

Dynamics of Price Adjustments: Evidence from Micro Level data for Chile*

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Abstract

This paper characterizes the dynamics of price adjustments in Chile using micro-level data. We compute the frequency of price adjustments for different types of goods included in the CPI basket, and also measures of price dispersion for each type of good across establishments. The mean and median of the frequency of price adjustments show that nominal rigidities seems to be lower when measured at micro-level compared to estimates based on macro data. Our preliminary results also show mixed evidence of changes in the pattern of price adjustments with the state of the economy. The frequency of price adjustments appears to be relatively stable over the sample period. However, if we decompose this frequency in upward and downward adjustments, we observe that the frequency of adjustments for some groups of products is correlated with the level of inflation.

1 Introduction

In this article we characterize the dynamics of price adjustments using micro-level data for the Chilean economy. Recently a number of papers have shown that, at a micro level, the frequency of price adjustment seems to be larger than the one assumed in macro models, necessary to account for the observed pattern in inflation at an aggregate level (Bils and Klenow (2004), Baudry, L., H. Le Bihan, P. Sevestre and S. Tarrieu (2004), Álvarez, L. and I. Hernando (2004), Aucremanne L. and E. Dhyne (2004)). Most of these research has focused on the US and individual countries within the European community that, to a larger extent, exhibit rather stable macroeconomic environment over the sample periods

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utilized. This paper is among the first attempts to analyze the adjustment price phenomena from a micro-level perspective for an emerging market, characterized by a more unstable macroeconomic conditions.¹

The objective of the paper is to understand the dynamic of price adjustment from a micro-level perspective. We are interested in determining the degree of nominal rigidity in the Chilean economy and the kind of relative price distortions generated by inflation. We answer questions such as: For how long do prices remain unchanged? Does the price adjustment process depends on the state of the economy? How does inflation affect price dispersion?

We use establishment-level data on different varieties of goods included in the CPI basket from 1999 until 2005. Our data set allows us –under certain assumptions– to construct price histories for up to 78 months for about 1200 different varieties of goods. At the same time, we are able to compute price dispersion measures for each variety amongst almost 450 retailing establishments.

Microeconomic evidence on price adjustment has proved to deliver a better understanding of the source of nominal rigidities. On one hand, time-dependent models of nominal rigidities consider that the fraction of firms that optimizes prices is exogenously fixed. Notable examples of time-dependent models are Taylor (1980) and Calvo (1983). In these cases, we expect no correlation between the frequency of prices changes at the micro level and any indicator of the aggregate state of the economy. In the other hand, if the nominal rigidities are modelled as a state-dependent phenomenon, the timing of prices changes is a endogenous decision. Therefore, if this type of models is more relevant for the Chilean economy, then we would expect that the frequency of price adjustment will correlated with the state of the economy (measured by some macro variables).²

An complementary way by which using micro-level data allows us disentangle which price adjustment paradigm is more relevant for the Chilean economy, is by analyzing price dispersion across establishments. For example, if the price adjustment mechanism is of the time-dependent type then we would expect a positive correlation between price dispersion across establishments and the overall level of inflation. This is so because the level of inflation has no effect on the frequency of price adjustment, but the magnitude of prices changes does depend on it. Therefore, higher inflation rate will result in larger price dispersion across firms. In the case of state-dependent models, a high level of inflation should be accompanied by a more frequent changes of prices, reducing the price dispersion across

¹A recent paper by Gagnon (2005) analyzes the price setting behavior at the microeconomic level in Mexico.

²Recent examples of aggregate state-dependent models can be found in Dotsey, King and Wolman (2000), Golosov and Lucas (2003), Burstein (2006), and Gertler and Leahy (2005).

firms.

Notice that the relationship between inflation and price dispersion is important to determine the welfare effects of stabilizing prices. If high price dispersion is the results of high inflation –due to a time-dependent type of nominal rigidity– then larger inflation rates will imply inefficient changes in relative price with the consequent resources miss-allocation (Woodford, 2001).

Our main results indicate that the frequency of price adjustment seems to be larger than the one estimated at macro level for Chile (Céspedes, Ochoa and Soto, 2005). Food items are the one for which firms tend to adjust prices more often. On average, prices on food items are changed every 1.3 months. On the contrary, prices of services related to *education and leisure* are the one that are less frequently adjusted. On average, they remain unchanged for about 12 months. Frequency of price adjustments show no correlation with the inflation level in the period analyzed. Since the inflation rate has been low and stable in the period considered, this result gives some support to the use time-dependent models of price rigidities to approximate the dynamics of inflation after 1999. Our results also show that price dispersion across retailing firms has slightly increased since 1999. However, there is no relationship between price dispersion and inflation rate at the aggregate level.

The rest of the paper is organized as follows: The next section briefly discuss the methodology utilized. Section three presents the micro level data for Chile taken from the CPI. Section four presents the main results. Section five concludes.

2 Frequency of Price Changes and Price Dispersion

2.1 Methodology

Our methodology is similar to the one utilized by Aucremanne and Dhyne (2004) and others at the ECB Inflation Persistence Network (IPN).³

Let S be the total number of varieties and J the number of establishments in our sample. We denote by $p_{i,j,t}$ the price of variety i in store j at time t . The frequency of price adjustment of variety i for establishment j in the whole sample is computed as follows:

$$f_{i,j} = \frac{\sum_{t=1}^T Adj(p_{i,j,t}, p_{i,j,t-1})}{\sum_{t=1}^T Comp(p_{i,j,t}, p_{i,j,t-1})} \quad (1)$$

where

$$Adj(p_{i,j,t}, p_{i,j,t-1}) = \begin{cases} 1 & \text{if } p_{i,j,t} \neq p_{i,j,t-1} \\ 0 & \text{otherwise} \end{cases}$$

³See http://www.ecb.int/home/html/researcher_ipn_papers.en.html

and

$$Comp(p_{i,j,t}, p_{i,j,t-1}) = \begin{cases} 1 & \text{if } p_{i,j,t} \text{ and } p_{i,j,t-1} \text{ were quoted} \\ 0 & \text{otherwise} \end{cases}$$

In computing (1), (2) and (3) we have defined a criteria on how to deal with missing data. This criteria does not consider all the information of each price history for every variety and establishment. For instance, if the price of variety i at establishment j was p at time t and it remained at p in time $t + k$ then the frequency of price changed would be underestimated. Unlike if there was a price change between t and $t + k$ this methodology would not count it. Another alternative would be to assume that the probability of a price to return to the same level is 0. This alternative would be explored in a next version of this work.

To compute the distribution of f_i , we average over establishments for each variety:

$$f_i = \frac{1}{J} \sum_{j=1}^J f_{i,j}$$

We are particularly interested in the mean and the median of the distribution of f_i . Next, we compute sub-sample averages $f_{i,\tau}$, following the same procedure but now for $f_{i,j,\tau}$ which we define as:

$$f_{i,j,\tau} = \frac{\sum_{j=1}^{T_\tau} Adj(p_{i,j,t}, p_{i,j,t-1})}{\sum_{j=1}^{T_\tau} Comp(p_{i,j,t}, p_{i,j,t-1})},$$

where T_τ is the number of periods (months or weeks) of subperiod τ . Additionally, we can obtain the average frequency of price changes for a set of varieties G at period t as:

$$f_{G,t} = \frac{1}{N_G} \sum_{i \in G} f_{i,t}$$

where N_G is the number of varieties in G . Analogously we can compute the average frequency of price increases and decreases for set of varieties in G at t :

$$f_{G,t}^+ = \frac{1}{N_G} \sum_{i \in G} f_{i,t}^+, \quad f_{G,t}^- = \frac{1}{N_G} \sum_{i \in G} f_{i,t}^-$$

We also compute the frequency of price changes for variety i at period t as:

$$f_{i,t} = \frac{\sum_{j=1}^J Adj(p_{i,j,t}, p_{i,j,t-1})}{\sum_{j=1}^J Comp(p_{i,j,t}, p_{i,j,t-1})} \quad (2)$$

From this, we can obtain the frequency of price increases ($f_{i,t}^+$) and decreases ($f_{i,t}^-$) of each variety i at each period t :

$$f_{i,t}^+ = \frac{\sum_{j=1}^J Adj^+(p_{i,j,t}, p_{i,j,t-1})}{\sum_{j=1}^J Comp(p_{i,j,t}, p_{i,j,t-1})}, \quad f_{i,t}^- = \frac{\sum_{j=1}^J Adj^-(p_{i,j,t}, p_{i,j,t-1})}{\sum_{j=1}^J Comp(p_{i,j,t}, p_{i,j,t-1})} \quad (3)$$

where

$$Adj^+(p_{i,j,t}, p_{i,j,t-1}) = \begin{cases} 1 & \text{if } p_{i,j,t} > p_{i,j,t-1} \\ 0 & \text{otherwise} \end{cases}$$

and

$$Adj^-(p_{i,j,t}, p_{i,j,t-1}) = \begin{cases} 1 & \text{if } p_{i,j,t} < p_{i,j,t-1} \\ 0 & \text{otherwise} \end{cases}$$

To shed light on the mechanism behind the type of nominal rigidities in the economy, we explore the relation between $f_{i,\tau}$ and GDP growth and inflation rate for different sub-samples. We also examine the relationship between $f_{G,t}$, $f_{G,t}^+$, $f_{G,t}^-$ and the monthly headline inflation rate.

