How expensive is Norway?

On deviations of purchasing power in Europe

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Summary

In this thesis, I have examined how Norwegian prices on various consumption goods and services differ from the prices in other wealthy countries in Europe. The goal has been to find out how expensive it actually is to live an average life for an average citizen in Norway.

The data used is based on European purchasing power parities study published by Eurostat. A key variable is the Price Level Index, which is an index for the price of a certain good or category of goods measured in a common unit, which makes it possible to compare price levels across countries. Another key variable is the Purchasing Power Standards, which are based on price level indices by converting these into an artificial common currency. Purchasing Power Standards (PPS) can thus be used when comparing quantities, like GDP per capita or consumption per capita, across countries.

The empirical results are based on twelve main consumption categories. These categories include both goods and services paid by the households as well as goods and services that are covered by the government. The results confirm that within most of the consumption categories, Norway does have one of the highest price levels among all the economies surveyed. These high price levels are a result of a high income level - high gross domestic product per capita and on high wages. Prices on alcohol and tobacco are exceptionally high in Norway, when compared to other economies. But on these goods, high prices are due to a political decision-making rather than being a result of economic development.

However, prices in Norway are not high for all the goods and services within the twelve categories. Both housing and other communal services as well as the communication sector are relatively inexpensive in Norway compared to the other European countries. Presumably, the reasons for that include governmental subsidies and different taxation policies. In addition, one must not forget the fact that consumers in different countries have different tastes and preferences, making the universal comparison more complicated.

As prices influence both the quantity produced and the patterns of consumption, the thesis also takes a look at to what extent prices actually influence households' consumption expenditure based on income levels. In case of Norway, the evidence indicates that when prices are measured against households' average gross wage, there does not seem to be any clear effect on consumption patterns. However, when prices are measured against households'

net average wages, there seems to be a slight effect on households' consumption. Thus Norwegian income tax and social security contributions do have an impact on actual consumer demand.

The results show that for an average citizen working in Norway, it is not an expensive country to live in. This is because wages fit the prices and many of the vital services like healthcare, housing and education are partly covered by the state.

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Abbrevations

AIC	Actual Individual Consumption
ESA95	The European System of Accounts, revised 1995
EU	European Union
EU27	All current 27 Member States of the European Union
EUR	Euro
GBP	Great Britain Pound
GDP	Gross Domestic Product
HFCE	Household Final Consumption Expenditure
n.e.c	Not elsewhere classified
NOK	Norwegian krone
PCE	Personal Consumption Expenditure
PLI	Price Level Index
PPP	Purchasing Power Parity
PPS	Purchasing Power Standard
UK	United Kingdom
US	United States

1 Introduction

From the early 1970s, Norway experienced accelerated growth as a result of exploiting large oil and natural gas deposits that had been discovered in the North Sea. Its emergence as a major oil and gas producer transformed the economy and the rapid growth of the petroleum sector has contributed significantly to Norwegian economic vitality and stimulated onshore economic activities. Today, Norway ranks as one of the wealthiest countries in the world in terms of GDP per capita and with the second largest capital reserve per capita in Europe[1]. It is the world's fifth largest oil exporter[2], and the petroleum industry accounts for around a fifth of its gross domestic product[3]. In addition to oil and natural gas, Norway is a large exporter of seafood and has rich resources of hydroelectric power, forests and minerals. Following the financial crisis of 2007–2010, World bankers declared the Norwegian krone to be one of the most solid and reliable currencies in the world[4]. It has been repeatedly placed on top of various cost of living rankings, like the Economist, and the capital Oslo has climbed to the rank of the world's most expensive city in various surveys, like UBS.

On the other hand, this rapid welfare growth has led to a steep increase in its overall cost level. And, given the energy industry's weight in the economy, diversification into other industries is a long-term challenge for Norway.

In this paper, I will take a closer look at Norway's price level, focusing on the consumer side of the economy. I will compare it to ten large and wealthy economies in Europe to find out whether Norway's reputation as a high cost land is justified or not.

In order to look at how prices differ on consumer goods and services, I use empirical data from the European purchasing power parities study undertaken by Eurostat. This study provides data of comparable prices on various goods and services, as well as the corresponding quantities. The quantity figures are based on consumption in value, adjusted to

[1] After Luxembourg, Eurostat (nama_gdp_c)
[2] Pr 2009, http://en.wikipedia.org/wiki/List_of_countries_by_oil_exports
[3] Pr 2010, http://www.ssb.no/english/yearbook/fig/fig-289.html
[4] http://www.time.com/time/business/article/0,8599,1887090,00.html

price level differences between the countries[5]. The data is based on a consumer with typical western European preferences and is mainly collected for the last few years.

Is it so, that Norway is the most expensive for all consumer goods and services or are there any differences? And if so, are these differences based on economic or political decision-making? Does government subsidization on services like health and education trigger a larger domestic consumption for these services in Norway than, for instance, in United Kingdom? The thesis tries to find the answers to those questions.

[5] As most of the data in this thesis is represented visually, the actual figures are found in the appendix section.

2 Theoretical framework

Purchasing power parities, PPPs, are currency conversion rates that both convert to a common currency and equalize the purchasing power of different currencies. By doing so, the differences in price levels between countries are eliminated. PPPs can be used both as a theoretical tool, using real exchange rates, as well as a practical tool, which are based on nominal exchange rates.

The real exchange rate is the relative cost of a common reference basket of goods where the baskets' costs in the two countries are compared after converting them into a common unit like euros. The Theory of PPP predicts that the real exchange rate should equal to one, or at least have a tendency to return quickly to one, when that long-run ratio is disturbed for some reason. This is often referred to as the absolute PPP. The relative PPP is the weaker statement meaning that there are some equilibrium relative price levels, generally differing from one, but these tend to move towards equilibrium. Both the absolute and the relative PPP is founded on the *law of one price.* The idea behind it is that in absence of transaction costs and official trade barriers, identical goods will have the same price in different markets when the prices are expressed in one currency. There is thus a possibility for arbitrage, meaning that there is a possibility of a risk-free profit at zero cost. If such arbitrage were pervasive, both gas and gold bars would sell for the same price everywhere - in Mumbai as well as in Oslo. Arbitrage would thus be possible for every commodity as long as it's transportable from one country to another.

In theory, if purchasing power parity held exactly, the real exchange rate would always equal to one. However, in practice, real exchange rates exhibit both short- and long-run deviations from this value. There can be market differences between purchasing power adjusted GDP per capita, and those converted via market exchange rates, the PPPs. For instance the World Bank's World Development Indicators show that in 2010, Norway's nominal GDP per capita was around US$84,538[6], but its PPP figure showed only US$56,692[7].

Although the law of one price and exchange rate based PPPs seem to be the same, there is an important difference: the law of one price applies to individual commodities whereas

[6] http://data.worldbank.org/indicator/NY.GDP.PCAP.CD/countries
[7] http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD

exchange rate PPP applies to the general price level. In addition, empirical evidence shows that both of these approaches fail dramatically in practice, even for products that commonly enter international trade. The reasons for this does not only include transport costs and official trade barriers, but also a noncompetitive market structures, which is a major hinder for emerging market economies entering international trade.

2.1 Harrod-Balassa-Samuelson effect

A country's price level should reflect its domestic purchase price of a well-defined basket of commodities, given some fixed numeraire like in terms of euros. This price level is increasing in the prices of both tradables and nontradables. The nontradables are defined as goods that are so costly to ship that they do not enter international trade (like most of personal services), while tradables are the opposites and can be transported abroad. Typical tradable goods are food, clothing and electronics, while typical nontradables are rental housing and postal services.

