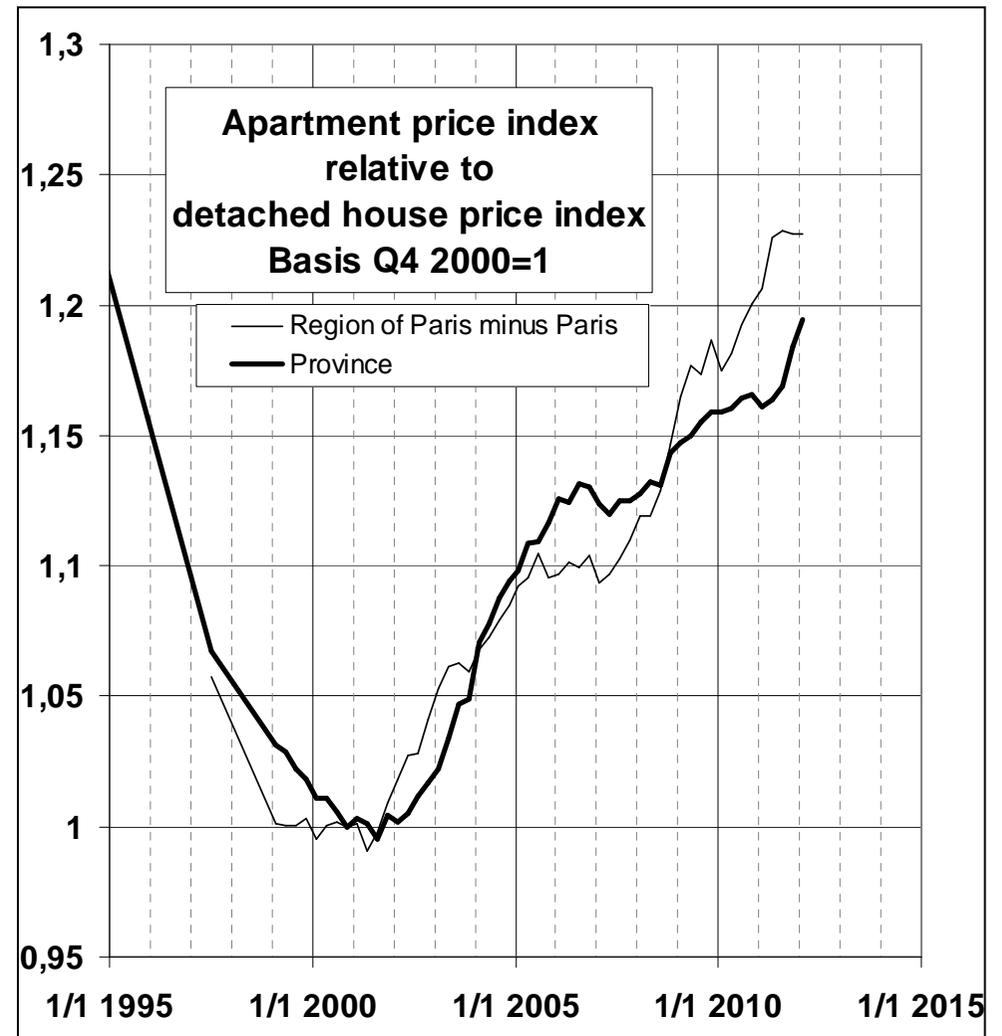
http://www.cgedd.developpement-durable.gouv.fr/IMG/pdf/difference-variation-prix-immobilier-par-departement_cle76a2da.pdf



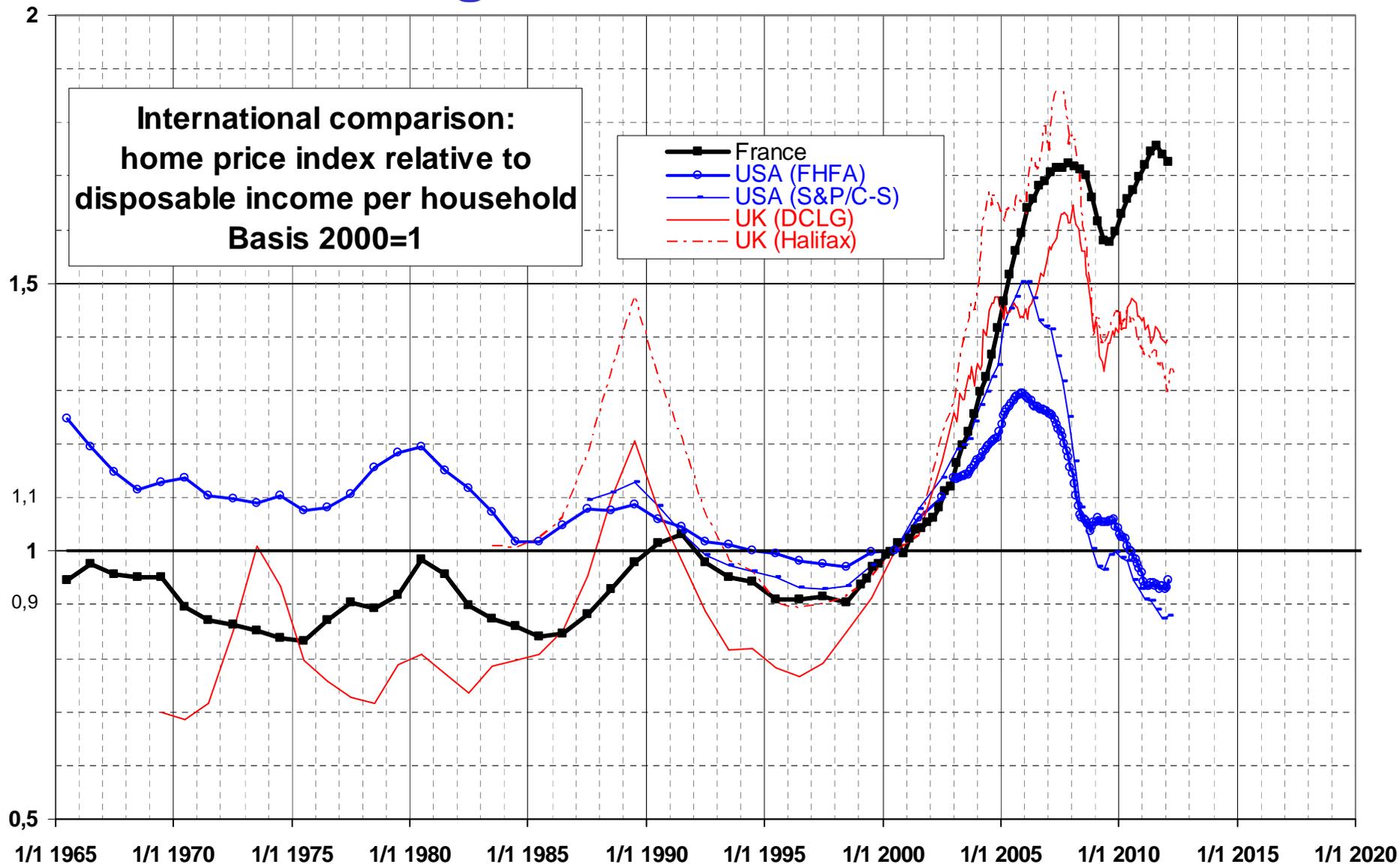
2000-2010: inversion of apartments / indiv. houses differentiation

Relative to indiv. houses, apartments have:

- **appreciated** from 1950 to 1965 (*exit from rent controls, which had impacted apartments more than individual houses*)
- **depreciated** from 1965 to 2000 (*while occupants were getting poorer*)
- **appreciated** from 2001 (*while occupants went on getting poorer*)



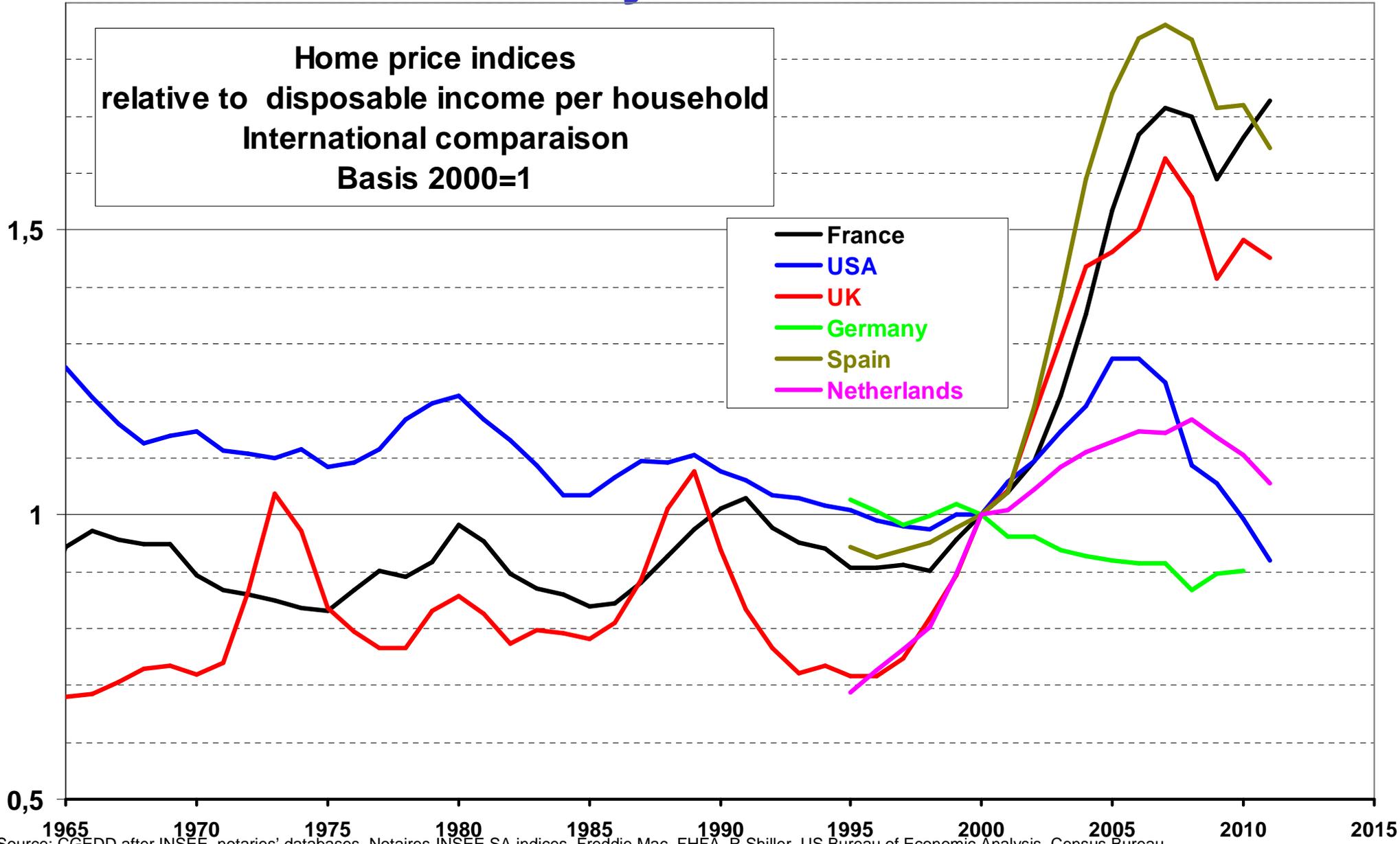
International comparison (1) France, USA and UK: similar long run trends over 1965-2000



Source: CGEDD after INSEE, notaries' databases, Notaires-INSEE SA indices, Freddie Mac, FHFA, R.Shiller, US Bureau of Economic Analysis, Census Bureau, UK DCLG, UK National Statistics, Halifax

International comparison (2)

Diversity since 1995

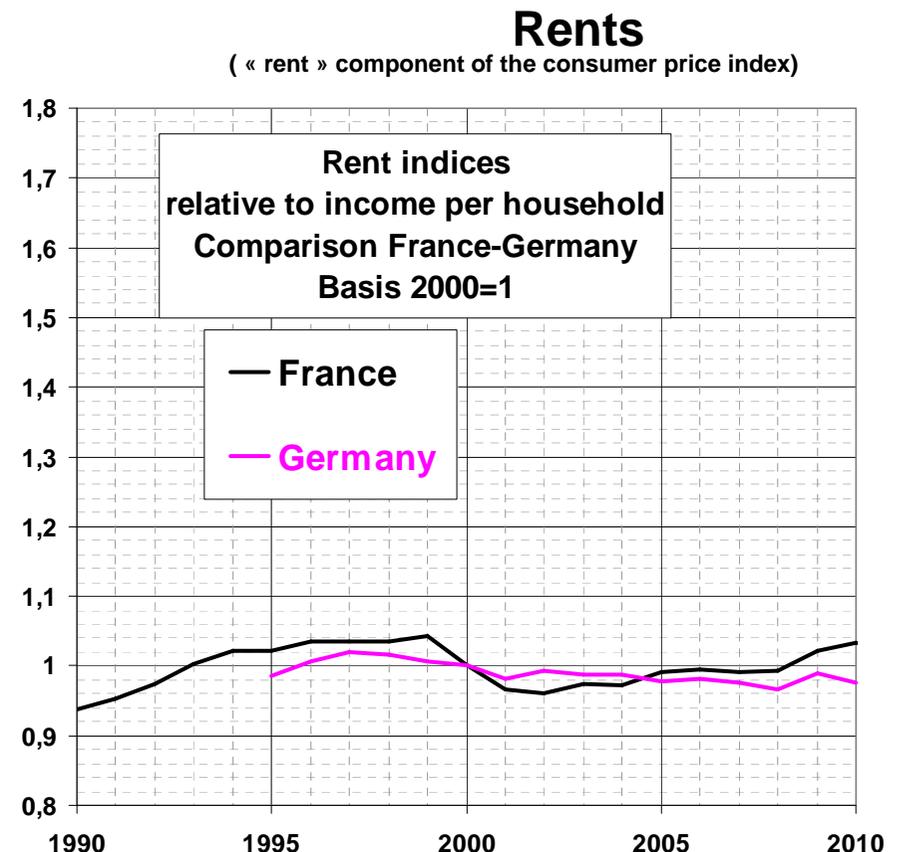
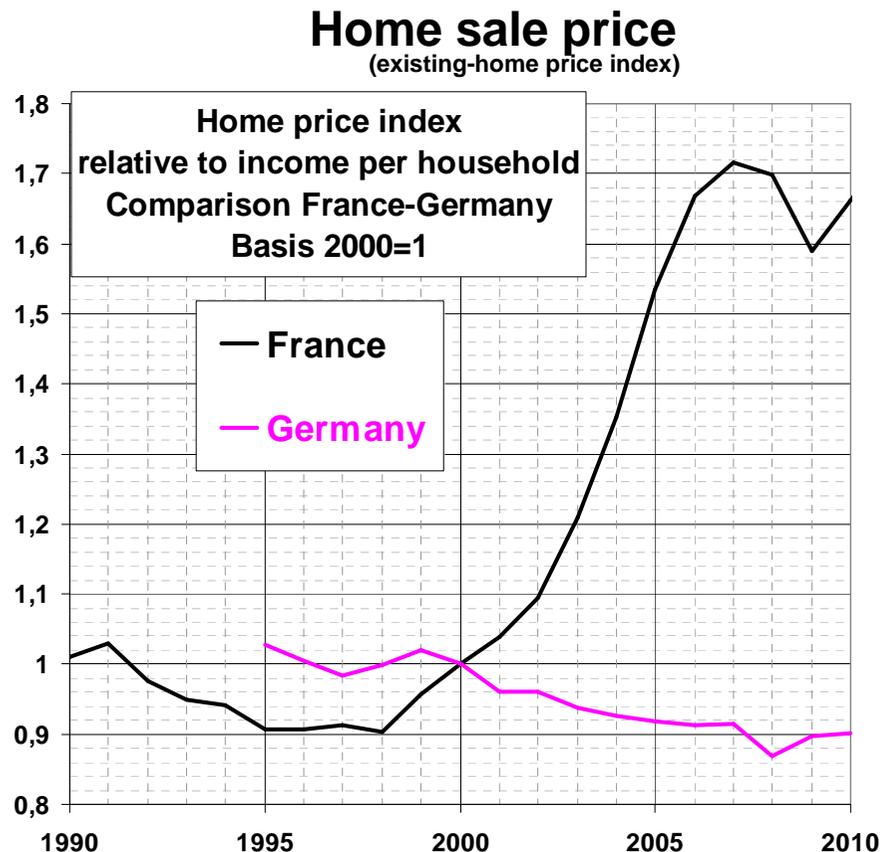


Source: CGEDD after INSEE, notaries' databases, Notaires-INSEE SA indices, Freddie Mac, FHFA, R.Shiller, US Bureau of Economic Analysis, Census Bureau, UK DCLG, UK National Statistics, Destatis, Gewos, Central Bureau voor de Statistiek, Instituto Nacional de Estadística, R. Vergès.

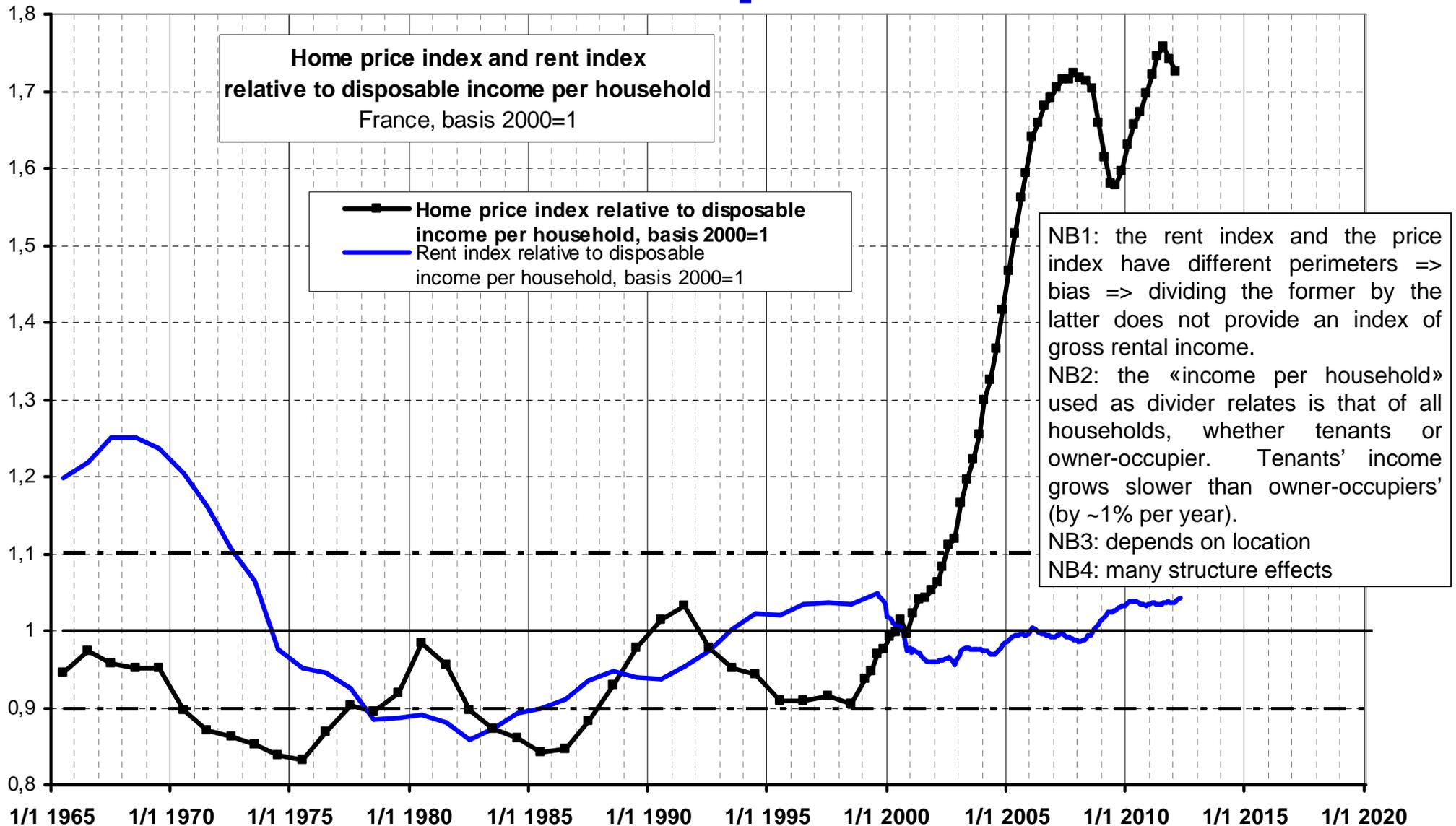
International comparison (3) France-Germany:

Relative to income per household, from 2000 to 2010,

- **home price indices diverge**
- **but rent indices remain flat in both countries**
(impact of German households' very high long term debt in 2000)