Together with the frequency of price adjustments, we also compute the magnitude of such adjustments. We can therefore, decompose total inflation into the fraction of price changes (extensive margin) and the size of price changes (intensive margin). The average magnitude of price changes for variety i at period t is computed as follows:

$$\pi_{i,t} = \frac{1}{J} \sum_{j=1}^J (p_{i,j,t}/p_{i,j,t-1} - 1) \quad (4)$$

This magnitude can be decomposed in a weighted difference between the magnitude of price increases and decreases:

$$\pi_{i,t} = f_{i,t}^+ \pi_{i,t}^+ - f_{i,t}^- \pi_{i,t}^-$$

where $\pi_{i,t}^+$ and $\pi_{i,t}^-$ are the magnitude of price increases and decreases respectively. They are defined as:

$$\pi_{i,t}^+ = \frac{\sum_{j=1}^J Adj^+(p_{i,j,t}, p_{i,j,t-1})(p_{i,j,t}/p_{i,j,t-1} - 1)}{\sum_{j=1}^J Adj^+(p_{i,j,t}, p_{i,j,t-1})}$$

$$\pi_{i,t}^- = -\frac{\sum_{j=1}^J Adj^-(p_{i,j,t}, p_{i,j,t-1})(p_{i,j,t}/p_{i,j,t-1} - 1)}{\sum_{j=1}^J Adj^-(p_{i,j,t}, p_{i,j,t-1})}$$

We compute the average magnitude of price changes, increases and decreases, for a set of varieties G as follows:

$$\pi_{G,t} = \frac{1}{N_G} \sum_{i \in G} \pi_{i,t}$$

$$\pi_{G,t}^+ = \frac{1}{N_G} \sum_{i \in G} \pi_{i,t}^+$$

$$\pi_{G,t}^- = \frac{1}{N_G} \sum_{i \in G} \pi_{i,t}^-$$

As in the case of the frequency of price adjustments, we analyze the correlation between these measures of the size of average price changes with monthly inflation.

Finally, we compute a measure of price dispersion across establishments. Our measure of price dispersion is given by

$$dp_{i,t} = \sqrt{\sum_{j=1}^J (p_{i,j,t} - \bar{p}_{i,t})^2}$$

where $\bar{p}_{i,t} = \frac{1}{J} \sum_{j=1}^J p_{i,j,t}$ corresponds to the price average of variety i . Below we analyze whether price dispersion is affected by total inflation and other aggregate variables in the economy.

2.2 Data

The data set comprises establishment-level data on prices for different varieties of goods included in the CPI basket. The data covers from January 1999 until July 2005, and it is of monthly and weekly frequency. The information is taken from the National Statistics Institute (INE). Comparable information for previous years is not available. Our measure of price corresponds to final expenditure on a particular variety (last transaction or final consumer sell price).

The consumption basket contains more than 1.000 varieties of about 500 different products or services. The basket was chosen based on the 5th Households Budget Survey of 1996-97. This survey was conducted to more than 8.000 households for the main Santiago area.

The CPI basket comprises 8 groups of products. Each group has several sub-groups; each one of them is composed by different types of articles and these types of articles are, in turn, composed by several products. In total, the CPI includes about 500 products (Table 2). For example, group *Housing* includes the subgroups: *Lease and other fixed expenditures*, *Basic Services*, *Communications*, and *Reparations*. The subgroup *Lease and other fixed expenditures* considers the following articles: *Lease*, *Mortgages* and *Other fixed expenditures*. Articles included in *Other fixed expenditures* comprise: *taxes on property*, *fees on garbage recollection* and *housing insurances*. Varieties of each product correspond to different brands, fantasy names and materials that characterize each product.

Prices at establishment-level are collected in several points in the Great Santiago with different periodicity. Prices of goods in the groups *Food* and *Fuel* (*Housing* and *Transport*) are surveyed weekly. Prices of the remaining groups are surveyed monthly. It is important to mention that, due to seasonality and other motives, not all prices are collected in all periods.

The establishments include: supermarkets, shops, gasoline stations and others (see Table 1). The sample was elaborated based on the Selling Locations survey of 1997 to about 1300 households from the main Santiago area.⁴ Prices on some special services were informed directly by the providers. In the case of housing, a special monthly survey was used.

3 Results

3.1 Frequency of price adjustments

Results are summarized in tables 3 and 4 and figures 1 to 10. The mean average frequency of price adjustment for all types of goods is about 0.4, and the median is 0.3. These figures imply roughly that prices are changed on average every 3 months. The group that presents the highest frequency of price adjustment is fuel, with a median for the all period of 1.8. This figure implies that prices of fuel change, on average, twice a month. On the other extreme, the prices of only 14% of varieties in the group *Education and Leisure* are adjusted every month (this fraction is 8% if we consider the median rather than the mean). In other words, prices in this group are adjusted, on average, once a year.

Tables 3 and 4 also present the sub-samples mean and median of the frequency of price adjustment for three period (1999-2000, 2001-2003 and 2002-2005). While is true that these sub-samples cover only short periods in time (two or three years) evaluating whether the frequency of price adjustments has change over time is indicative of the characteristic of the adjustment process. In particular, if we would were to observe dramatic changes in the average frequency of price adjustment we could conclude that the best representation of this adjustment process is given by a state-dependent model, where the frequency of adjustments depends on the state of the economy. On the other hand, is the frequency is relative constant over time (and the size of price adjustment varies with the state of the economy) we could then conclude that a time dependent model is the best characterization of the data.

From the table we observe that in general, the frequency of price adjustment did not significantly changed form sub-sample to sub-sample. In the Table we also report the average annual growth rate and inflation rate for the corresponding periods. While inflation remained relatively constant over the all sample, the rate of growth of output did significantly changed from one period to another. Hence, at a longer period of time, the frequency of price adjustment seems not related to the aggregate of the economy in a systematic way. Although this results can indicate that the time-dependent adjustment of prices describes

⁴Establishments were chosen according to the share of expenditure they received, rather than the frequency of selling.

this microeconomic evidence, a caveat to this conclusion has to be mentioned. A recent work on price adjustment at the micro level on Mexico by Gagnon (2005) has suggested that when the inflation rate is low and stable, frequency of price adjustment are not correlated with inflation. This result can still be explained by a state-dependent model since the frequency of price changes are roughly constant when the magnitude of shocks –nominal and real– is small (see Burstein, 2006).

We also explore the relationship of frequency price adjustment in each group with total inflation at in a monthly basis for the period 1999-2000. These is shown is figures 11 to 14. For some groups of we do not observe a significant correlation between frequency of price adjustment and inflation rate. This is case for groups of products related to Housing, Health, and Others. We decompose the frequency of price changes as the sum of the frequencies of price increases and decreases. In these groups, the frequency of price increases does rise with the level of the monthly inflation rate. However, we also observe that frequency of price decreases diminishes with the inflation rate. This effect offsets the positive relationship between frequency of price increases in the overall frequency of price changes. For products associated with the groups of House equipment, clothing, transport, and education a month of high inflation is also related with a rise of the frequency of price increases. However, in contrast with the other groups, the frequency of price decreases for education does not reduce that much with the inflation rate. Therefore, we see a rise in the frequency price change as inflation increases.

A particular case it is the case of clothing. The products in this group, on average, increases substantially their frequency of price adjustments with the level of inflation. This is mainly explained by the significant rise in the frequency of price increases as the inflation rate rises.

These last set of results shed light on the price rigidity mechanism. Examining high frequency of micro data on the adjustment of prices of establishments , we have some evidence that the fraction of firms changing prices depend on the state of the economy. Hence, time-dependent models of price rigidities can be relevant to explain the behavior of some groups of products such as clothing and education.

3.2 Dispersion of prices

Table 5 and 6 shows, respectively, the mean and median standard deviation of prices across establishment. Price dispersion seems to have increased over the period. The lowest price dispersion of prices is found in the fuel group. In the other extreme, varieties on clothing display the higher price dispersion. There is no a clear connection between the level of inflation and the price dispersion across varieties. Inflation rate reduces from the period

1999-2000 to the second sub-sample 2001-2003 while prices dispersion increases. In contrast, there is a clear and systematic increases in price dispersion from sub-sample 2001-2003 to 2004-2005 and the inflation rate increases between both sub-samples.

