

# **Changes in cost of living in India – pro-poor or pro-rich?**

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## **Abstract**

India has been through a period of tremendous growth and great structural changes in its economy over the last 30 years. Because preferences are known to be non-homothetic, changes in prices are expected to affect the rich and the poor differently, depending on whether prices for luxury goods increased relative to necessities.

In this thesis, I study whether the price changes we have seen in India have been “pro-poor” or “pro-rich” using various price indexes. My findings are that preferences are indeed non-homothetic since the budget shares for poor and non-poor are substantially different, and that for the period as a whole the development was pro-poor. When dividing in sub periods, the development was pro-poor from 1983 to 1987 and from 1993 to 2004, but it was pro-rich from 1987 to 1993. These findings are robust to different choices of price indexes.

## **Acknowledgements**

My inspiration for this topic was the ongoing debate about how the present accelerating food prices will affect the cost of living in various countries, and I want to thank my supervisor Ingvild Almås for the idea of looking at the development in India the last 30 years. It has been very interesting to work with this topic and I have learned a great deal.

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# 1 Introduction

In 1991, India went through a liberalization which altered most aspects of the economy, including industrial policy, fiscal policy, financial market regulation, and trade and foreign investment. The implications have been a tremendous change in the Indian economy, and the GDP growth rate has accelerated to 7.5 % (Herd et al., 2007). In a period with tremendous growth and great structural changes in the economy, it is expected that prices would change since we know that preferences are non-homothetic, i.e., that the consumption basket of the poor is not only smaller than that of the rich, but also contains different proportions of each good. For example, we would expect that the poor have larger budget shares for cereals and rice than the rich. Hence, changes in prices could affect the rich and the poor differently, depending on whether prices for luxury goods increase relative to necessities.

In this thesis, I study whether the price changes we have seen in India has been “pro-poor” or “pro-rich”. The comparison is made by estimating separate price indexes for poor and non-poor households, and subsequently, analyzing how the ratio between them develops over time. I make no attempt to compare the price *levels* over time; I only focus on the development in the price index *ratio* between the poor and non-poor households.

The following method is used. Since I am comparing unit values over time, the analysis only uses food prices, and hence, prices of clothing, foot wear, durable goods and leisure are not taken into account. First, unit values are calculated for all commodities for all the years used from the survey. The households are then divided into two income groups, poor households and non-poor households, based on monthly expenditure per capita and India’s official poverty lines. Income group specific food weights are estimated for each survey year, and based on these the average food weights over the years are computed. Then, price indexes are identified for the poor and the non-poor households in the chosen years, followed by a discussion of the development from 1983 to 2004.

This thesis reports three main findings. First, the budget shares for the poor households are substantially different from those for the non-poor households. This implies that preferences are indeed non-homothetic and consequently, price changes affect the poor and the non-poor households differently. Second, the price changes in India have been pro-poor for the

period as a whole, from 1983 to 2004, in the sense that the cost of living for the poor decreased relative to the cost of living of the rich. Third, when dividing up the period, the development was pro-poor from 1983 to 1987 and from 1993 to 2004. From 1987 to 1993, however, the price development was pro-rich. These findings are robust to different choices of price indexes.

In this thesis, consumption expenditure is used instead of income because empirical literature has shown that consumption is not closely tied up to income fluctuations, and that consumption is smoother and less-variable than income (Deaton and Zaidi, 2002). Another advantage offered by relying on consumption data is that it offers a better method to identify annual living standards when observing consumption for a short period, even a week. Such accuracy and detail are not possible through similar observations of income. Thirdly, where self-employment, including small business and agriculture, is common, it is difficult to gather accurate income data or to separate business transactions from consumption transactions. Throughout this thesis, I use the term income instead of expenditure.

As the budget shares vary with income, consumers have non-homothetic preferences. By allowing the households to have different food weights, I create price indexes where food consumption varies between the income groups, not prices. I also create a price index for the poor with average food shares for these households across years, as well as a similar index for the non-poor.

The World Bank computes national poverty lines from household survey data, and converts these lines to international currency using purchasing power parity (PPP) (Deaton and Dupriez, 2009). For the economy as a whole, the budget shares are defined as aggregate expenditure on each good divided by aggregated total expenditure on all goods. This method is criticized because the expenditure patterns at the poverty line differ from the aggregated expenditure patterns in the National Accounts, which provides the weights for the usual consumption PPP. This is the reason why it is relevant to separate the food consumption for poor and non-poor households and analyze how the ratio between them has developed over time. Throughout this thesis, I assume that the two income groups face the same prices every year, but that the food weights vary between the groups.



In order to compare the cost of living for poor households and non-poor households, various methods may be applied. In this thesis, I report results based on the Laspeyres, the Paasche and the Fisher price index.