As prices are increasing in both tradables and nontradables, the international productivity differences can have implications for relative international price levels, i. e. the real exchange rates, which show the relative cost of the common reference basket of goods. This is commonly referred to as Harrod-Balassa-Samuelson effect meaning that a country with higher productivity in tradables compared to nontradables have also generally higher price levels.

To illustrate the Harrod-Balassa-Samuelson effect, let us assume that traded goods are composed with a uniform price in each of two countries – Home and Foreign. Nontraded goods have distinct Home and Foreign prices in terms of tradables, denoted as p and p*. For illustrative purposes, let us assume a particular functional form to describe how the price level, the cost of living, depends on the prices of traded and nontraded goods. Assume that the price level is a geometric average with weights γ and 1- γ, of prices of both tradables and nontradables. Taking tradables as a base group, with a common price of 1 in both countries, the Home and Foreign price indices are

$$P = (1)^{\gamma} p^{1-\gamma} = p^{1-\gamma} \qquad P^* = (1)^{\gamma} (p^*)^{1-\gamma} = (p^*)^{1-\gamma}$$

Thus the Home-to-Foreign price level ratio is

$$\frac{P}{P^*} = \left(\frac{p}{p^*}\right)^{1-\gamma}$$

We see that in this model, Home's real exchange rate against Foreign depends only on the internal relative prices of nontraded goods, 1-γ. By log-differentiating this ratio and using equation showing the price change of nontradables, $\hat{p}$, as a function of productivity growth in tradables and nontradables, $\hat{A}_T$ *and* $\hat{A}_N$ respectively, we can see how relative productivity shifts cause real exchange rates to change systematically:

$$\hat{p} = \frac{\mu_{LN}}{\mu_{LT}}\hat{A}_T - \hat{A}_N,^{8}$$

Here, assuming that $\frac{\mu_{LN}}{\mu_{LT}} \geqslant 1$, i.e. that the labor's share of the income generated in the nontraded goods sector exceeds the labor's share in traded sector, the price change on nontradables, $\hat{p}$, is higher when the productivity growth in tradables, $\hat{A}_T$, exceeds the productivity growth in nontradables, $\hat{A}_N$.

Letting both countries' sectoral outputs be proportional to the functions $F(K_T, L_T)$ and $G(K_N, L_N)$, but with possibility for different factor productivities, then

$$\hat{P} - \widehat{P^*} = (1-\gamma)(\hat{p} - \widehat{p^*}) = (1-\gamma)\left[\frac{\mu_{LN}}{\mu_{LT}}\left(\widehat{A_T} - \widehat{A_T^*}\right) - \left(\widehat{A_N} - \widehat{A_N^*}\right)\right].$$

As $\frac{\mu_{LN}}{\mu_{LT}} \geqslant 1$, it follows that Home will experience real appreciation (a rise in its relative price level) if its productivity growth advantage in tradables exceeds its productivity growth advantage in nontradables[9]. This result holds regardless of any assumptions about the model's demand side and, in particular, is robust to international differences in consumption tastes.

As the productivity gain is more limited in nontradables than in tradables, rich countries should have become rich mainly through high productivity in tradables. Although they are also likely to have achieved higher productivity in nontradables than poorer countries, the difference tends to be less pronounced. This is the reasoning to Harrod-Balassa-Samuelson proposition that price levels tend to rise with country's per capita income.

[8] See appendix for detailed calculations
[9] Obstfeld, M. and Rogoff, K. (1996): "Foundations of International Macroeconomics", p.207-212

3 Measuring prices

All countries produce and consume tens of thousands of commodities and services, many of which have prices that differ from country to country because of transport costs, tariffs and other trade barriers. A model that can incorporate these goods and services can be such that focuses on the relative prices of a small set of aggregate output groups. As it's difficult and too complicated to incorporate all goods' relative prices, it is more common to compare the relative prices of a small set of goods' groups. Relative prices play a central role in an open economy's adjustments to economic shocks and both the relative costs of living in different countries and the relative prices of countries' exports and imports often display dramatic short- and long-term shifts as changes in relative prices will include substitution effects on actual expenditure. As price level indices can differ both by the basket used to define them and the item used in itself, the most common way of measuring the basket is to collect the most representative consumer purchases.

3.1 Purchasing power parity

As mentioned earlier, Purchasing power parities, PPPs, can be used both as a theoretical tool as well as a practical tool, based on exchange rates. The practical approach of PPPs is used to measure nominal exchange rates[10] based on relative price levels of two countries, in order show how many currency units a given quantity of goods and services cost in different countries. For example, if the price of bread in Norway is 21,5 krones and in Finland 2,9 euros, the PPP for bread between Norway and Finland is 21,5 krones to 2,9 euros, or $\frac{21,5}{2,9} = 7,41$ krones to one euro. This means that for every euro spent on bread in Finland, 7,41 krones would have to be spent in Norway to obtain the same quantity and quality, i.e. the same volume, of bread. Applying nominal exchange rates in this process would overestimate the actual price for the country with high price levels relative to the country with low price levels. The use of PPPs ensures that a particular commodity is valued at a uniform price.

[10] The rate at which currency can be exchanged

3.1.1 Price Level Indices

In recent years, a new way of comparing prices between countries has been adapted – called Price Level Indices, PLIs. This method is very useful when comparing countries based on a single country or a group of countries (e.g. European Union), giving a good indication of the economic and social development of each country and the price convergence between them.

PLIs are found by dividing a country's PPP with its annual average nominal exchange rate and converting the result into a percentage. For example, if the PPP for bread between Norway and Finland is 7,41 and if, at the same time, the nominal exchange rate between the krone and the euro is 7,88 krone to one euro, the PLI for bread in Norway and Finland would be:

$$PLI_{Norway} = \frac{7{,}41}{7{,}88} * 100\% = 94 \qquad PLI_{Finland} = \frac{7{,}88}{7{,}88} * 100\% = 100$$

This means that the price of bread in Norway is 6% lower, taking Finland as the base country.

As exchange rates are used in PLI comparisons, the exchange rate movements have a major impact on country's PLIs. An appreciation of a country's currency will make the country more expensive compared to other countries and this will show as an increase of the relative price level expressed in the PLI. This understanding of the differences in price levels is important when comparing economic data in national accounts, such as GDP, because higher relative prices could make an economy look healthier than it really is.

European Union and Eurostat[11] use PLIs to compare EUs single market for goods and services and to look at the price convergence among its Member States. PLIs are not intended to rank countries strictly, but used as indicators of the magnitude of country's price level in relation to the others. In addition, the degree of uncertainty associated with the basic price data and the methods used for compiling PPPs, may lead to differences between the PLIs.

3.1.2 Purchasing Power Standards

When comparing economic variables, like GDP and consumption, we need to take into account the large differences in prices that are shown in the price level indices. Eurostat does this by converting the economic variables into an artificial common currency, Purchasing Power Standards, making use of the PPP-figures. For example, if GDP per capita for Norway

[11] Eurostat is the statistical office of the EU, providing statistics collected from all European statistical agencies.

is NOK 516 100[12] and its corresponding PPP is 11,6881[13] and the figures for United Kindgom are GBP 23 500 and 0,8583 respectively, GDP per capita expressed in PPS is:

Norway: $\frac{NOK\ 516\ 100}{11{,}6881} = PPS\ 44\ 156$ United Kingdom: $\frac{GBP\ 23\ 500}{0{,}8583} = PPS\ 27\ 380$

These figures are now expressed in the same currency and in the same prices and thus represent real expenditure, i.e. volumes. Now, choosing United Kingdom as a base country, we find out that Norway's economy in per capita terms is 61,3 per cent bigger than that of United Kingdom, after price level difference between these two countries is taken into account:

Norway: $\frac{44\ 156}{27\ 380} * 100\% = 161{,}27$ United Kingdom: $\frac{27\ 380}{27\ 380} * 100\% = 100$

3.1.3 The pricing of health and education services

PPPs on typical market goods and services are relatively easy to collect, as these are observed in the market. Finding comparable PPPs for non-market services like health and education is more complicated as they are not priced in any way. Because of this, national accountants have adopted the convention of valuing the outputs of non-market producers by totaling up the costs to produce them. Government can either buy health and education services from market producers or produce these services itself after households have made the purchase.