3.3 Magnitude of price adjustments

Figures 15 to 18 depict the correlation between the average magnitude of price changes and the inflation rate in a monthly basis for the period 1999-2000. For most groups of products we see a moderate positive correlation between the magnitude of prices changes and the inflation rate. Two exception are clothing and education. We also decompose the average magnitude of price changes as the weighted difference between the average magnitude of price increases and the average magnitude of price decreases. For the groups that we observe a positive correlation between inflation rate and average magnitude of price changes, the average rise of the magnitude of price increases with the inflation rate explain part of this positive association. The other part is explained by the fact that the fraction of establishment rising prices increases with the inflation rate as we described in subsection 3.1.1. For clothing and education we do not observe a rise in the magnitude of price increases as the inflation rate increases. This phenomenon dampens how the overall magnitude of prices changes varies with the inflation rate. This result also confirms that price setting behavior of products in clothing and education are best described for state-dependent models.

4 Conclusions

This paper characterizes the dynamics of price adjustments in Chile using micro-level data. We compute the frequency of price adjustments for different types of goods included in the CPI basket, and also measures of price dispersion for each type of good across establishments. The mean and median of the frequency of price adjustments show that nominal rigidities seems to be lower when measured at micro-level compared to estimates based on macro data. Our preliminary results also show mixed evidence of changes in the pattern of price adjustments with the state of the economy. The frequency of price adjustments appears to be relatively stable over the sample period. However, if we decompose this frequency in upward and downward adjustments, we observe that the frequency of adjustments for some groups of products is correlated with the level of inflation.

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Table 1: Establishment types.

Establishment type	Number of establishments
Supermarkets	55
Stores	81
Street markets	54
Butcheries and fisheries	38
Department stores	79
Gasoline stations	37
Warehouses	7
Drugstores	81
Clinics	25
Bookstores	83
Schools	52
Total	457

Table 2: CPI structure: Number of varieties per group.

Groups	Name	Number Subgroups	Number Items	Number Products	Number Varieties
1	Food	11	58	162	303
2	Housing	5	12	29	38
3	Housing equipment	7	25	84	152
4	Clothing	6	26	75	142
5	Transport	2	11	26	77
6	Health	3	9	44	90
7	Education and leisure	4	12	55	291
8	Others	3	3	8	41
9	Fuel				9
	Total	41	156	483	1143

Table 3: Mean frequency of price change for different groups of products and periods.

	sample			
	1999-2005	1999-2000	2001-2003	2004-2005
All groups	0.461	0.464	0.495	0.447
Food	0.995	0.955	1.066	0.963
Fuel	1.930	1.228	2.399	3.110
Housing	0.384	0.415	0.393	0.354
H. Equip.	0.320	0.385	0.329	0.225
Clothing	0.388	0.363	0.412	0.399
Transport	0.438	0.461	0.508	0.440
Health	0.308	0.288	0.332	0.270
Educ. n leis.	0.140	0.153	0.137	0.140
Others	0.322	0.310	0.325	0.252
GDP growth ^(a)	3.67	1.86	3.16	6.26
inflation ^(a)	2.63	3.42	2.18	3.05

^(a) median corresponds to the geometric average of annual figures.

Table 4: Median frequency of price change for different groups of products and periods.

	1999-2005	1999-2000	2001-2003	2004-2005
All groups	0.333	0.343	0.333	0.289
Food	0.777	0.773	0.906	0.719
Fuel	1.851	1.230	2.299	2.841
Housing	0.269	0.345	0.266	0.200
H. Equip.	0.313	0.374	0.320	0.228
Clothing	0.412	0.378	0.439	0.411
Transport	0.375	0.428	0.416	0.363
Health	0.308	0.285	0.327	0.263
Educ. n leis.	0.082	0.087	0.068	0.111
Others	0.161	0.187	0.146	0.125
GDP growth ^(a)	3.65	1.83	3.16	6.26
inflation ^(a)	2.78	3.41	2.17	3.04

^(a) median corresponds to the geometric average of annual figures.

Table 5: Mean standard deviations of prices across establishments.

	1999-2005	1999-2000	2001-2003	2004-2005
All groups	0.273	0.242	0.256	0.310
Food	0.207	0.192	0.204	0.246
Fuel	0.036	0.038	0.036	0.031
Housing	0.227	0.196	0.228	0.251
H. Equip.	0.287	0.252	0.291	0.344
Clothing	0.359	0.335	0.368	0.393
Transport	0.314	0.139	0.144	0.342
Health	0.216	0.244	0.210	0.246
Educ. n leis.	0.278	0.279	0.280	0.321
Others	0.236	0.223	0.229	0.264
GDP growth ^(a)	3.67	1.86	3.16	6.26
inflation ^(a)	2.63	3.42	2.18	3.05

^(a) median corresponds to the geometric average of annual figures.

Note: Mean were computed using the variances across varieties.

Table 6: Median standard deviations of prices across establishments.

	1999-2005	1999-2000	2001-2003	2004-2005
All groups	0.219	0.165	0.184	0.239
Food	0.157	0.133	0.153	0.164
Fuel	0.027	0.031	0.026	0.027
Housing	0.212	0.185	0.192	0.201
H. Equip.	0.209	0.154	0.205	0.245
Clothing	0.345	0.327	0.348	0.353
Transport	0.269	0.068	0.039	0.307
Health	0.115	0.113	0.107	0.113
Educ. and leis.	0.212	0.213	0.211	0.225
Others	0.180	0.169	0.171	0.186
GDP growth ^(a)	3.65	1.83	3.16	6.26
inflation ^(a)	2.78	3.41	2.17	3.04

^(a) corresponds to the geometric average of annual figures.

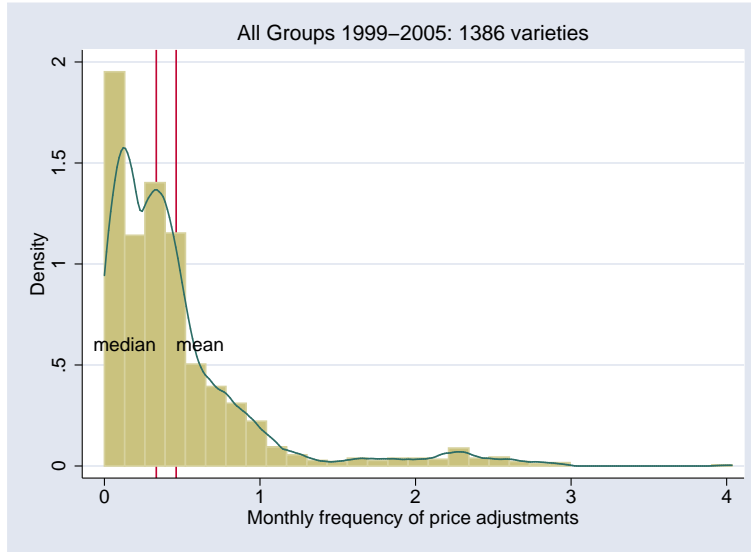


Figure 1: Frequency distribution of price changes.

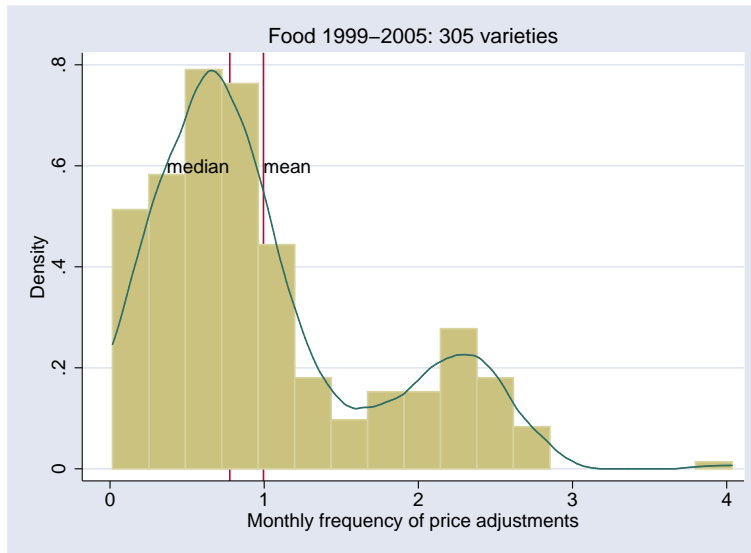


Figure 2: Frequency distribution of price changes.

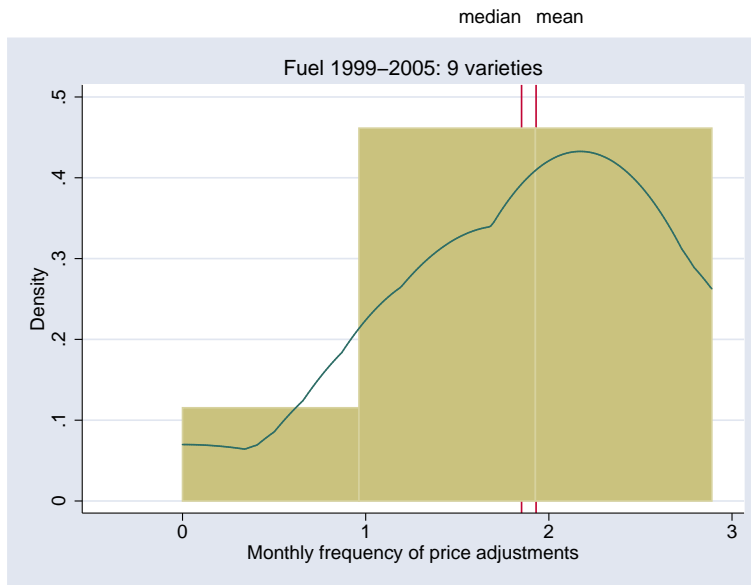


Figure 3: Frequency distribution of price changes.

