Chronicles of a Deflation Unforetold

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Motivation

Lucas's 1995 Nobel lecture begins with Hume (1752):

- neutrality of money "evident"
  - "If we consider any one kingdom by itself, it is evident that the greater or lesser plenty of money is of no consequence; since prices of commodities are always proportion'd to the plenty of money"
- experience shows otherwise
  - "tho' the high price of commodities be a necessary consequence of the encrease of gold and silver, yet it follows not immediately upon that encrease, but some time is requir'd before the money circulate thro' the whole state, and make its effects be felt on all ranks of people"

Motivation (2)

- How the quantity of money changes matters
- Hume's thought experiment "magical"
  - "suppose that, by miracle, every man in Britain shou'd have five pounds slipt into his pocket in one night"

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. . . or was it?

Hume was in fact referring to an actual experiment.

This paper

A magical experiment:

- from August 1723 to September 1724 the French government reduced the nominal supply by 45%
- it did so in a series of four unforetold reductions in the face value of money
- from 1723 to 1726 prices and wages fell slowly, and by less than 45%
- at the same time, (industrial) output contracted sharply
- in 1726 the policy was reversed; prices moved up quickly and output rebounded
- I document all of the above

Institutional background

- absolute monarchy
- cabinet: principal ministers (secret meetings, no minutes)
- finance minister: oversees public finance, economic regulation
- *intendants*: central government's agents in the provinces
- council of trade: finance ministry bureaucrats + businessmen
- inspectors of manufactures

coins and francs

the system consists of

- coins (physical objects, made of gold, silver)
- units of account (*livre* or *franc*)

Coins are produced by the mint on demand at a fixed nominal price (MP)
The relation between coins and francs is set by government:

- *legal tender*: a coin worth X gives the right to cancel a debt worth X

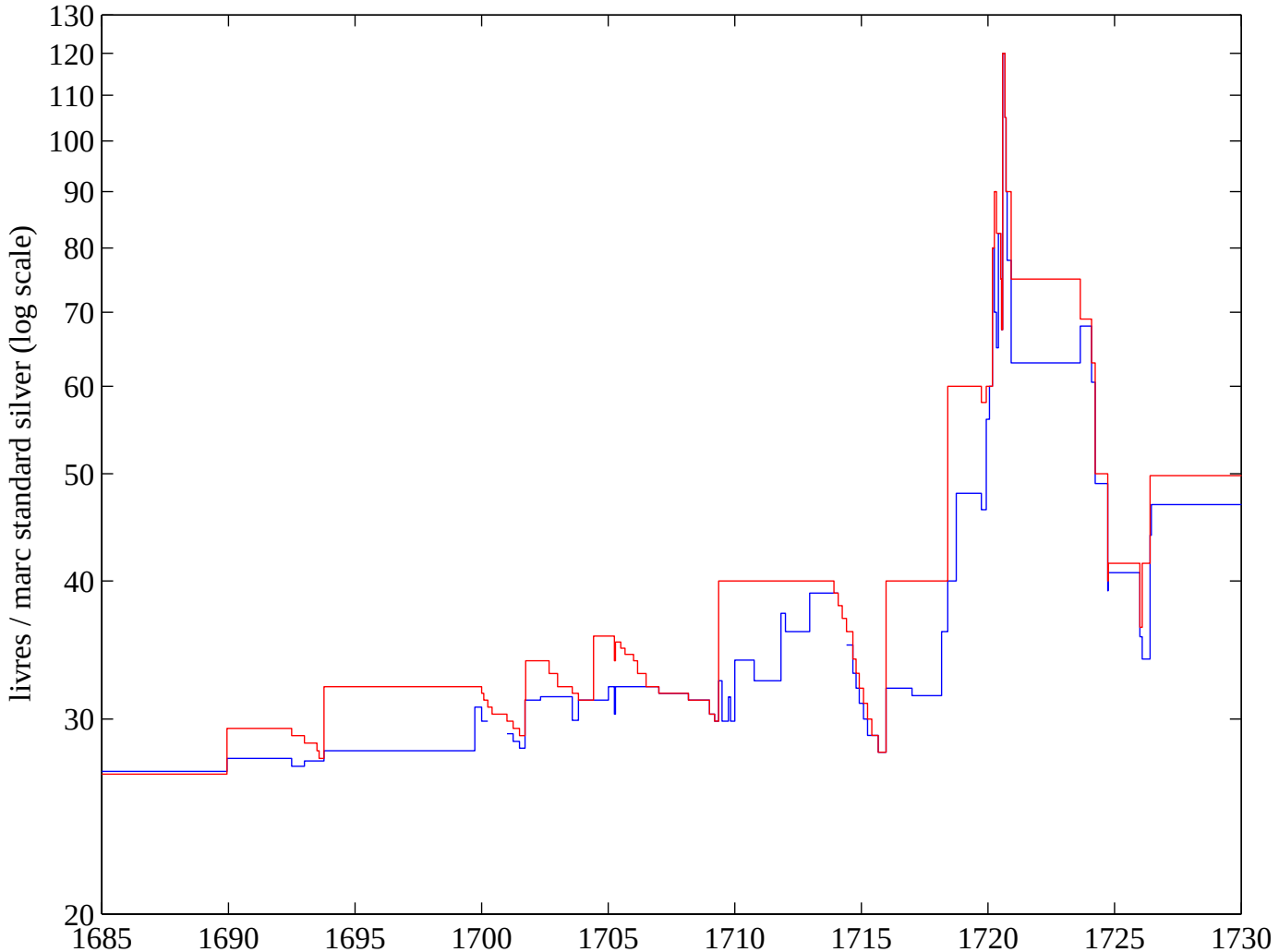
It can change over time:

- stable from 1641 to 1690
- changed many times between 1690 and 1726 (to raise seigniorage)

It can be tracked by two indices:

- mint equivalent (ME): francs/weight of silver assigned to coins
- mint price (MP): price paid by the mint for silver (in units of account)

ME and MP in France, 1685–1730



Monetary policy (1)

- diminutions

date	écu's value	diminution	cumulative diminution
	7.5		
Aug 1723	6.9	-8.0%	-8.0%
Feb 1724	6.3	-8.7%	-16.0%
Apr 1724	5	-20.6%	-33.3%
Sep 1724	4	-20.0%	-46.7%
recoinage			-44.7%

- attempts to "talk down" prices and wages
- importance of expectations: diminution of Sep 1724 to be "the last"

Monetary policy (2)

- harvest crisis of 1725
- looming European war: new taxes, another monetary reform
  - recoinage and augmentations

date	écu	dim.	cum. dim.	ME
Jan 1726	3.5	-8.0%	-12.5%	36.3
recoinage				
Feb 1726	5	-8.7%	+14.3%	41.5
May 1726	6	-20.6%	+20.0%	49.8

- June 1726: government dismissed
- unit of account remains (roughly) constant until 1914

Monetary policy: motivation

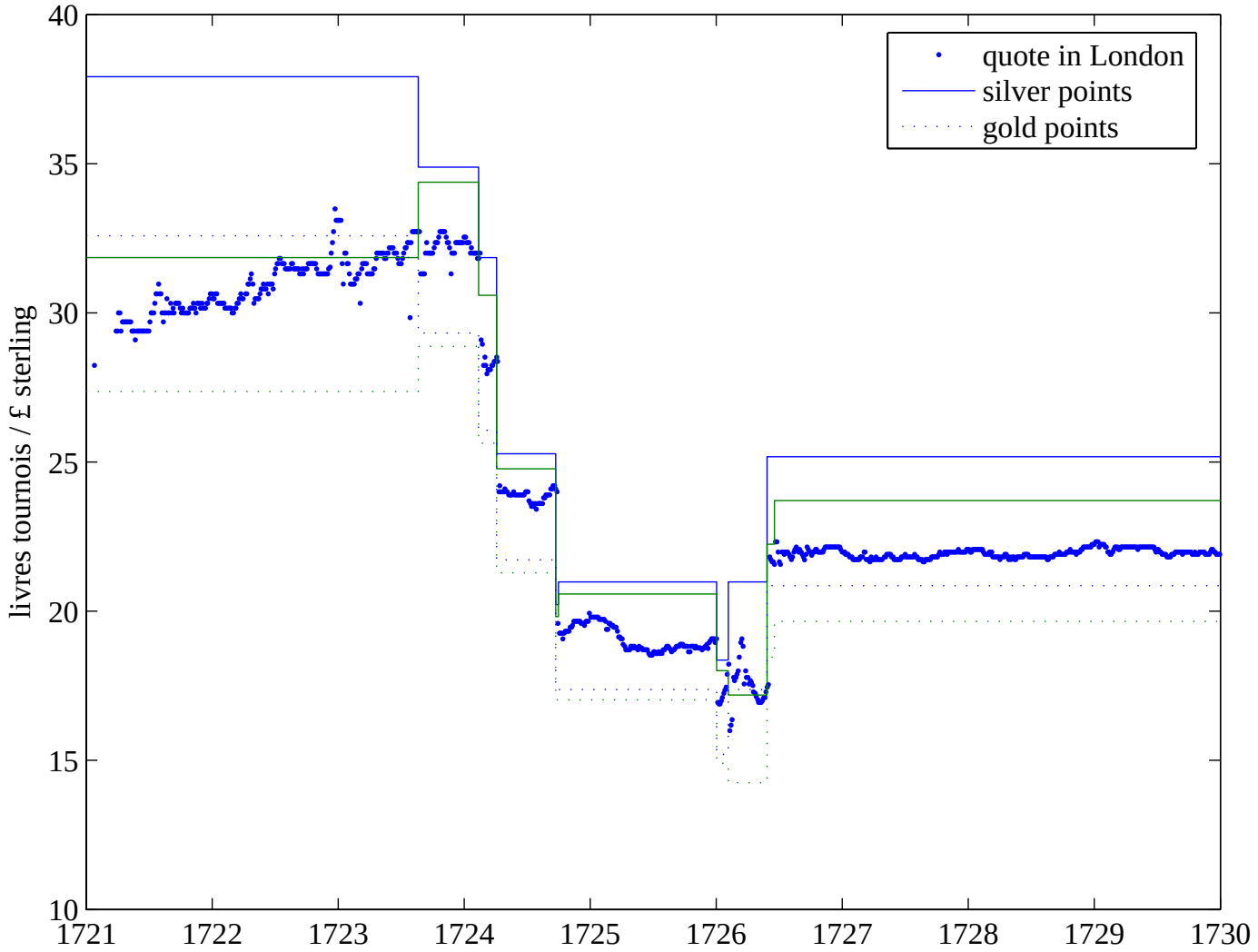
reasons:

- prices and wages "too high"
- increase real value of government debt
- mis-aligned exchange rates?