2000-2010: rental return (=rent / price) collapses



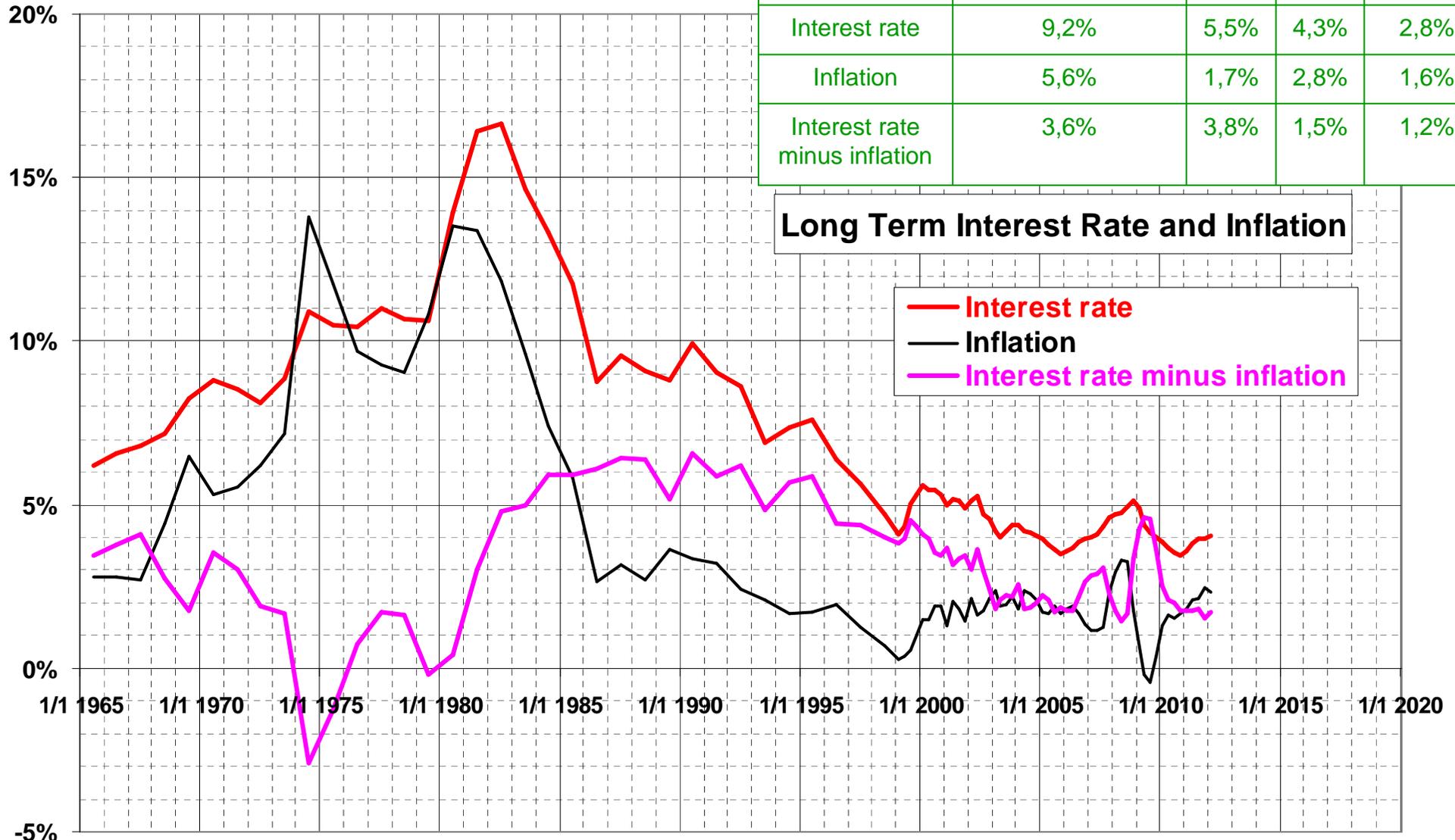
Resilience of the 6% gross rental return

- **In 1900-1910:**
 - inflation +0,3%/year,
 - income per household +1,6%/year,
 - Paris home price indexes +1,1%/year,
 - Gov't debt interest rate 3,1%/year
- **The gross rent of the (residential) properties purchased by La Fourmi Immobilière (a property company) (from 1899 to 1913) was worth 6 to 7% of their price (quoted by F. Simmonet, « La Fourmi Immobilière »).**
- **« The average gross rental return in Paris would be 6,36% (from 5,13% in the 16th arrondissement to 7,76% in the 20th arrondissement) », of which 33% expenses must be subtracted (P. Leroy-Beaulieu, « L'art de placer et gérer sa fortune », 1906).**
- **6% gross rental return ⇔ « a residential building is worth 200 monthly rents »**

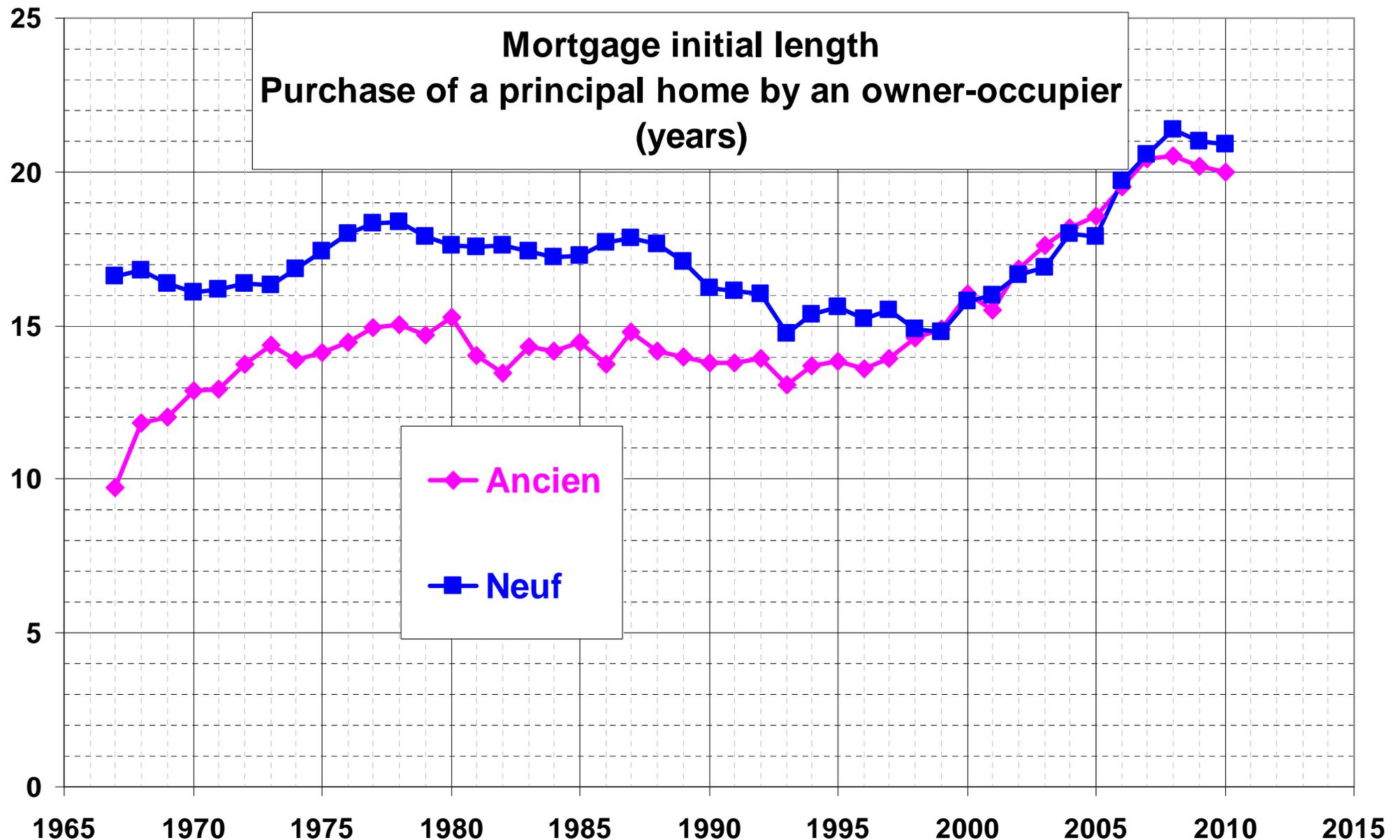
Interest rates are at a historical low ...but their decrease had begun much earlier than 2000

- Which rates (nominal, or net of past inflation, or net of expected inflation)?
- Low with respect to which reference?

	Average 1965-2000	2000	2008	Fin 2010
Interest rate	9,2%	5,5%	4,3%	2,8%
Inflation	5,6%	1,7%	2,8%	1,6%
Interest rate minus inflation	3,6%	3,8%	1,5%	1,2%



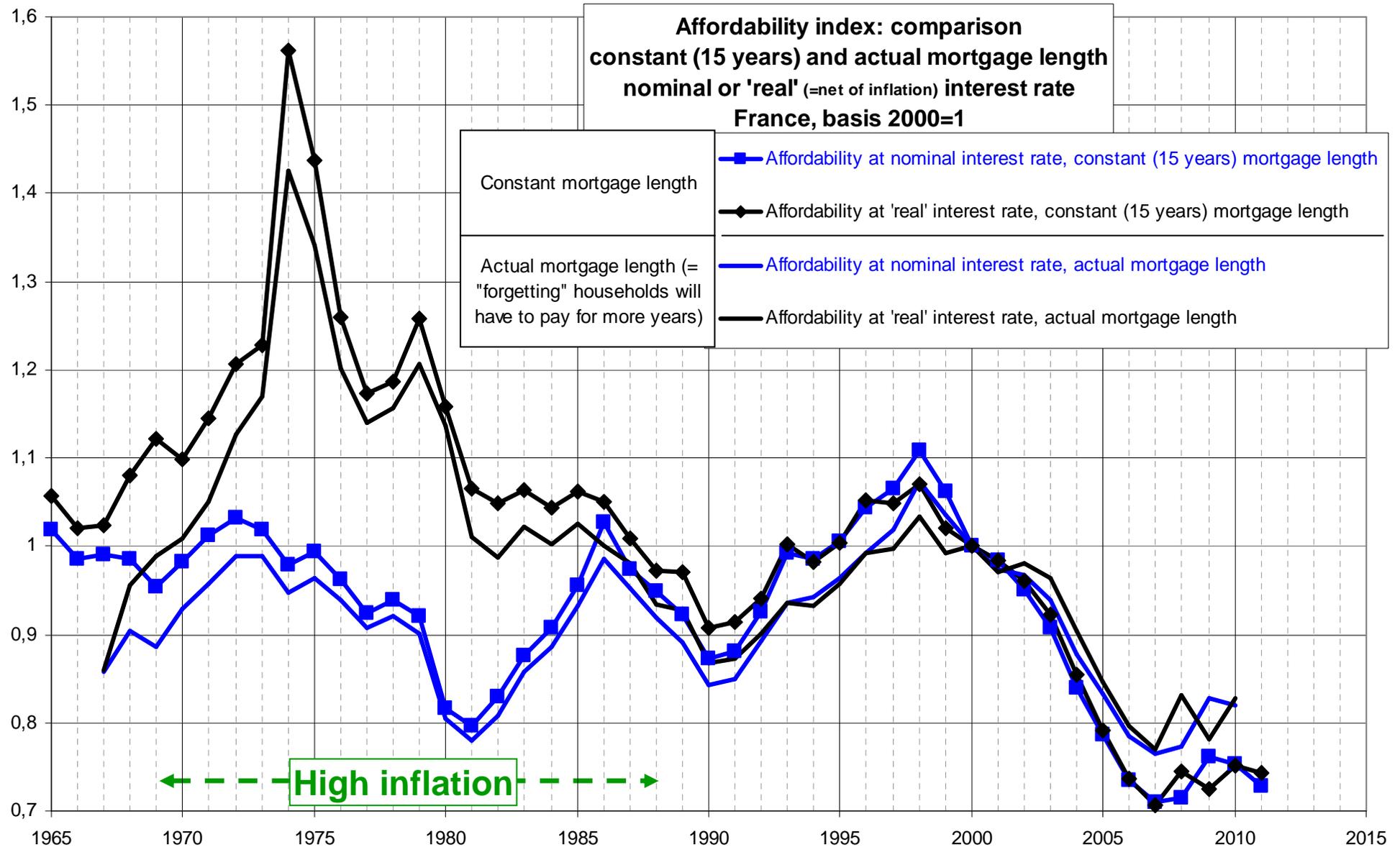
2000-2010: increase of mortgage initial length



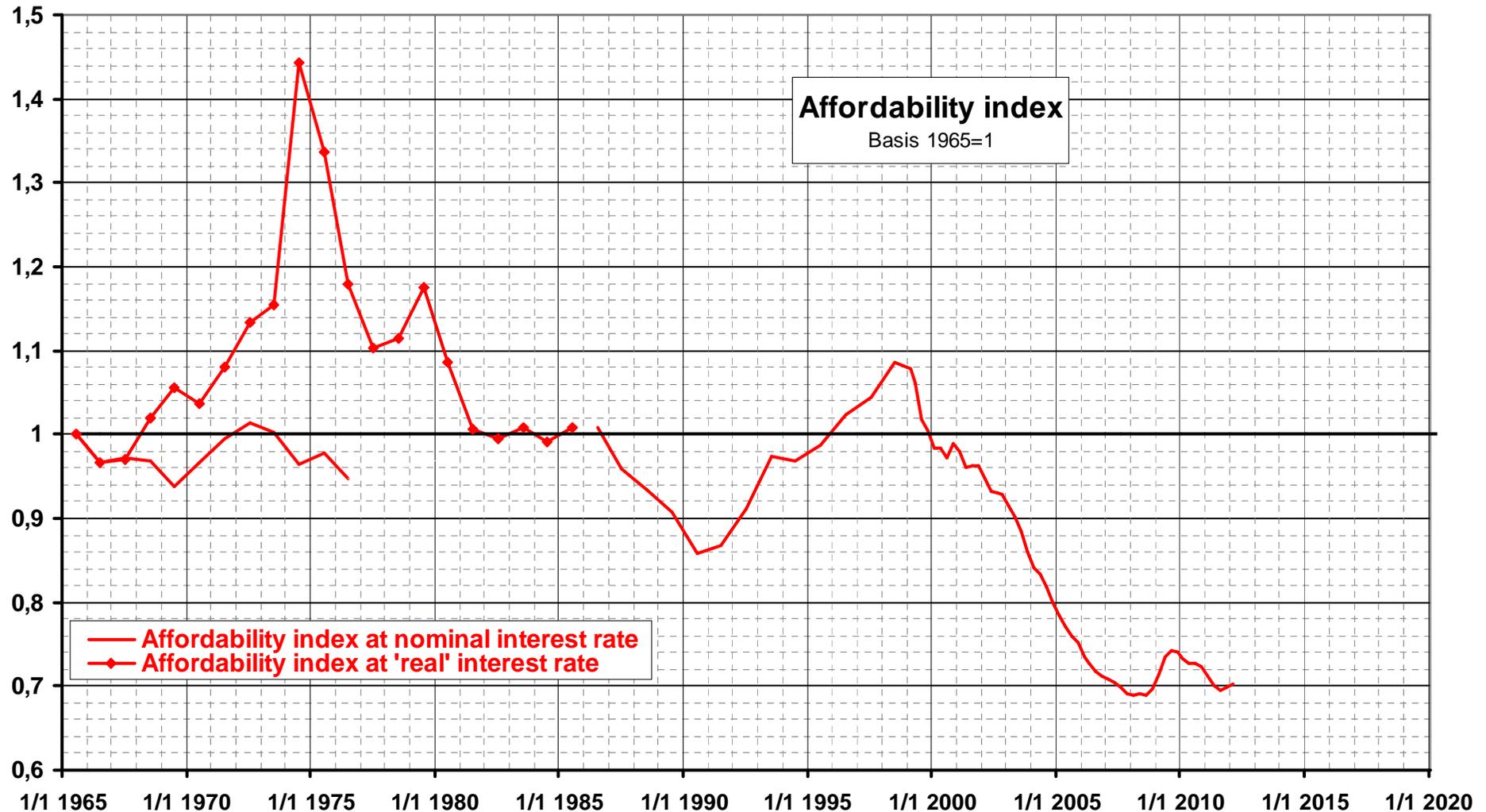
« Affordability », « property purchasing power », etc. indices: what are we talking about?

- Which period? (ex: 2000-2010 or 1990-2010 or 1965-2010)
- Which area? (ex: Paris or France)
- Which price? (« constant quality » index or average price? new or existing?)
- Which income? (buyers'? borrowers'? all households'? « disposable » or net taxable or gross taxable income?)
- Which financing conditions?
 - Which interest rate? (several series, more or less consistent and continuous and reliable; what with adjustable rates, capped adjustable rates?)
 - From 1973 to 1985, how do we factor in inflation, progressive monthly payments?
 - How do we take into account changes in mortgage length?
 - How do we take into account changes in downpayment?
- Other variables: transaction costs, interaction with the gov't (subsidies and taxes)
- Other points of view: purchasing power in rent years??

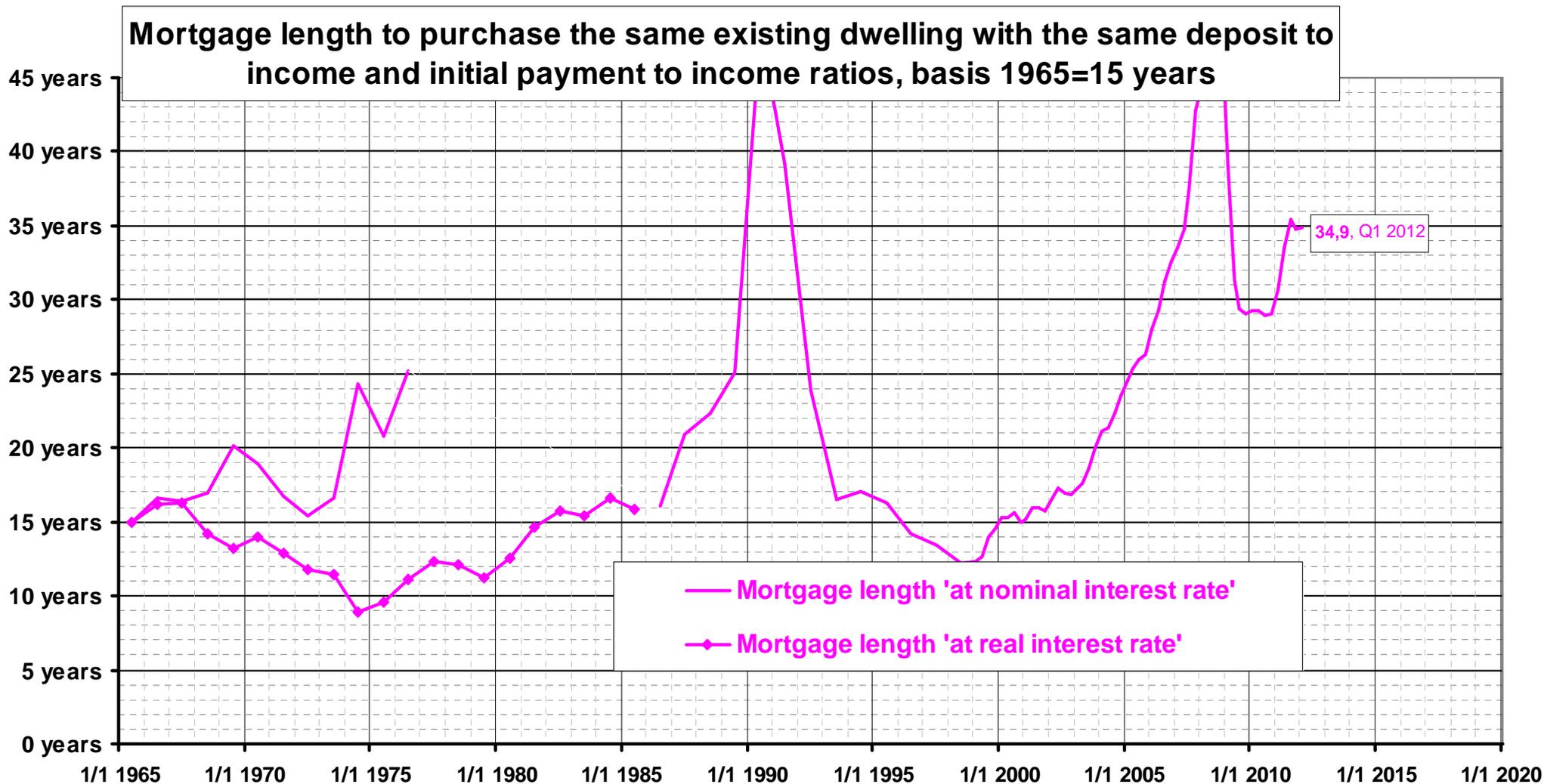
Example: impact on « affordability » of nominal / 'real' (=net of inflation) interest rate, and of mortgage length



2000-2010: decrease in the affordability index *at nominal and 'real' interest rate*



2000-2010: increase in the mortgage length necessary to purchase the same existing dwelling with the same deposit to income and initial payment to income ratios, basis 1965=15 years