The government can either buy non-market services from market producers, when available, or produce services itself. For services bought from the market producers, PPPs are collected based on output price. PPPs for services that the government produces itself are based on input prices, i.e. on basic cost components. The basic cost components used is based on the assumption that the data will be taken from the government production account and is as follows:

- compensation of employees
- intermediate consumption
- gross operating surplus
- net taxes on production

[12] Real figures for 2010, Eurostat (nama_gdp_c)
[13] Real figures for 2010, Eurostat (prc_ppp_ind)

- receipts from sales

Compensation of employees is reported as a national average for a selection of occupations in public education and hospitals, including basic salary or wage and employers' social contributions. Overtime payments and benefits are excluded as it is too difficult to obtain data that is comparable across countries. Receipts from sales is required to net off gross output to obtain government final consumption expenditure on the production of these services. Gross operating surplus and net taxes on production are included for completeness. As net operating surplus is expected to be insignificant, gross operating surplus will be equal to consumption of fixed capital.

The input price approach does not take into account differences in productivity between the producers of non-market services in different countries. It assumes that non-market producers are equally efficient and that the same level of input will yield to the same volume of output, regardless of the country in which the non-market producer is operating. This means that differences in price levels to a large extent reflect differences in wage levels measured in common currency. This again will affect the PPPs and expenditure levels not only on health and education alone, but also on main aggregates of which these expenditure categories are a part of, i.e. Actual Individual Consumption, AIC, and GDP[14].

[14] Eurostat, OECD (2006): "Methodological manual on purchasing power parities", annex to ch. 5: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-BE-06-002/EN/KS-BE-06-002-EN.PDF

4 Consumption expenditure

PPPs are not only used in price comparisons, but also in national accounts aggregates, in order to convert various economic indicators into comparable real expenditures. For instance, if the PPP for GDP between France and United Kingdom is 1,39 euros to one pound, meaning that for every pound spent on GDP in the United Kingdom, 1,39 euros would have to be spent in France in order to purchase the same volume of goods and services. In volume comparisons, baskets of goods and services used do not have to be exactly identical and can vary between countries, reflecting differences in tastes and cultural backgrounds. But both baskets will, in principle, provide equivalent satisfaction of utility and thus a good unit of measurement.

In national accounts, gross domestic product, GDP, is the most frequently used measure for the overall size of a country's economy, while derived indicators like GDP per capita, i.e. GDP divided by number of inhabitants, is widely used when comparing living standards across countries. An additional relevant variable is the households' share of consumption expenditure in GDP is often used. Table 4.1 shows that in 2010 this share was about half of the total GDP in all countries, with the highest shares in UK (61,8%) and Italy (60%). In contrast, the consumption share in Norway was the lowest among all ten economies, constituting for 41,1 per cent of total GDP. This is largely due to high savings level. In fact, the data from 2009 shows than Norway had the highest savings level among all European economies, constituting for 33,8 per cent of gross national disposable income[15]. Measured in per capita terms, households in Switzerland had the highest consumption expenditure (PPS 20 100), followed by Norway (PPS 18 200) and UK (PPS 16 900).

	Percentage of GDP			Per capita (PPS)		
	2000	2005	2010	2000	2005	2010
Denmark	46,9	47,5	47,7	11 800	13 200	14 800
Germany	56,8	57,2	55,9	12 700	14 900	16 100
Spain	58,8	56,9	56,7	10 900	13 000	13 900
France	54,3	55,1	56,1	11 900	13 600	14 800
Italy	59,6	58,6	60,0	13 300	13 900	14 800
Finland	47,4	49,3	52,1	10 600	12 700	14 700
Sweden	47,6	46,6	47,0	11 600	12 700	14 100
United Kingdom	63,1	62,5	61,8	14 300	17 100	16 900
Norway	41,4	40,7	41,1	13 000	16 200	18 200
Switzerland	58,0	58,0	55,9	16 000	17 200	20 100

Source: Eurostat (nama_fcs_c)

Table 4.1: Final consumption expenditure of households

[15] See Appendix for details

Other areas of consumption patterns where PPPs are used include Personal Consumption Expenditure (PCE), which shows actual individual consumption expenditure by households, and Household Final Consumption Expenditure (HFCE), which denotes expenditure on goods and services that are purchased and paid for by households only and do not take into account the goods and services that are paid for by the government. PCEs are broader in scope and usually include some of the spending on behalf of consumers by employers and government agencies, while HFCE shows expenditure only paid by the households. In international volume comparisons Actual Individual Consumption, AIC, is often used.

4.1 Actual Individual Consumption

Actual Individual Consumption, AIC, consists of goods and services paid for by individuals as well as services paid for by governments like education and health services. AIC consists thus of goods and services actually consumed by individuals, irrespective of whether these goods and services are purchased and paid for by household, by government or by other institutions. This means that comparisons based on HFCE would to some degree be misleading as they do not compare like with like. AIC, on the other hand, is not influenced by the fact that the organization of certain important services consumed by households, like health and education services, differs a lot across countries. An example is dental services, which are paid for by the government in one country, and by households in another. The AIC will take this fact into account, providing a fair comparison between the countries.

Actual individual consumption is divided into following sub-groups:

- the individual consumption expenditures by households (HFCE)
- general government
- non-profit institutions serving households (NPISHs)

Here, the general government includes all institutional units which are non-market producers and whose output is intended for individual and collective consumption and/or all institutional units principally engaged in the redistribution of national income and wealth. General government is mainly financed by compulsory payments made by units belonging to other sectors. General government includes all administrative departments of the State and general public services like education, health, defense, public order and safety.

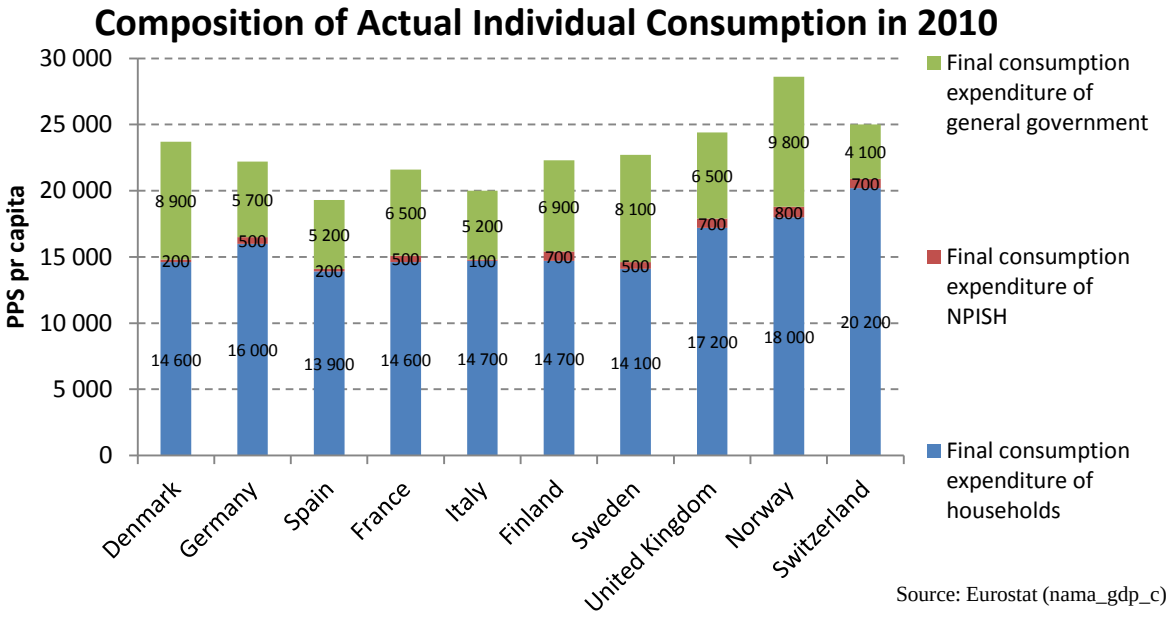
Non-profit institutions serving households are private, non-market producers, and involve institutions that are mainly financed and controlled by the government providing goods and services for free or at very low prices. Their main resources come from voluntary contributions, occasional sales and property income as well as from payments made by general governments. Examples include churches and other religious societies, sports and other clubs, trade unions and political parties.