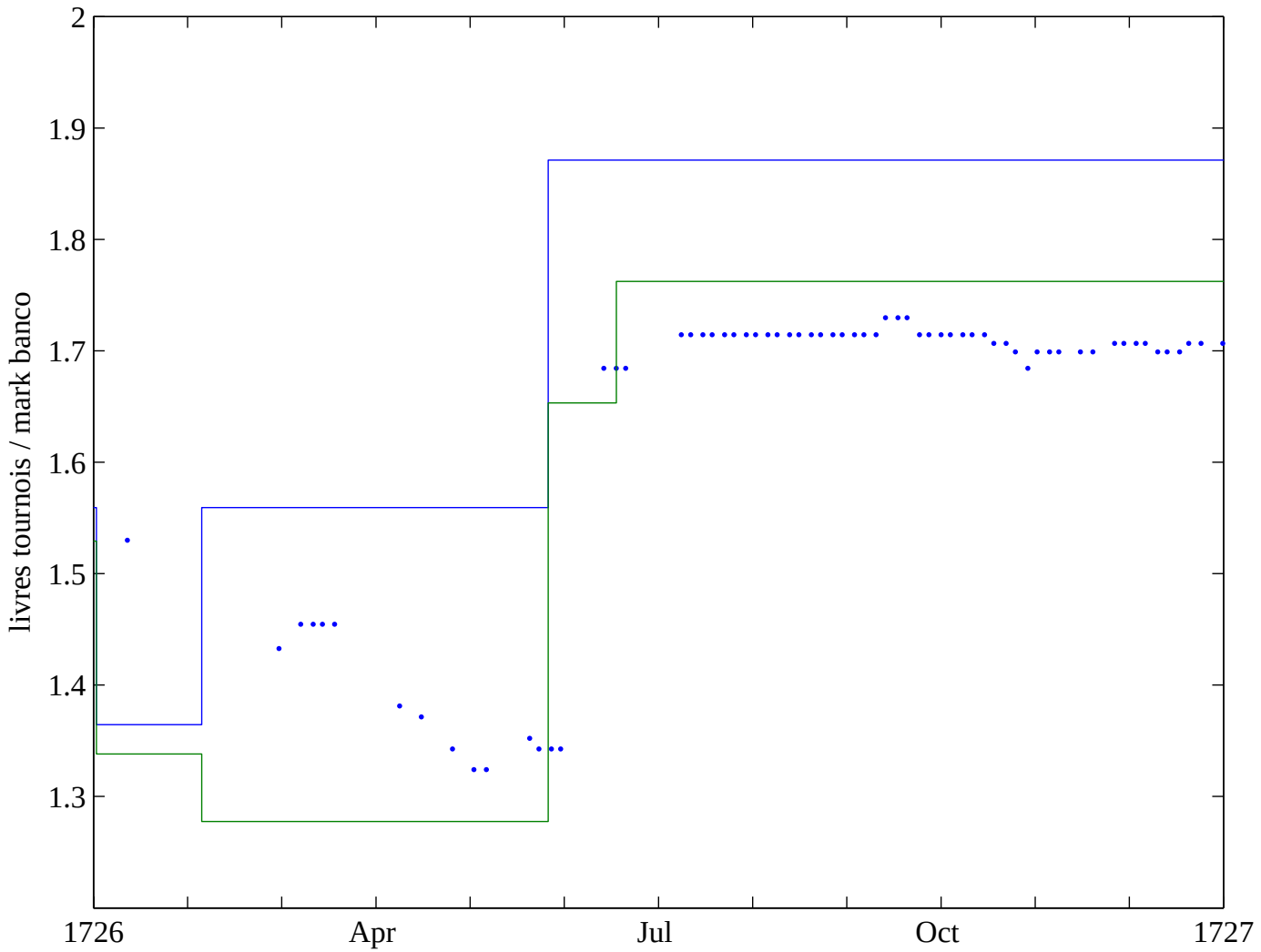
Qualitative evidence

- Data collection
- Reports from the fairs and provinces
  - booming economy to mid-1723
  - from 1724: falling sales, sellers reluctant to reduce prices, production cutbacks
  - 1724–25: "credit crunch" (rising interest rates, "lack of coin")
  - reduced foreign demand
  - role of expectations: buyers drive up prices to avoid capital loss on money holdings
  - Sept 1724: govt recognizes lack of transparency
- Government attempts at enforcing deflation
  - jawboning (producers, merchants, retailers)
  - jailing (workers)
  - no price controls (deemed too dangerous)

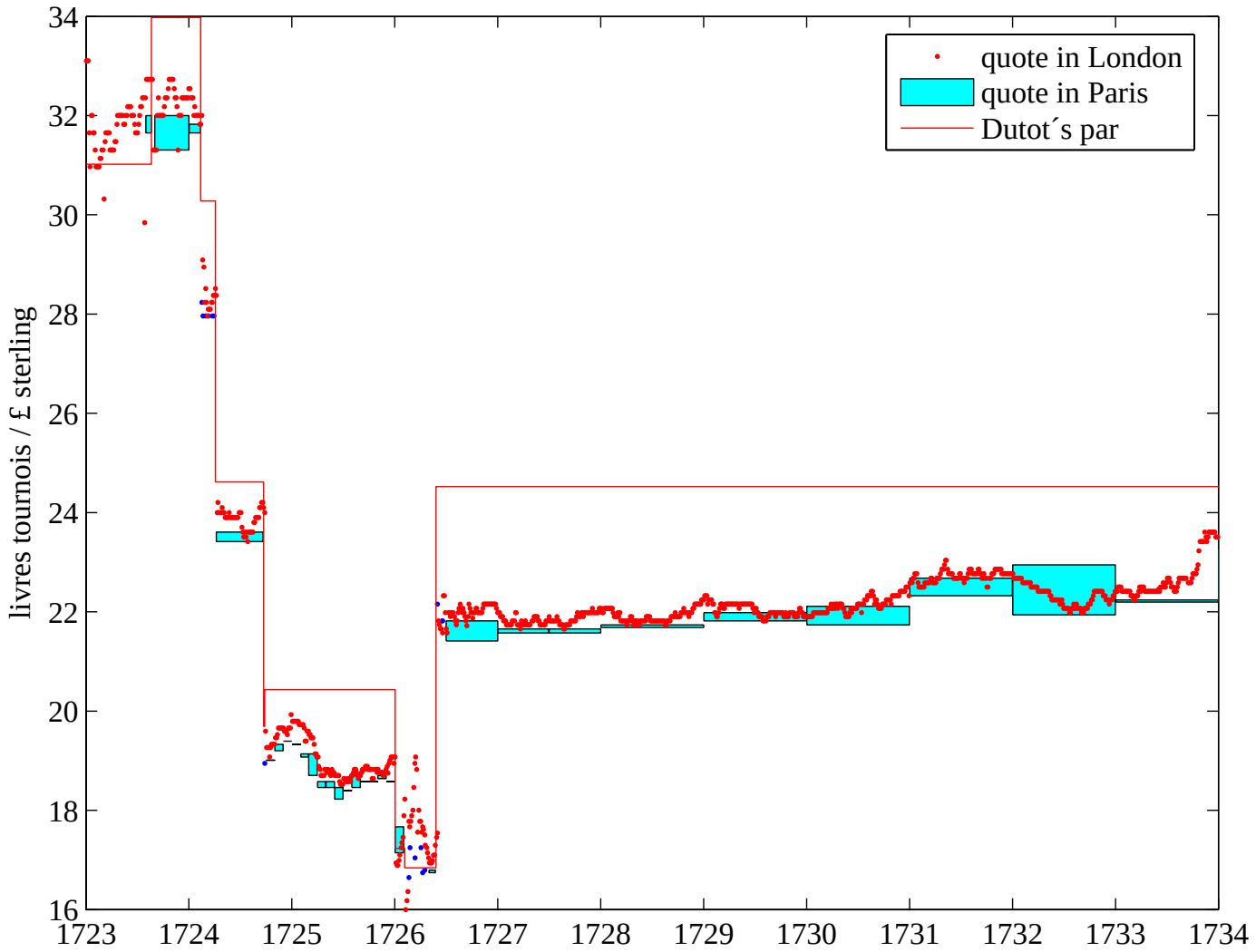
Exchange rates on Paris in London, 1721–29.