This paper is organized as follows. In Chapter 2, the theory of non-homotheticity is presented, and in Chapter 3, the price indexes are presented, strengths and limitations are discussed. Chapter 4 presents the methodology, starting with an econometric specification, and then presenting the household survey data. In Chapter 5, the results are presented and discussed, and conclusions are given in Chapter 6.

## 2 Non-homotheticity

Homotheticity is a commonly used assumption in consumer demand theory in economics, and a homothetic function is defined as a monotonic transformation of a homogenous function (Varian, 1992). If consumer preferences are homothetic, then doubling the quantities doubles the utility (Deaton and Muellbauer, 1980, Varian, 1992). An implication of homothetic preferences is that the composition of the budget is independent of total expenditure or of utility, and hence, all expenditure elasticities are in unity. In this thesis, budget shares vary with income, and consequently, there are non-homothetic preferences. The difference between homotheticity and non-homotheticity is illustrated by these figures:

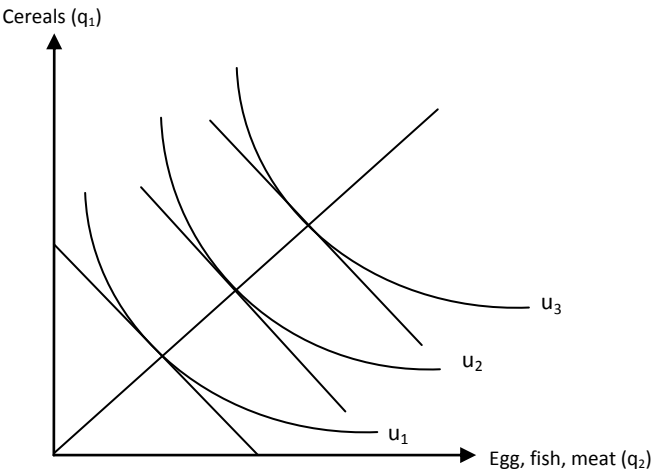


Figure 1: Homothetic preferences

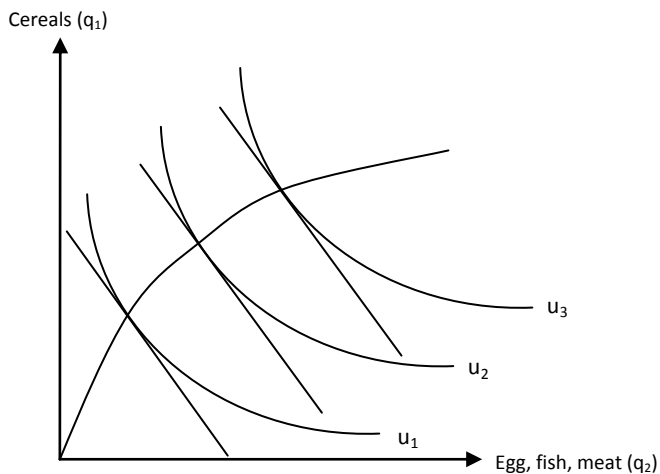


Figure 2: Non-homothetic preferences

The figures illustrate a household's choice between two commodity groups for different income levels. A household is richer the larger the consumed quantity of food. Two groups of food are illustrated, cereals ( $q_1$ ) and egg, fish and meat ( $q_2$ ). In both figures, the households have the same preferences, given by the utility curves. The utility curves are illustrated by three households, where the poorest households have the utility curve  $u_1$ , households with utility  $u_2$  are richer, and households with utility  $u_3$  are the richest. When preferences are homothetic, budget shares do not vary with income, so all households consume equally shares of cereals relatively to egg, fish and meat.

With non-homothetic preferences, the budget share for food depended on the households' income even though all households have the same preferences. The poorest households use a larger share of their food expenditure on cereals relatively to egg, fish and meat, and an increase in income results in a larger increase in cereal consumption than in consumption of egg, fish and meat. For the richest households, which have a larger share of egg, fish and meat relatively to cereals of their food consumption than the poor households, an income increase results in a larger increase in consumption of egg, fish and meat relatively to cereals. All of the households have the same preferences, but their income makes them choose differently.

### 3 Price indexes

Price indexes are used to compare the cost of living over time, between countries and within countries. In this chapter I describe different price indexes and how they are relevant to this study. All of the price indexes are computed for poor and non-poor households.

#### 3.1 Laspeyres and Paasche price indexes

The Laspeyres and the Paasche price indexes compare prices in period 1 with a base period 0. The difference between the two indexes is that the Laspeyres price index uses the consumed quantity in the base year, while the Paasche price index uses the consumed quantity for year 1. The base period is chosen to be the 38<sup>th</sup> round, so the index shows how the price indexes have changed from 1983.