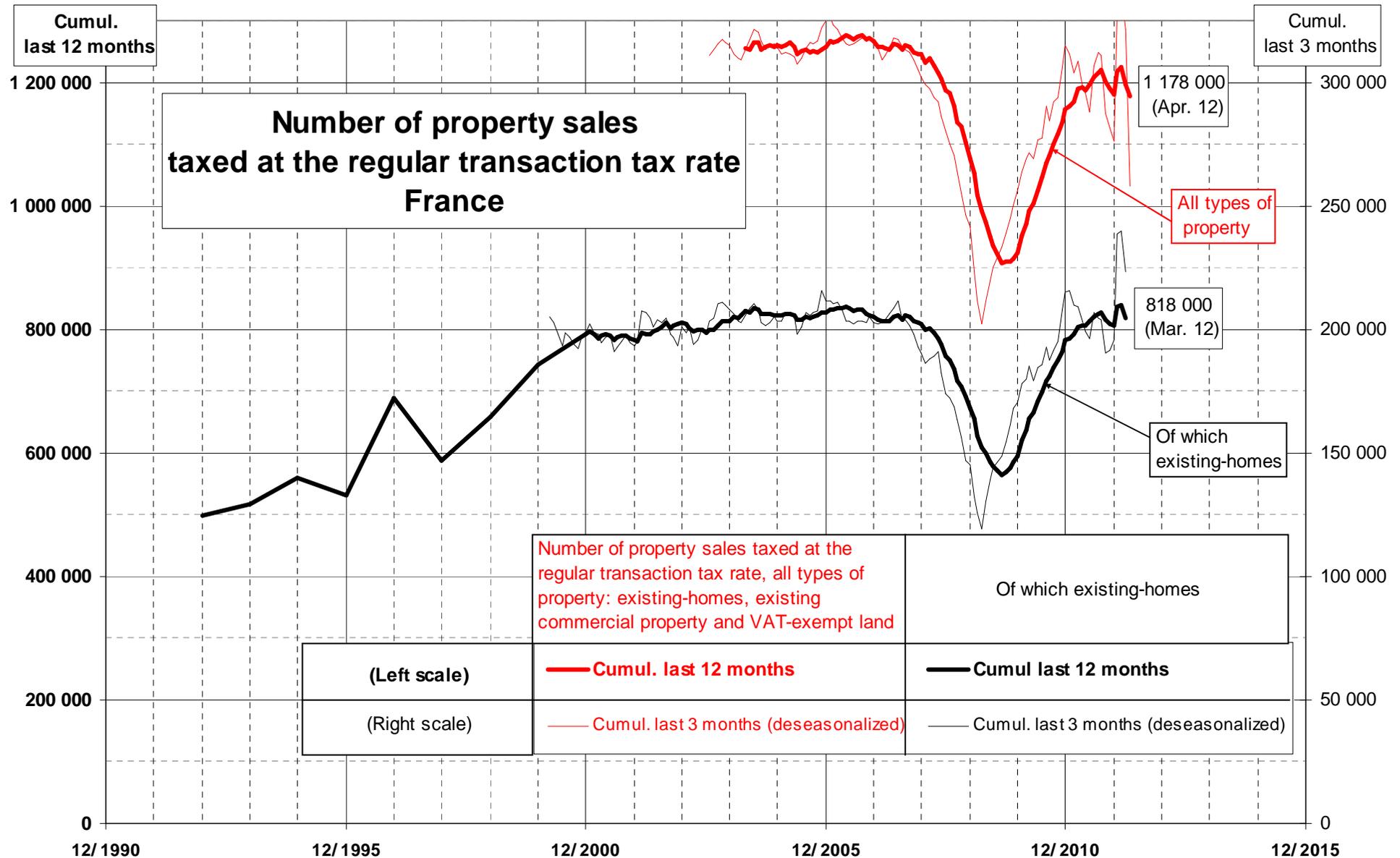


Source: CGEDD after INSEE, notaries' databases, Notaires-INSEE SA indices, Banque de France.

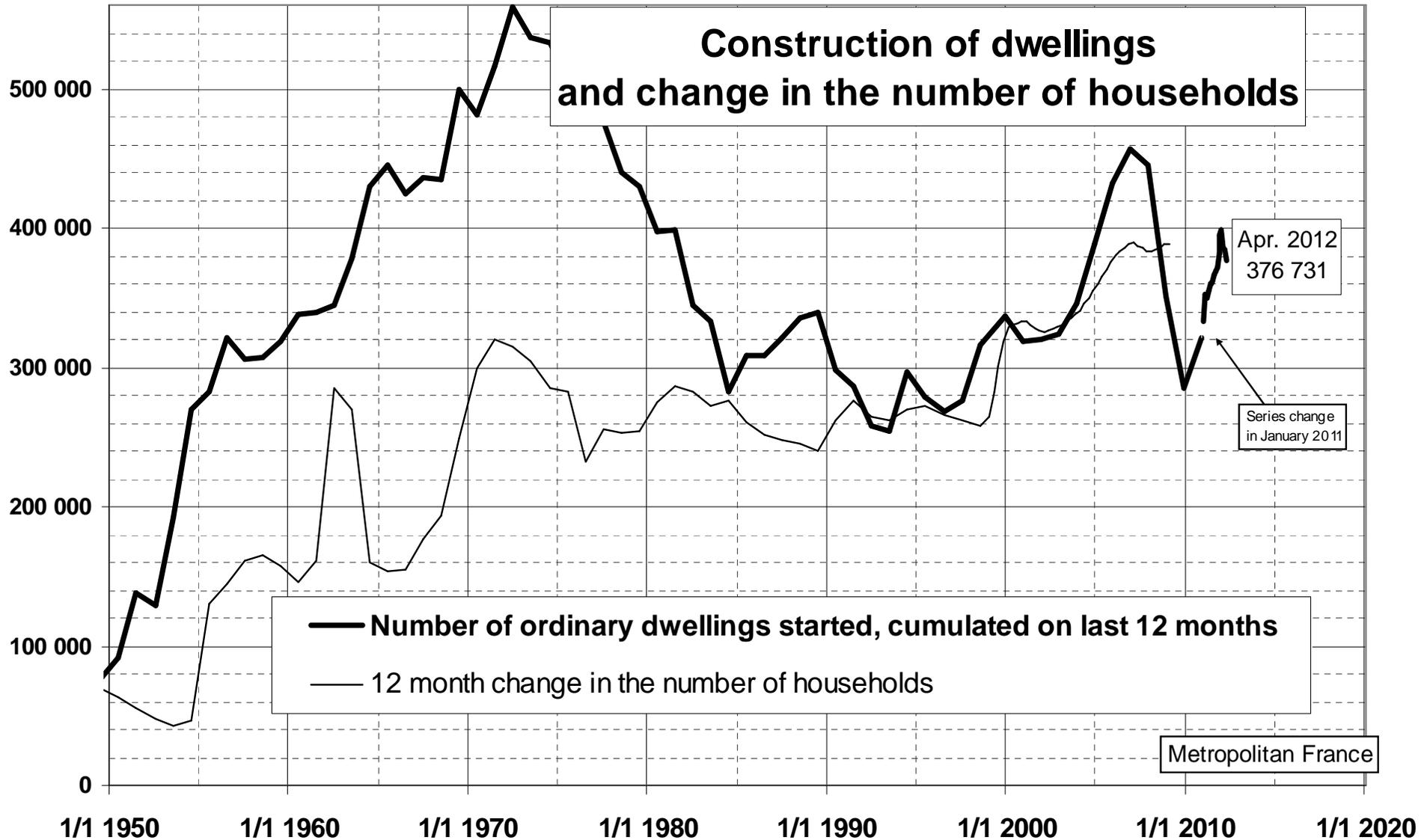
2000-2010: New versus existing-home price

- The **average** price has grown faster for existing homes than for new homes
- We have no price index (i.e. **at constant quality**) for new homes for now (maybe it's going to change: INSEE is working on it) SO we don't know whether a new-home index would grow faster or slower than the existing-home price index

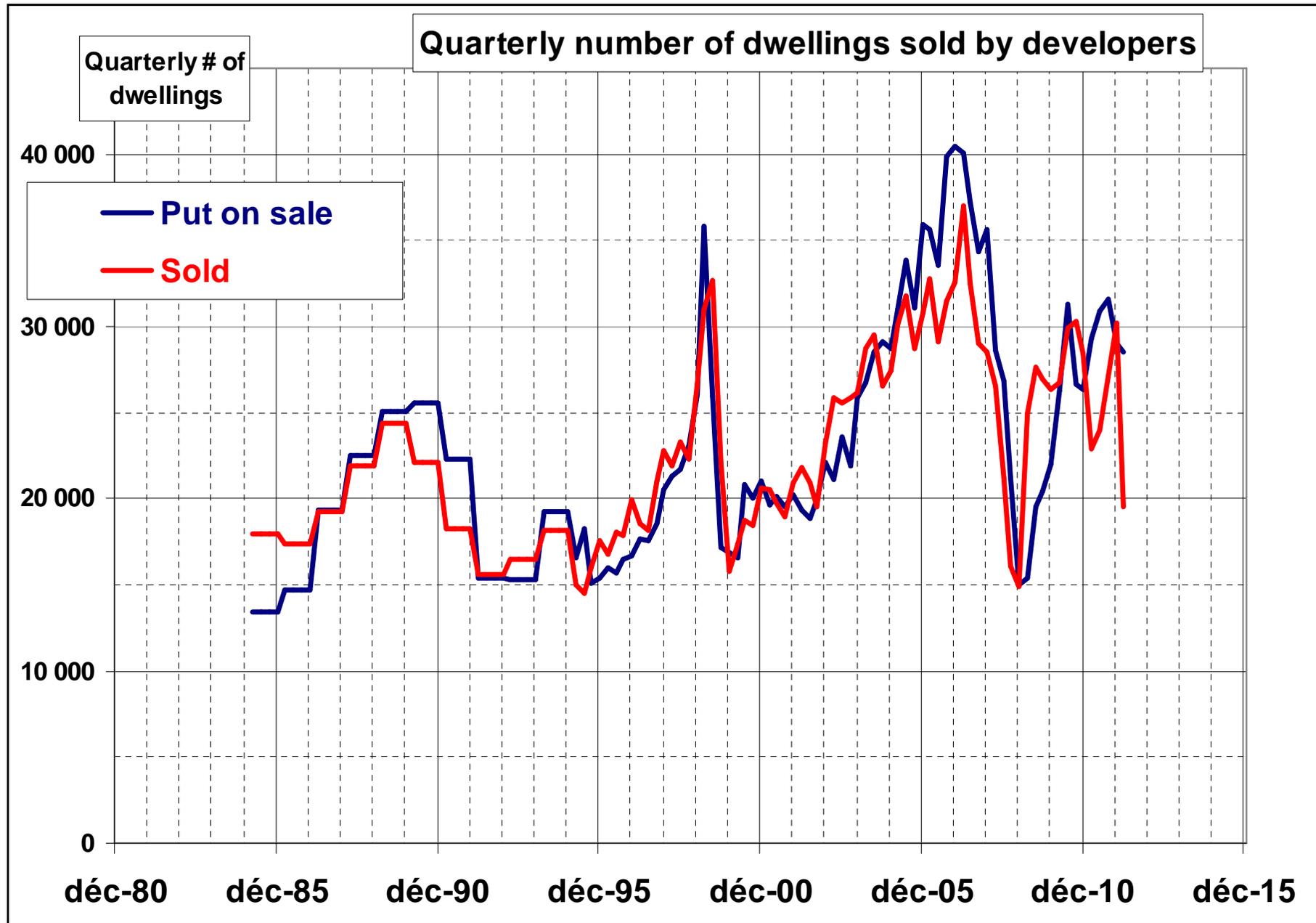
2000-2010: the number of existing-home sales has remained quite constant



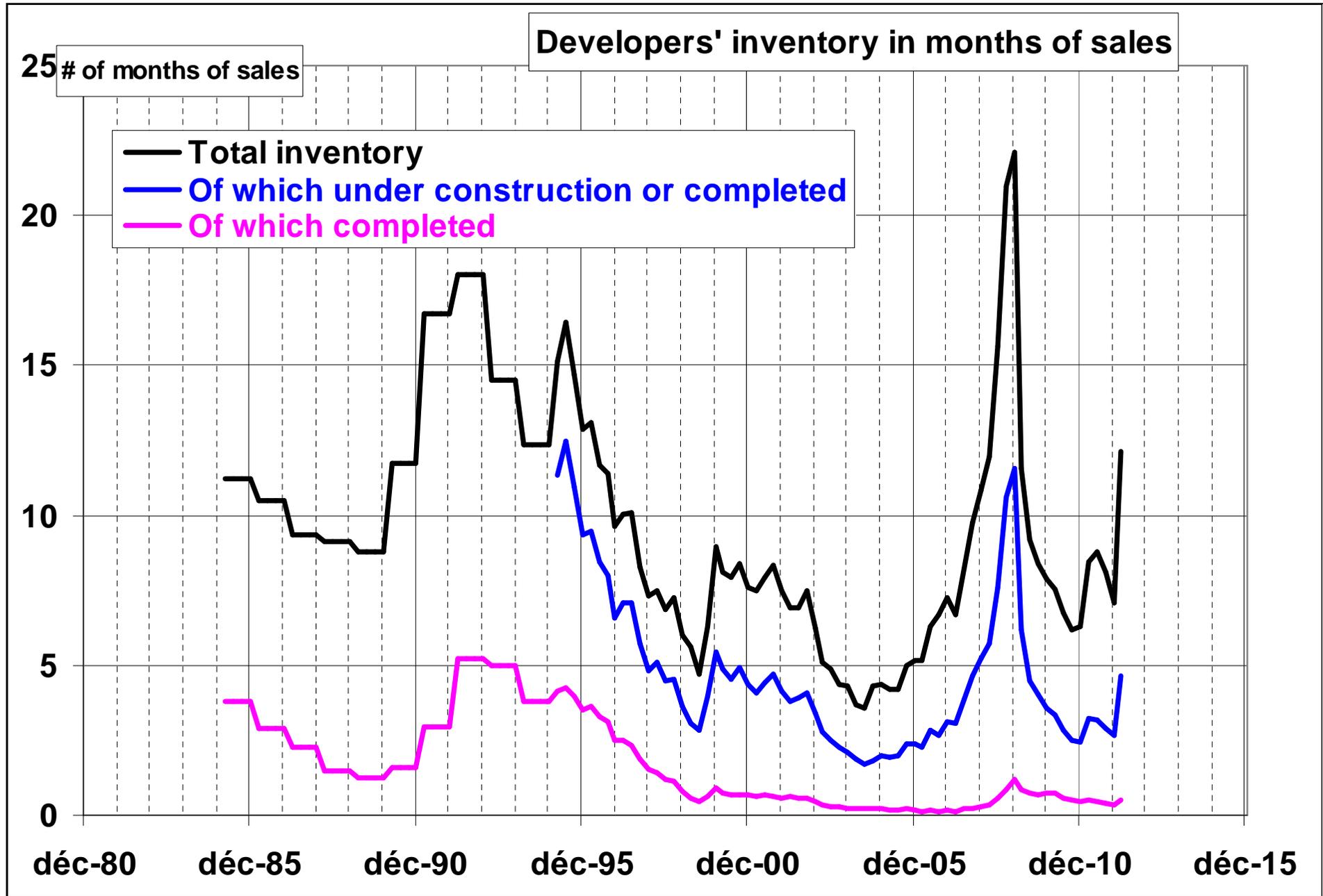
2000-2010: construction of new dwellings: no excesses



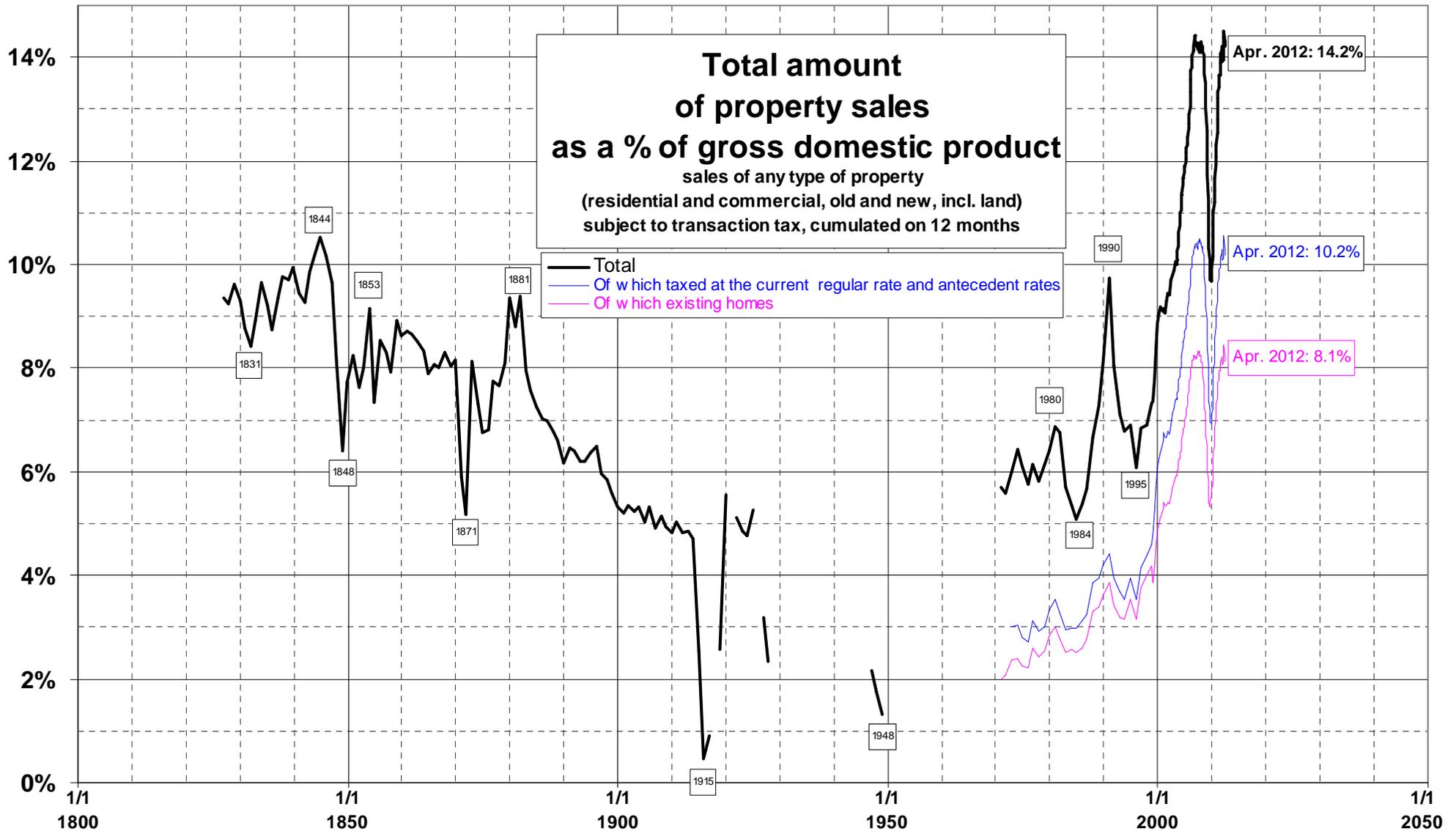
Sales of new dwellings by developers (NB: only 1/3 of new dwellings)