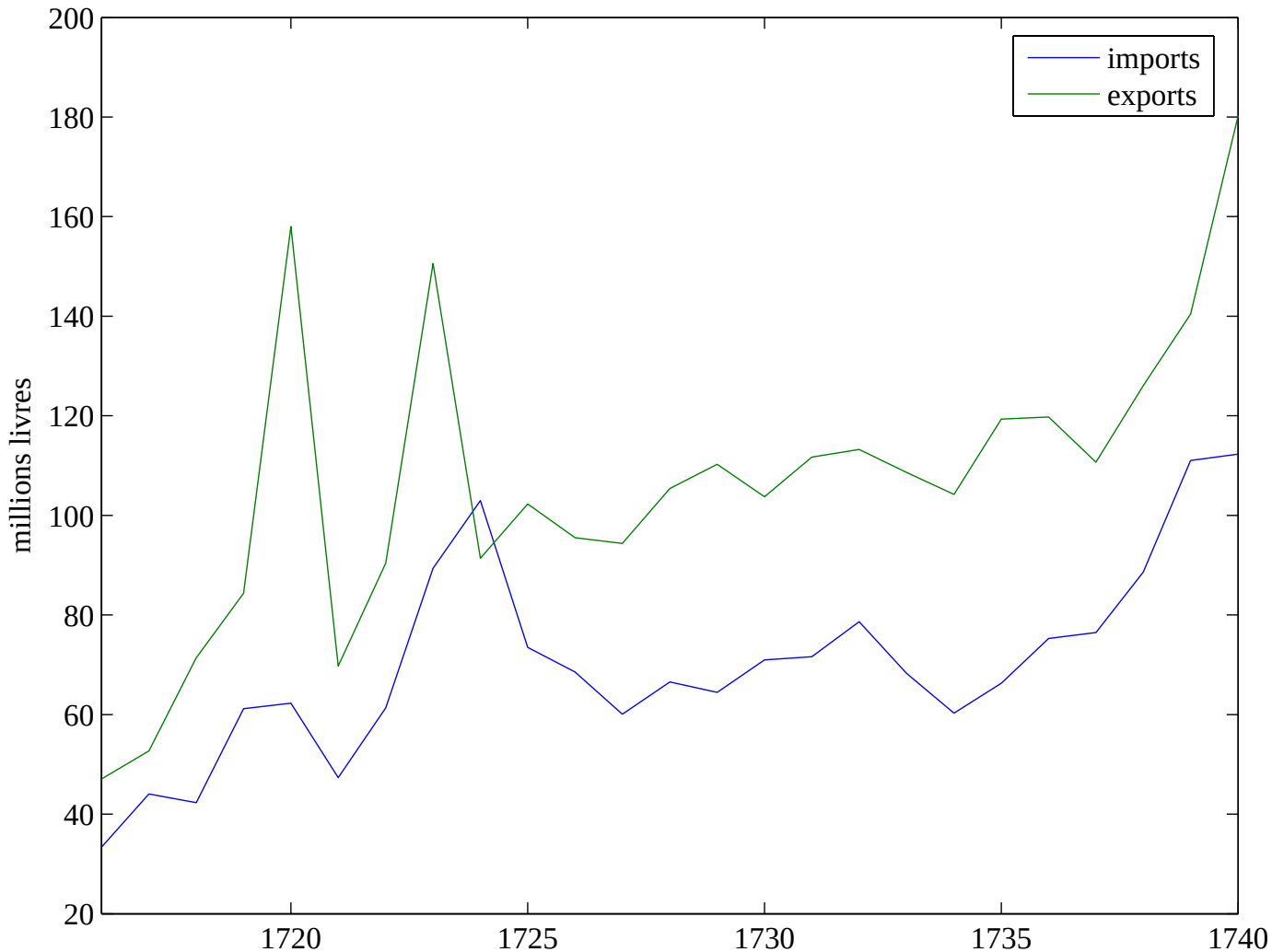
Exchange rates on Paris in Hamburg, 1726



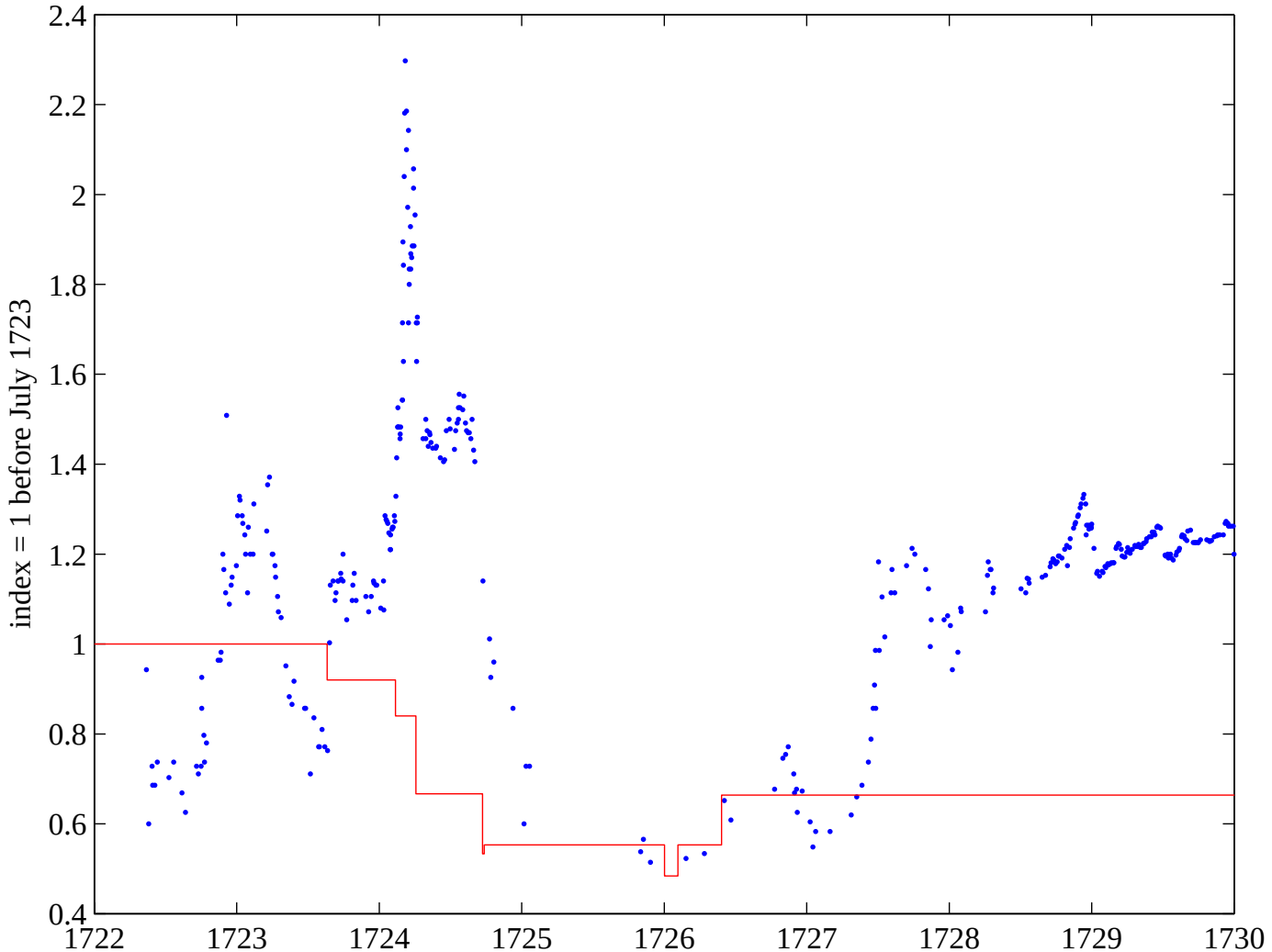
Exchange rate on London in Paris, 1723–34