Comparing the per capita measures of GDP and AIC, it is obvious that they're highly correlated as country's high level of production, measured by GDP, will also lead to potentially high level of consumption.

4.2 Consumption expenditure and Actual Individual Consumption

As mentioned, AIC is a measure of individual goods and services that households actually consume, as opposed to what they actually purchase (i.e. HFCE) and consists of the following three consumption groups: 1) final consumption expenditure of households, 2) final consumption expenditure of general government and 3) Final consumption expenditure of non-profit institutions serving households (NPISHs).

Figure 4.1 shows the composition of these 3 consumption groups:



Source: Eurostat (nama_gdp_c)

Figure 4.1: Composition of AIC per capita, price level adjusted

Norway had the highest total Actual Individual Consumption level (PPS 28 600), followed by Switzerland (PPS 25 000) and Denmark (PPS 23 700). On a disaggregated level, there are visible deviations between the countries. The share of households' expenditure was largest in Switzerland (PPS 20 200), closely followed by Norway (PPS 18 000) and UK (PPS 17 200). The part paid for by the general government was highest in Norway (PPS 9 800), followed by Denmark (PPS 8 900) and Sweden (PPS 8 100). Switzerland's general government contributed least to AIC (PPS 4 100) among all ten economies.

Table 4.2 illustrates the allocation of these 3 groups as a percentage of total GDP. The table shows that consumption expenditure by households has constituted most to the total GDP, ranging from 41 per cent for Norway to nearly 63 per cent for UK in 2010. At the same time, the expenditure of general government and NPISHs were between 11-30 per cent and 0,4 - 2,6 per cent respectively.

Final consumption expenditure, % of GDP (2010)

	Households	NPISHs	General government
United Kingdom	61,8	2,6	23,0
Italy	60,0	0,4	21,1
Spain	56,7	1,0	21,1
France	56,1	2,0	24,8
Germany	55,9	1,6	19,7
Switzerland	55,9	2,1	11,5
Finland	52,1	2,5	24,6
Denmark	47,7	0,8	29,1
Sweden	47,0	1,6	26,9
Norway	41,1	2,0	22,0

Source: Eurostat (nama_gdp_c)

Table 4.2: Actual individual consumption in sub-groups

There is a wide gap between the expenditure levels of general government between the countries. In 2010, this figure was highest in Denmark and Sweden with 29,1 and 26,9 per cent respectively, while it was lowest in Switzerland, constituting for 11,5 per cent of its total GDP.

As mentioned, municipal services like healthcare and education are in many countries partly covered by the government. Table 4.3 shows how big this has been over the last decade.

	Expenditure on health in % of GDP			Expenditure on education in % of GDP		
	2000	2005	2009	2000	2005	2009
Denmark	6,6	7,2	8,7	7,4	7,3	8
Germany	6,2	6,3	6,9	4,2	4,2	4,4
Spain	5,2	5,7	6,7	4,4	4,3	5
France	7,1	7,9	8,4	6,3	6,1	6,2
Italy	6	6,9	7,5	4,6	4,7	4,8
Finland	5,7	6,9	7,9	5,9	6,2	6,6
Sweden	6,1	6,7	7,4	6,7	7	7,3
United Kingdom	5,7	6,9	8,5	5	6,2	6,9
Norway	6,9	7,3	7,9	5,7	5,7	6,2
Switzerland	:	:	1,9	:	:	5,7

: not available

Source: Eurostat (gov_a_exp)

Table 4.3: General government expenditure on health and education

In Norway, the general government has one of highest consumption levels among all ten economies. In 2009, Norwegian government expenditure on health was about 8 per cent and on education above 6 per cent of its GDP. This may indicate lower prices that consumers must pay for themselves.

In total, AIC consists of the following twelve consumption categories[16] (jf. ESA95[17]):

Actual Individual Consumption	
Category	Components
1. Food and non-alcoholic beverages	Bread and cereals, meat, fish, milk, cheese, eggs, oils, fats, fruits, vegetables, potatoes, other food, non-alcoholic beverages
2. Alcoholic beverages, tobacco and narcotics	alcoholic beverages, tobacco and narcotics[18]
3. Clothing and footwear	Womens, mens and infant clothing and footware
4. Housing, water, electricity, gas and other fuels	Actual rentals for housing, maintenance and repair of the dwelling, water supply and miscellaneous services relating to the dwelling
5. Housing furnishings, equipment and maintenance	Furniture and furnishings, carpets and other floor coverings, household textiles and appliances, glassware, tableware and household utensils, tools and equipment for house and garden, goods and services for routine household maintance
6. Transport	Purchase of vehicles, operation of personal transport equipment, transport services
7. Communication	Postal services, telephone and telefax equipment and services
8. Recreation and culture	Audio-visual, photographic and information processing equipment, other major durables for recreation and culture, other recreasional items and equipment, gardens and pets, recreational and cultural services, newspapers, books and stationary, package holidays

[16] See appendix for detailed list of goods and services collected

[17] The European System of Accounts used by members of the European Union.

[18] Although illegal, market transactions in such goods and services have to be recorded in the accounts, see section 3.96 p. 106 in OECD (2008): "System of National Accounts"

9. Restaurants and hotels	Catering services, accomondation services
10. Miscellaneous goods and services	Personal care, social protection, insurance, personal effects n.e.c., financial services and other services n.e.c.
11. Health	Medical products, appliances and equipment, out-patient services, hospital services
12. Education	Pre-primary and primary education, secondary education, post-secondary non-tertiary education, tertiary education, education not definable by level

Source: Metadata on Purchasing Power Parities, Eurostat

European Price Statistics 2008, Eurostat

In 2009, the allocation of AIC for an average European households was as follows:

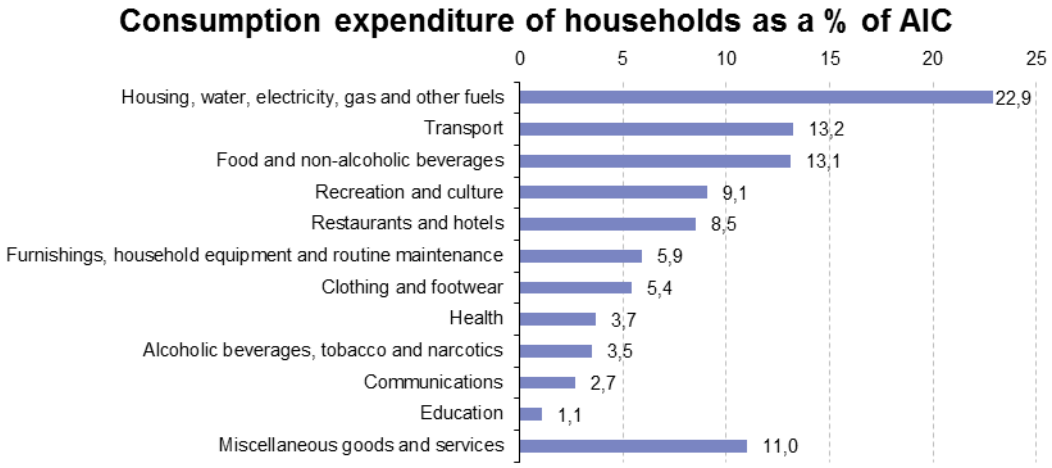


Figure 4.2: Average consumption expenditure of households in Europe, 2009

Figure 4.2 shows that nearly a quarter, 22,9 per cent, of AIC consisted of communal services like housing, water, electricity, gas and other fuels, followed by expenditures on transport and food and non-alcoholic beverages, with 13,2 and 13,1 per cent respectively. The lowest expenditure was recorded on communication and education, constituting for 2,7 and 1,1 per cent respectively.

5 Empirical results

In national accounts, Gross Domestic Product, GDP, is the most frequently used measure for the overall size of a country's economy, while derived indicators such as GDP per capita, i.e. GDP divided by number of inhabitants, is widely used in comparison of living standards across countries. The results should also be price level adjusted (e.g. PPSs), so that differences in price levels among countries are taken into account.

Figure 5.1 shows GDP per capita for 2000 and 2010. The figure shows that in 2010, Norway had the highest GDP per capita, being 49 per cent above the average of all the countries within the European Union, followed by Denmark and Sweden with 24 and 23 per cent above the EU average respectively. Compared with the year 2000, most of the economies on the figure have had a decrease in its GDP per capita, relative to the EU average. Switzerland has lost its number two spot from the year 2000 and has had the largest decrease in its GDP per capita relative to the EU average, dropping by 34% from 2000 to 2010. This is presumably due to a large drop in its export levels, which is major part of country's GDP[19].

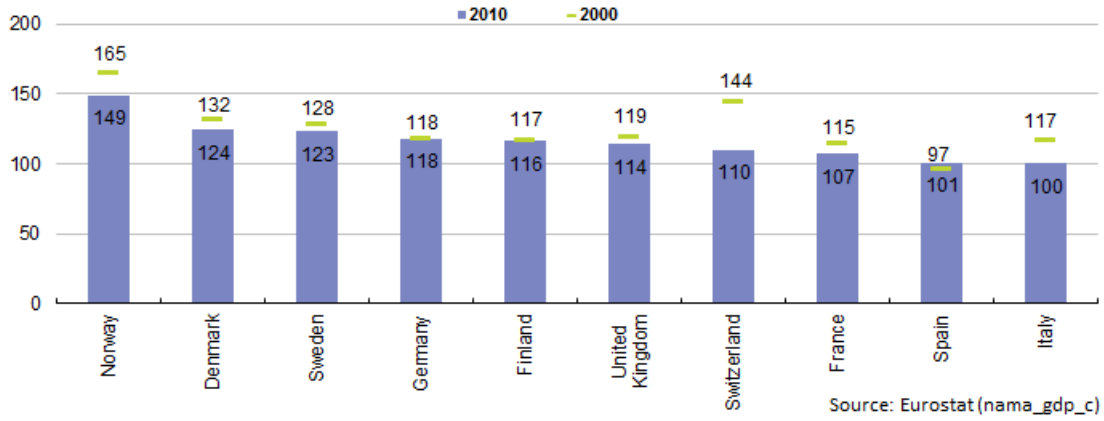


Figure 5.1: GDP per capita price level adjusted, relative to the EU average (PPS, EU27=100)

5.1 Prices

Table 5.1 shows the overall price level, based on AIC[20]. It can be seen that Norway, Switzerland and Denmark have had the highest overall price levels over the last decade. In 2010, Norway topped the ranking, being 56% above the EU average, followed by Switzerland

[19] http://www.state.gov/r/pa/ei/bgn/3431.htm
[20] See appendix for actual calculations

and Denmark with 51% and 47% respectively. The lowest overall price level that year was measured in Spain, being 4% below the EU average.

Price level on AIC (EU27=100)			
	2000	2005	2010
Norway	137	145	156
Switzerland	145	142	151
Denmark	132	146	147
Sweden	127	124	126
Finland	120	123	123
France	106	109	111
Italy	98	107	105
Germany	110	103	104
United Kingdom	121	111	102
Spain	84	91	96

Source: Eurostat (prc_ppp_ind)

Table 5.1: The overall price level on AIC

As PLIs are computed using exchange rates, the exchange rate fluctuations have a direct impact on prices. Table 5.2 shows the exchange rates against the euro for period 2000-2010. During this period, Norwegian krone has appreciated against the euro, making Norway more expensive in comparison to the countries in the euro area[21].

Exchange rates to EUR			
	2000	2005	2010
Swedish krona	8,4452	9,2822	9,5373
Norwegian krone	8,1129	8,0092	8,0043
Danish krone	7,4538	7,4518	7,4473
Swiss franc	1,5579	1,5483	1,3803
Euro	1,0000	1,0000	1,0000
Pound sterling	0,60948	0,68380	0,85784

Source: Eurostat (ert_bil_eur_a)

Table 5.2: Exchange rates against euro, annual average

After 2010, Norwegian krone has appreciated even more – by the 27th of January 2012 the exchange rate was 7,65 krones for one euro[22], meaning that since 2010 the Norwegian krone has appreciated by 4,4 per cent.

[21] By the end of 2010 16 European countries had adopted the currency Euro: Austria, Belgium, Cyprus, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia, Spain. From 2011 there are 17 Member States, including the recent entry Estonia.

[22] http://www.norges-bank.no/no/prisstabilitet/valutakurser/eur/

5.1.1 The income level and prices

Why do some countries have higher prices than others and what are the underlying reasons for these prices? According to Harrod-Balassa-Samuelson effect, higher income level (i.e. GDP) will also lead to higher prices. Is there any empirical evidence for this effect?

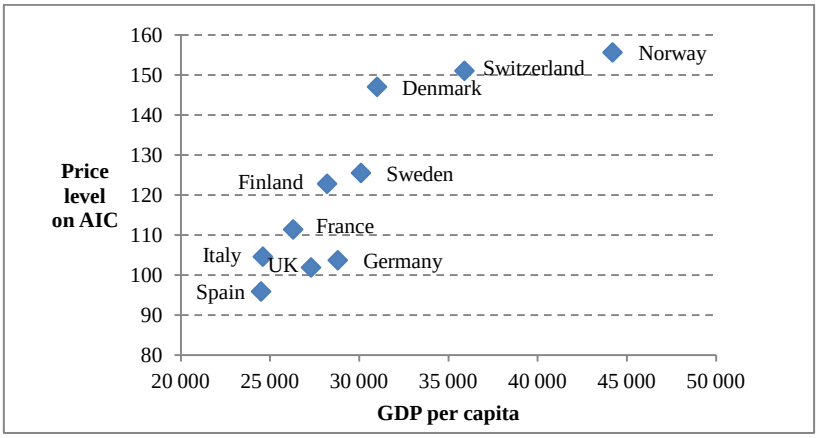


Figure 5.2: Price level on AIC (PLI) and GDP per capita (PPS) in 2010

As can be seen from figure 5.2, there is a clear positive relationship between countries income level and price level. Norway, being the most expensive country among all ten economies, has also the highest GDP per capita levels, and Spain, being the most inexpensive country in the survey, has the lowest GDP per capita level among all ten economies. Thus, the empirical evidence supports the Harrod-Balassa-Samuelson effect that wealthy countries have high prices.