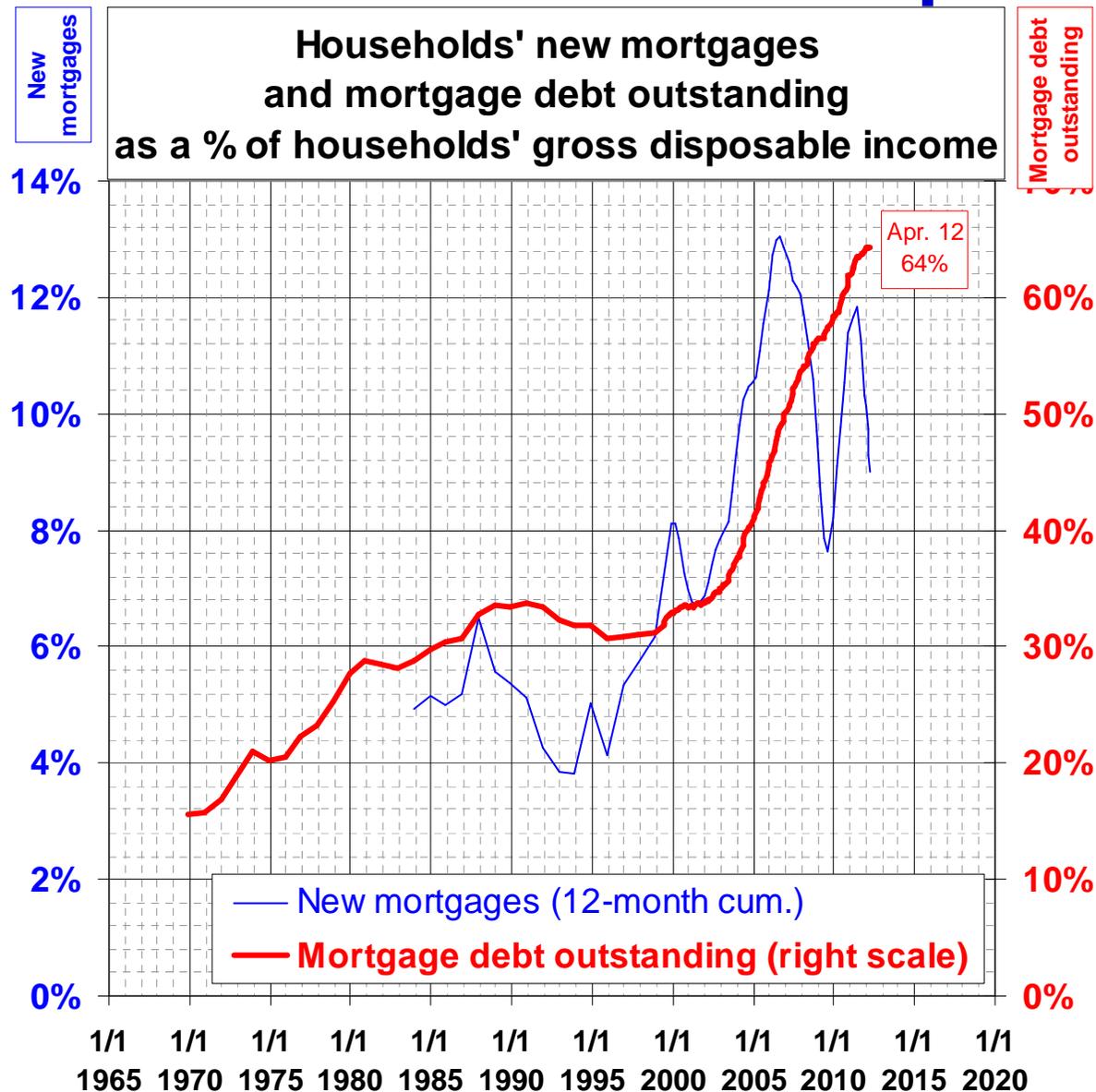
Developers' inventory: reasonable but picking up



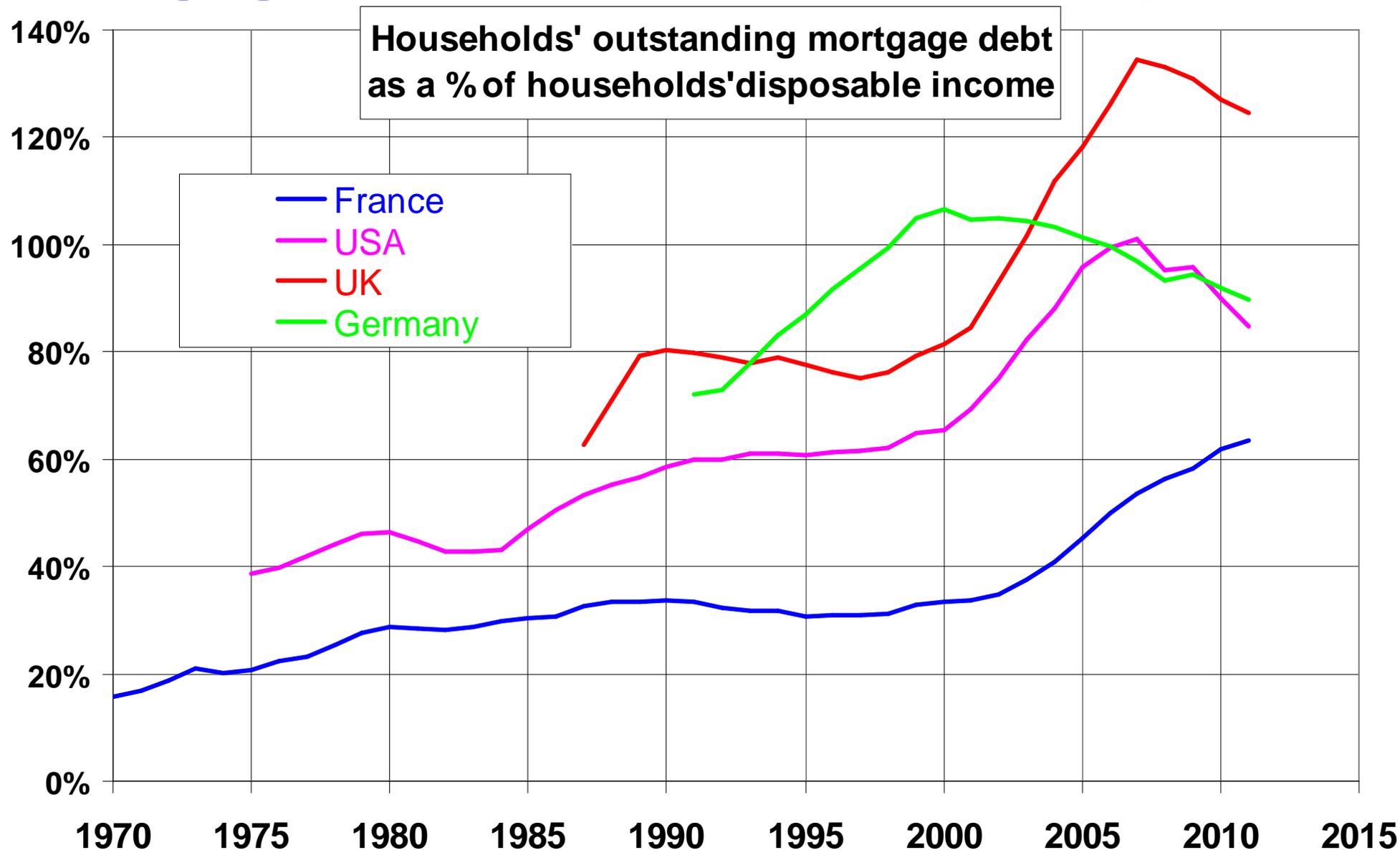
2000-2010: increase in the amount of property sales relative to GDP



2000-2010: households' outstanding mortgage debt doubles with respect to their income



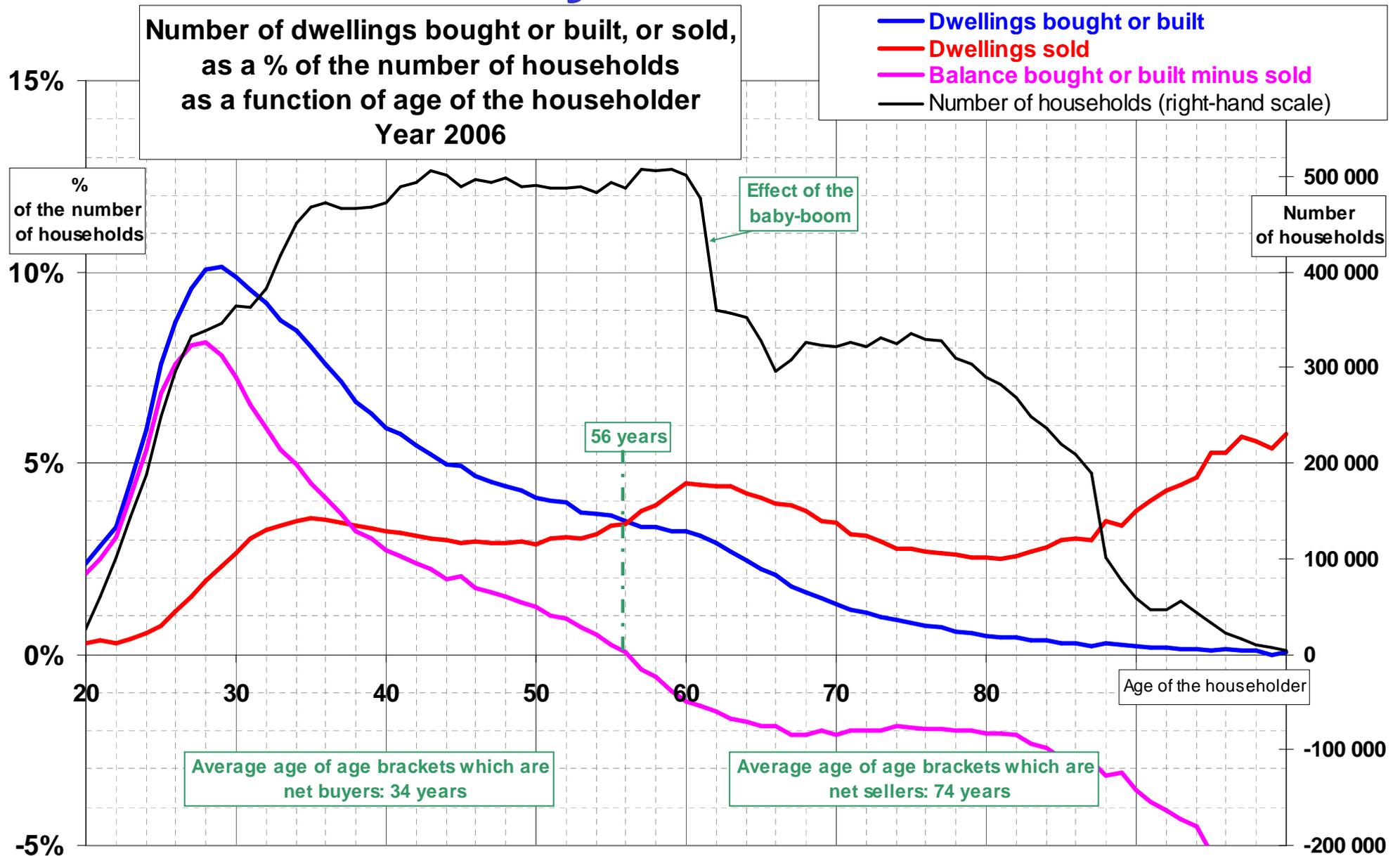
2000-2010: households' outstanding mortgage debt – international comparison



Consequences of the increase of home prices 2000-2010 (1)

- **Increase in incomes indexed on home prices (realtors, notaries, etc.) and in departments' receipts in transactions taxes**
- **Wealth creation for owners** (but almost no « equity withdrawals » in France)
- **Compared to 2000, cash transfer**
 - From net buyers to net sellers
 - From (not too) poor to rich
 - From younger than 56 years to older than 56 years

Net buyers and net sellers: the 56 year threshold



Source: CGEDD after DGFIP, SOeS, notaries' databases, EPTB, Filocom

Consequences of the increase of home prices 2000-2010 (2)

- **Injection of the cash provided by increased mortgages**

(cumulated over 2000-2010: 15 to 20% of GDP) into

- (a little) construction
- (a little) financial savings
- (mostly) consumption => GDP growth, households' income, increase in tax receipts, increase in trade deficit – no gain in competitiveness

- **Future increase in cash disbursements by borrowers (because of increased mortgage length)**

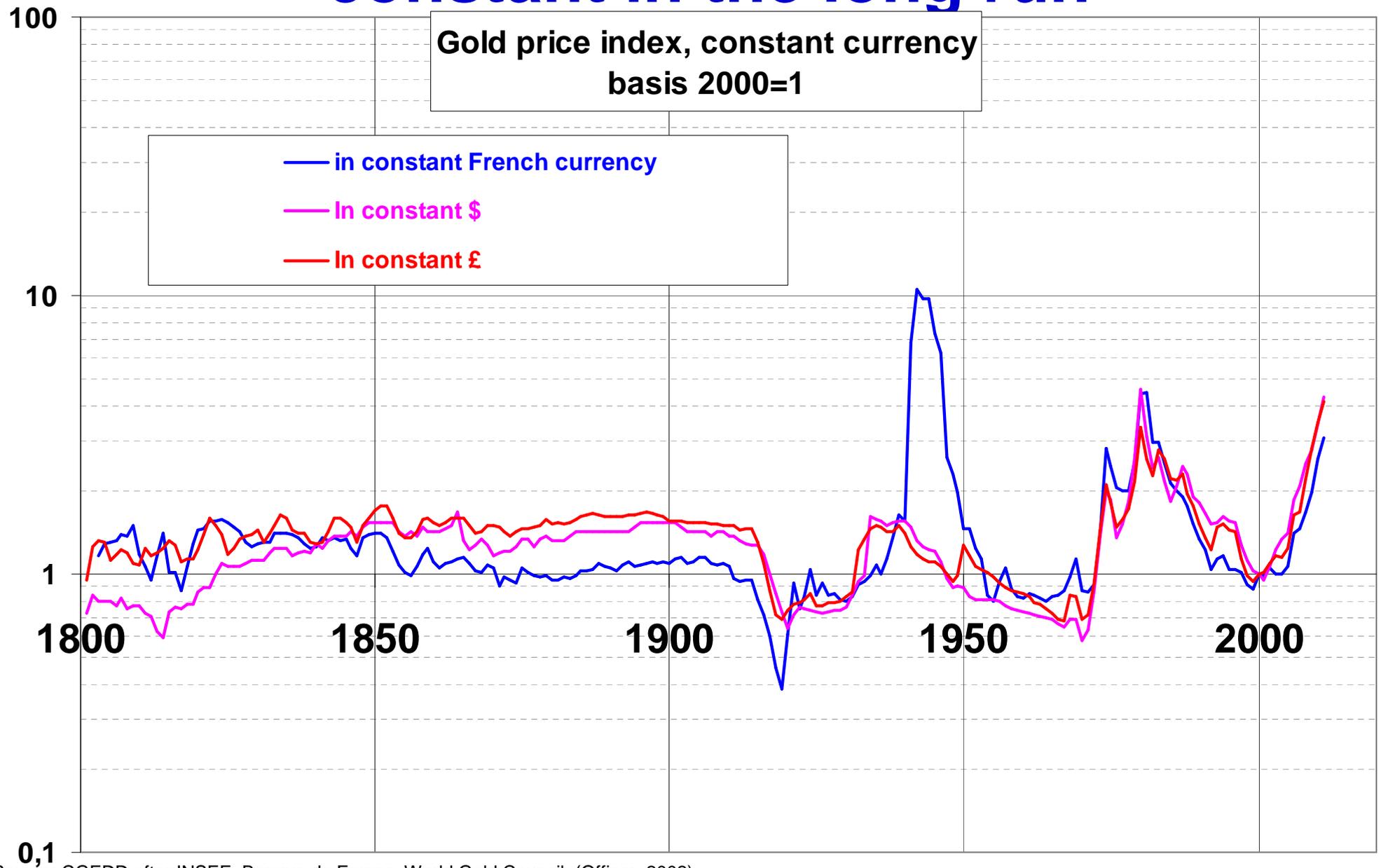
- **Buyers increased their debt to purchase an asset**

- which does not provide any additional income (non productive asset)
- the price of which is higher today but will (as we argue thereafter) revert to its past trend level with respect to income per household

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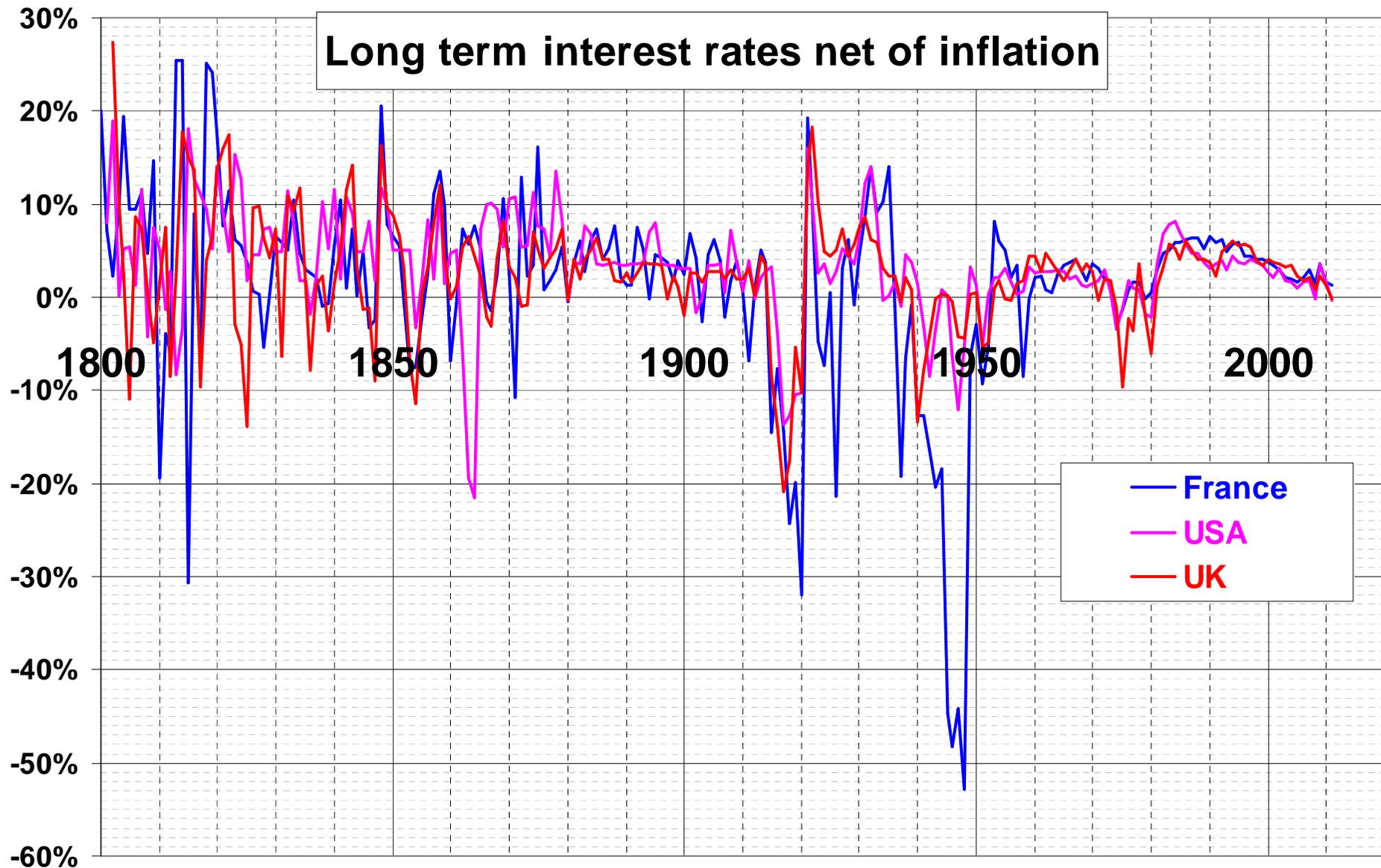
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Price of gold net of inflation: constant in the long run

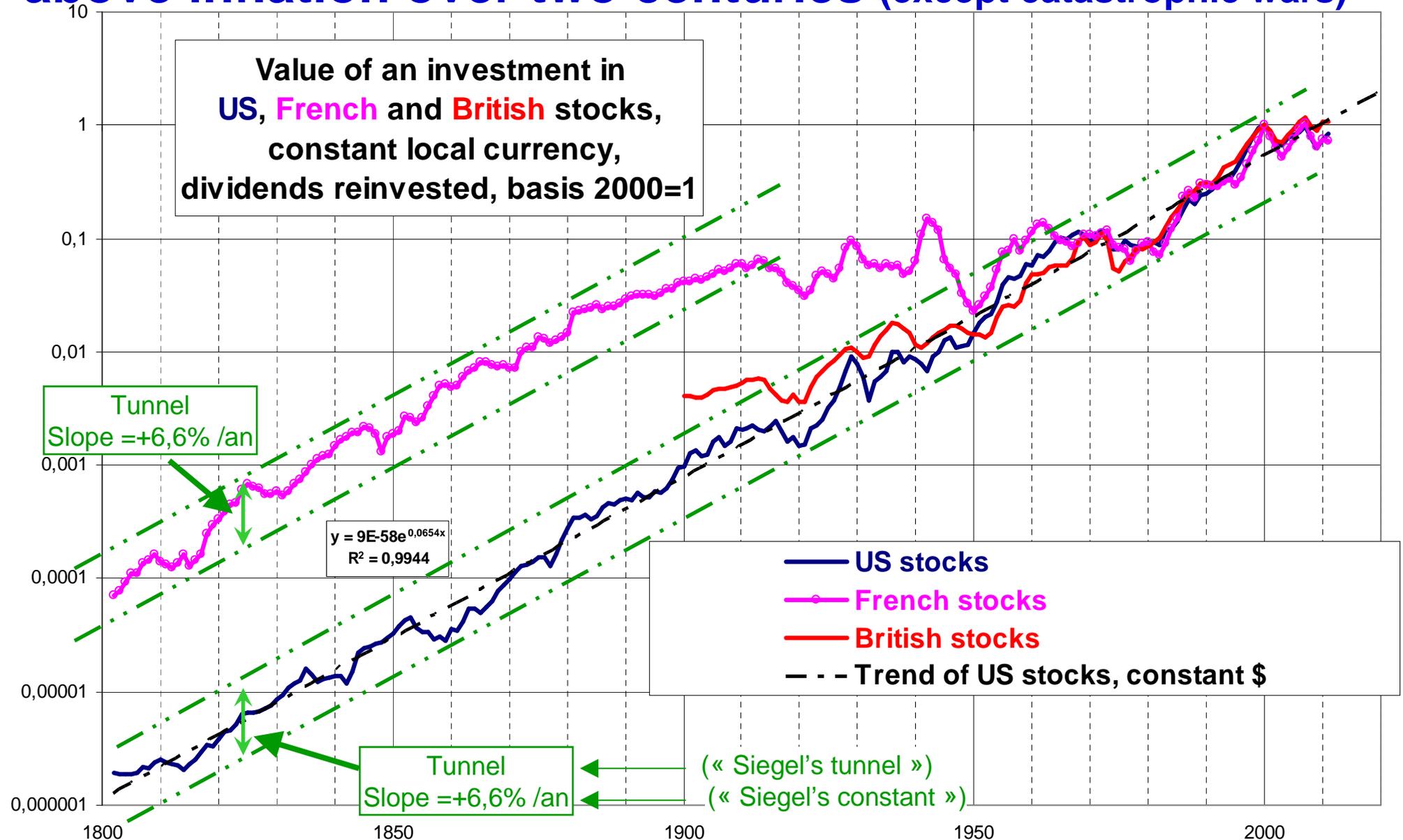


Source: CGEDD after INSEE, Banque de France, World Gold Council, (Officer, 2002).