The Laspeyres index can be written in budget shares form (see e.g., Deaton (2008)):

$$P_{10}^L = \sum_{k=1}^n w_{k0} \frac{p_{k1}}{p_{k0}}.$$

Equivalently, the Paasche index can be written as:

$$P_{10}^P = \sum_{k=1}^n w_{k1} \frac{p_{k1}}{p_{k0}}.$$

In these equations,  $w_{k0}$  is the budget share for food  $k$  in period 0, and equivalently,  $w_{k1}$  is the budget share for food  $k$  in period 1.  $p_{k1}$  is the price of food  $k$  in period 1 and  $p_{k0}$  is the price in period 0.

Again, I use budget shares for the poor and the non-poor and hence calculate one price index for the poor and one for the non-poor.

#### 3.2 Fisher's price index

The Fisher price index is a geometric mean of the Laspeyres and the Paasche price indexes, and it is written as:

$$F_{10} = \sqrt{P_{10}^P * P_{10}^L}.$$

Where  $P_{10}^P$  is the Paasche price index and  $P_{10}^L$  is the Laspeyres price index. The Fisher price index is a superlative index, which means that it is exact for a flexible functional form subject

to a budget constraint (Diewert and Nakamura, 1993). A flexible functional form is one which can provide a second order approximation to an arbitrary function.

Diewert and Nakamura (1993) argues that the correct price index is somewhere in the gap between the Laspeyres and Paasche price indexes and that his theorems provide a strong economic justification for the use of the Fisher price index. Hence, they name the index the Fisher ideal price index.

The problem with price indexes is that the correct price is not observable. Since the Fisher price index is a superlative price index, it is only exact when there are homothetic preferences. When homotheticity is violated, it offers an approximation only at some level of cost of living intermediate between the two points being compared (Deaton and Tarozzi 2002).

### **3.3 A Laspeyres price index with equal food weights**

In this version of the Laspeyres price index, food weights are replaced by average food weights over the years,  $\bar{w}_k$ . The index is computed for poor and non-poor households and can be written as:

$$P_{10}^L = \sum_{k=1}^n \bar{w}_k \frac{p_{k1}}{p_{k0}}.$$

This Laspeyres index is equal to the Paasche price index, which makes the Fisher index equal both of them. Hence, when we have equal food weights over time, the Fisher price index is not a superior index to use for estimating the cost of living.

## **4 Methodology**

In this chapter, the econometric specification and the household survey data is presented accompanied with a discussion of advantages and disadvantages of the presented methods.

### **4.1 Econometric specification**

#### **Unit values**

Unit values are calculated from dividing the value of the food consumption by the consumed quantity for every food. Unit values are computed for all consumers for each one of the

foods, and then the median are chosen as the representative unit value for the each food, as in Deaton and Tarozzi (2000). The median is used instead of the mean because it is less sensitive to extreme values.

$$\text{Unit Value}_k = \text{median}\left(\frac{\text{Value}_k}{\text{Quantity}_k}\right).$$

The unit values can be separated in price vectors for poor and non-poor households, but to identify relative price indexes between the groups, it is here assumed all households face the same unit values in each year. The values and the quantities in the unit values are based on aggregated values and quantities which mean that in addition to cash purchases, home grown stock and gifts are included. For the 38<sup>th</sup> round, in 1983, quantities on some foods are changed to be comparable to the other rounds<sup>1</sup>.

In Table 1 in the appendix selected unit values over the four years are listed. The unit values increased from 1983 to 1993 in general, but the unit values in round 61 are significantly lower. The decline cannot be explained by comparing quantity or value with the other rounds, but the Indian rupee had a devaluation in 1999 which may be one of the reasons. However, in regards to this analysis being a comparison of the *relative* price indexes between the household groups, the *level* differences across the rounds do not influence the results.

One of the strengths of using unit values is their representativeness (Deaton and Tarozzi, 2000). They are based on more than 3.5 million observations of consumer expenditures in each year, divided in value and quantity, and gathered from all states in India and from households with different incomes. Another advantage is that the unit values are based on actual transactions. A potential source for prices is a weighted average of price lists reported by the shops, but the price lists does not reflect what households actually pay for a commodity. A third advantage is the additional information the survey offer since the transactions are linked to the households answering the survey. The socio-economic characteristics make it possible to analyze the unit values according to the level of living,

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<sup>1</sup> Quantities of these foods have been multiplied with 100 to make them comparable to the other rounds: Chicken, Eggs, Banana, Pineapple, Coconut, Guava, Orange, Tumeric, Black Pepper, Dry Chillies, Garlic, Tamarind, Ginger, Curry Powder, Other Spices, Tea cups, Tea leaf, Coffee cups, Coffee powder, Cold Beverages, Fruit Juice, Coconut (green), Pickles, Sauce, Jam/Jelly, Other Proc. Food, Pan leaf, Pan finished, Supari, Lime, Katha, Other Pan ingredients, Bidi, Cigarettes, Snuff, Hookah Tobacco, Cheroot, Zarda Kimam Serti, Other Tobacco products, Ganja, opium, Electricity, Matches, Coal Gas, LPG.

occupation or demographic structure. In this thesis, the third advantage is used to divide the households by the poverty lines, and then to identify their cost of living.