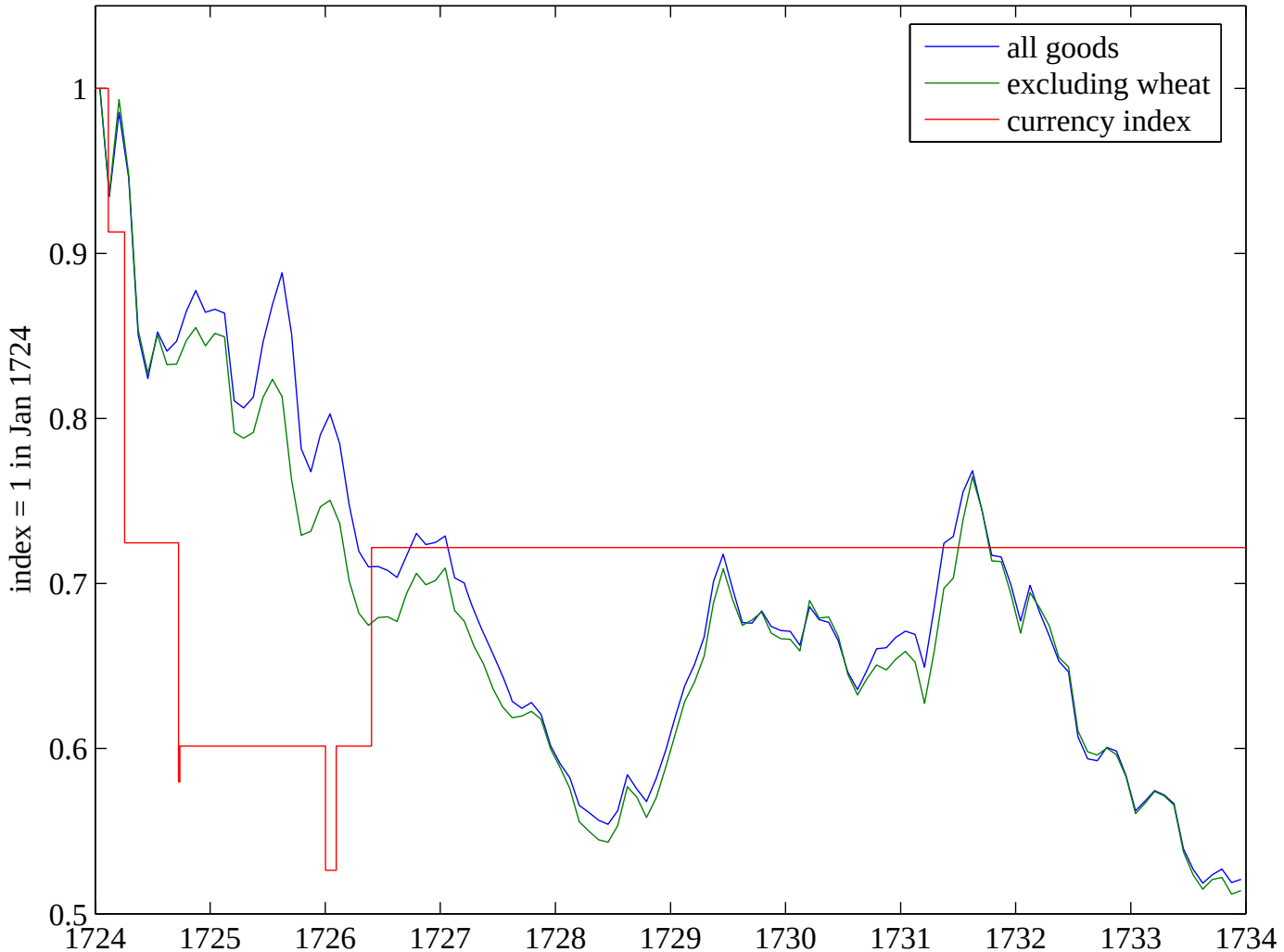
trade balance



Price of shares in the Compagnie des Indes, 1722–29



Foodstuffs: the Halles, monthly, 1724–33



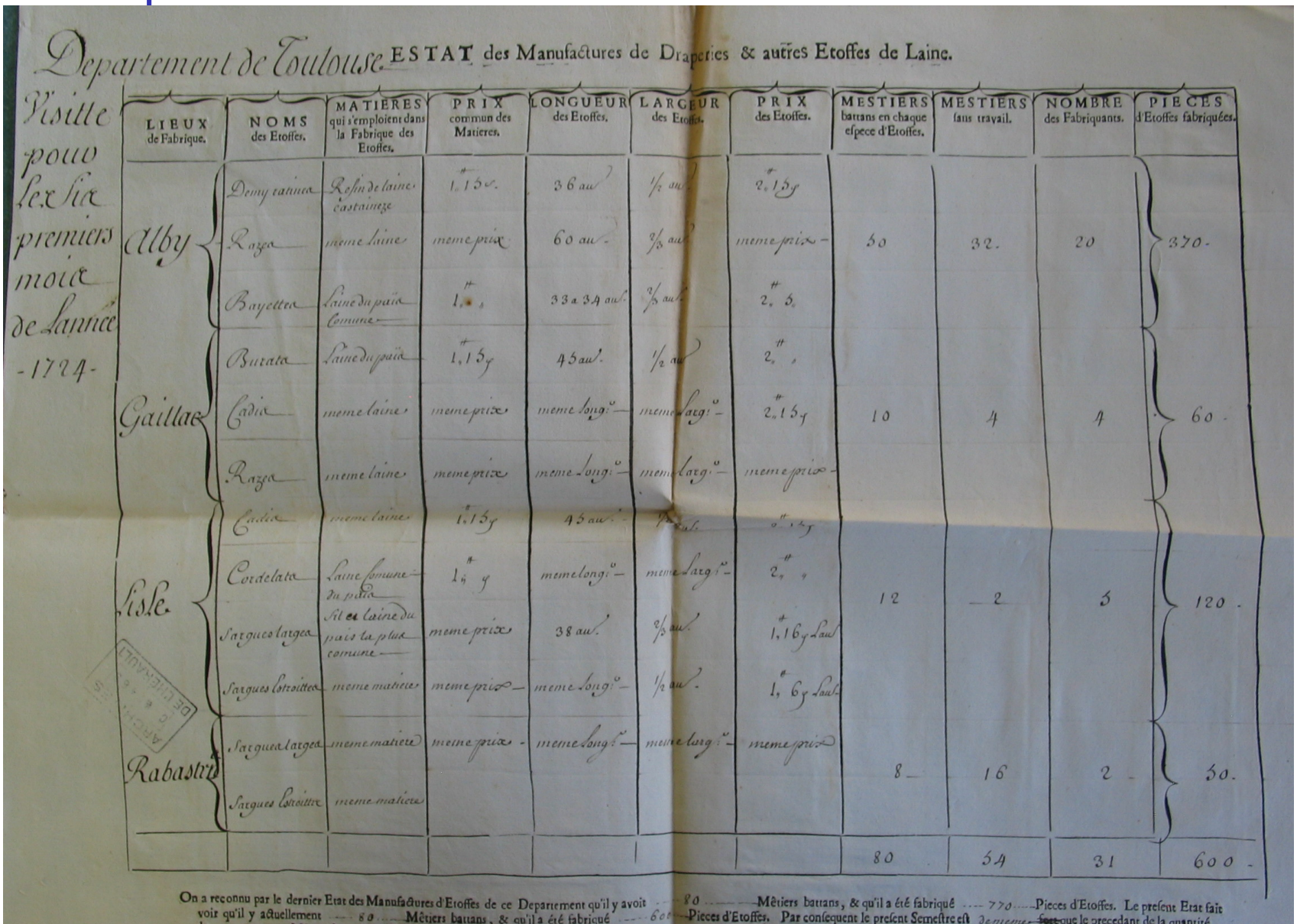
Markets day by day

		wheat			bread		eggs	pork	candles	butter
		high	low	mode	high	low	avg	avg	avg	avg
Feb 1724	1	25.5			3.75		52.5	6.75	14.5	95
	5	25.5			3.75		52	7.75	14.5	75
	9	25			3.5		57.5	7.75	14.5	80
*	12	24.25			3.5		65	7.75	14.5	85
	16	24.5			3.5		70	6.75	14.5	85
Apr 1724	1	27.5			3.25				14.5	85
*	5	23.5			3.25				14.5	85
	8	25			3.25				14.5	92
	12	24.5			3.25				14.5	90
Sep 1724	6	25			3		29	6.75	10.5	60
	9	25.25			3		29.5	6.75	10.5	63
	13	26.5			3.25		30	6.75	10.5	60
	16	27.25			3.25		34	6.75	10.5	72
	20	26.75			3.25		34	6.75	10.5	66
*	23	25			3.25		35	6.75	10.5	65
	27	25.75			3.25		32	6.75	10.5	63
	30	26			3.25		36.5	6.75	10.5	65
May-Jun 1726	15	24.5	12	20	2.75	2.5	24	5.75	9.75	46
	18	24	12.5	18.25	2.75	2.5	23	5.75	9.75	46
	22	24	12	19	2.75	2.5	25	5.75	9.75	46
	25	23.25	12	18.5	2.75	2.5	23.5	5.75	9.75	46
*	29	23.25	12	20.5	2.75	2.5	23.5	5.75	9	43
	1	23.25	12.5	19.9	2.75	2.5	23.5	6	9	42
	5	23.25	13	21	2.75	2.5	25	6.25	9	
	8	23.25	13	22	2.75	2.5	24.5	7.25	9	42
	12	23	13	21	2.75	2.5	23.5	6.75	9	40

sources

- woolen industry regulated: quality standards set and enforced
- regional inspectors certify each bolt
- from 1714, they are asked to produce a census
- semi-annual reports listing:
  - location, type of cloth (name, width, length), wool prices, cloth price, looms working, looms idle, producers, pieces produced
  - many reports are missing
- some reports on regional fairs (quantities brought, sold, prices)