Fixed income: long term interest rate = inflation + 3% + wide fluctuations

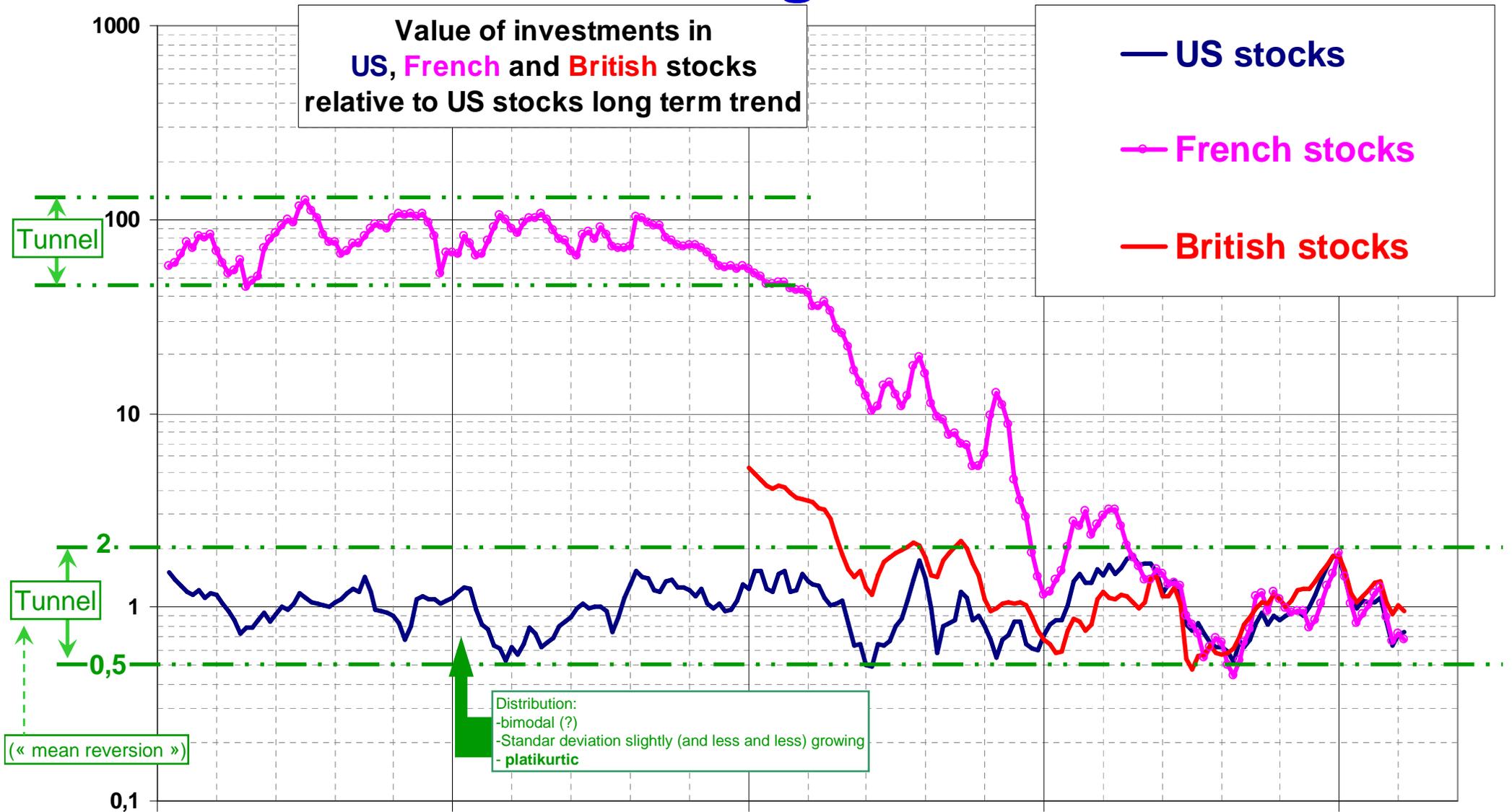


Stocks have been providing a 6.6% trend total return above inflation over two centuries (except catastrophic wars)



Source: CGEDD after (Arbulu 1998), SGF, Euronext, (Chabert, 1949), (Lévy-Leboyer & Bourguignon, 1985), INSEE, (Schwert 1990), (Shiller 2000), S&P, STAT-USA, US Bureau of Labor, (Dimson, Marsh & Staunton, 2001), UK Office of National Statistics

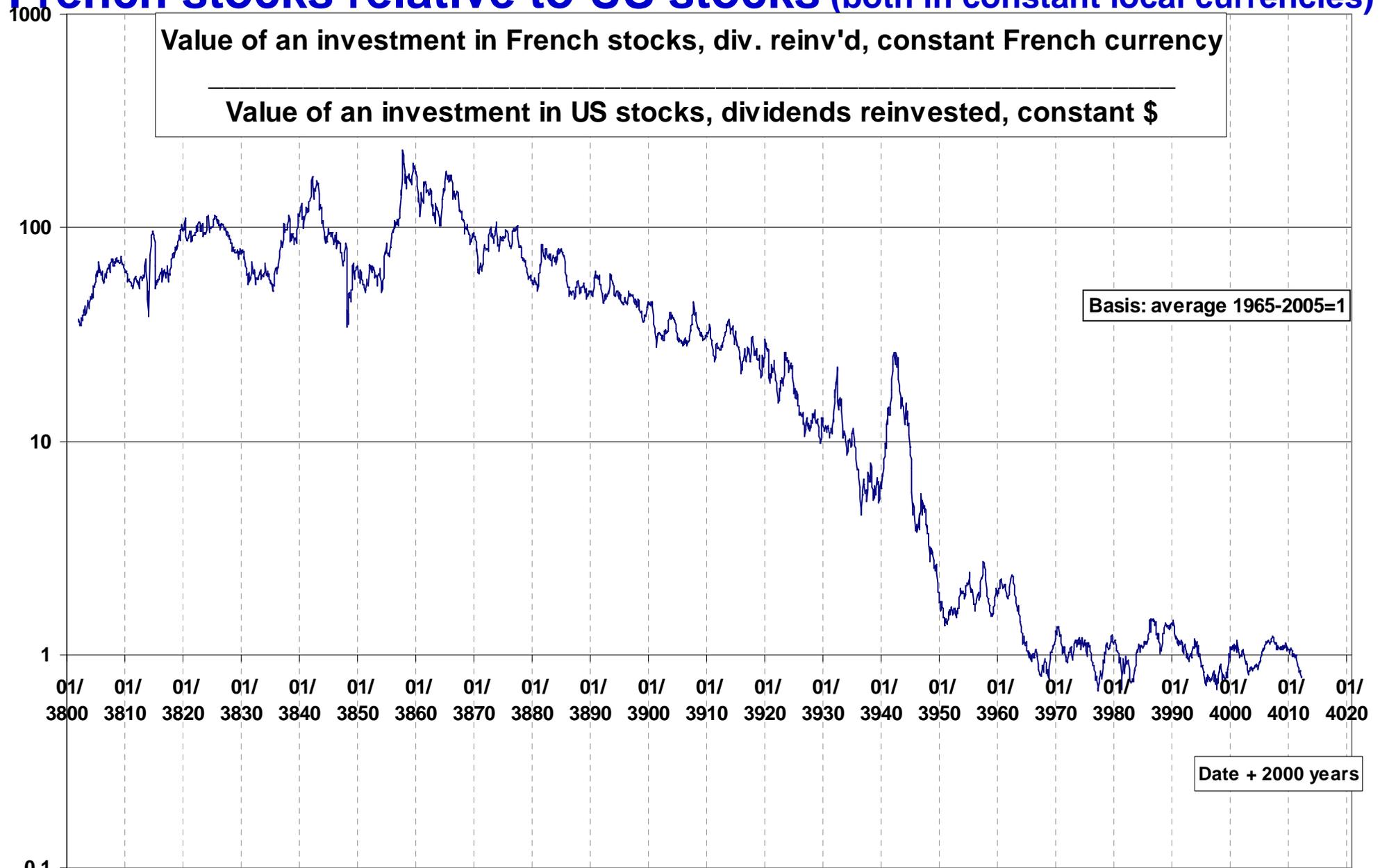
Value of an investment in stocks (dividends reinvested) relative to long term trend



1800 1850 1900 1950 2000

Source: CGEDD after (Arbulu 1998), SGF, Euronext, (Chabert, 1949), (Lévy-Leboyer & Bourguignon, 1985), INSEE, (Schwert 1990), (Shiller 2000), S&P, STAT-USA, US Bureau of Labor, (Dimson, Marsh & Staunton, 2001), UK Office of National Statistics

Value of an investment (total return: dividends reinvested), French stocks relative to US stocks (both in constant local currencies)

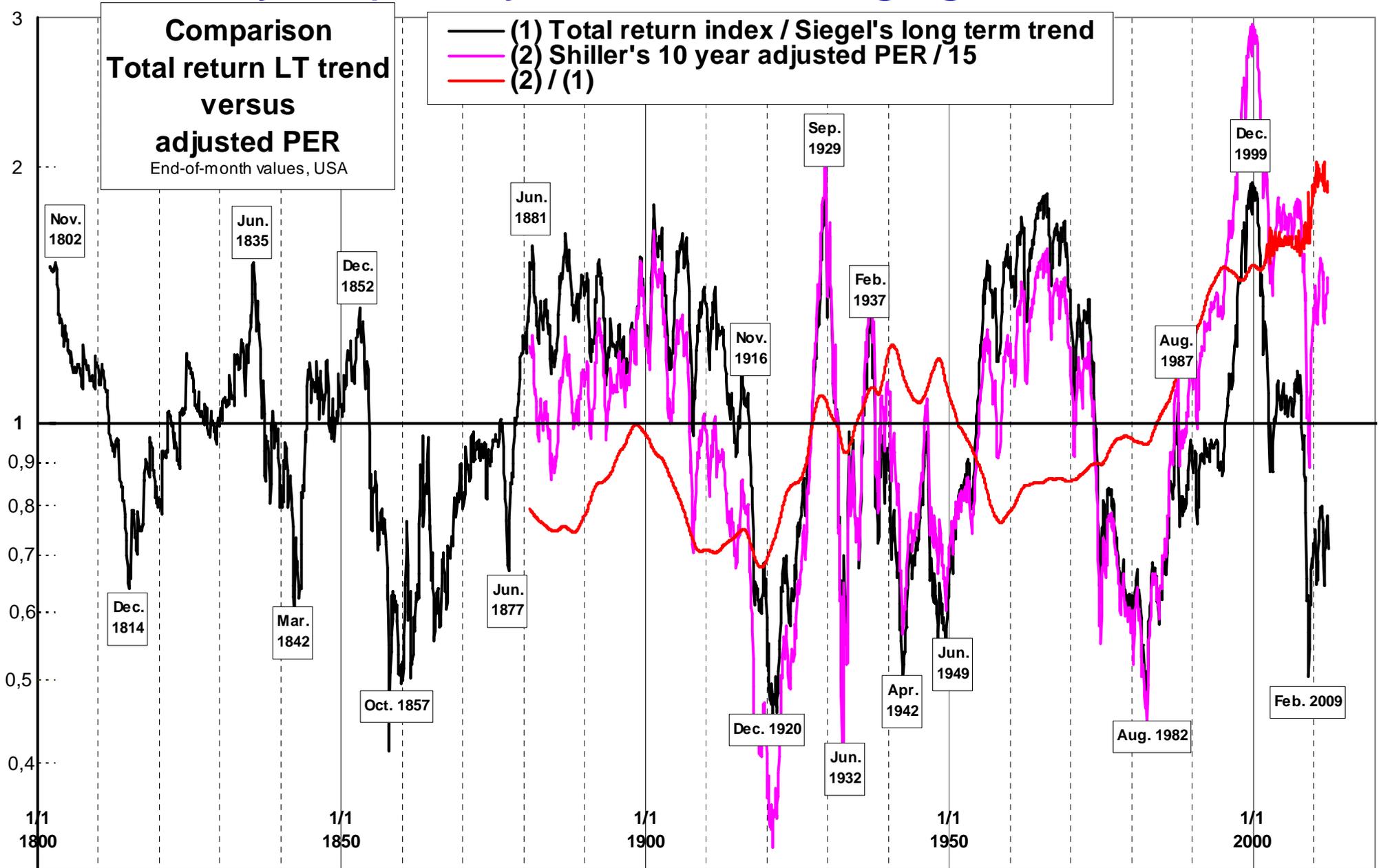


Source: CGEDD after (Arbulu 1998), SGF, Euronext, (Chabert, 1949), (Lévy-Leboyer & Bourguignon, 1985), INSEE, (Schwert 1990), (Shiller 2000), S&P, STAT-USA, US Bureau of Labor

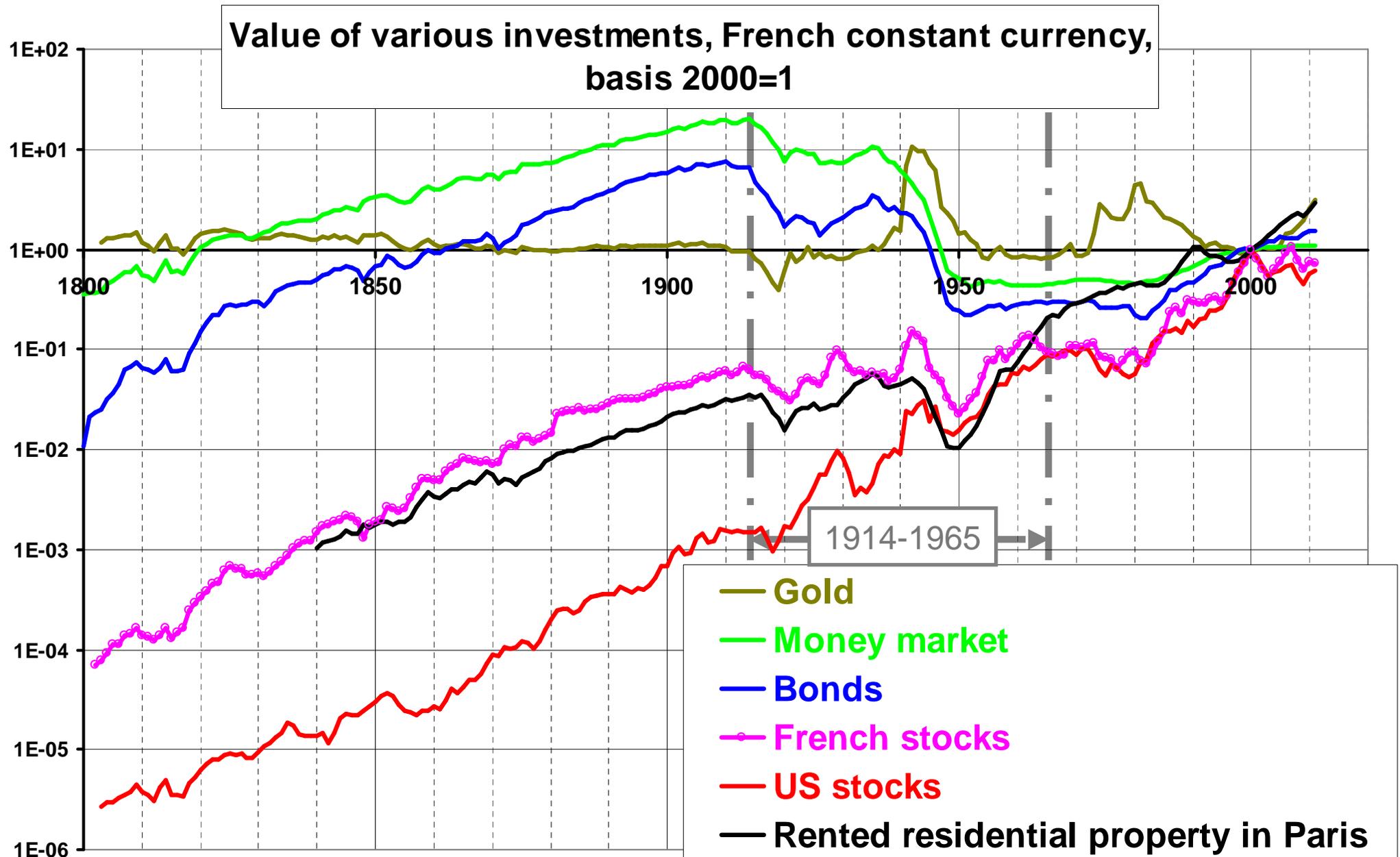
Other yardsticks for stocks

- Price/earnings ratios [which earnings: past (over which duration)? future (over which duration)?]
- Price / dividends ratio [which dividends? past (over which duration)? future (over which duration)?]
- If the ratio departs from its long term average, will it revert to it by the numerator, the denominator or both?

Which yardstick: « Siegel's tunnel » or PER (earnings smoothed over 10 years)? They have been diverging since the 1990's



Value of various investments (yearly returns reinvested)



Source: Source: CGEDD after Arbulu, Euronext, Vaslin, Loutchitch, Ixis, Banque de France, ECB, notaries' databases, Notaires-INSEE indices, Duon, INSEE, Schwert, Shiller, S&P, World Gold Council, Officer.