There are some problems with the use of unit values, and the first is that not all foods have defined quantities (Deaton and Tarozzi, 2000). Some foods in the survey have number as their unit of measure, and since price tend to vary with the size of a commodity this may cause biases. A second problem is the fact that unit values are not prices. Since foods are not perfectly homogenous, unit values may fluctuate in a way not caused by differences in prices. Richer households have higher unit values than poorer households, and these differences indicate either higher prices or higher quality. A third problem is that the commodity categories are heterogeneous, i.e. the category “Other milk products”.

Tests should be done to analyze if the variation in unit values are dominated by price variation rather than quality effects or product heterogeneity within the commodity group (Deaton and Tarozzi, 2000). This is beyond the scope of this paper. Additionally, papers correcting for quality effects find that the correction only has small effects (Almås, 2011). Hence, I do not correct for quality effects.

## Food weights

The consumer price indexes (CPI) in India are based on a fixed basket of food, and they are criticized for reflecting outdated consumption behavior. To get more realistic food weights, I compute budget shares for each commodity in each round, both for poor and non-poor households. In one of the price indexes, average food weights over the four years are used. The food weights are split in poor and non-poor households to take into account the non-homothetic preferences observed in the data.

$$\bar{w}_k^P = \frac{1}{t} \sum_{k=1}^n w_k^P.$$

$$\bar{w}_k^{NP} = \frac{1}{t} \sum_{k=1}^n w_k^{NP}.$$

In these equations  $\bar{w}_k$  is the average food weight for food  $k$ , and  $w_k$  is the food weight for food  $k$  in each year. The number of years used from the survey has the notation  $t$ .  $P$  stands for poor households, and  $NP$  is non-poor households. The food weights are based on value, not quantity.

According to Deaton and Tarozzi (2000), it is better to use the mean food weight rather than the median because the budget shares have to be between zero and one. Second, they point out that it is better to have food weights on an individualized basis, rather than on a household basis. Third, the use of averaged budget shares is better because then the poorer households is weighted as much as the richer households. These three arguments are considered in my analysis.

In Chapter 4, food weights are computed for all commodities alongside a Laspeyres price index with equal budget shares for food consumption over time, estimated for both poor and non-poor households. They face the same unit values, but since we have non-homothetic preferences, the average budget shares for food consumption are different for the two groups. Hence, we simplify and assume that the food weights are fixed within each group.

## **4.2 Household survey data**

This section has a description of the data set and definitions of the variables used in the analysis.

### **The National Survey Sample (NSS)**

The National Survey Sample Organization (NSSO) conducts socio-economic surveys in India. Surveys are done every year, but only every 5<sup>th</sup> or 6<sup>th</sup> year, information from a large sample is gathered. In my study, I have used information from four of the five latest large rounds, the 38<sup>th</sup>, 43<sup>rd</sup>, 50<sup>th</sup> and 61<sup>st</sup> round, respectively gathered in the years 1983, 1987-88, 1993-94 and 2004-05. Throughout this paper, I consistently write years 1983, 1987, 1993 and 2004. The 55<sup>th</sup> round, gathered in 1999-2000, is not included in this study because the data set was not available.

Table 2 in the appendix shows the data set for the largest Indian states only. The survey asks about 110,000 households in each round, where a household is defined as a group of persons normally living together and taking food from a common kitchen. They are separated into rural and urban sector, with twice as many rural respondents, about 70,000, than urban respondents, about 40,000. The households are separated in poor and non-poor households, and the poverty ratio fall from 39.2 % in 1983 to 22.6 % in 2004. This does not

match the official head count ratio precisely because the official numbers are weighted by how large the states are. Although the percentages do not match exactly, they have the same development as the official numbers.

The monthly expenditure per capita in the survey includes all domestic consumer expenditure during the last 30 days. This makes it possible to separate consumption for food and for non-food. Food expenditure is reported for 30 days expenditure, while other variables are reported for both 30 days and 365 days. This is reasonable given that people rarely buy a representative amount of clothes, foot wear and durable goods every month. Monthly expenditures per capita are reported in both 30 and 365 days, and I have used the data from 30 days in my analysis. This may cause some biases because people tend to over report consumption for a month in proportion to reporting for a year.