5.1.2 Productivity and prices

According to Harrod-Balassa-Samuelson effect, rich countries have especially high prices in nontraded goods. Figure 5.3 (a) and (b) show the relationship between countries income level and the corresponding price levels on all twelve consumption categories. Figure 5.3 (a) shows that prices on typical nontraded goods like restaurants, hotels, recreation, culture and miscellaneous goods and services do tend to be highest in rich countries like Norway, Switzerland and Denmark, while Spain and Italy seem to have lower prices. For instance, price difference on restaurants and hotels between the most expensive (Norway) and the least expensive (Spain) country is 84 per cent. The tendency seems to be the same for other nontraded goods like recreation and culture and miscellaneous goods and service.

Figure 5.3 (b) shows price levels on consumption groups within health and education. Norway has the highest prices within health, being 73 per cent above the EU27 average.

Prices on education are highest in Switzerland, being 118 per cent above the EU27 average, followed by Norway and Denmark with 104 and 77 per cent respectively. Again, these figures correspond well with these countries' high income levels.

On the other hand, both figure 5.3 (a) and (b) show that prices on nontraded goods (housing, health, education) seem to vary a lot less than prices on traded goods (food, clothing, furnishings), and thus seems to contradict the Harrod-Balassa-Samuelsson effect. One of the explanations in case of Norway can be its agricultural regulations (e.g. trade barriers on food) and taxation policies on alcohol and tobacco.

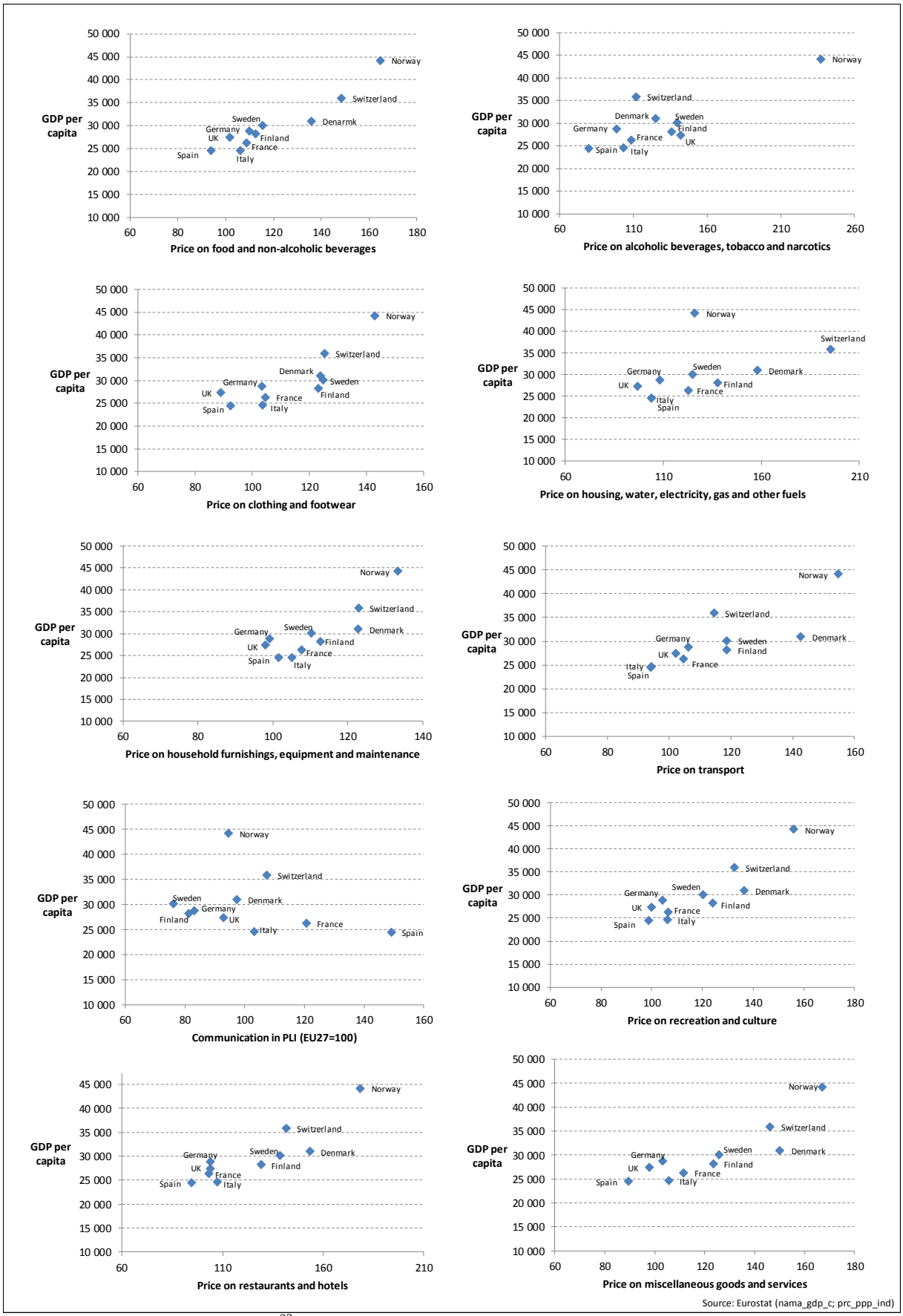


Figure 5.3(a): GDP per capita[23] (PPS) and prices for consumption categories (PLI, EU27=100) in 2010

[23] GDP at market prices

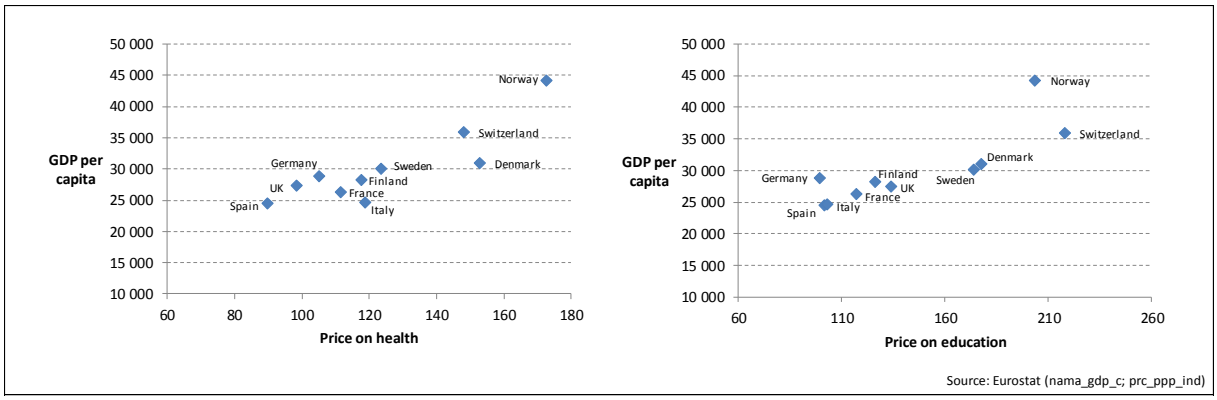


Figure 5.3(b): GDP per capita (PPS) and prices for municipal goods and services (PLI, EU27=100) in 2010

Also here, some branches within nontraded goods and services are partly funded by the general government and price levels shown on the figure may not reflect the actual price households must pay for these goods and services. In addition will currency fluctuations have an impact on prices shown on figure 5.3 (a) and (b).