Trend total return of an investment in housing on the basis of 1965 2000

•(a) Capital gain:

GDP growth

Households' disposable income growth

Minus growth in the number of households

Equals: growth in income per household

Capital gain

Somewhat too high?

inflation + 2,5%

idem: inflation + 2,5%

- 12%

inflation + 1,3%

***idem*: inflation + 1,3%**

•(b) Net rental income:

Gross rental income

6,0%

Minus expenses 37% (incl. heavy repairs)

- 22%

Minus purchase expenses (11%) depreciated over 20 years

- 05%

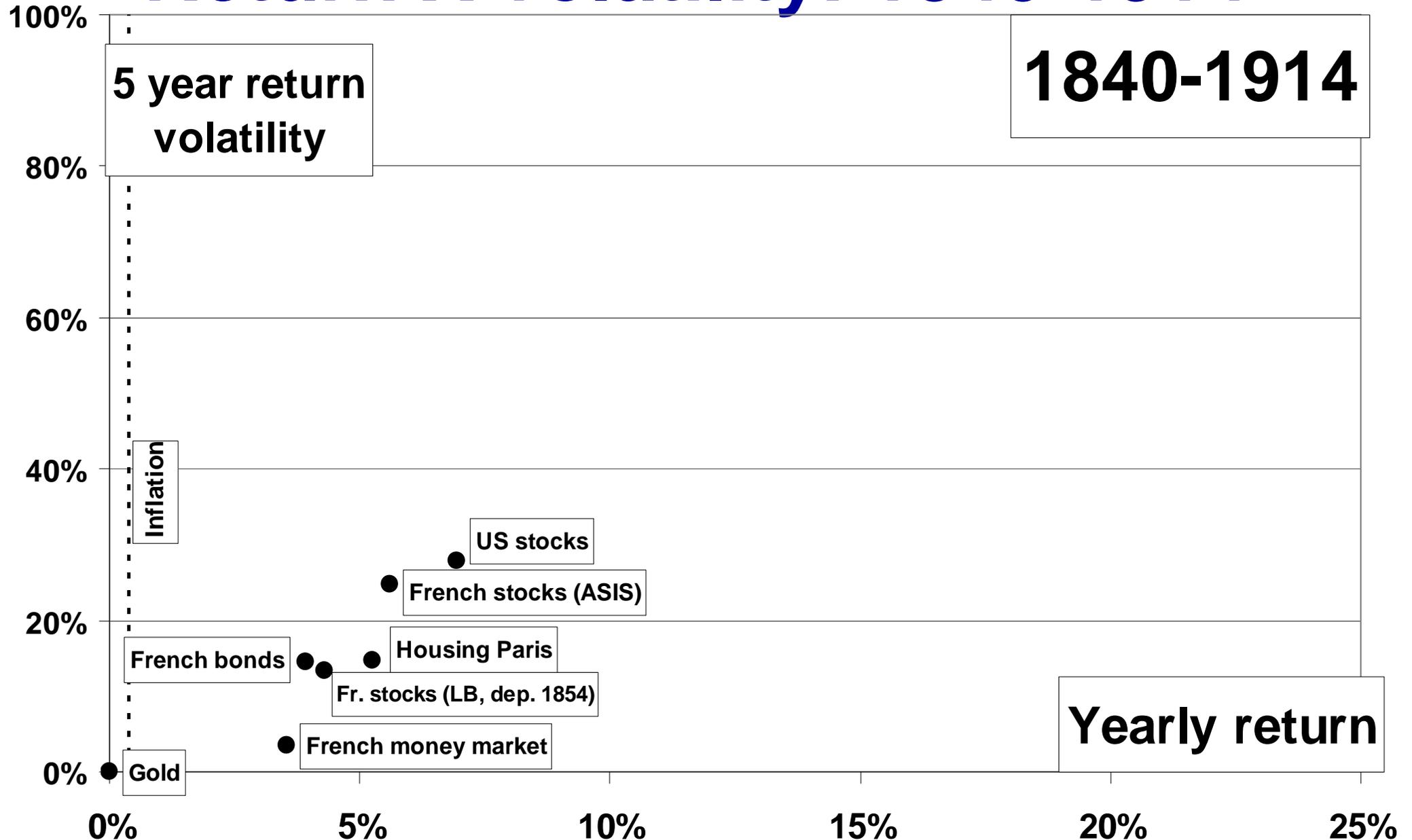
Equals: net rental income

3,3%

•Total return = (a)+(b)

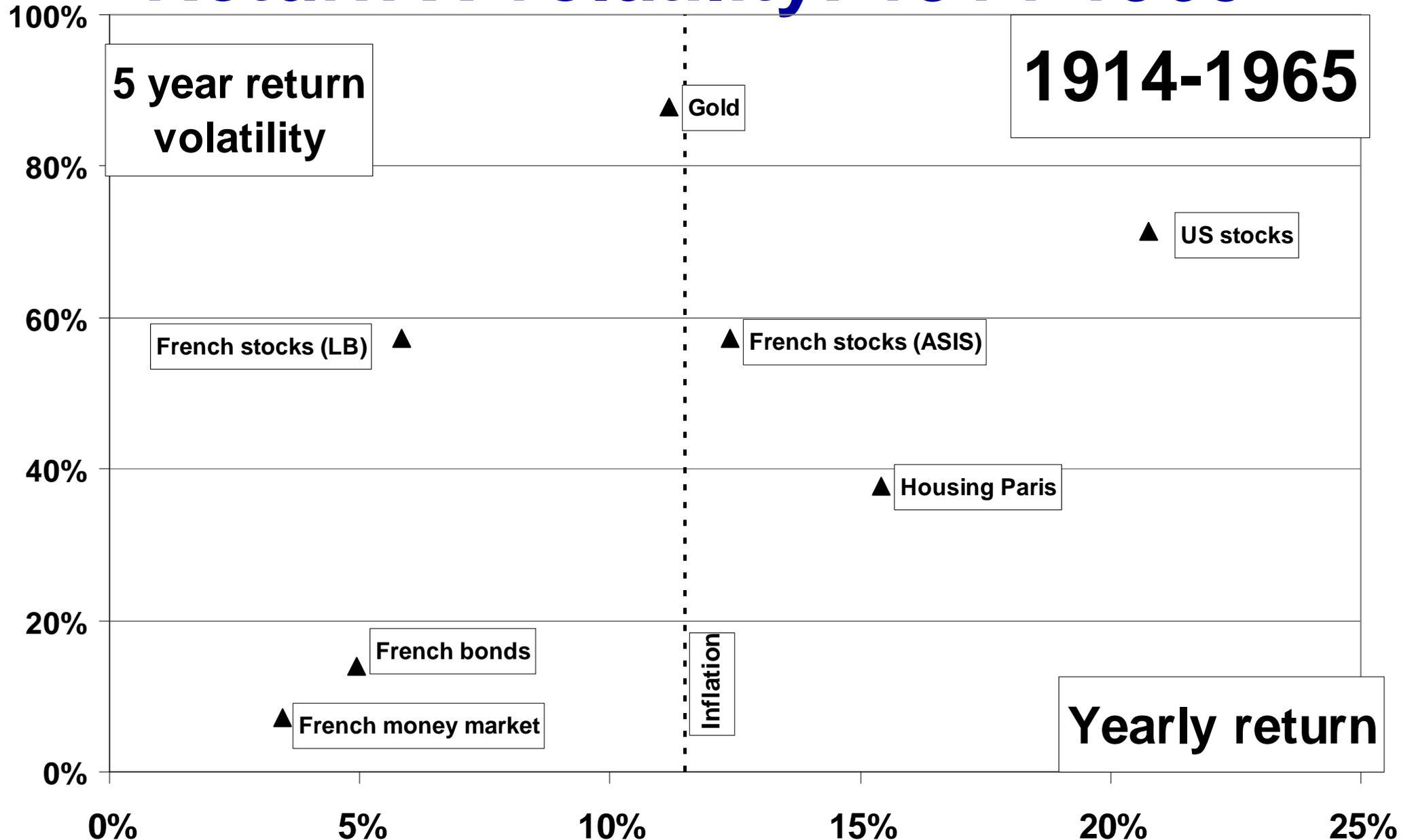
inflation + 4,6%

Return X volatility: 1840-1914



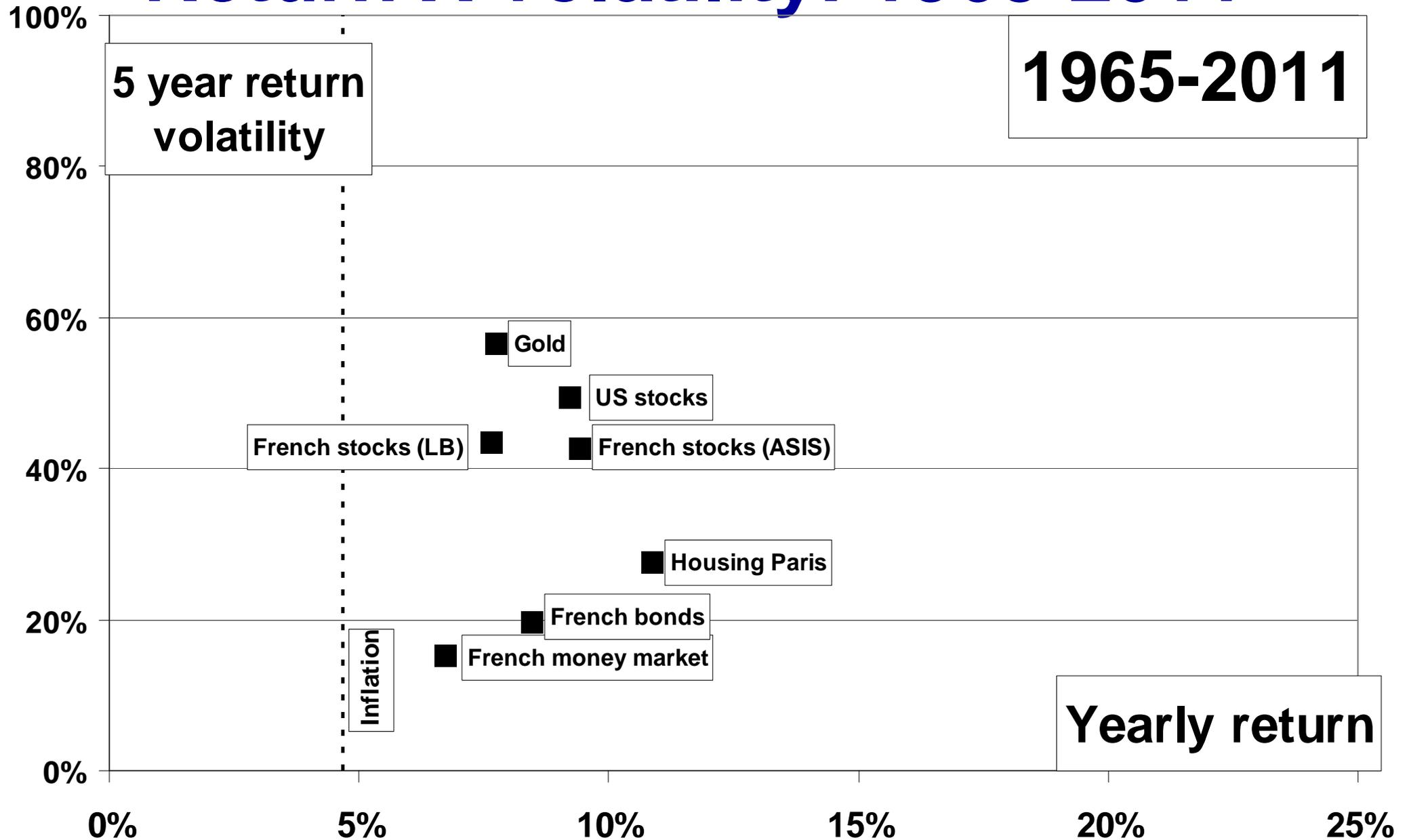
Source: CGEDD after Arbulu, Le Bris & Hautcoeur, Euronext, Vaslin, Loutchitch, Ixis, Banque de France, ECB, notaries' databases, Notaires-INSEE indices, Duon, INSEE, Schwert, Shiller, S&P, World Gold Council, Officer. NB : ASIS = Arbulu-SGF-INSEE-SBF250 series. LB = Le Bris series

Return X volatility: 1914-1965



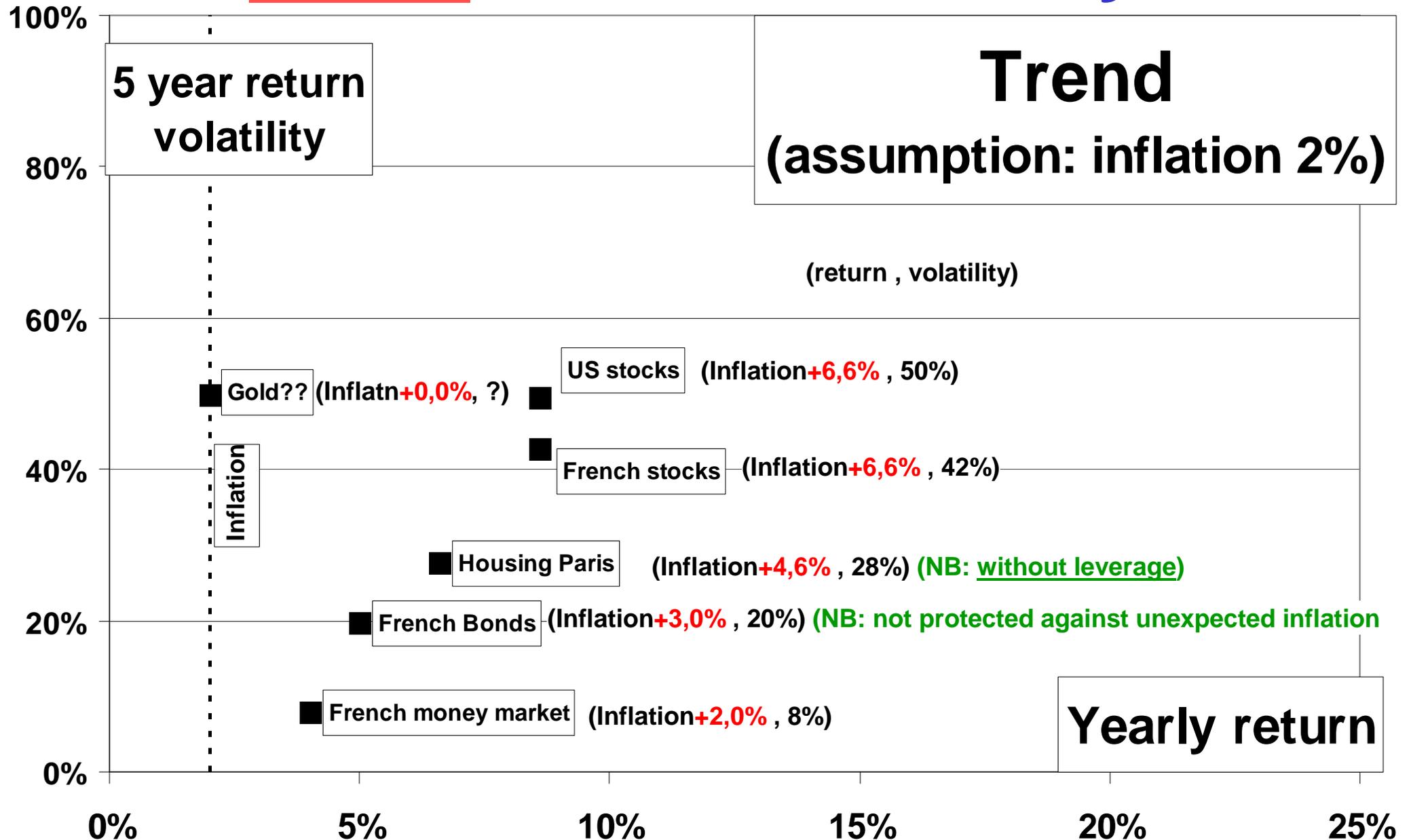
Source: CGEDD after Arbulu, Le Bris & Hautcoeur, Euronext, Vaslin, Loutchitch, Ixis, Banque de France, ECB, notaries' databases, Notaires-INSEE indices, Duon, INSEE, Schwert, Shiller, S&P, World Gold Council, Officer. NB : ASIS = Arbulu-SGF-INSEE-SBF250 series. LB = Le Bris series

Return X volatility: 1965-2011



Source: CGEDD after Arbulu, Le Bris & Hautcoeur, Euronext, Vaslin, Loutchitch, Ixis, Banque de France, ECB, notaries' databases, Notaires-INSEE indices, Duon, INSEE, Schwert, Shiller, S&P, World Gold Council, Officer. NB : ASIS = Arbulu-SGF-INSEE-SBF250 series. LB = Le Bris series

Trend return X volatility



Source: CGEDD after Arbulu, Euronext, Vaslin, Loutchitch, Ixis, Banque de France, ECB, notaries' databases, Notaires-INSEE indices, Duon, INSEE, Schwert, Shiller, S&P, World Gold Council, Officer.

Other aspects of investing

- **Leverage**
- **Management costs and transaction costs**
- **Taxes**
- **Risks other than price volatility**
(valued differently depending on the investor)
- **Diversifying power**

Now

Relative to their respective long term trend,

- stock prices are low(*)**
- gold, bonds(**) and housing prices are high**

(*) although a decrease is possible in the short term

() except sustained very low inflation**

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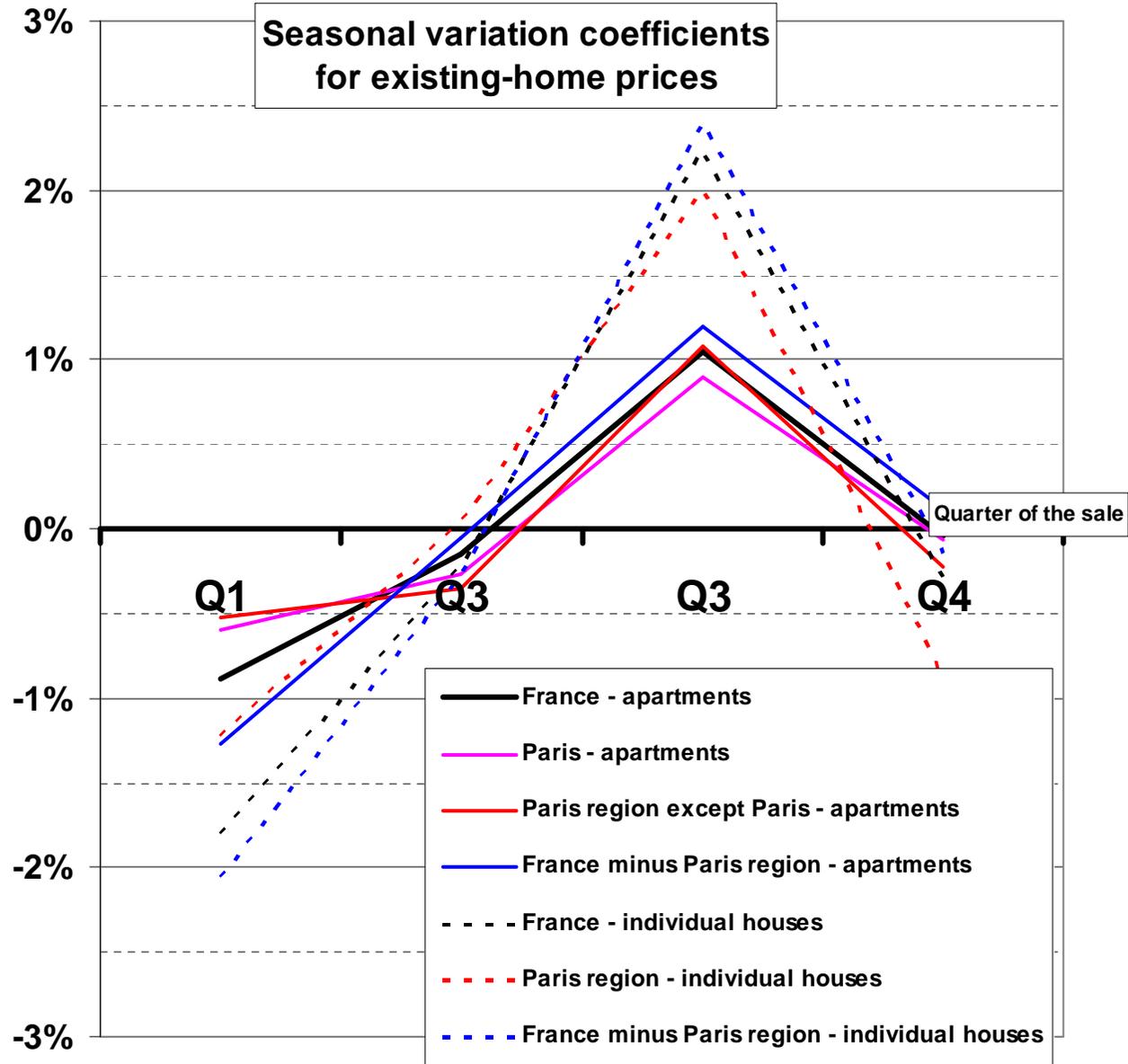
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Several properties of house prices (1)

- **Series are short** => limits the significance of **results** (incl. problem of lack of robustness of results)
- **High autocorrelation of 1 year price changes**
=> **strong cyclicity** (in the sense of high autocorrelation)
Deciders' « myopia » (= expectations based on the recent past = « short memory »), self-reinforcing phenomenon
Conversely, no short term autocorrelation for stocks (~ random walk)
- **No periodicity other than seasonality**

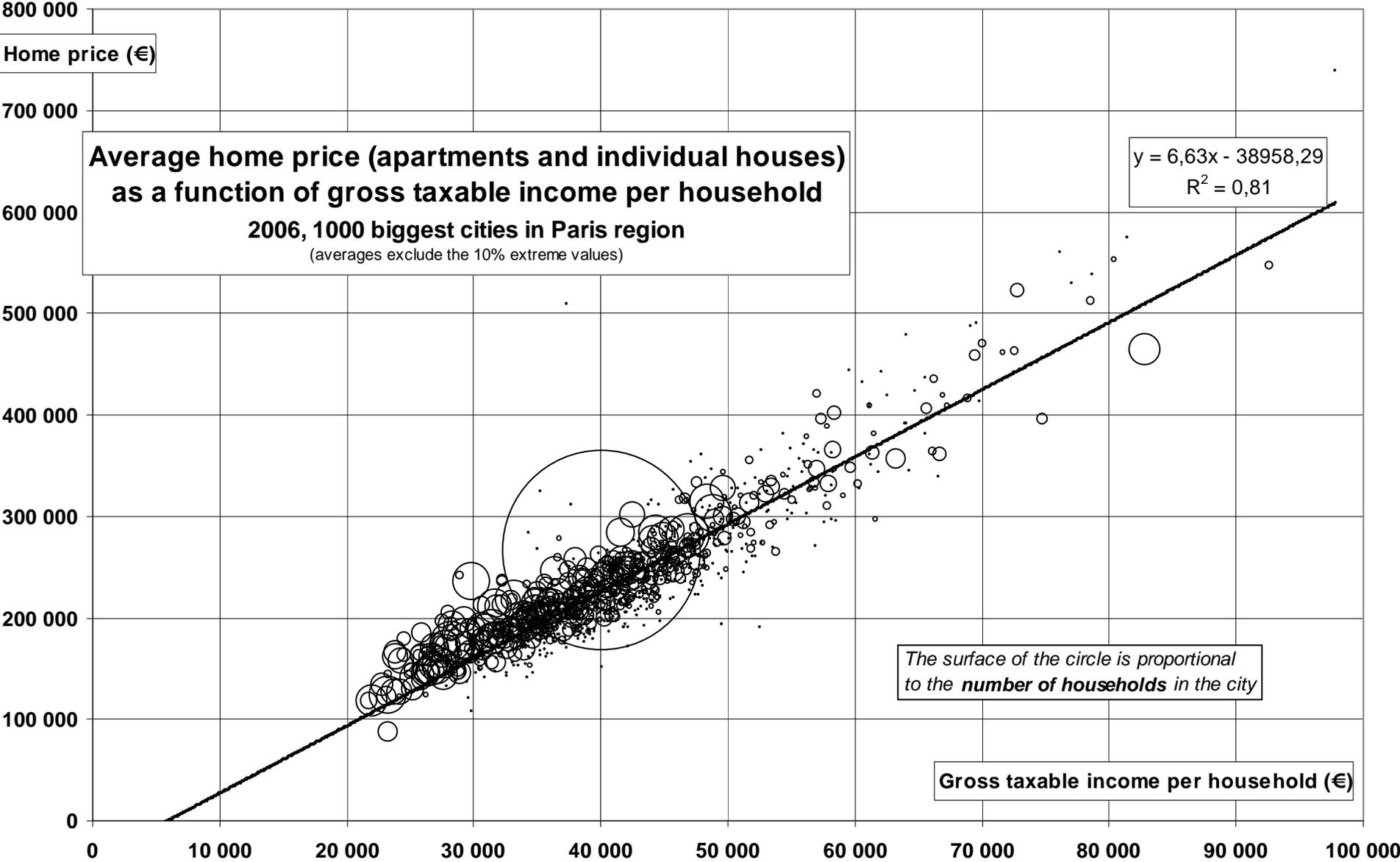
Seasonality



Several properties of house prices (2)