### **4.2.1 Defining the variables**

#### **States**

The national poverty lines are estimated for the 20 largest states in 1983 and 1987, 19 in 1993, and 23 in 2004, listed in List E in the appendix, and separated in rural and urban poverty lines. Since my analysis is based on these poverty lines, the small states are dropped (List F). This is not optimal; however, the large states cover from 87.5% in 2004 to 93.2 % in 1983 of the population in the NSS rounds (Table 3). In 1993, Kerala has been dropped as well because the state is not in the official poverty line.

The number of states is different over the rounds due to official changes. Three states were established in 2000, and hence, only included in the 61<sup>st</sup> round, year 2004<sup>2</sup>.

#### **Foods**

185 foods are compared over the four rounds, shown in List A in the appendix. As can be seen in List A, the foods include electricity and other fuel and lighting sources which I choose to keep in the analysis because it is consumed frequently like the other commodities. For making the price indexes the same foods must be compared, but there have been some

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<sup>2</sup> Chhattisgarh, Jharkhand, Uttarakhand.



changes in the survey over the years. Some foods have been taken out of the NSS schedule, so they are only reported for the years 1983, 1987 and 1993 (List B).

The later years have fewer foods than the earlier rounds. To compare the foods throughout the rounds, some foods have been merged because they are listed together in the survey in 2004 (List C). Year 1993, the 50<sup>th</sup> round, have more foods than the other rounds because they have separated many food purchases into PDS (i.e., bought from the public distribution system) and market sources. Because the foods only are separated in two rounds, these foods will be merged (List D).

## **Poverty lines**

The poverty lines in my thesis are the official poverty lines in India, estimated by the Indian Planning Commission (IPC). They are based on monthly expenditure per capita. Since some states in India are larger than many countries in the world, the poverty lines are state specific, as well as specific for rural and urban households. The poverty lines are only determined for the larger states.

The official poverty lines have been criticized for understating the poverty in India (Deaton 2008). Deaton (2008) finds that the food component of the CPIAL understates the rate of food price inflation mainly for two reasons. First, the official poverty lines in India are based on the food weights from the survey in 1981-82, and hence, outdated. Second, the overall weights of food in the CPIAL are too large. Implications of this are, for example, that cereals are over-weighted in the food index, and its prices have fallen relative to other foods. Consequently, the price index is too low relative to the actual cost of living.

Table 2 in the appendix displays the official percentage of poor in each year and the percentage poor computed in my analysis with the official poverty lines. The official numbers are quite different in 1987 and 1993, but some of the differences may be explained by that my numbers are not adjusted by the size of the states since the percentage of poor varies greatly between states.

## **Income groups**

I divide the households into two income groups, consisting of poor and non-poor households. The poor households are defined as the households living on a monthly expenditure per capita under or on the official poverty lines from IPC. The non-poor households' monthly expenditures exceed the poverty lines. The survey from 2004 is adjusted for household size.

## **5 Results**

In this chapter, the results will be presented and discussed. First, the findings of the food weights are commented. Second, the computed price indexes are commented. The first year in the survey, 1983, is chosen as the base year for all the price indexes. This implies that the developments in relative prices are derived from a 1:1 ratio between the household groups in 1983.

### **5.1 Food weights**

Table 4 presents selected aggregated consumption groups' share of total consumption for the four years, divided into poor and non-poor households. The results are quite distinct, both between the household groups, within each household group and for the development over time. From 1987 to 1993, the consumption of cereals for the poor was about 15 percentage points above the non-poor households' cereal consumption, and as expected, the non-poor households consumed significantly more milk products and egg, fish and meat than the poor households. Within each household group, cereals have become less important, especially for poor households where their share has gone down from 47.96 % in 1983 to 27.23 % in 2004. Milk products and egg, fish and meat has become far more important, illustrated by an increase in consumption of milk products from 6.09 % in 1983 to 11.86 % in 2004 for the poor households. The development over time is that the food consumption shares for the two income groups have become closer. Also, cereals are substituted for other foods, which may indicate more varied diets among the population the latter years.

The implication of this finding is that price indexes made for the overall economy, such as the indexes that the World Bank computes, should take into account the large differences in

consumption baskets when generating poverty lines. This finding supports Deaton and Dupriez critic of how the World Bank computes their poverty lines. Since the consumption weights for the nation are quite distinct from those living close to the poverty line, a set of consumption weights for households close to the poverty lines should be estimated.

## **5.2 Price indexes**

### **Laspeyres price index**

Table 5 in the appendix presents the results of the Laspeyres index, and throughout the years, the development have been pro-poor. Consequently, in proportion to the price indexes facing the two different groups in 1983, the development in food prices facing the poor households have been more favorable than for the non-poor households. From 1983 to 1987, the poor households experienced the sharpest decline in the relative prices at 3.917 %. In the next period, from 1987 to 1993, the relative prices increased with 0.638 % for the poor, which means that the development was pro-rich. This was followed by a long period of pro-poor development, a decrease in the relative price index of 2.013 %.