Harrod-Balassa-Samuelson effect states also that an upward trend in labor productivity will lead to a higher price level. Table 5.3 shows the real labor productivity per hour worked[24] for each year since 2000. In 2010, productivity levels in Norway per hour worked were priced at 68,8 euros, being 43 per cent above the second highest Denmark . This stems also well with the GDP per capita levels for Norway shown on figure 5.1 and confirms the Harrod-Balassa-Samuelson effect that wealthy countries are more productive.

Real labour productivity per hour worked (EUR)				
	2000	2005	2009	2010
Denmark	45,3	48,2	46,4	48,0
Germany	37,3	39,9	40,9	41,5
Spain	27,3	27,9	29,5	30,2
France	42,0	44,9	45,5	46,3
Italy	32,0	32,4	31,8	32,4
Finland	34,4	38,4	39,1	40,6
Sweden	37,0	42,7	42,3	43,6
United Kingdom	33,8	38,0	38,6	:
Norway	65,0	73,1	68,9	68,8
Switzerland	40,8	42,8	:	:

: not available

Source: Eurostat (nama_aux_lp)

Table 5.3: Real labor productivity per hour worked

[24] Considering increasing part-time employment, productivity per hours worked is often preferred to productivity per worker, as it provides a more accurate measure of labor input. All figures are adjusted for inflation.

When comparing labor productivity, one should keep in mind that productivity levels are not only influenced by efficiency of labor force, but also by many other factors outside of workers' influence, including technology and amount of capital equipment used to produce all the commodities.

5.1.3 Gross Domestic Product and prices

Figure 5.4 (a) and (b) show the relationship between the cost of GDP and the main consumption categories. Figure 5.4 (a) shows consumption goods that are typically paid by the households only. The figure confirms that Norway's high income level does lead to correspondingly high prices. For most of the consumption groups, Norway's prices are more than 55 per cent above the EU average, in accordance to Harrod-Balassa-Samuelson effect. Norwegian prices are especially high on alcoholic beverages, tobacco and narcotics, being a whopping 137 per cent above the EU average, while in UK, the second most expensive country, prices are "only" 42 per cent above the EU average. Here, Norway's prices are strongly affected by high tax levels on both alcohol and tobacco.

Although expensive, Norway does not have the highest price level on all types of goods. This is clearly the case for communication category, including telecommunication and postal services, where Norwegian prices are actually 5 per cent below the EU27 average and thus one of the lowest among all ten economies. For communal services like housing and electricity, prices are 26 per cent above the EU27 average, but below Switzerland (by 69 per cent), Denmark (by 32 per cent) and Finland (by 12 per cent). In addition, as this category is the highest expenditure group for an average household (cf. figure 4.2), it can be assumed that an average household in Norway has more of its income left to other commodities and activities than households elsewhere in Europe.

Considering that since 2010 Norwegian krone has appreciated even more against the euro (by 4,4 per cent), the overall price level in Norway has increased even more, making it even more expensive relative to other countries in the euro area as showed on figure 5.4 (a).

Figure 5.4 (b) shows the price of GDP and municipal services like health and education, based on the EU average. Here, the tendency is the same as for figure 5.4 (a), showing that prices are highest in wealthiest countries. In 2010, Norway had the highest price level on health, being 73 per cent above the EU average, followed by Denmark and Switzerland with 53 and 48 per cent respectively. The lowest prices were recorded in Spain, being 10 per cent

below the EU average. Also for educational services, Norway, Switzerland and Denmark hold the top spots regarding countries with highest price levels. Here, Switzerland topped the comparison, being 118 per cent above the EU average, followed by Norway and Denmark with 104 and 77 per cent respectively.

When comparing price levels for municipal services, one must take into account the fact that prices on health and education are calculated differently than market prices and do not reflect the actual prices (cf. section 3.1.3). In addition, the fact these services are partly covered by general government, makes the share that households' actually pay for these lower than showed on the figure.

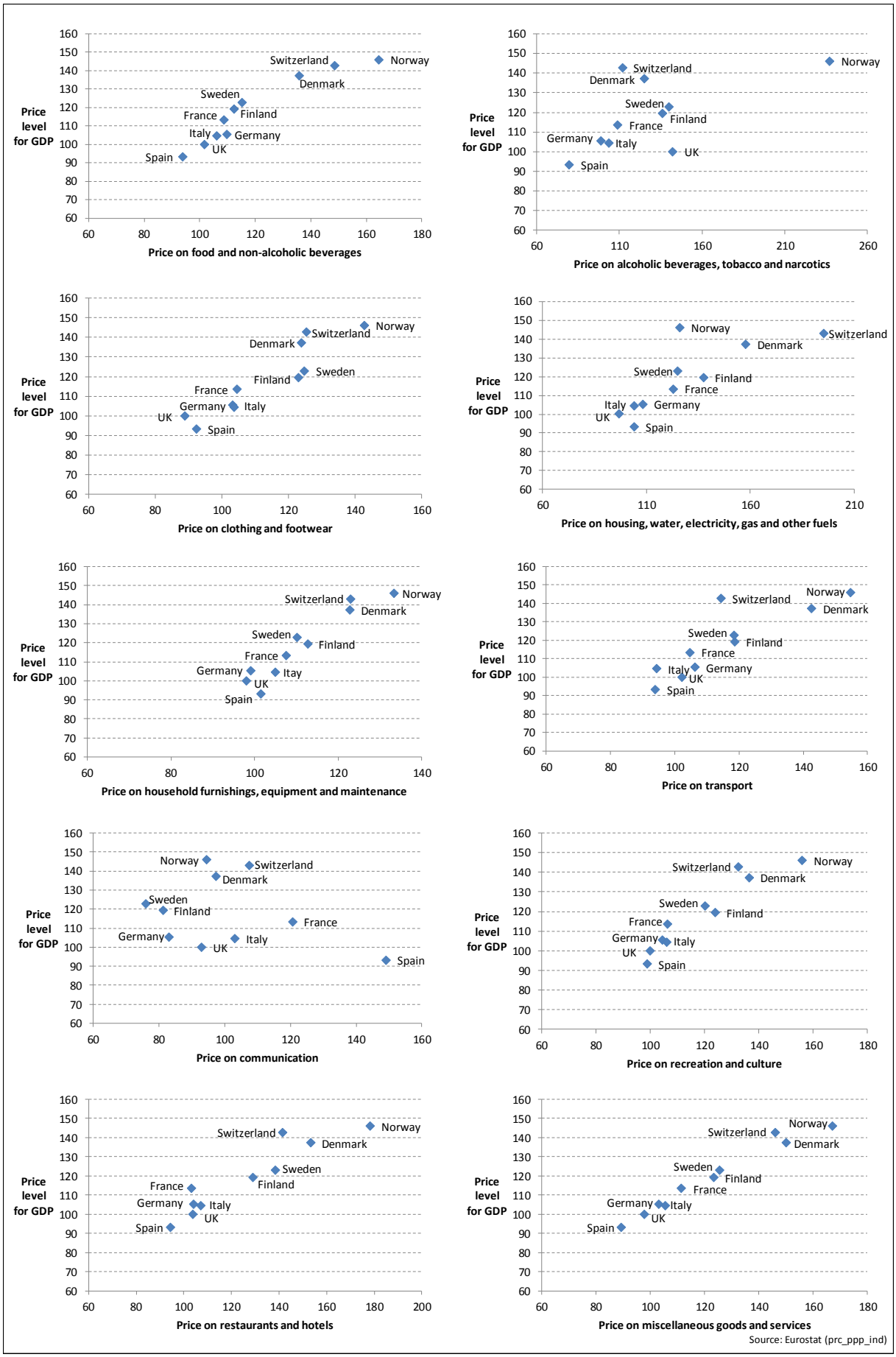


Figure 5.4(a): Prices on GDP and consumption categories, both measured in PLIs, in 2010 (EU27=100)