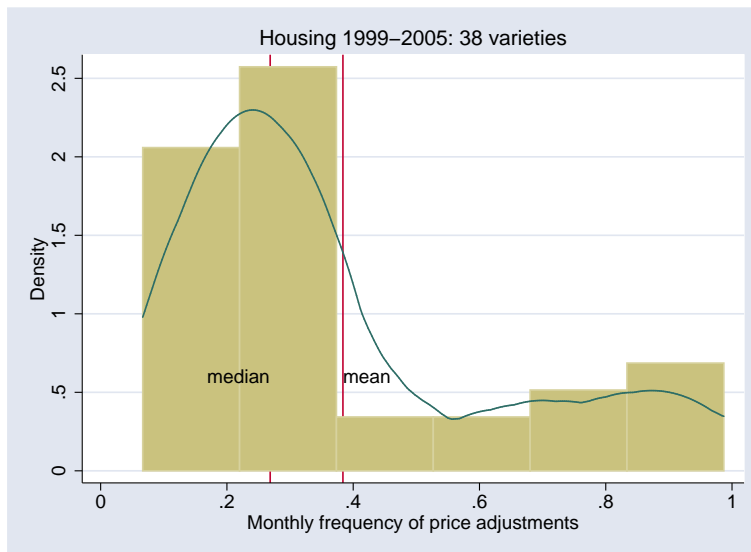


Figure 4: Frequency distribution of price changes.

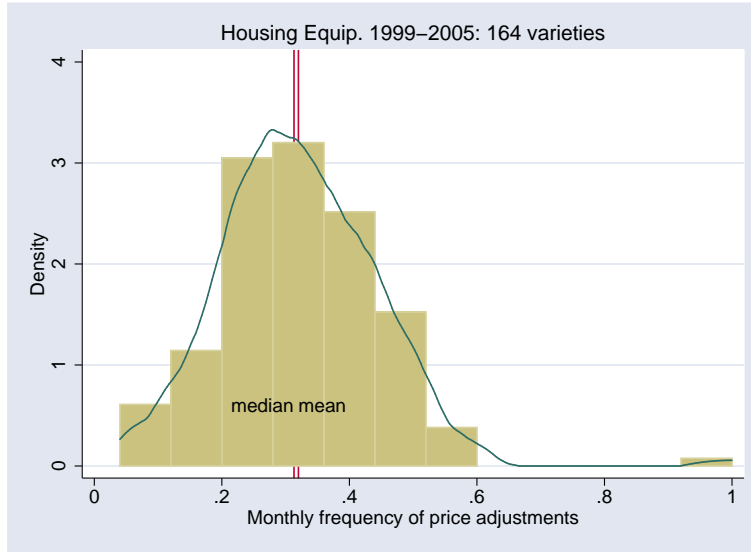


Figure 5: Frequency distribution of price changes.

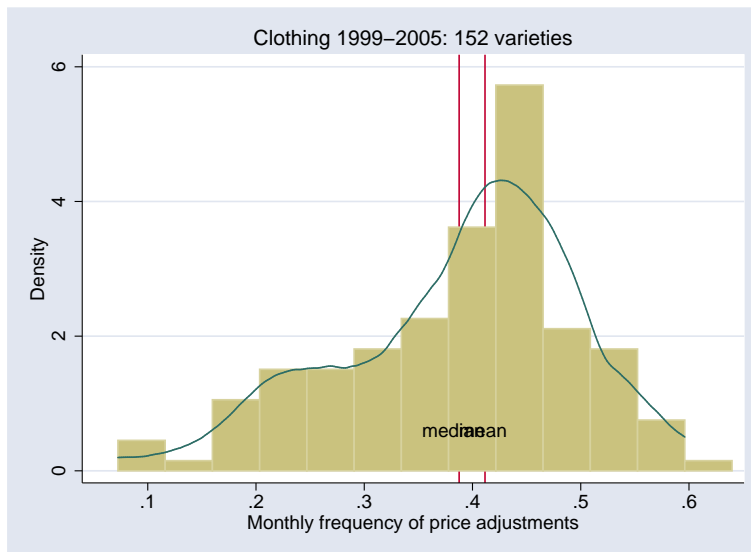


Figure 6: Frequency distribution of price changes.

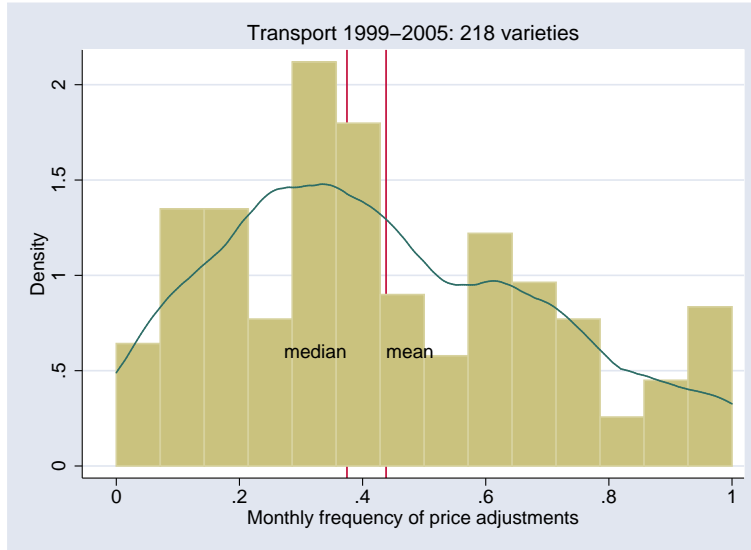


Figure 7: Frequency distribution of price changes.

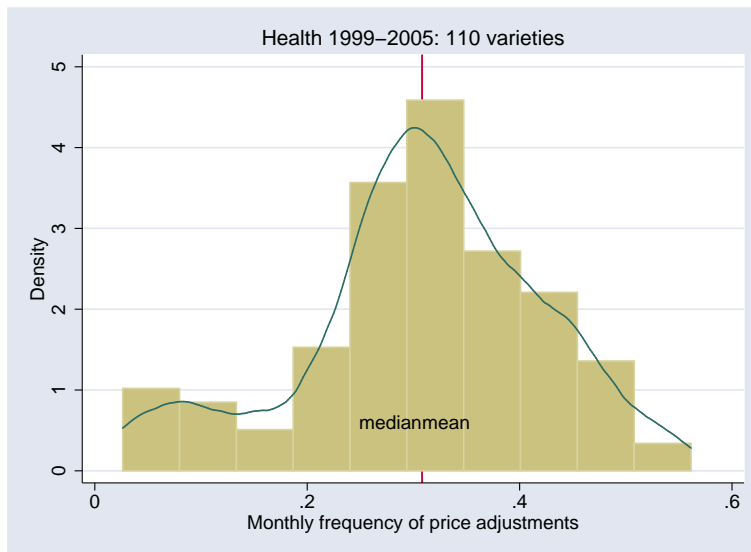


Figure 8: Frequency distribution of price changes.

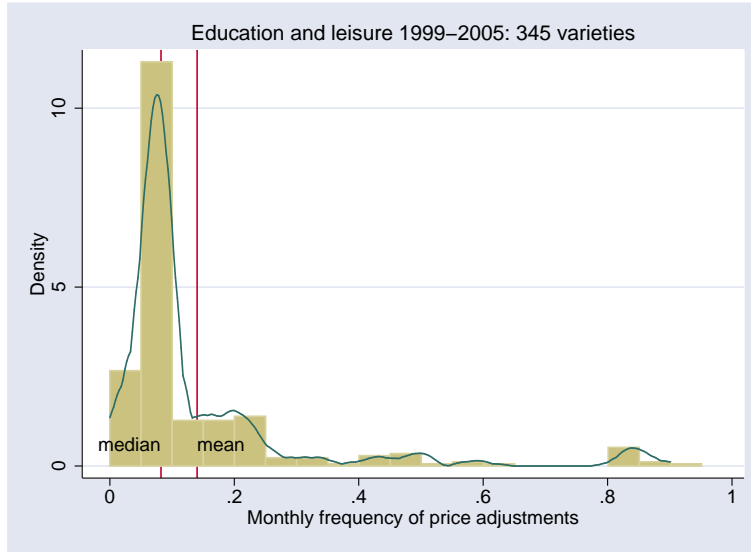


Figure 9: Frequency distribution of price changes.



Figure 10: Frequency distribution of price changes.