### **Paasche price index**

The Paasche price index, unlike the Laspeyres price index, uses the quantity in the respective years, not the base year. As shown in Table 6 in the appendix, the results are similar to the Laspeyres price index, but at different magnitude. The development over the period as a whole was pro-poor also in the Paasche price index. From 1983 to 1987, the development was pro-poor, and the ratio between the poor and the non-poor households in the Paasche price index fell 2.073 %. The next period, from 1987 to 1993, had a pro-rich development, and the ratio increased by 0.442 %. In the last period the poor households had a favorable development in relative prices of 0.302 %, thus the development was pro-poor. The Laspeyres price index has a more extreme percentage change, both in periods with declines and the period with increase.

### **Fisher price index**

The Fisher price index is the geometric average of the Laspeyres and Paasche price indexes, and the results are presented in Table 7 in the appendix. The index reports a pro-poor

development on how the poor's and the non-poor's cost of living were affected by the food prices. Hence, the relative prices are throughout the years lower for poor households than non-poor households, with a large decrease of 2.999 % in the first period, from 1983 to 1987. During the liberalization, from 1987 to 1993, the relative price index decreased by 0.540 %, thus the development was pro-rich. After the liberalization, from 1993 to 2004, the development returned to pro-poor with a decrease of 1.161 %.

Overall, it is possible to conclude that the price index facing the poor households has been developing favorably over the years relative to the non-poor households.

### **A Laspeyres price index with equal food weights**

Finally, a Laspeyres price index with equal food weights over the years has been computed. The average food weights differ for the poor and the non-poor, and the results are presented in Table 8. The development over time of the ratio is pro-poor; the poor households face lower food prices than the non-poor households. More detailed, the food prices facing the poor households have declined 1.931 % for the poor households relative to the non-poor households from 1983 to 1987. In the next period, from 1987 to 1993, the development was pro-rich with an increase in the ratio by 0.095 %. After the liberalization, from 1993 to 2004, the relative prices decrease by 2.377 %, thus the development was pro-poor.

Since this price index has the same food weights over the years, these changes in the price index are due to price changes on a fixed consumption basket for poor and non-poor households. Consequently, with a fixed basket, the relative price index for poor households has had a more favorable development than according to the Fisher price index.

## **6 Conclusion**

In this thesis, I have investigated the relative price indexes between poor and non-poor households in India in the period from 1983 to 2004. The first reported main finding is that the budget shares within food consumption for the poor and the non-poor households differs substantially, which implies that the difference in consumption weights should be accounted for when estimating national poverty lines. The second reported finding is that

the development of the ratio has been pro-poor throughout the period. This means that the relative cost of living for the poor has fallen relatively to the non-poor. This is not a product of the liberalization that was instigated in 1991, because the reported development is traceable from 1983 and it was strongest from 1983 until 1987. In the next period, from 1987 to 1993, the development was pro-rich. The development was pro-poor in the longest period, from 1993 to 2004, and this may indicate an ongoing trend.

Due to the representativeness of the data set used, the results are quite robust, especially since they are valid for all price indexes computed. The findings are influenced by choice of poverty lines. In 2011, IPC revised their poverty lines due to the critic of outdated weights (Tendulkar et al., 2009). The expert group behind the revising proposed five important changes which were taken into account. First, they moved away from basing the poverty lines on the calorie intake norm because the norm did not correlate well with the observed nutritional outcome. Second, since the rural data are more controversial than the urban data, the rural poverty line basket (PLB) will be based on the urban's PLB, adjusted for within-state urban-relative-to-rural and rural and urban state-relative-to-all-India price differentials. Third, the PLB is updated to the latest available data, from 2004. Fourth, the price indices are based on household-level unit values, and fifth, the poverty lines are computed for all states, not only the largest. Using these revised poverty lines would have made the analysis more robust, but there were not available.

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## Appendix

**Table 1: Selected unit values and number of purchases**

	Round 38		Round 43		Round 50		Round 61	
	Unit value	Purchases	Unit value	Purchases	Unit value	Purchases	Unit value	Purchases
Rice	3.300	107,731	3.833	104,597	6.667	108,482	1.000	112,869
Wheat/Atta	2.210	123,590	2.500	122,138	4.500	109,365	0.850	83,407
Milk (liquid)	3.000	94,458	4.000	84,804	7.000	74,498	1.200	83,092
Beef/Buffalo Meat	7.000	6,588	10.000	7,211	20.000	6,840	5.000	7,575
Eggs	0.550	27,161	0.700	28,432	1.200	28,091	0.175	38,917
Potato	2.000	88,608	2.500	100,802	4.000	89,532	0.750	96,882
Banana	0.208	32,805	0.333	51,746	0.500	55,739	0.088	61,240
Garlic	0.008	75,370	0.020	79,356	0.020	77,072	0.003	118,628
Tea, leaf	0.030	69,721	0.040	81,727	0.080	75,219	0.014	91,107
Electricity	0.583	32,710	0.500	53,927	0.850	63,169	0.211	76,031
Kerosene	2.167	101,694	2.700	111,915	3.000	69,115	1.000	60,394