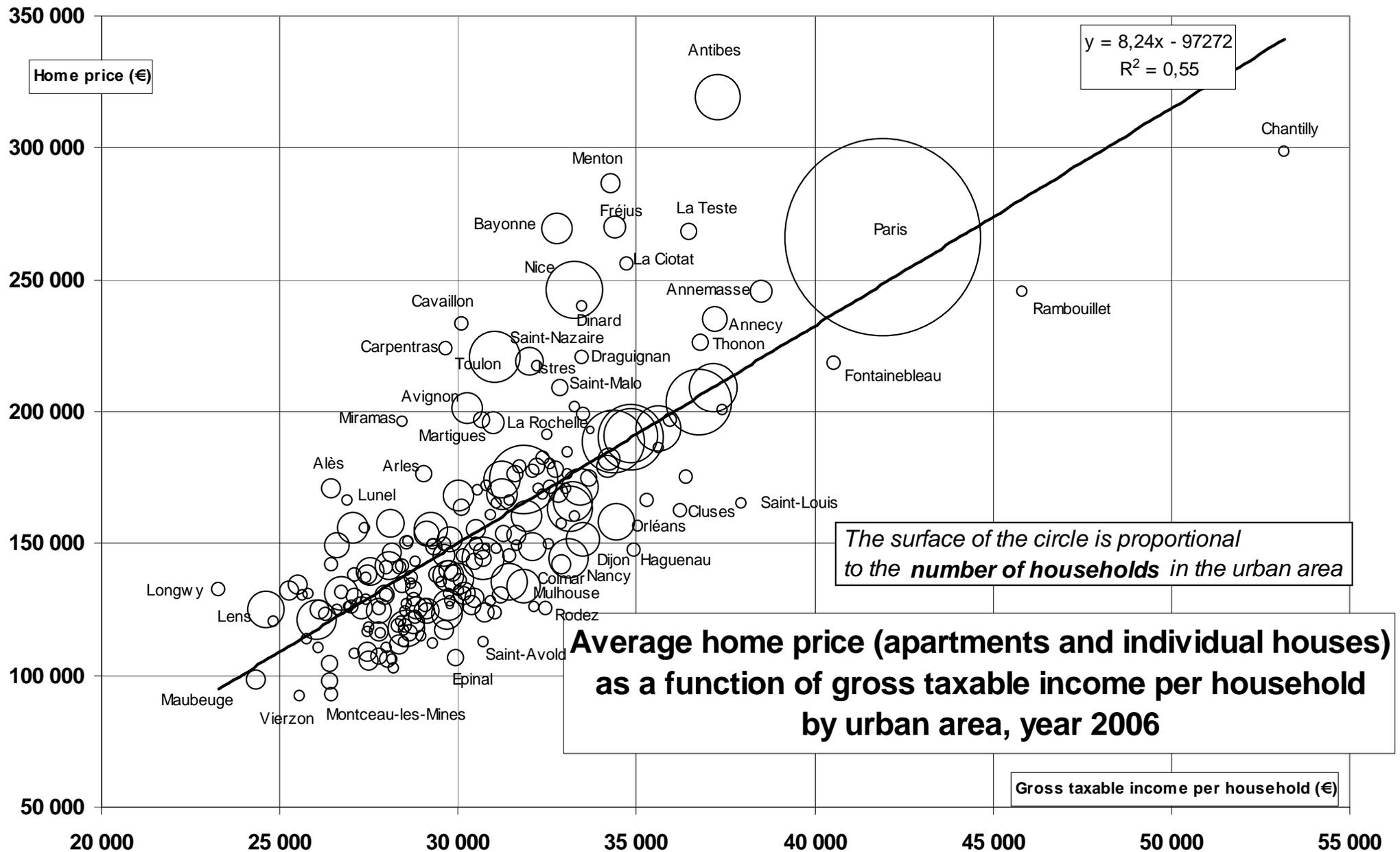
- Link with **households' income** :
 - *in time*: intuitive **in appearance**, empiric in reality
 - and *in space*

Link home price X income per household: by city in the Paris region



Source: CGEDD after notaries' databases and Filocom (DGFIP)

Idem by urban area (impact of secondary homes)



Source: CGEDD after notaries(databases and Filocom (DGFIP)

Interpretation of the link price X income

Households' asset (1)

-100% of users are households (housing expense = 1/5 of their income)

•29 million households, 34 millions dwellings of which 1/10 secondary homes (differences = vacancy)

-95% of buyers are households (a household' biggest purchase during its existence)

-8 dwellings out of 10 are owned by households

•difference =8/10 « social housing » (« HLM ») + 2/10 owned by other non-individuals

- $\frac{3}{4}$ of households own a dwelling at least once in their existence, 63% of households own at least one dwelling, 59% of households own their principal residence

Households' asset (2)

-Out of 10 households:

- 4 own no dwelling

- 4 own at least 1 dwelling

- 2 own more than 1 dwelling (on average 2.8 dwellings, incl. their principal residence)

By comparison only 2 households out of 10 own stocks (and only 5% own a significant amount of stocks)

-Out of 10 households:

- 4 are tenants (of which 2 get a housing benefit)

- 2 are owner-occupier and reimburse a mortgage (« accédants à la propriété »)

- 4 are owner-occupier and don't reimburse a mortgage (« propriétaires non accédants »)

-Out of 3 dwellings purchased

- 1 is the first principal residence of the buyer

- 1 is a principal residence of rank >1 (the 2nd one, the 3rd one, etc.) of the buyer

- 1 is a rental investment or a secondary home (of which: 2/3 rental investments and et 1/3 secondary residence)

-A household purchases on average 2,5 dwellings during its existence

Households' asset (3): number of dwellings getting into or out of an individual's ownership during his lifetime

		During the lifetime of an individual as part of a household	Number of dwellings
Entry into or exit from ownership	With payment	Dwellings purchased or built	2,5
		<i>(of which purchased existing)</i>	<i>(1,8)</i>
		<i>(of which purchased new or built)</i>	<i>(0,7)</i>
		Dwellings sold	1,8
		Difference purchased or built minus sold	0,7
	Without payment	Net balance of dwellings given or received as donations	0,0
		Dwellings inherited	0,4
		Dwellings owned at death	1,1

Several properties of house prices (3)

• **Low univariate correlation** of house price changes and **interest rate changes**

- **counter-intuitive** but is the basis of the **diversifying power** of housing investment with respect to bonds (maybe different for whole buildings owned by large investors?)
- => one has to factor out many other phenomena to see the sensitivity of home prices with respect to interest rates
- Link by the return to the hierarchy of trend return-risk couples but this return is not immediate

• **No univariate correlation** of house price changes

with stock investment [nevertheless stock krachs have often (1929, 1987, 2000, 2008) but not always (1882) been followed by an increase in house prices (particularly rented house prices)]

- **Time-series analyses (with autoregression) methods don't yield better results**
- **Multivariate analyses (incl. changes in offer and supply, income) impaired by the series brevity (at most 46 years)]**

=> Diversifying power of housing investment with respect to financial investments

Several properties of house prices (4)

A fundamental property: **the elasticity of housing price** with respect to **housing supply** seems in the **-1 or -2** range, maybe (?) slightly more (-3?) in the Paris region

Details in the paper:

http://www.cgedd.developpement-durable.gouv.fr/IMG/pdf/elasticite-prix-immobilier-nombre_cle093f5d.pdf

Elasticity of housing price with respect to housing supply (complement 1)

- Quite few works
- Complicated because
 - Many variables must be taken into account
 - Reverse effects
 - Time lags
 - Time series are short => results not robust with respect to the period studied
 - Analyses in space may compensate the lack of memory... but few local data
- Many more works on a reverse problem: sensitivity of construction to housing price changes

Elasticity of housing price with respect to housing supply (complement 2)

- Barker report + Oxford team: $e=-2$ in the UK
- Murphy, Duca & al. (Oxford + Fed Reserve): $e=-1$ in the USA
- Other references: widely dispersed results (by a factor 8 for the USA!)
- Often, economists' assumptions may be seriously debatable (incl.: arbitrage is not instantaneous)
- Result robustness is rarely mentioned
- Economists may be wrong: cf. (McQuinn, 2004) about Ireland, (OECD: Girouard, Kennedy & al., 2006) about the USA
- But results form a cloud centered around an order of size of -1 or -2

Elasticity of housing price with respect to housing supply (complement 3)

References

Country, period	Elasticity	Reference
Ireland, 1977-2004	-0,007 (ancien), -2,0 (neuf)	(OCDE, 2006)
Ireland, 1980-2002	-0,5	(McQuinn, 2004)
Netherlands, 1970-2002	-0,5	(OCDE, 2004)
USA, 1979-2007	-1	(Duca, Muellbauer & Murphy, 2009)
Netherlands, 1980-2003	-1,4	(Verbruggen & al., 2006)
Norway, 1990-2004	-1,7	(Jacobsen & Naug, 2005)
UK, 1969-1996	-1,9	(Meen, 2002)
UK, 1972-2003	-2	(Cameron, Muellbauer & Murphy, 2006)
Idem	Idem	(Barker, 2004)
Danmark, 1984-2005	-2,9	(Wagner, 2005)
USA, 1981-2003	-3,2	(McCarthy & Peach, 2004)
Paris, 1986-2004	-3,6	(Bessone, Heitz & Boissinot, 2005)
Australia, 1975-2003	-3,6	(Abelson & al., 2005)
Spain, 1989-2003	-6,9 à -8,1	(OCDE, 2005)
USA, 1981-1998	-7,9	(Meen, 2002)

Source: CGEDD after table 3 of (OCDE: Girouard, Kennedy et al., 2006), as well as (Duca, Muellbauer & Murphy, 2009) , (Cameron, Muellbauer & Murphy, 2006).

Elasticity of housing price with respect to housing supply (complement 4)

- Our contribution
 - Comparison France / UK over 1970-2005: elasticity = minus a few units
 - Comparison of the various French departments (1994-2010) (multiple regression of housing price change with respect to change in income, population, number of dwellings, etc.)
 - Confirms an order of -1 or -2 ,
 - maybe (?) slightly more (-3?) in the Paris region
 - Results are sensitive to the subperiod studied (problem of robustness)

PLAN

1. Home prices in France, a Historical perspective
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4. How Can We Explain the 2000-2010 Price Rise?
5. Home Price Prospective

How can we explain the 2000-2010 price rise?

- **Supply-demand of housing service?**
- **Inflationary impact of housing subsidies?**
- **Other explanations except financial environment ?**
- **Financial environnement?**
 - for the investor
 - for the buyer of his own principal residence

How can we explain the 2000-2010 price rise?

•Supply-demand of housing service?

No because:

- Elasticity** price/supply too **low** (-1 or -2)

- No rent rise beyond historical trend**

- Qualitative effects?

 - Decrease in household size?

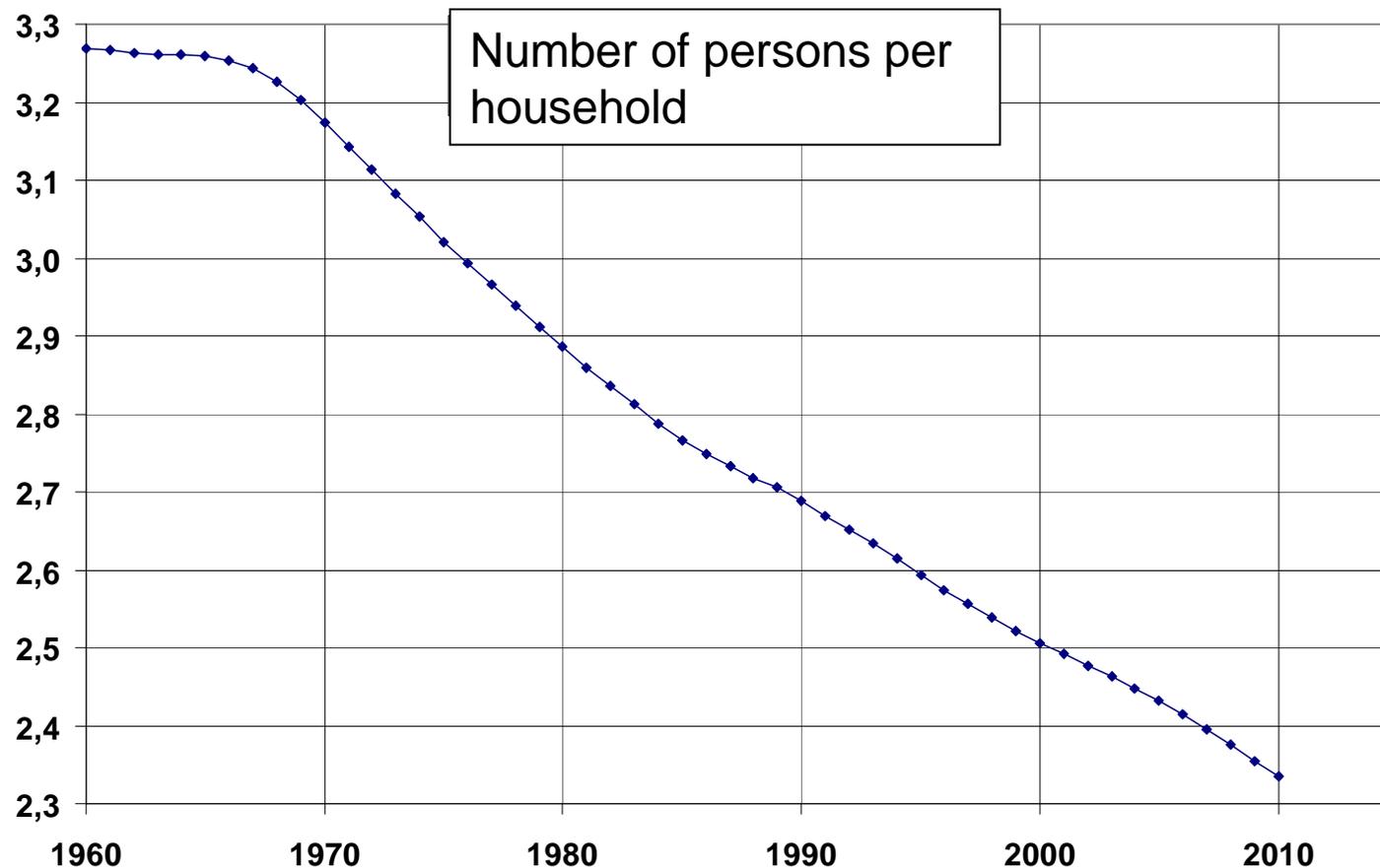
 - Ageing?

 - Foreigners?

no or not at the scale of the problem

How can we explain the 2000-2010 price rise?

- **Decrease in household size: is not new and goes on at the previous pace**



How can we explain the 2000-2010 price rise?

•Ageing: **impact >0 or rather <0?**

Households who prepare their retirement would have realized that their pensions might be lower than for previous generations and as a consequence would save more and accept lower expected returns?

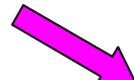
* True they accept lower *rental* returns, but is it sustainable?

* This demographic interpretation may be reversed: increase in the % of households older than 56, threshold beyond which households become net sellers.

How can we explain the 2000-2010 price rise?

- (Net) purchases by **foreigners**? **Too few** bar exceptions

Purchases of existing dwellings net of sales by foreigners as a % of the number of sales

	Moy 94-99	2000	2002	2004	2006	2008	Evol.
All foreigners	2,3%	2,6%	3,2%	3,2%	2,4%	2,1%	
Britons		0,5%	1,3%	1,7%	0,9%	0,4%	
Other		2,1%	1,9%	1,4%	1,5%	1,8%	
<i>Of which MATT</i> (mostly resident)		<i>0,6%</i>	<i>0,7%</i>	<i>0,5%</i>	<i>0,5%</i>	<i>0,6%</i>	
<i>Of which Portuguese</i> (mostly resident)		<i>0,3%</i>	<i>0,2%</i>	<i>0,2%</i>	<i>0,2%</i>	<i>0,3%</i>	
<i>Of which Germans</i>		<i>0,1%</i>	<i>0,0%</i>	<i>0,0%</i>	<i>-0,1%</i>	<i>-0,1%</i>	
<i>Of which others</i>		<i>1,1%</i>	<i>1,0%</i>	<i>0,8%</i>	<i>0,9%</i>	<i>1,0%</i>	

How can we explain the 2000-2010 price rise?

• Inflationary impact of subsidies?

Not at the scale of the 70% to be explained

- Households' housing expense = 15% of GDP
- Amount of dwellings purchased or built by households = 250 Billion € = 13% of GDP in 2007 (at its highest)
- Amount of property inflation generated in 2007 by the 70% increase in home prices relative to income: ~100 Billion €

To be compared to

- Transfers organized by gov't in favor of housing = 1 to 2% of GDP (depends on how one counts)
- Leeway on these transfers = ten times smaller
- « PTZ »: around 2,5 Billion € equivalent-subsidy (at its maximum)

How can we explain the 2000-2010 price rise?

- **Other explanations** except financial environmt ? (1)

- **Resale financed the price rise?**

By nature resale feeds rises (and falls: **reversible** effect) but

- a) Resale financed the same % (21%) of purchases (of principal residences by owner-occupiers) in housing surveys 2002 and 2006
- b) The number of existing-home sales remained constant (800 000/year) from 2000 to 2007 => the « rotation speed » of the housing stock did not increase (rather it decreased)
- c) Departments where home price rised most were those where there were the fewest owner-occupied principal residences as a % of all dwellings

- **Inheritance and donations finance (and will finance) the price rise?**

Not that much and not more than previously

- One inherits from parents around 55
- Donations financed a low (3%) and constant % of purchases (of principal residences by owner-occupiers) in housing surveys 2002 and 2006
- Lagged and **reversible** effect

How can we explain the 2000-2010 price rise?

- **Others explanations** except financial envirt ? (2)

- The price rise since 2000 results from land price rise and scarcity? **No**

Land price

- The market price of constructible land is determined by the price of existing dwellings in its neighborhood => the rise in home prices caused the rise in land prices, not the reverse.
- The *average* price of land used for building individual houses did not grow faster than the average price of existing homes, whereas the construction cost index grew much slower.

Land « scarcity »

- The elasticity of housing price with respect to housing supply being around -1 or -2, an increase in the supply of constructible land parcels (by regulatory changes or by sellers' decision to sell) decreases housing prices only slightly.
- When, from 2004, construction grew from 300 000 to more than 400 000 per year, finding land was not a problem.

How can we explain the 2000-2010 price rise?

- **Other explanations** except financial environmt ? (3)
 - **The price rise is just a continuation of the increase in the weight of housing expense as in households' budgets experienced since 1965? No** since the increase in housing expenses from 1965 to 2000 took place while the house price index was constant relative to households' income: it resulted from an increase in the quality of housing, without any equivalent in the 2000-2010 period.

How can we explain the 2000-2010 price rise?

- **Financial environment?**

A. Housing as an investment: arbitrage against other assets (risk X expected return)

- « Rational » investors value housing as a rent-indexed perpetual bond (R_{net} initial $\sim r - i + k - a$ where r = interest rate, i = expected inflation, k = risk premium, a = expected growth rate of rent, net of expenses and inflation)

- **In 2010** interest rates were low (relative to their trend level) => could justify housing prices in spite of low rental returns...: housing investment was competitive with respect to **bonds**, which provided low expected returns too (but isn't it risky to finance an indexed perpetual bond by a 25 year bond?)

- ...but **stocks** were low (relative to their trend level) and their expected return was high in the long term

- Certainly many households don't arbitrage housing against stocks in any way

- but only « **myopia** » (after the 2000 stock crash) can explain that the others didn't move to stocks.