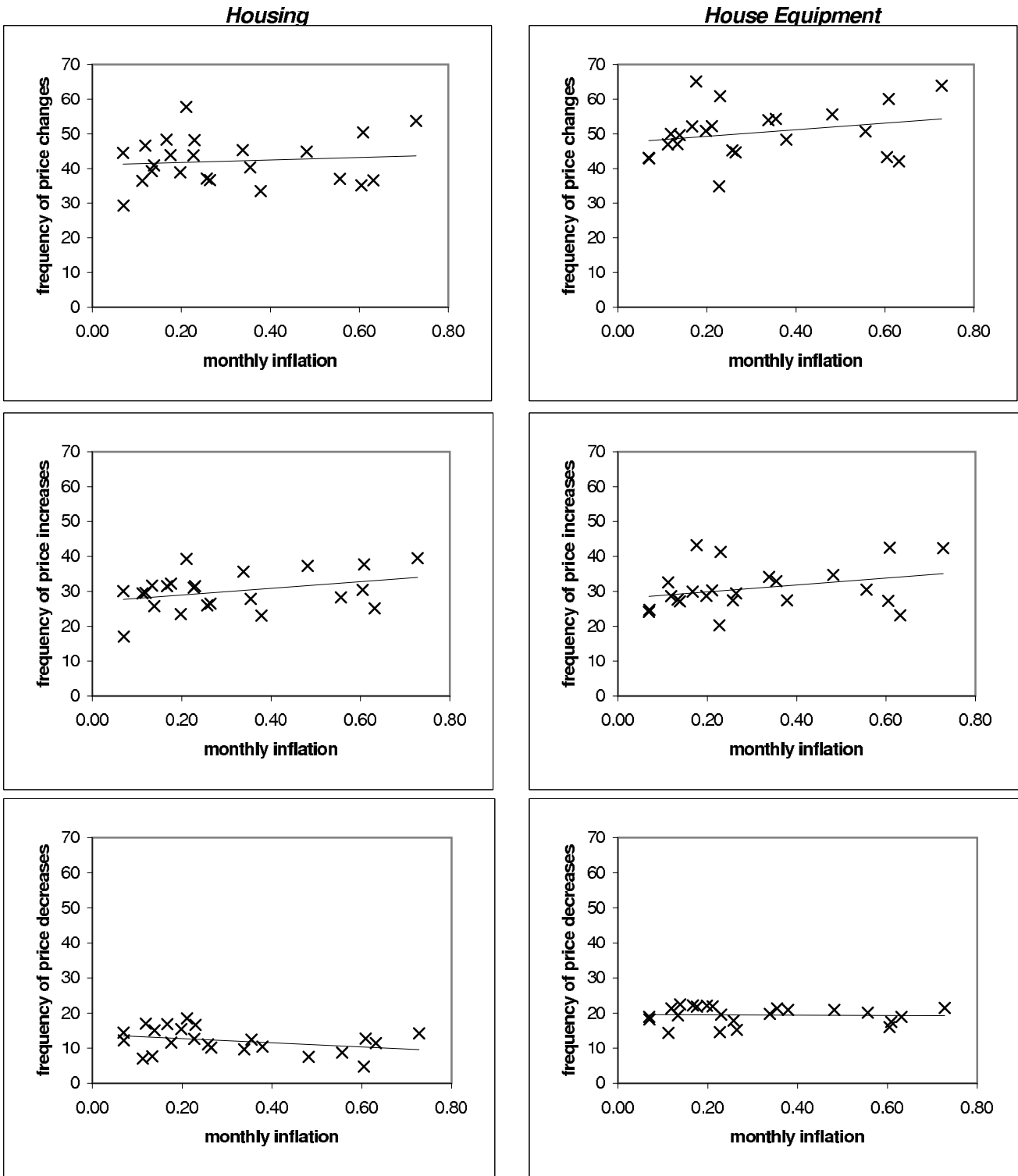


Figure 11: Frequency of price changes and inflation rate: Housing and House Equipment.

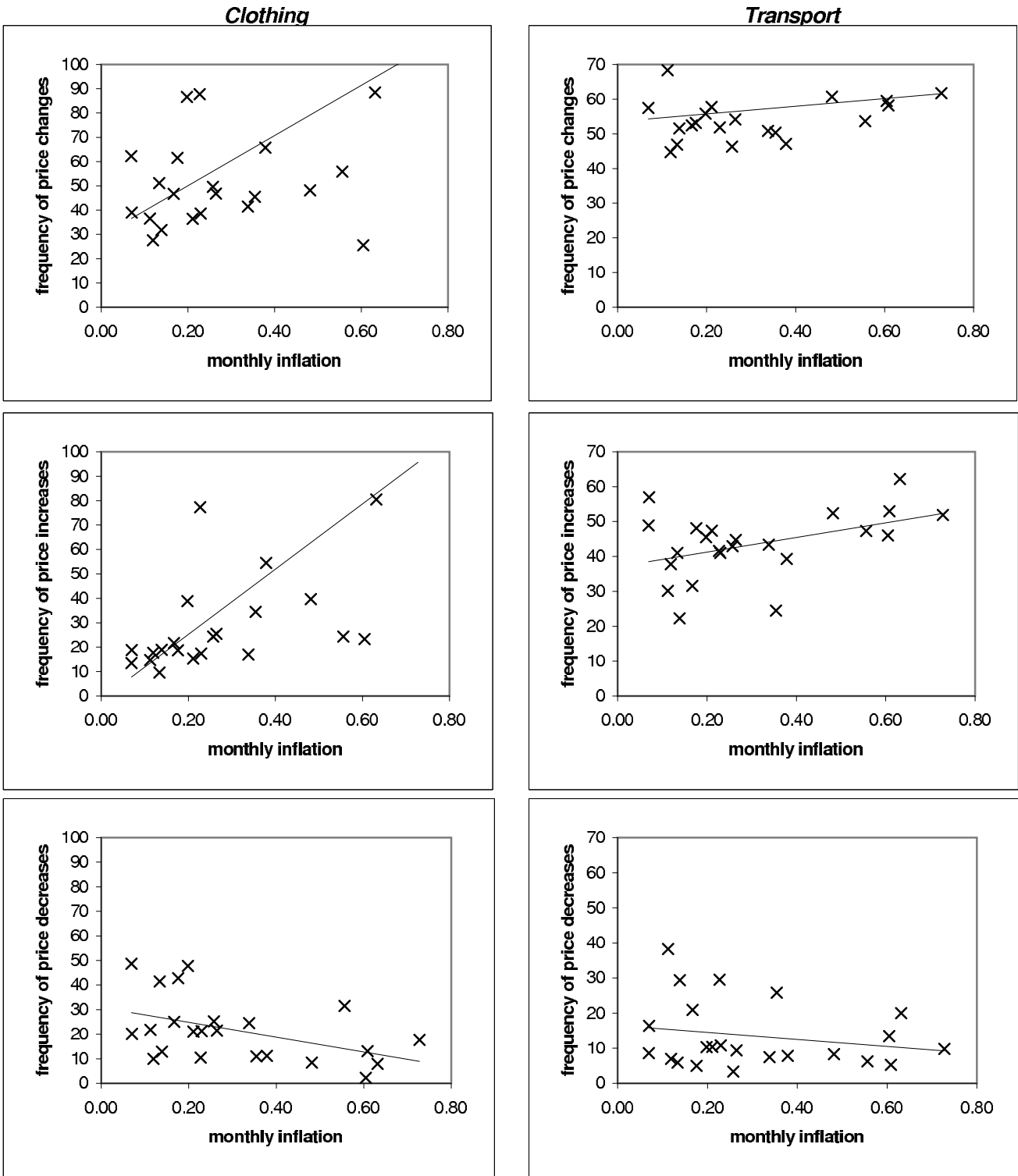


Figure 12: Frequency of price changes and inflation rate: Clothing and Transport.