18th c. spreadsheets



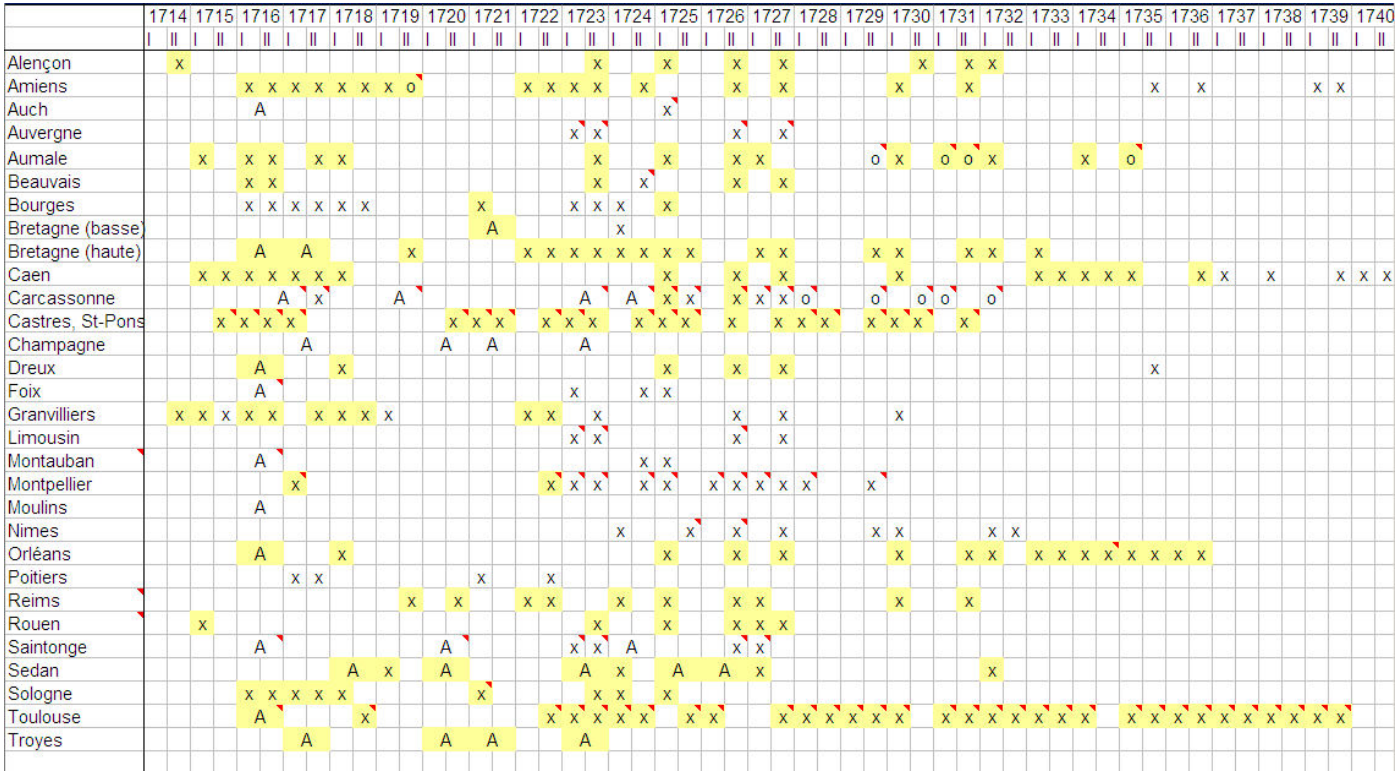
Département de Toulouse. ESTAT des Manufactures de Draperies & autres Etoffes de Laine.

Visitte pour les six premiers mois de l'année -1724-

LIEUX de Fabrique.	NOMS des Etoffes.	MATIERES qui s'emploient dans la Fabrique des Etoffes.	PRIX commun des Matieres.	LONGUEUR des Etoffes.	LARGEUR des Etoffes.	PRIX des Etoffes.	MESTIERS battans en chaque espece d'Etoffes.	MESTIERS sans travail.	NOMBRE des Fabriquants.	PIECES d'Etoffes fabriquées.
Alby	Demy ratine	Resin de laine castainese	1# 15s.	36 aul.	1/2 aul.	2# 15s				
	Raza	meme laine	meme prix	60 aul.	2/3 aul.	meme prix	30	32.	20	370.
	Bayette	Laine du pais comune	1#	33 a 34 aul.	2/3 aul.	2# 5s				
Gaillac	Burate	Laine du pais	1# 15s	45 aul.	1/2 aul.	2#				
	Cadis	meme laine	meme prix	meme long.r	meme larg.r	2# 15s	10	4	4	60.
	Raza	meme laine	meme prix	meme long.r	meme larg.r	meme prix				
	Cadis	meme laine	1# 15s	45 aul.	1/2 aul.	2# 15s				
Isle	Cordelate	Laine comune du pais	1# 4s	meme long.r	meme larg.r	2#				
	Sargues larges	Fil et laine du pais la plus comune	meme prix	38 aul.	2/3 aul.	1# 16s Saul	12	2	5	120.
	Sargues etroittes	meme matieres	meme prix	meme long.r	1/2 aul.	1# 6s Saul				
Rabastens	Sargues larges	meme matieres	meme prix	meme long.r	meme larg.r	meme prix				
	Sargues etroittes	meme matieres					8	16	2	30.
							80	54	31	600.

On a reconnu par le dernier Etat des Manufactures d'Etoffes de ce Departement qu'il y avoit 80 Mêtiers battans, & qu'il a été fabriqué 770 Pieces d'Etoffes. Le present Etat fait voir qu'il y actuellement 80 Mêtiers battans, & qu'il a été fabriqué 600 Pieces d'Etoffes. Par conséquent le present Semestre est de même sort que le precedant de la quantité

missing data



statistical model

- Data is log-normalized:

$$y_{it} = \frac{\log(Y_{it}) - \bar{y}_i}{\bar{\sigma}_{yi}}$$

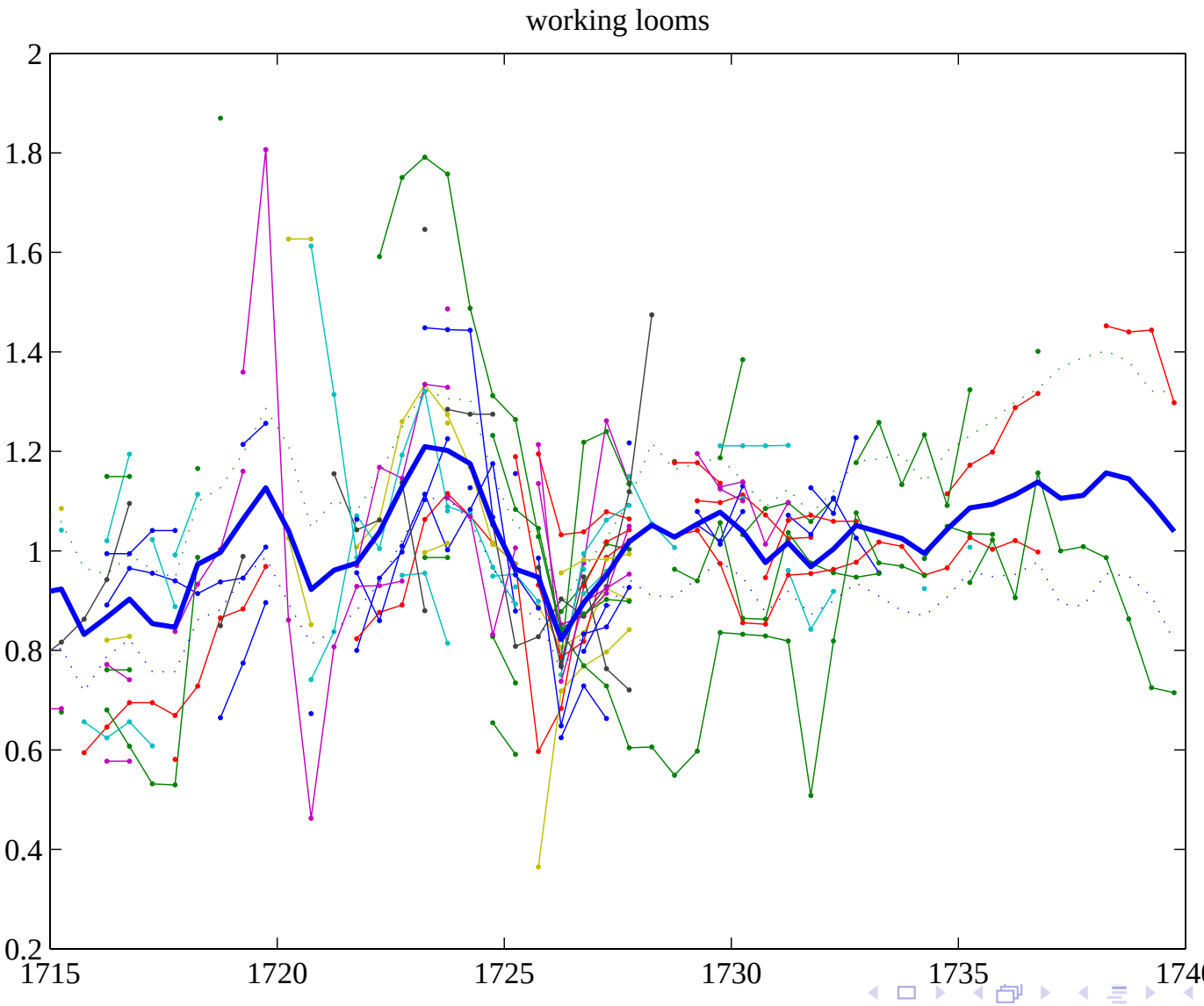
.