**Table 2: Summary of the NSS surveys**

Year	1983	1987	1993	2004
Households	109,485	116,662	102,562	109,109
Rural	72,101	75,054	61,464	69,360
Urban	37,384	41,608	41,098	39,749
Poor households	42,906	33,220	29,095	24,688
Non-poor households	66,579	83,442	73,467	84,421
Poor (%)	39.2 %	28.5 %	28.4 %	22.6 %
Official headcount ratio	44.5 %	38.9 %	36.0 %	27.5 %

**Table 3: Official Poverty Lines and Small States**

Year	1983	1987	1993	2004
Official poverty line	93.2 %	91.3 %	88.9 %	87.5 %
Small states	6.8 %	8.7 %	11.1 %	12.5 %

**Table 4: Selected aggregated food weights for poor and non-poor households**

Year	1983		1987		1993		2004	
	Poor	Non-poor	Poor	Non-poor	Poor	Non-poor	Poor	Non-poor
Cereals	47.96 %	33.19 %	39.00 %	27.06 %	37.55 %	25.29 %	27.23 %	22.78 %
Milk products	6.09 %	14.37 %	8.44 %	15.84 %	9.17 %	17.15 %	11.86 %	15.13 %
Egg, fish and meat	3.54 %	5.06 %	4.23 %	5.30 %	4.30 %	5.31 %	4.75 %	5.33 %
Vegetables	6.71 %	6.69 %	7.56 %	7.37 %	8.66 %	8.32 %	8.98 %	8.58 %
Fruits	1.05 %	2.28 %	1.52 %	2.95 %	1.16 %	3.33 %	2.29 %	2.96 %

**Table 5: The Laspeyres Price Index**

Year	1983	1987	1993	2004
Poor households	1	1.332	2.252	0.409
Non-poor households	1	1.386	2.329	0.431
Ratio	1	0.961	0.967	0.948
Change from last round (%)		-3.917 %	0.638 %	-2.013 %

**Table 6: The Paasche Price Index**

Year	1983	1987	1993	2004
Poor households	1	1.361	2.328	0.418
Non-poor households	1	1.390	2.367	0.426
Ratio	1	0.979	0.984	0.981
Change from last round (%)		-2.073 %	0.442 %	-0.302 %

**Table 7: The Fisher Price Index**

Year	1983	1987	1993	2004
Poor households	1	1.346	2.290	0.413
Non-poor households	1	1.388	2.348	0.429
Ratio	1	0.970	0.975	0.964
Change from last round (%)		-2.999 %	0.540 %	-1.161 %



**Table 8: A Laspeyres price index with equal food weights**

Year	1983	1987	1993	2004
Poor households	1	1.419	2.423	0.437
Non-poor households	1	1.447	2.469	0.456
Ratio	1	0.981	0.982	0.958
Change from last round (%)		-1.931 %	0.095 %	-2.377 %

**List A: Commodities in the analysis**

Paddy <sup>3</sup>	Groundnut Oil	Other Vegetables	Cold Beverage
Rice	Coconut Oil	Banana	Fruit Juice, Shake
Chira	Gingelly Oil	Jackfruit	Coconut, green
Khoi, Lawa	Linseed Oil	Water Melon	Biscuits & Confect
Muri	Refined Oil	Pineapple	Salted Refreshment
Other Rice Products	Palm Oil	Coconut	Prepared Sweets
Wheat/Atta	Rapeseed Oil	Guava	Cake, Pastry
Maida	Oil seeds	Singara	Pickles
Suji, Rawa	Edible Oils (others)	Orange, Mausami	Sauce
Seewai, Noodles	Goat Meat/Mutton	Mango	Jam/Jelly
Bread, Bakery	Beef/Buffalo Meat	Kharbooza	Other Proc Food
Other Wheat prods	Pork	Pears (naspatti)	Pan, leaf
Jowar & products	Other Meat, etc	Berries	Pan, finished
Bajra & products	Chicken	Leechi	Supari
Maize & products	Eggs	Apple	Lime
Barley & products	Fish	Grapes	Katha
Small Millets & products	Potato	Other Fresh Fruits	Other Pan ingred.
Ragi & products	Arum	Coconut (copra)	Bidi
Gram (whole grain)	Radish	Groundnut	Cigarettes
Gram Products	Carrot	Dates	Leaf Tobacco
Tapioca/Sago <sup>3</sup>	Turnip	Cashew Nuts	Snuff

<sup>3</sup> Only in the 38<sup>th</sup>, 43<sup>rd</sup> and 50<sup>th</sup> rounds.