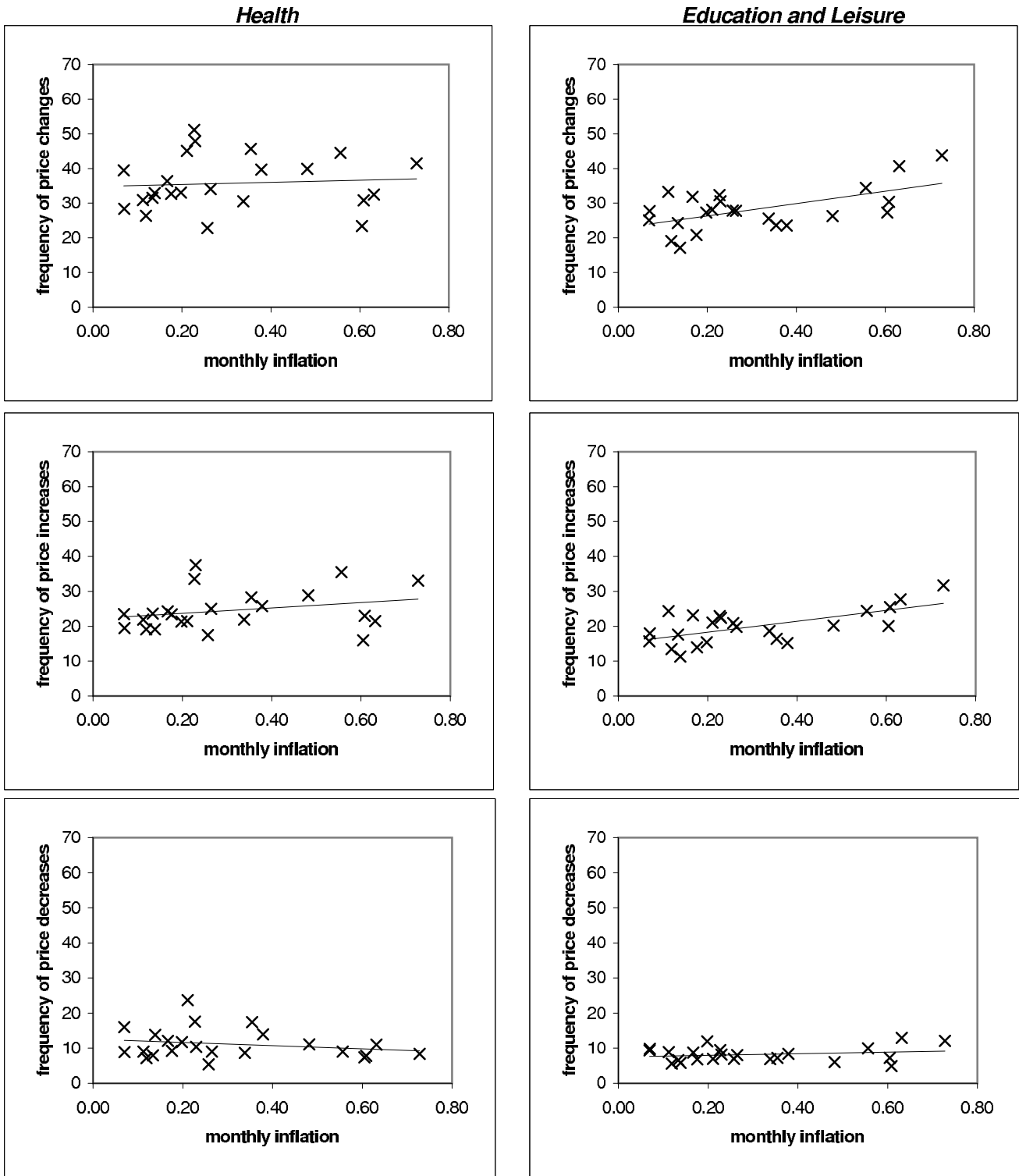


Figure 13: Frequency of price changes and inflation rate: Health and Education.

Others

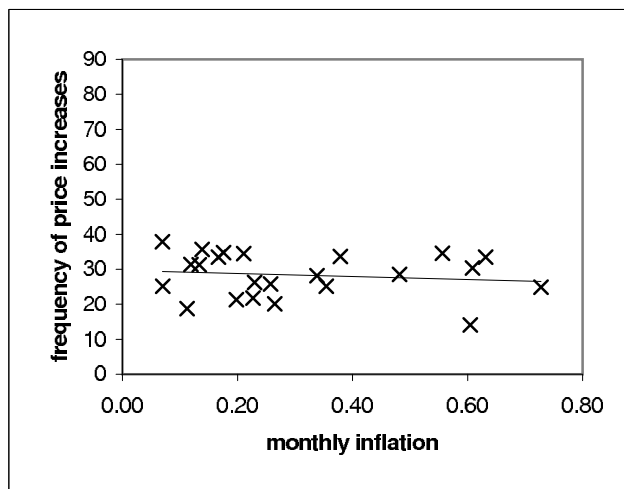
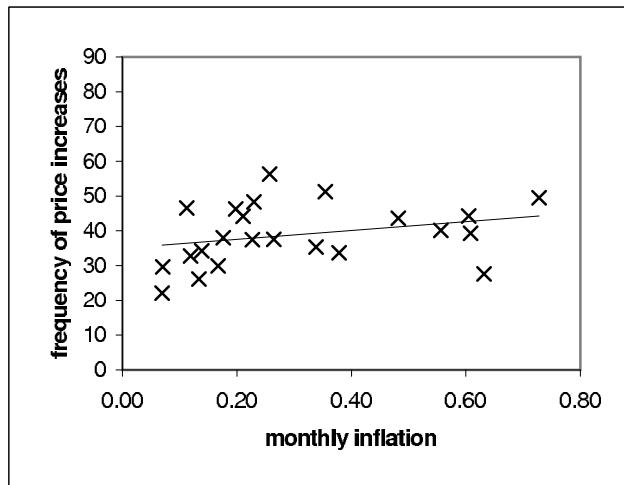
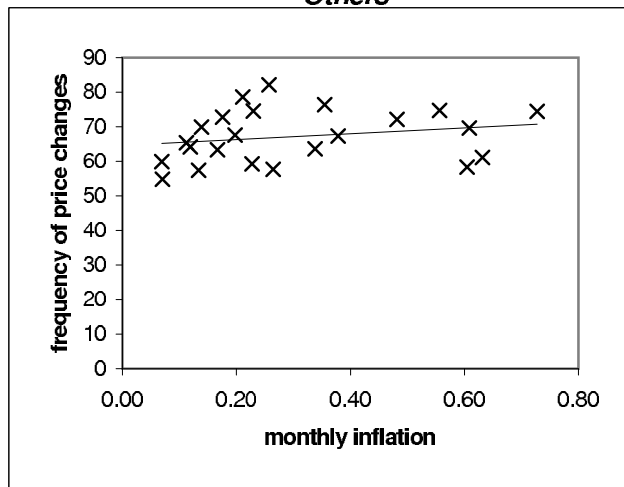
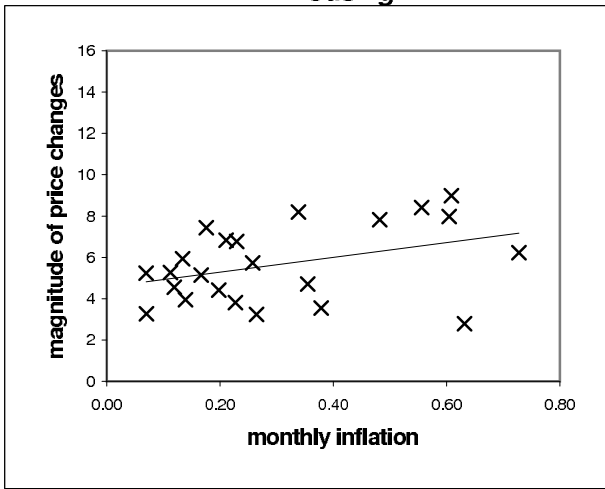


Figure 14: Frequency of price changes and inflation rate: Others.