- The model is:

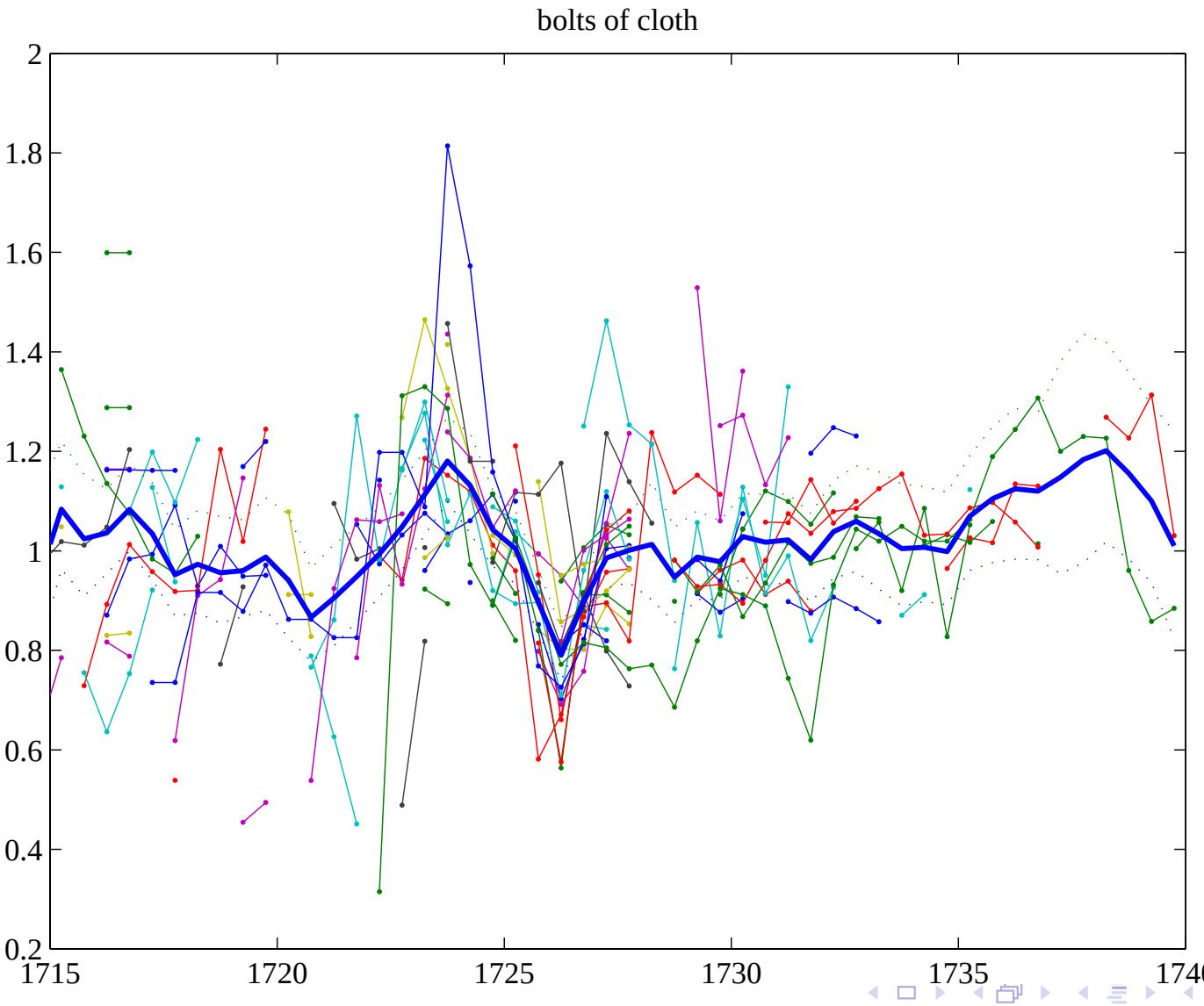
$$\begin{aligned} y_{it} &= \lambda_i \mu_t + g_t + \epsilon_{it}, \\ g_t &= -\sum_{i=1}^{s-1} g_{t-i} + \omega_t, \\ \mu_t &= \mu_{t-1} + \nu_t + \xi_t, \\ \nu_t &= \nu_{t-1} + \zeta_t \end{aligned}$$

$\epsilon_{it} \sim (0, \sigma_\epsilon^2)$, $\omega_t \sim (0, \sigma_\omega^2)$, $\xi_t \sim (0, \sigma_\xi^2)$, $\zeta_t \sim (0, \sigma_\zeta^2)$, $\sigma_\zeta^2 \equiv 1$, $\lambda_i = 1$.