Tapioca (green) <sup>3</sup>	Beet	Walnuts	Hookah Tobacco
Mahua <sup>3</sup>	Sweet Potato	Other Nuts	Cheroot
Jackfruit seed <sup>3</sup>	Onion	Raisins(kishmish)	Zarda, Kimam, Serti
Other Cereal Subs	Other Root Veg.	Other Dry Fruits	Other Tobacco prod
Arhar (tur)	Pumpkin	Sugar (crystal) PDS	Ganja
Gram (split)	Gourd	Khandsari	Toddy
Moong	Bitter Gourd	Gur (cane)	Country Liquor
Masur	Cucumber	Gur (others)	Opium, Bhangharas
Urd	Parwal/Patal	Sugar Candy (misri)	Beer
Khesari	Jhinga/Torai	Honey	Foreign Ref.Liquor
Peas	Snake Gourd	Sugar (others)	Other Drugs and
Soybean	Other Gourd	Salt	Coke
Other Pulses	Cauliflower	Turmeric	Firewood and Chips
Besan	Cabbage	Black Pepper	Electricity
Other Pulse Products	Brinjal	Dry Chillies	Dung Cake
Milk, liquid	Lady's Finger	Garlic	Kerosene
Baby Food	Palak/Other Leafy veg	Tamarind	Matches
Milk, cond./Powder	French Beans,	Ginger	Coal
Curd	Tomato	Curry Powder	Coal Gas
Ghee	Peas	Other Spices	L.P.G.
Butter	Chili (green)	Tea, cups	Charcoal
Ice-cream	Capsicum	Tea, leaf	Other Lighting Oils
Other Milk Products	Plantain (green)	Coffee, cups	Candles
Vanaspati	Jackfruit (green)	Coffee, powder	Gobar Gas
Margarine	Lemon	Ice	Other Fuel and light
Mustard Oil			

## List B: Dropped commodities

Egg products

Other beverages

Cooked Meals

Methylated Spirits

### **List C: Merged foods<sup>4</sup>**

Rice PDS, Rice Other Sources

Wheat PDS, Atta PDS, Wheat other, Atta Other

Jowar PDS, Jowar Other, Jowar Products

Bajra PDS, Bajra Other, Bajra Products

Maize PDS, Maize Other, Maize Products

Barley, Barley Products

Small Millets, Small Millets Products

Ragi, Ragi Products

Goat Meat, Mutton

Buffalo Meat, Beef

Other Meat, Other Birds, Other Meat etc

Fish (fresh), Fish (dry), Fish (canned)

Palak, Other Leafy Vegetables

Sugar (Other), Sugar (Crystal) Other

Sea salt, Other Salt

Other Lighting Oils, Other Fuel and Light

### **List D: Merged foods in round 50<sup>5</sup>**

Arhar, Arhar Other

Gram (split), Gram (split) Other

Moong, Moong Other

Masur, Masur Other

Urd, Urd Other

Khesari, Khesari Other

Vanaspati, Vanaspati Other

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<sup>4</sup> Merging mostly because they are listed merged in round 61. After merging the frequency of the observations are close.

<sup>5</sup> Round 50 have more foods than the other rounds because they have divided one food into two with the word "other". When merging the food and the "other" the frequency has been comparable.

Mustard Oil, Mustard Oil Other  
Groundnut Oil, Groundnut Oil Other  
Coconut Oil, Coconut Oil Other  
Gingelly Oil, Gingelly Oil Other  
Linseed Oil, Linseed Oil Other  
Refined Oil, Refined Oil Other  
Palm Oil, Palm Oil Other  
Rapeseed Oil, Rapeseed Oil Other  
Coal, Coal Other

**List E: Large states in the rounds.**

Andhra Pradesh

Assam

Bihar

Dadra and Nagar Haveli

Delhi

Goa

Gujarat

Haryana

Himachal Pradesh

Jammu and Kashmir

Karnataka

Kerala<sup>6</sup>

Madhya Pradesh

Maharashtra

Orissa

Punjab

Rajasthan

Tamil Nadu

Uttar Pradesh

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<sup>6</sup> Not in round 50.

West Bengal

Chhattisgarh<sup>7</sup>

Jharkhand<sup>7</sup>

Uttarakhand<sup>7</sup>

### **List F: Dropped small states in the rounds.**

Andaman and Nicobar Islands

Arunachal Pradesh

Chandigarh

Daman and Diu

Lakshadweep

Manipur

Meghalaya

Mizoram

Nagaland

Pondicherry

Sikkim

Tripura

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<sup>7</sup> Only in the 61<sup>st</sup> round. Established in 2000.