Housing



House Equipment

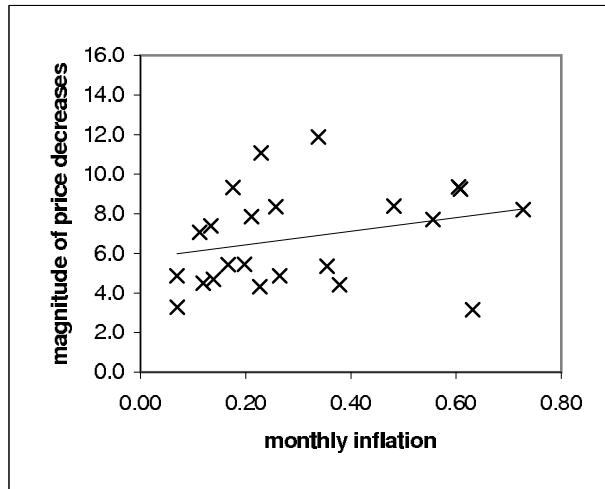
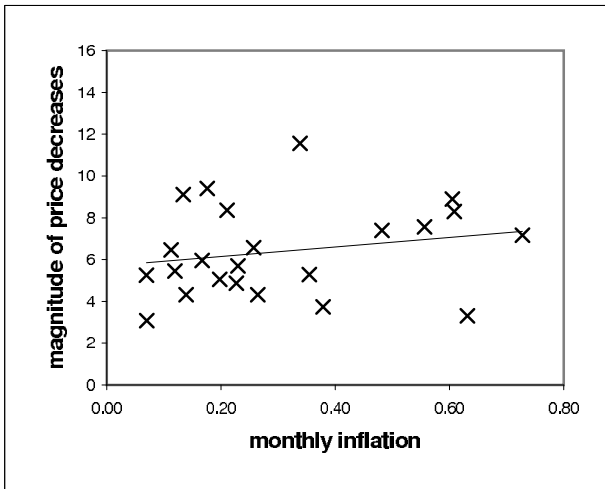
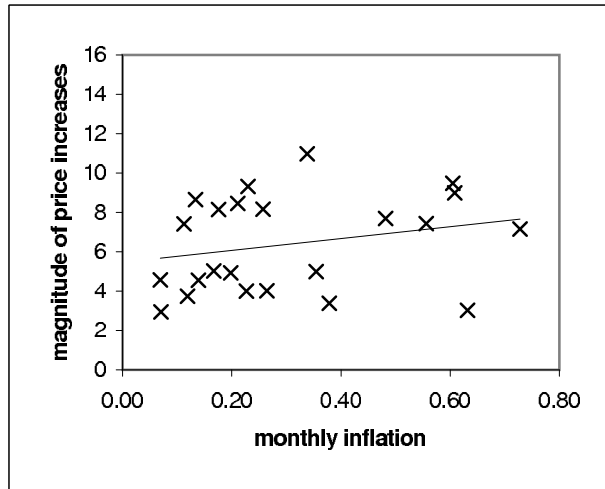
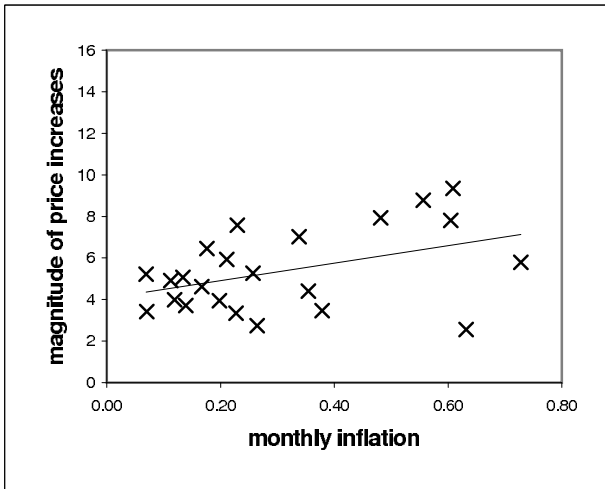
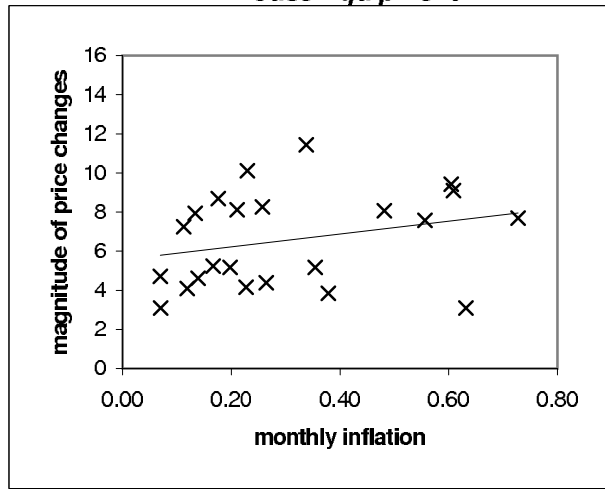
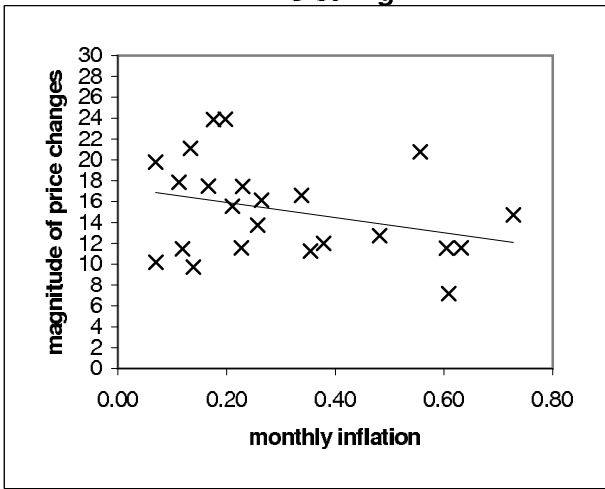


Figure 15: Magnitude of price changes and inflation rate: Housing and House Equipment.

Clothing



Transport

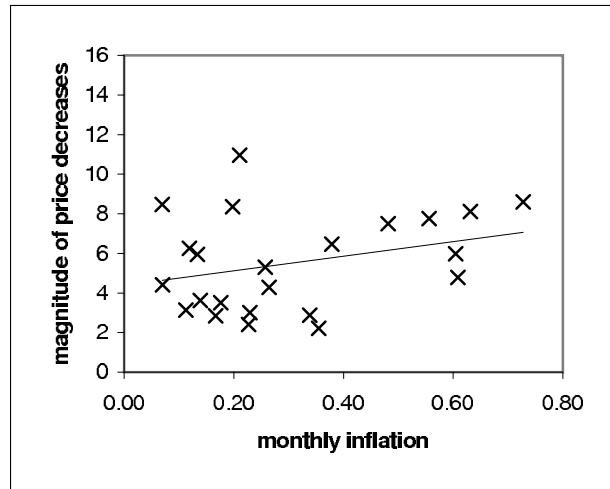
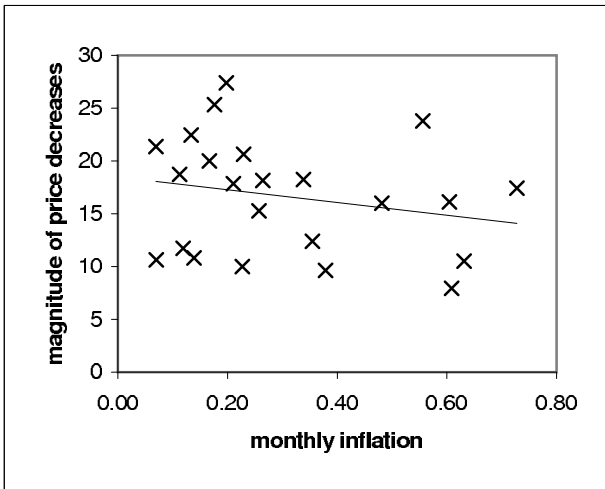
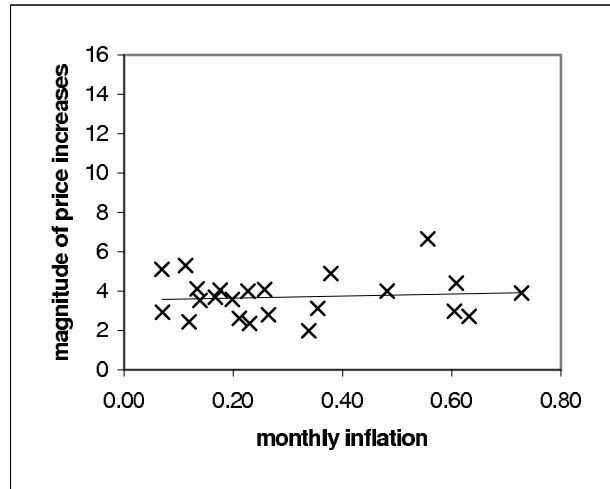
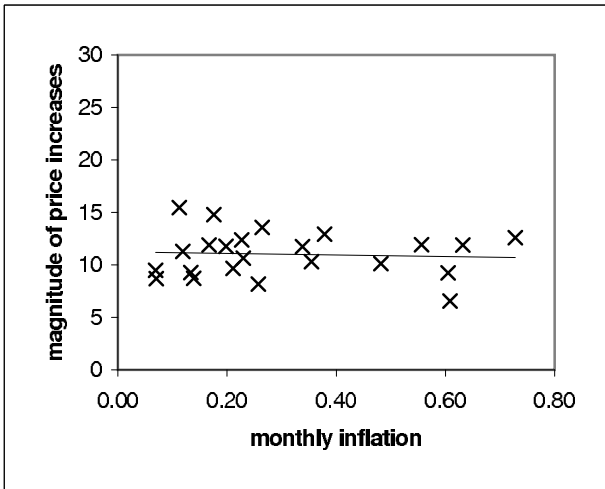
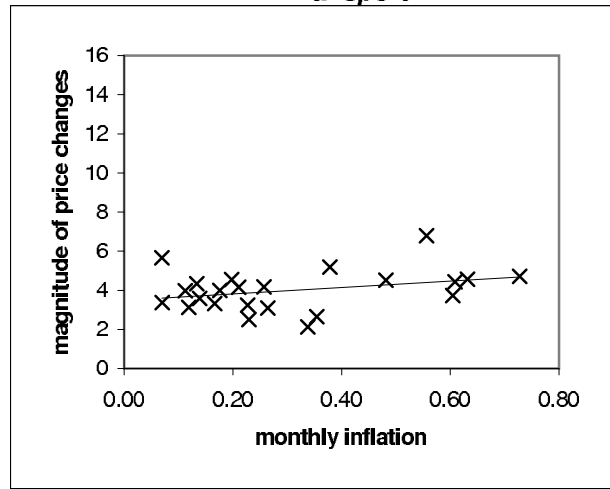


Figure 16: Magnitude of price changes and inflation rate: Clothing and Transport.