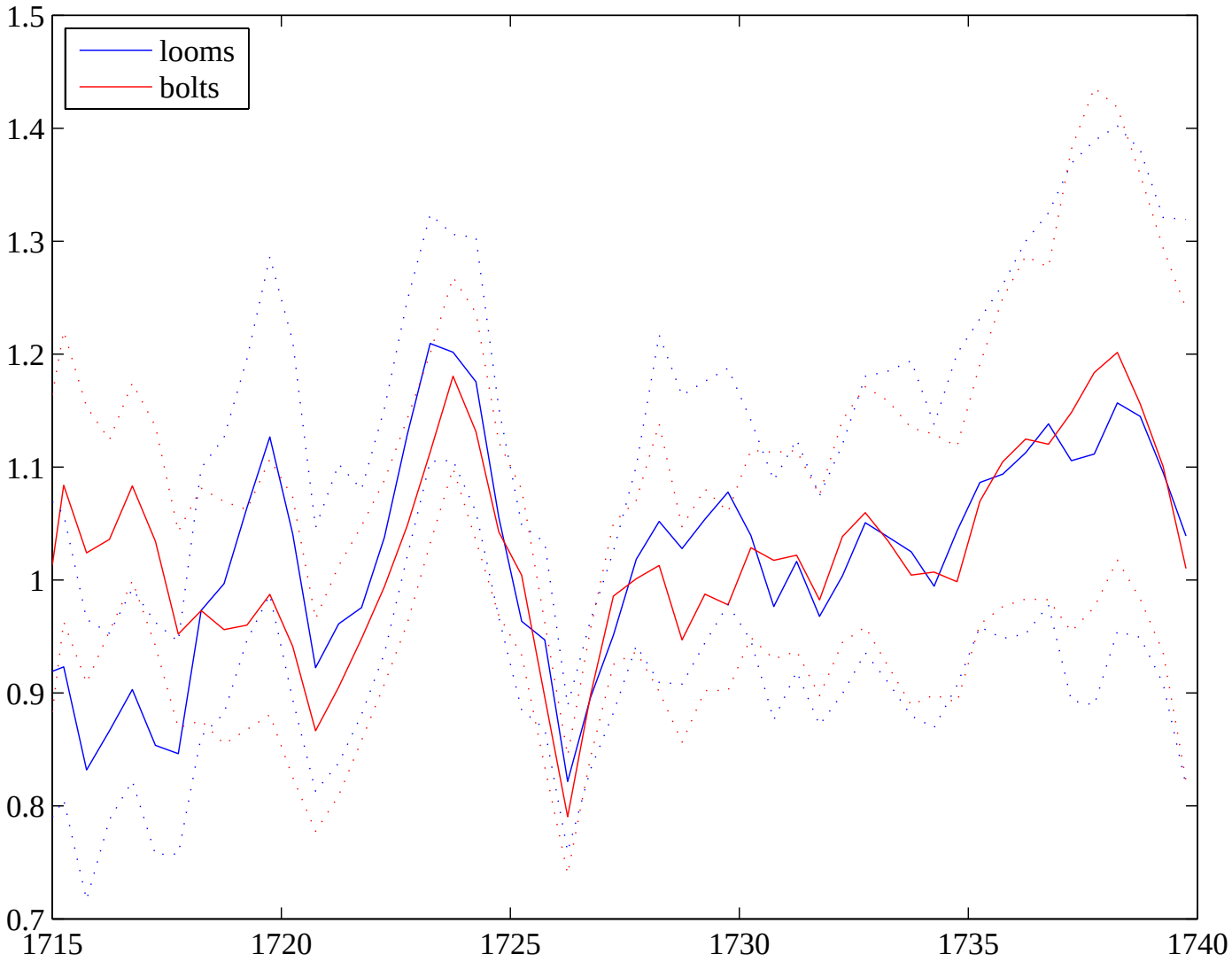
Looms working



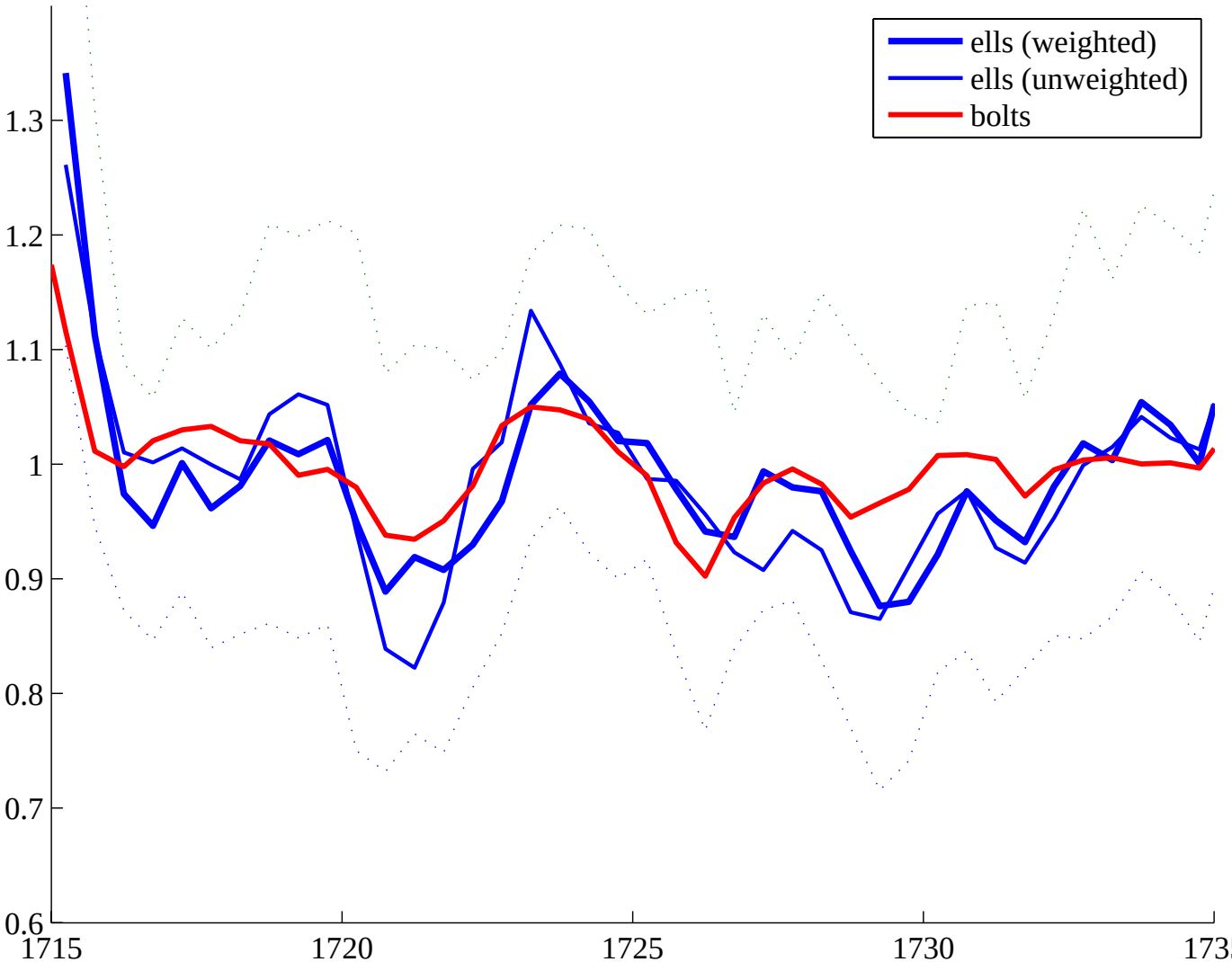
Bolts produced



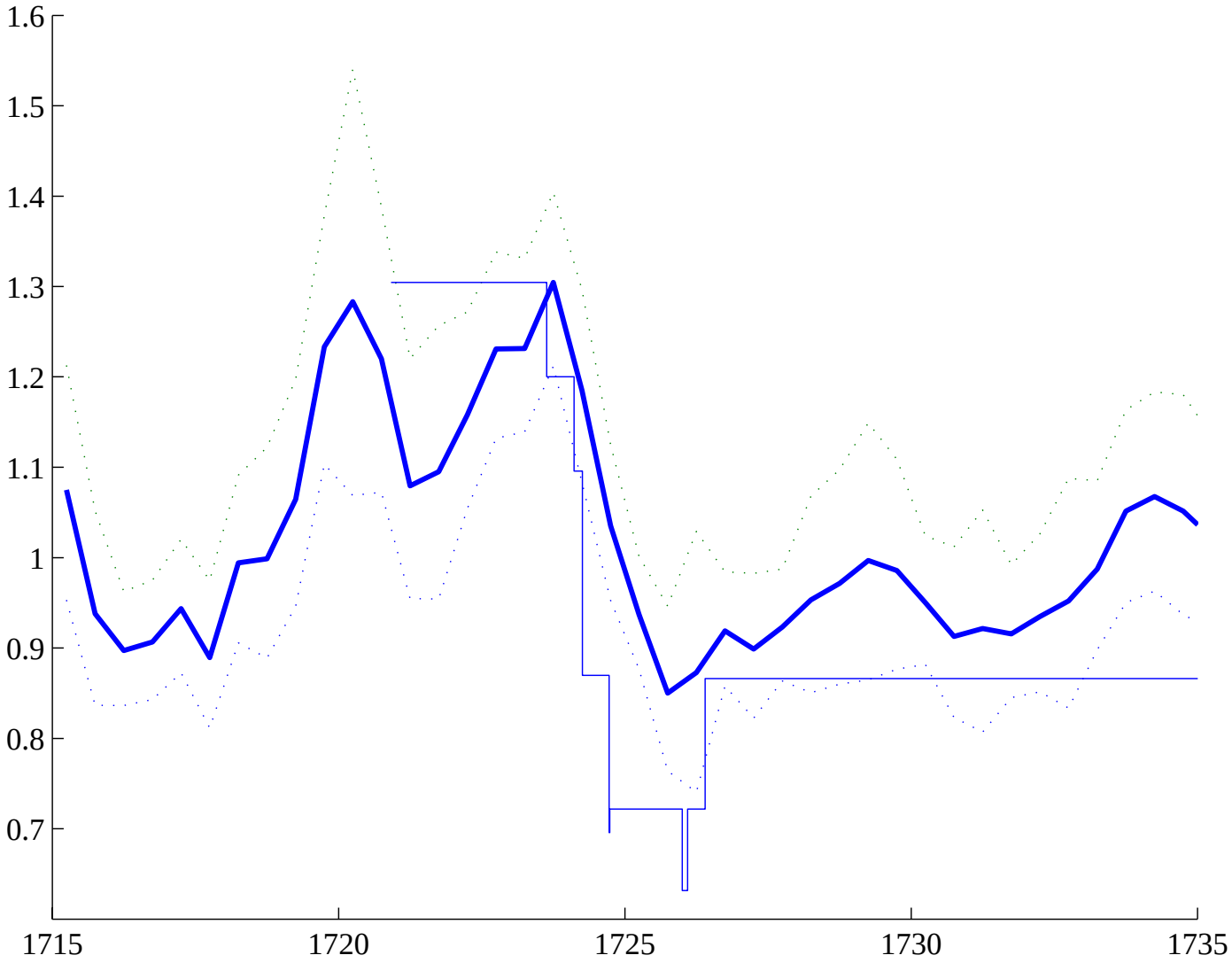
Indices of bolts and looms



Comparison of weighted and unweighted quantities



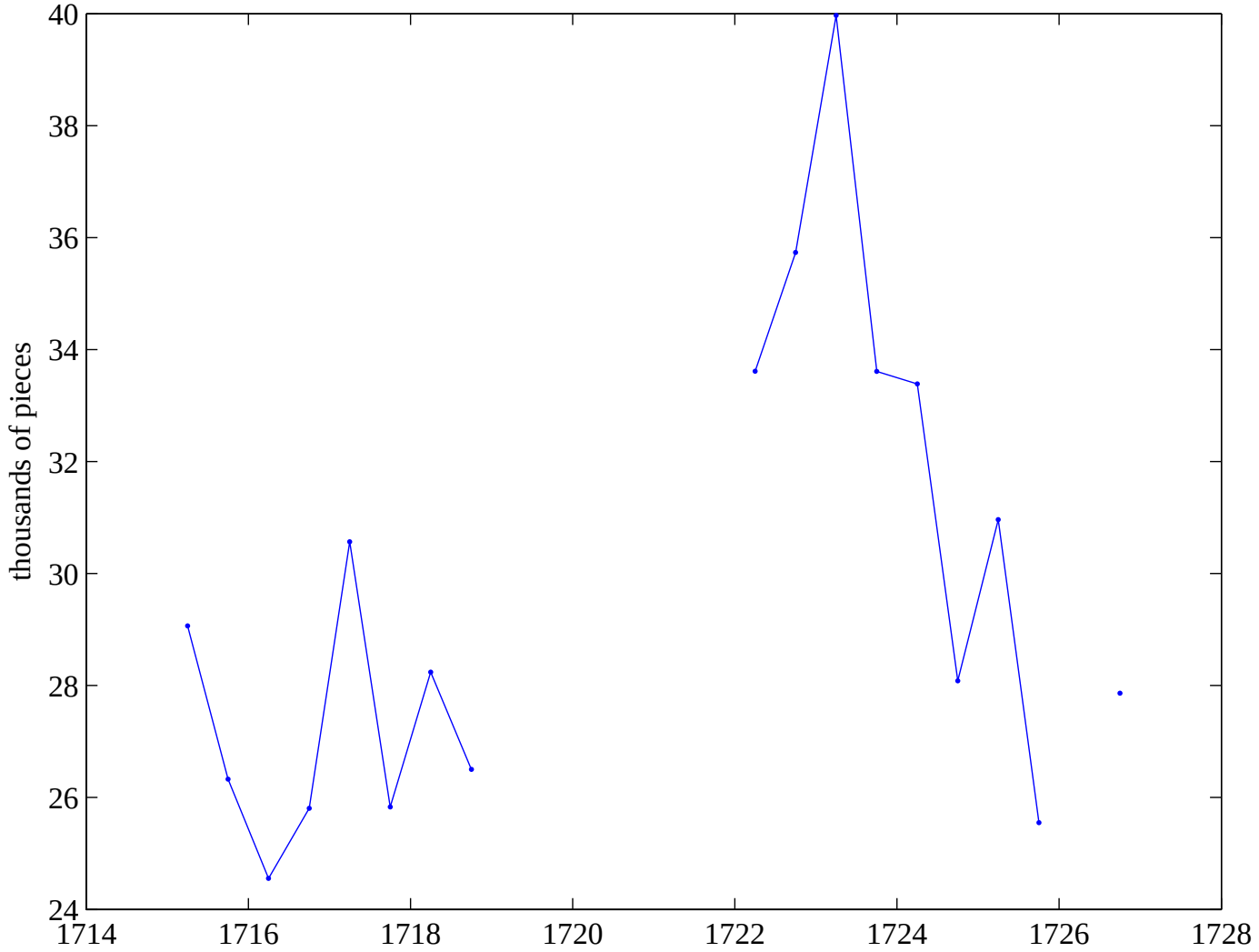
Weighted price index of bolts



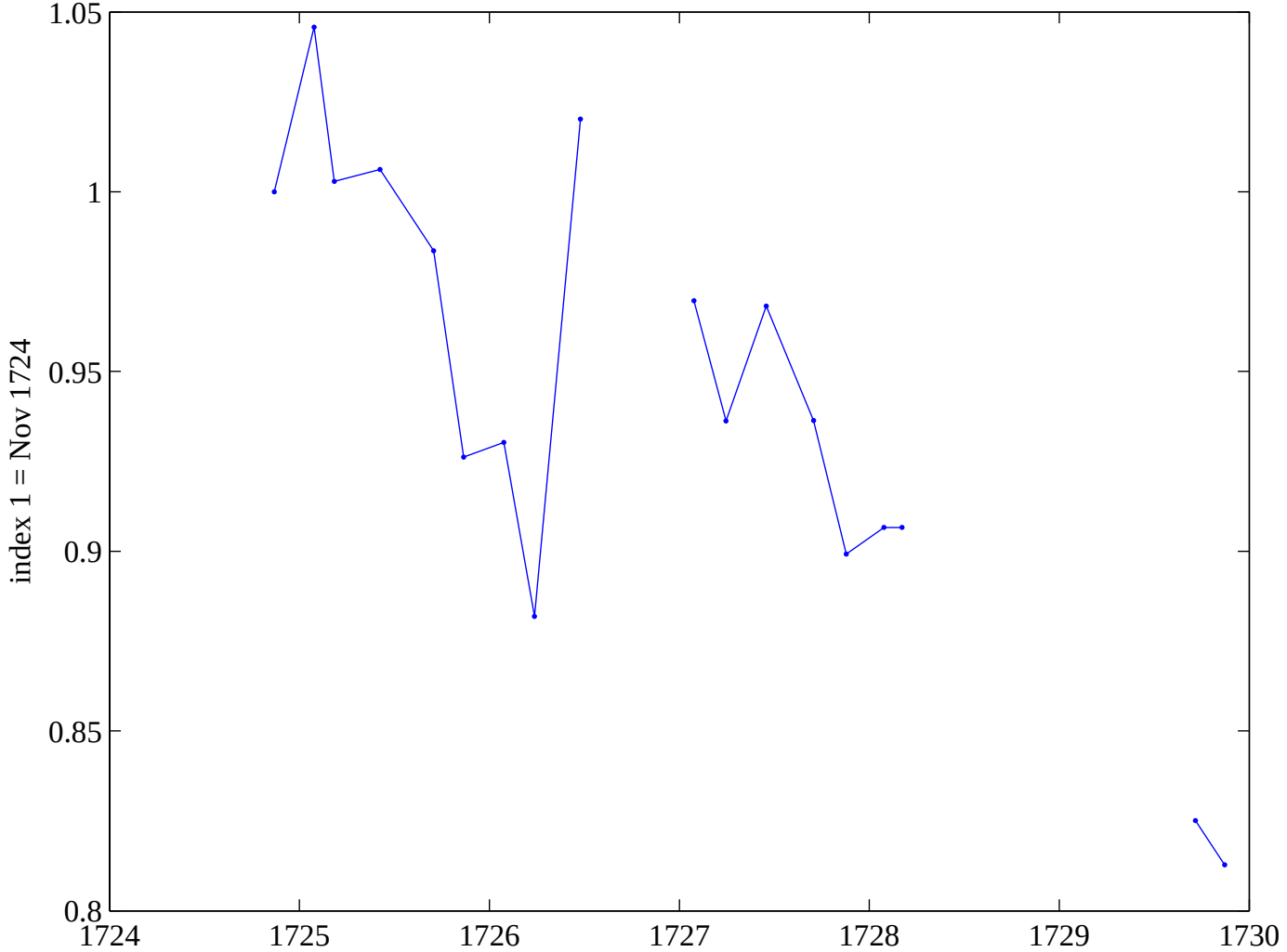
Wages in the Carcassonne district

	1712	1716	1719	1723	July 1724	Dec 1724	1726:s1	1726:s2
wages								
Carcassonne	1.00	0.91	1.25	1.27	1.26	0.82	0.78	0.88
Montagne	1.00	0.86	1.03	1.23	1.24	0.91		
Mazamet	1.00	1.02	1.03	1.48	1.49	1.04		
Dourgne	1.00	1.05	1.08	2.07	1.79	1.43		
all	1.00	0.89	1.12	1.27	1.26	0.88		
output prices								
Carcassonne	1.00	0.87	1.94	1.53	1.31	0.91	0.84	1.10
w/p	1.00	1.04	0.64	0.83	0.96	0.91	0.94	0.80
ME	1.00	1.00	1.50	1.88	1.25	1.04	1.04	1.24

Bolts brought to the Paris cloth-hall



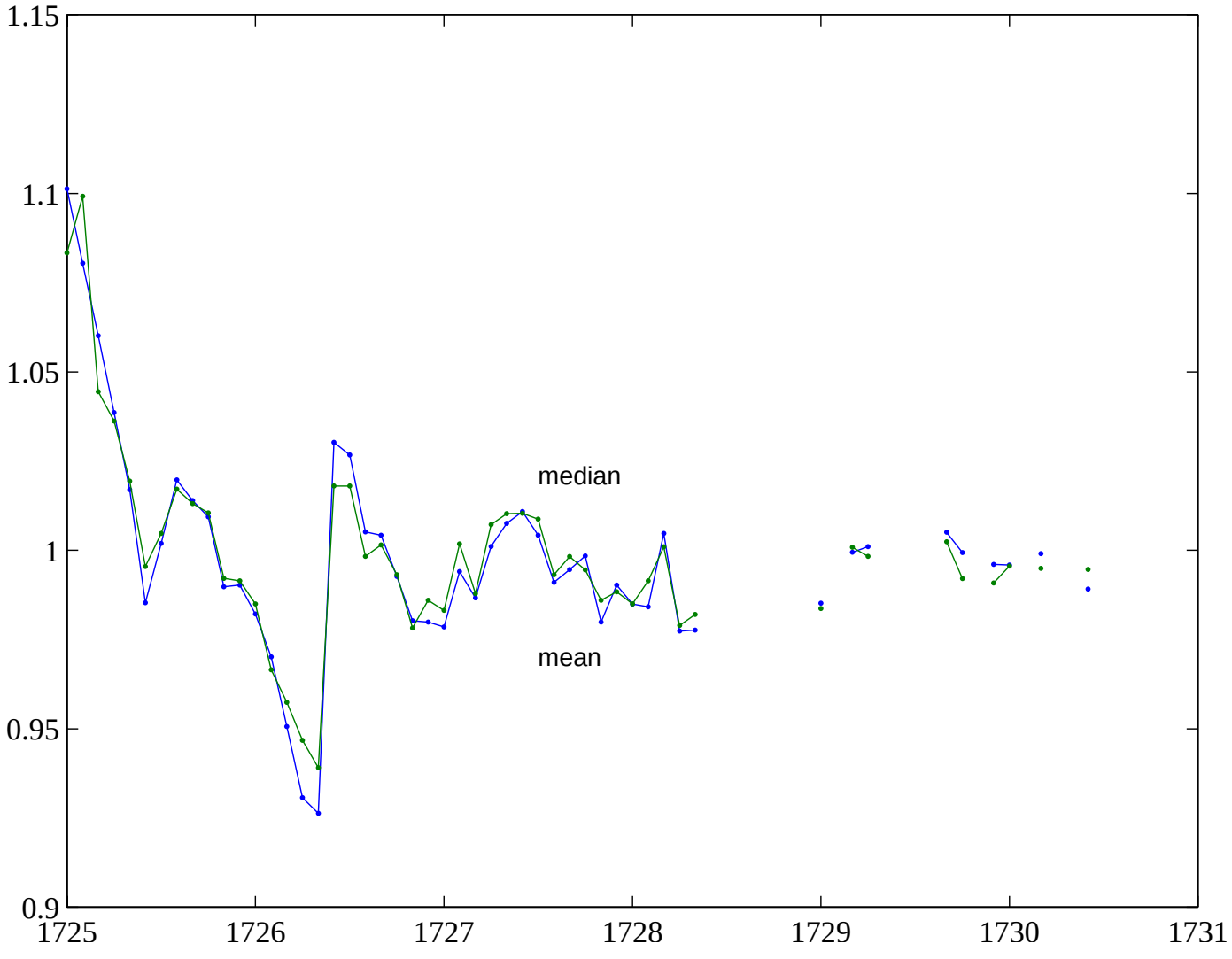
Prices of cloths at the Pézenas and Montagnac fairs



Price changes (%)

	ME	Prices		
		mean	median	std dev
factory prices for 16 cloths				
1716–17 to Jan 1724	+72	+70	+67	11.7
Jan 1724 to Apr 1724	-27	-13	-14	5.3