- Parallel with 1930-1935

=> The 2000 2010 home price rise can be explained by arbitrage only if one assumes deciders' «myopia»

How can we explain the 2000-2010 price rise?

- **Financial environment?**

B. Housing as principal residence (=majority) : what can one buy for a given monthly payment?

- Lower interest rates impact owner-occupiers less than investors (15-20 year mortgage less sensitive than perpetual bond to interest rate)
- Longer mortgage length
 - In the **short term: to be relativised** (increased the amount purchased by 12% to 15% everything else being equal),
 - In the **long term: repayment takes longer (=> from which budget will households take the cash?)**
- **Downpayment as a % of price has decreased from 2000 to 2006** (consequence of increase in indebtedness allowed by longer mortgages and lower interest rates)
- **Other conditions** have fluctuated as they have since 1965 – may have contributed moderately to the price rise
- **Conclusion: for owner-occupiers, lower (net) interest rates relative to the 1965-2000 reference (3.6%) have not compensated the price increase, even taking into account longer mortgages**

How can we explain the 2000-2010 price rise?

To summarize:

- **Mortgage conditions** (rate + length) favored some price increase,
- + deciders' « myopia » (mainly investors)

These factors impact rental investment more than purchases by owner occupiers

=> explains that since 2000, prices have been growing faster

- for apartments (3/4 rented) than for individual houses (3/4 owner-occupied)
- In departments with lower % of owner-occupied principal residences

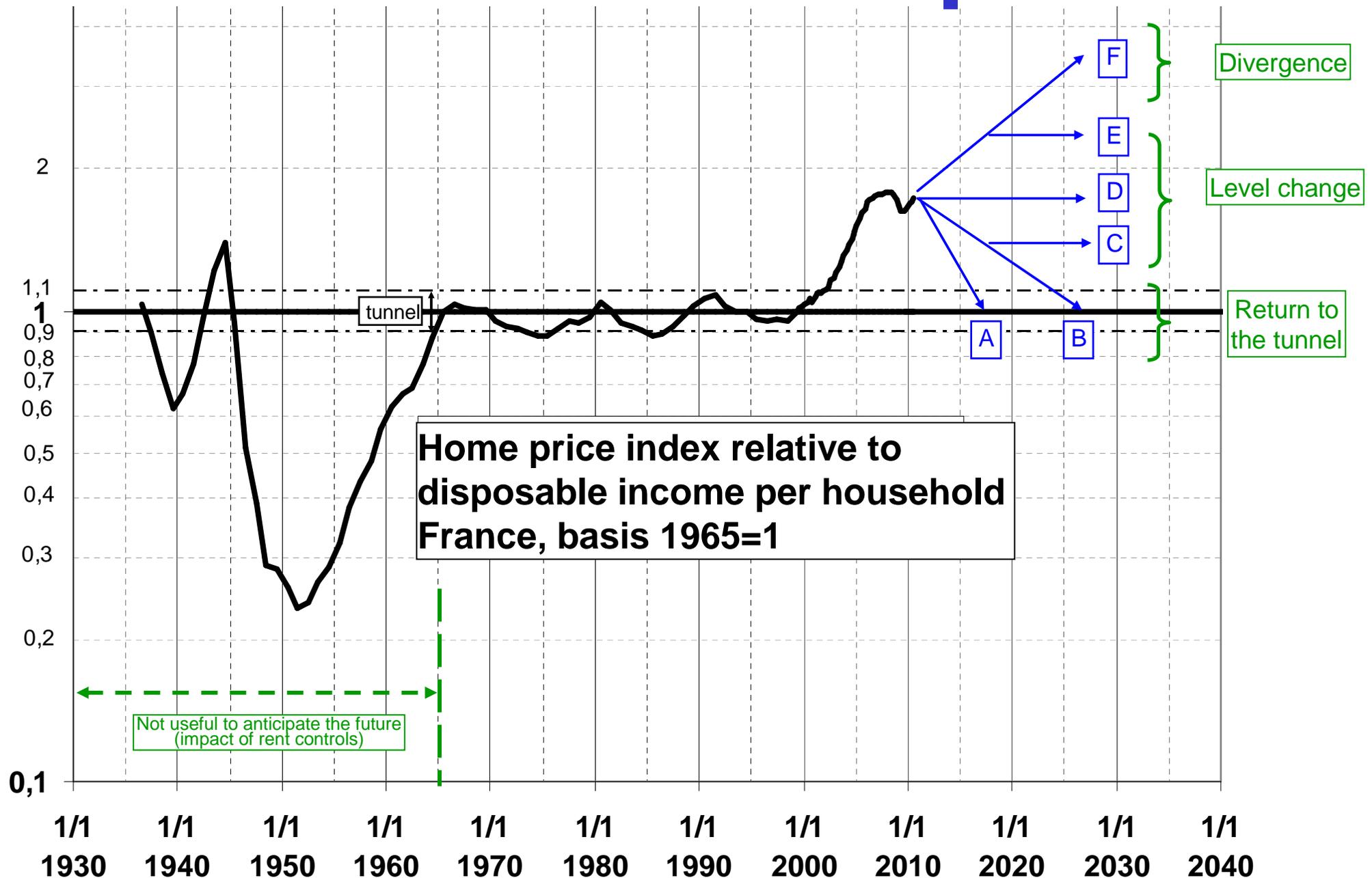
The same factors seem to have caused the rebound in home prices in 2009-2010:

- Additional fall in 'real' interest rates (not sustainable)
- Deciders' « myopia », even more so after the 2nd stock crash (2008 after 2000) (reversible)
- Higher rebound in larger urban areas (where more rented dwellings)
- Difference 2008-2010 France – UK - USA:
 - Few housing investors + « subprimes » and repossessions in the USA
 - Fewer investors + (adjustable!) interest rates fell by more in the UK,

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Home Price Prospective



Source : CGEDD after notaries' databases, Notaires-INSEE indices and INSEE

Scenario F (divergence) looks unlikely

- Rental returns can't decrease indefinitely
- => after a certain while, rents would be disproportionate relative to households' incomes
- => Scénario F is unlikely
- => the home price index will probably resume a progression parallel to income per household

Will the « tunnel » change level?

(= scenarios C, D et E)

Does the 2000-2010 price rise signal permanent « level change » resulting from irreversible phenomena?

- **Will the causes of the 2000-2010 price rise have a permanent impact?**
 - Explanations by « supply / demand »: have been rejected
 - Explanations by inflationary impact of subsidies: have been rejected
 - Other explanations other than financial environment: have been rejected (or are reversible)
 - Remains: financial environment and deciders' « myopia »
- **New phenomenon: level of public debt**

Financial environment:

A. Housing as an investment

- Interest rates will revert to the trend level = 3% plus inflation
- Risk - return couples will revert to their trend levels for other investments
- Arbitrage => idem for housing investment: total return will revert to its trend
- « Level » => housing investment's capital gains will be at its trend level

=> Rental return L/P (total return minus capital gains) **will revert to its trend level** (net ~ 3,5%)

Rents L should not grow faster than income per household:

- Have grown at the same pace up to now
- Low elasticity / supply and demand
- Tenants can not pay much more than they do as a % of their income
- Tenants' income grows slower than average households' income

=> Housing price P should revert to its past trend level relative to income per household

- In addition deciders' « myopia » (the impact of which is temporary and reversible by nature) with respect to stocks will end and invert its impact at some point
- **=> « Return to the tunnel »**

Financial environment

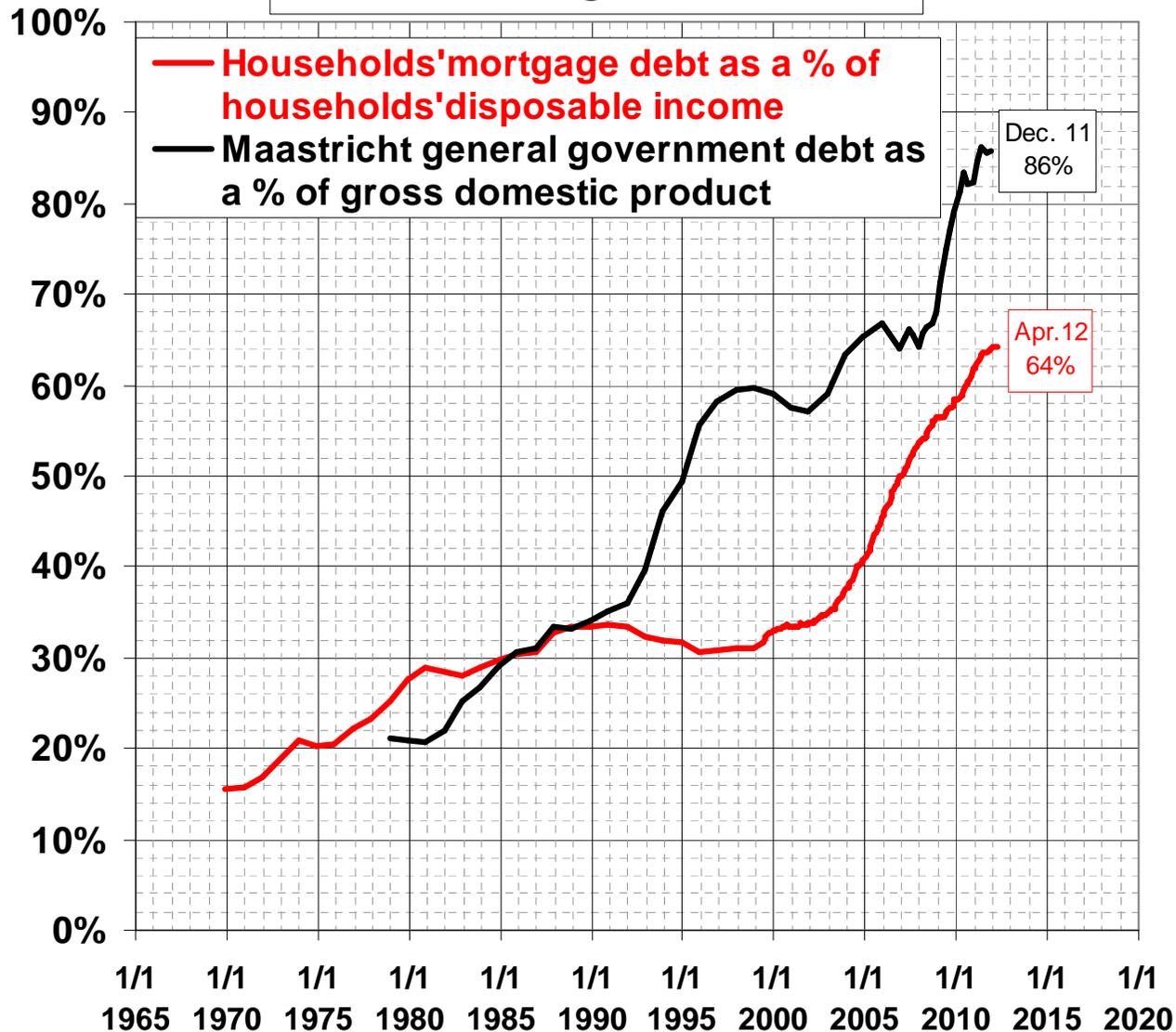
B. Housing as principal residence

- **Interest rates** will **revert** to the trend level = 3% plus inflation
 - **Mortgage length**
 - In the long term,
 - **Reverse effect of additional monthly payments** on the amount of further purchases [where will people find the cash? Lower housing purchases? Lower other housing expenses? Lower other expenses (cars, vacations, etc.)?]
 - Part of the increase in average price will be an increase in quality (cf. mortgage lengthening of 1965-1975) => further reduces the impact on the house price index
 - In the USA, mortgage lengthening in the (21 years in 1963, 27 years in 1980) has not coincided with a « level change » (rather the opposite)
 - **Other:** no reason not to assume past constants will change + reversibility in some cases
- => No cause for a significant level change in the long run.**

Government deleveraging

Will impact in some way households' housing purchases

Households' mortgage debt and Maastricht government debt

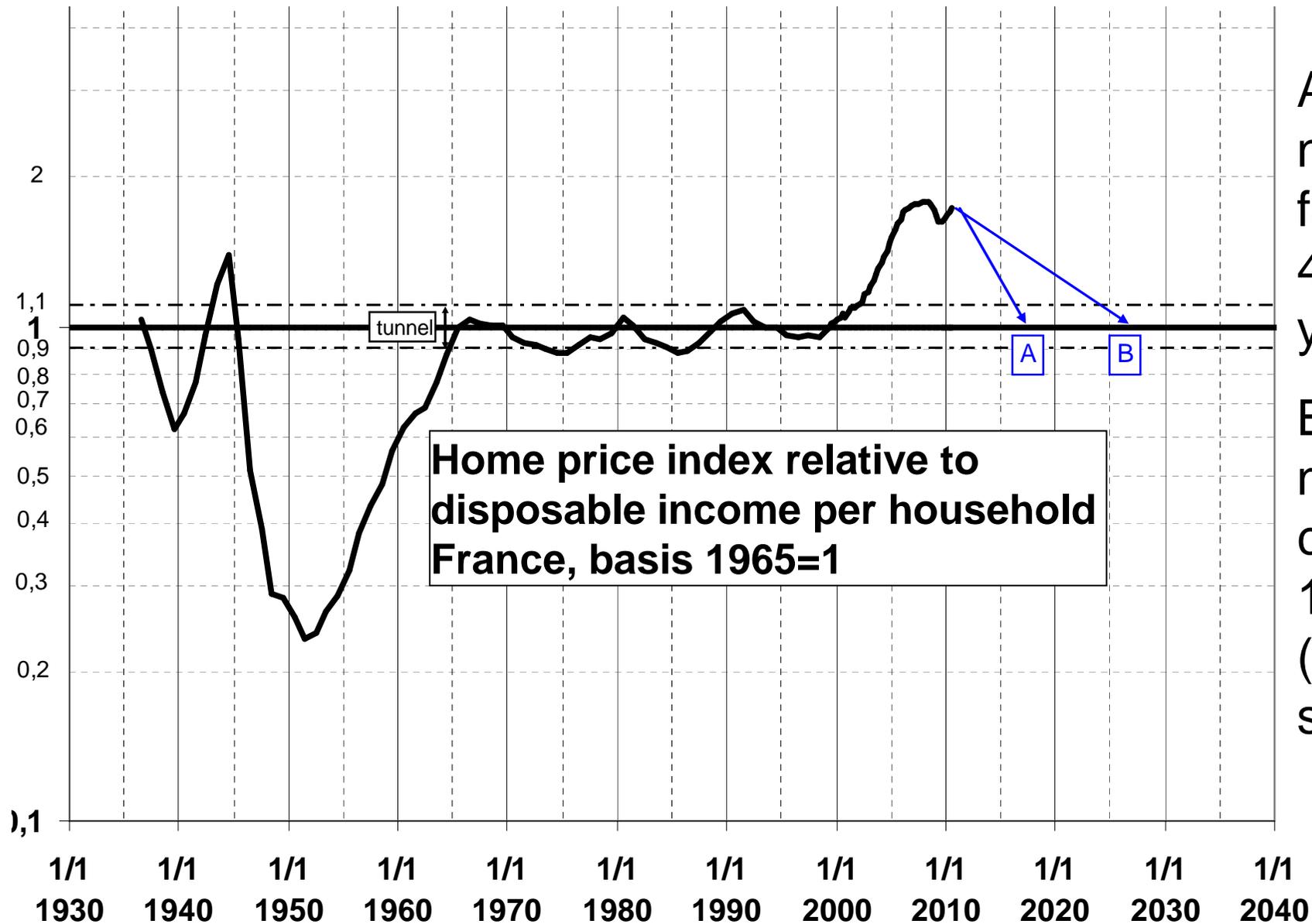


Source : CGEDD after
Banque de France
and INSEE

As a conclusion: a « level change » looks unlikely

- Rejection of explanations by « supply-demand »
 - Rejection of explanations by subsidies and misc.
 - Reversion to « trend » interest rates (3% plus inflation)
 - For the **investor**: stability of the risk/return hierarchy of the various investments (return to rental returns of years prior to 2000) and end of « myopia »
 - For the **owner-occupier**: reverse impact of mortgage lengthening
 - Government deleveraging
- ⇒ a « level change », if any, should be small: we reject scenarios C, D and E
- ⇒ Remain: scenarios A and B: « return to the tunnel »

How fast shall we revert to the tunnel?



**Home price index relative to
disposable income per household
France, basis 1965=1**

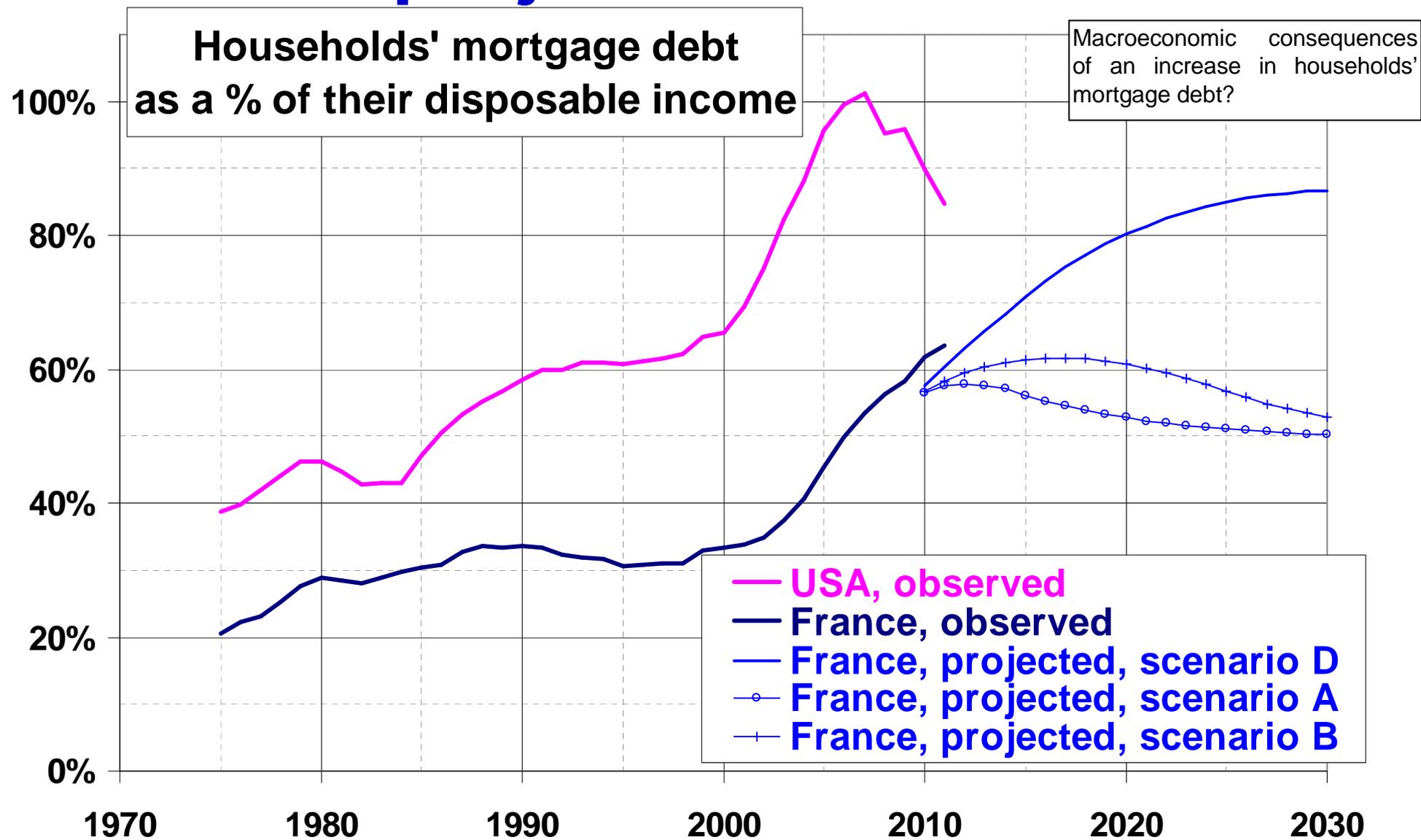
A (fast) =
nominal prices
fall by 35 to
40% in 5 to 8
years

B (slow)=
nominal prices
constant for
15 to 20 ans
(« Japanese
scenario »)

How fast shall we revert to the tunnel?

- **Based on years 1965-2000, scenario A (fast) est likelier than scenario B (slow) which may not be excluded nevertheless**
- **Low interest rates lessen the likelihood of scenario A until deciders' « myopia » reverses its effect**
- **Local scenarios may differ** (depending on the 2000-2010 change in home price and on the past and prospective change in income, unemployment, population, number of dwellings, % of secondary residences, etc.)

Prospective: households' mortgage debt projected to 2030



Source: CGEDD after (up to 2011) Banque de France, INSEE, Federal Reserve, Bureau of Economic Analysis
 Paper: http://www.cgedd.developpement-durable.gouv.fr/IMG/pdf/dette-immobiliere-2030-friggitt_cle7496ca.pdf