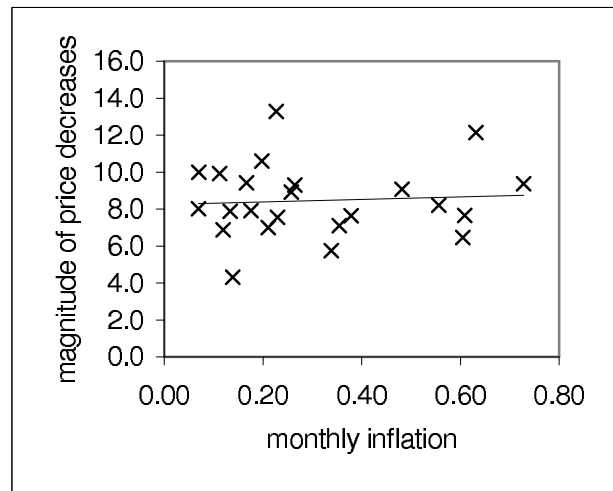
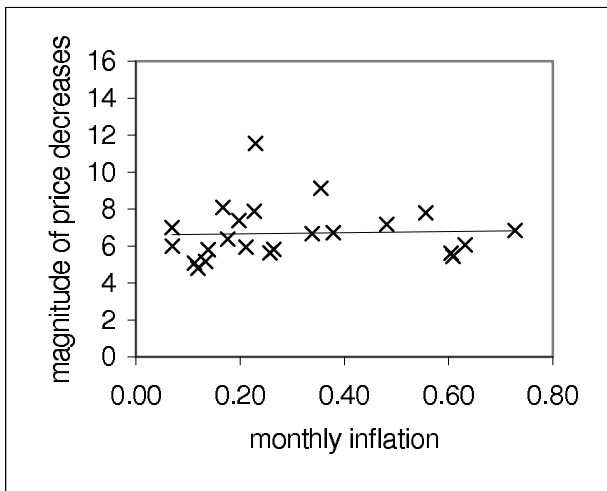
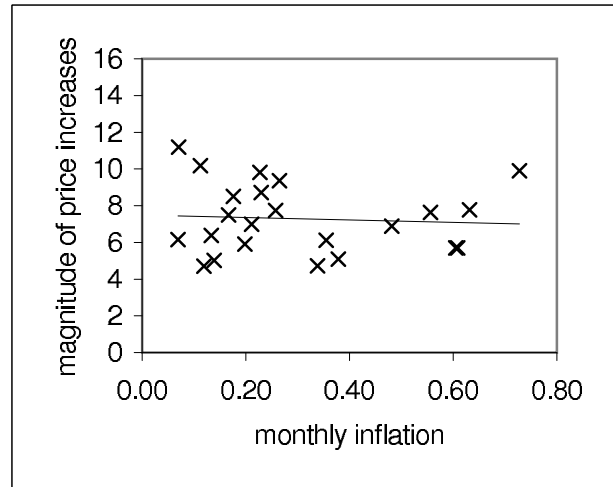
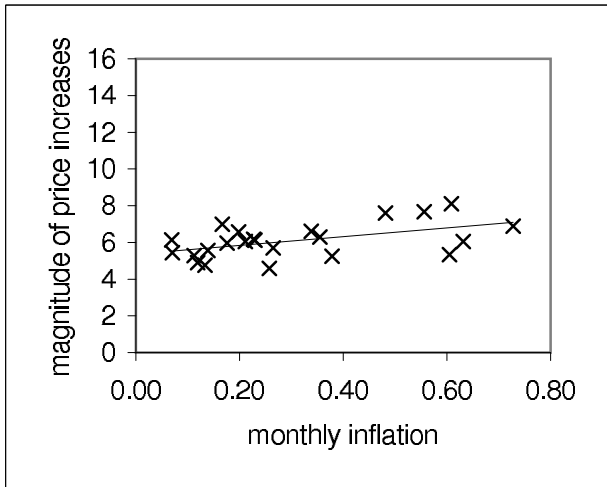
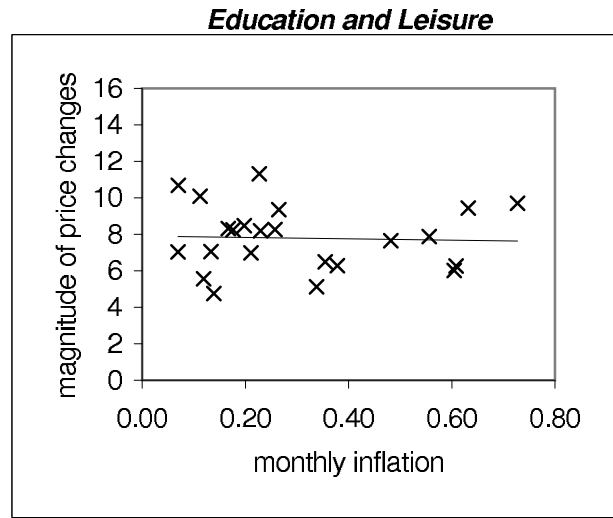
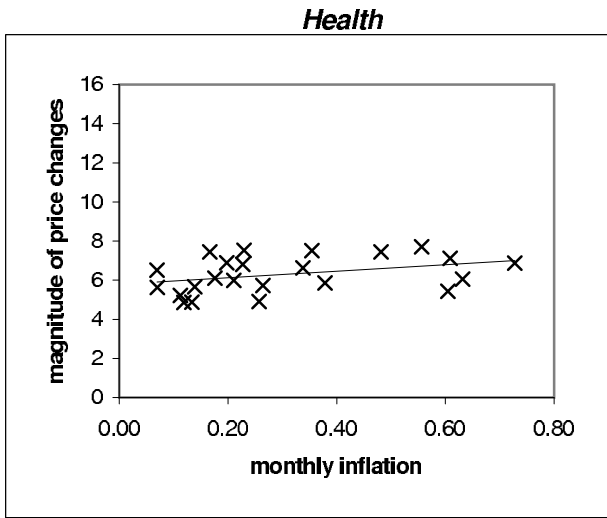


Figure 17: Magnitude of price changes and inflation rate: Health and Education.

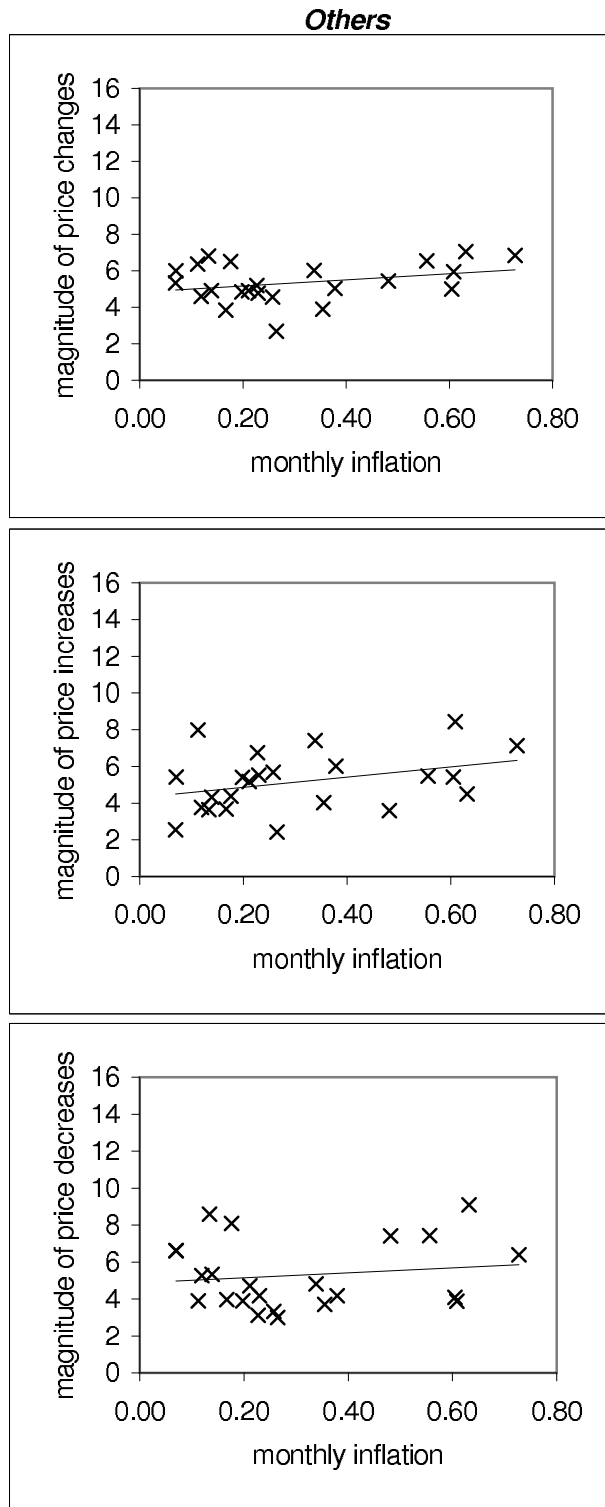


Figure 18: Magnitude of price changes and inflation rate: Others.