Apr 1724 to Oct 1724	-17	-14	-13	6.4
prices at the Amiens cloth-hall for 107 cloths				
Jan 1724 to Oct 1724	-40	-25	-25	6.5
prices in Lyon for 11 silks				
Dec 1723 to May 1724	-26	-32	-43	5.7
prices in Lyon for 44 silks				
before Sep 1724 to Nov 1724	-20	-16	-16	6.5
prices at the Clermont fair for 42 cloths				
May 1724 to Aug 1724	0	7	5	6.7
prices at the St. Germain fair for 22 cloths				
Feb 1724 to Feb 1725	-40	-33	-33	6.0
prices in Rouen for 36 goods				
Sep 1724 to Oct 1724	-17	-12	-12	6.1
prices in Orlans for 34 goods				
Sep 1724 to Nov 1724	-17	-12	-10	13.6
Sep 1724 to Dec 1724	-17	-23	-18	19.8
Sep 1724 to Jan 1725	-17	-23	-18	19.6
Sep 1724 to Feb 1725	-17	-26	-21	19.8
Sep 1724 to Mar 1725	-17	-27	-24	19.7
Sep 1724 to Apr 1725	-17	-28	-24	19.1

Prices of cloths at the Rouen cloth-hall



Conclusion

- massive failure of the quantity theory
- experiment not as clean as one would like (prior history of monetary policy, second-guessing of government)
- price "rigidities" documented even in market contexts (foodstuffs, wages)
- only one market reacts fully and immediately (foreign exchange)
- output reaction: coincidence or causation?