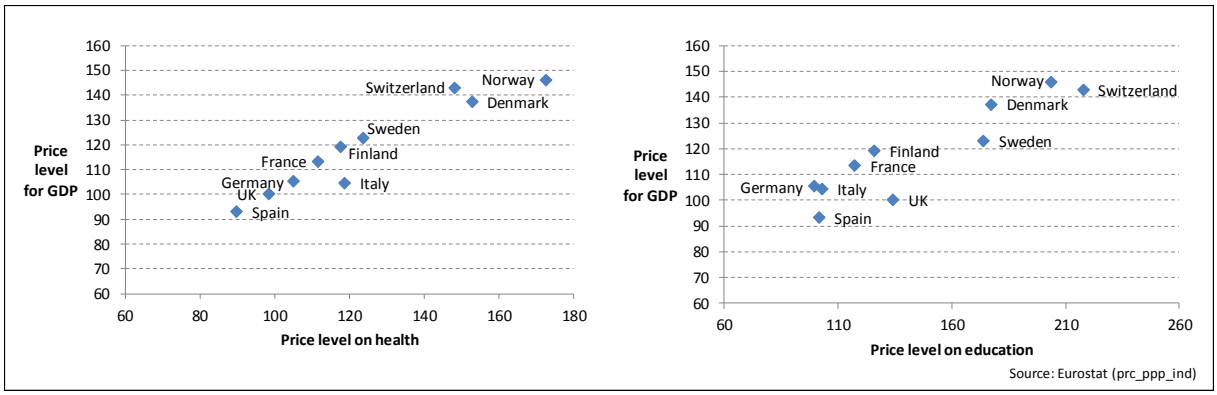


Figure 5.4(b): Prices on GDP and municipal goods and services, both measured in PLIs, in 2010 (EU27=100)

5.1.4 Relative consumption and relative prices

Figure 5.2 showed that there is a positive relationship between countries' income level and the corresponding prices. In section 5.1.3 we saw that a high overall price level does not necessarily imply high prices on all consumption categories. In this section we want to explore further the differences in prices across consumption categories, for example why prices on restaurants and hotels are very high in Norway, while the price on communication is not high relative to the price in other countries. In particular, we want to distinguish between supply and demand effects. If the difference across countries is due to differences on the supply side, we would expect favorable supply conditions in one sector to lead to high quantity and low prices. Thus, we would expect a negative correlation between relative quantity and relative prices. In contrast, if the difference across countries is due to differences on the demand side, we would expect high demand to lead to both high quantity and high prices, i.e. there would be a positive correlation between relative quantity and relative prices.

Figures 5.5 (a) and (b) show the results[25]. For three categories, like alcoholic beverages etc, communication, and restaurants and hotels, we see a clear negative relationship, suggesting that the difference is on the supply side. For example, the high price on alcohol and tobacco in Norway reflects high taxes on these products, and the high price seems to have a clear negative impact on households' consumption of alcohol and tobacco.

There are no consumption categories with a strong and clear positive correlation between relative price and relative consumption, which would have indicated demand driven

[25] Relative consumption: defined as real expenditure per consumption category relative to total real expenditure; relative price: defined as price of each consumption category relative to price on AIC in general.

differences. However, for a number of categories, the relationship is rather mixed, suggesting that the differences are caused by a multitude of factors.

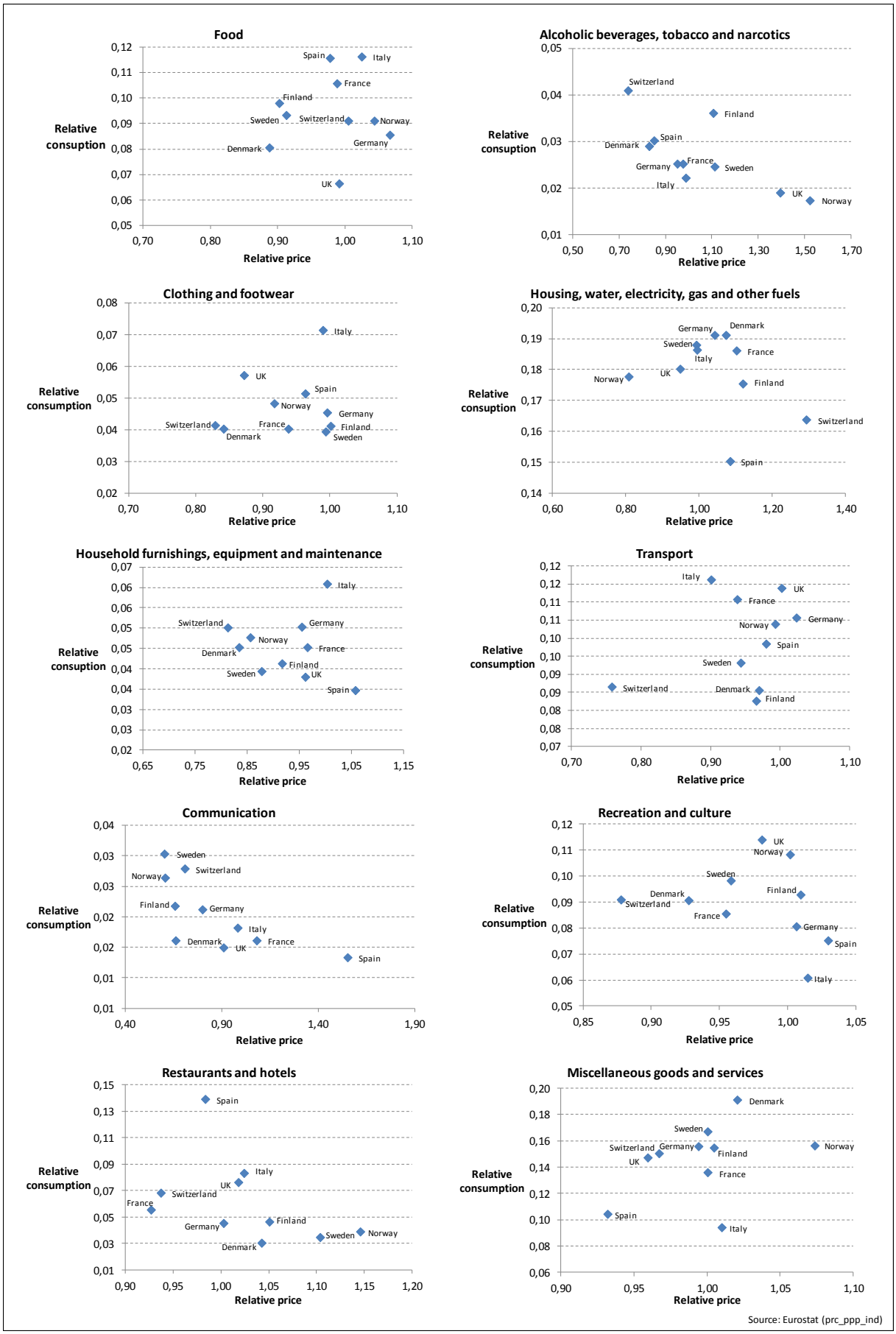


Figure 5.5(a): Relative consumption and relative prices on consumption categories in 2010 (EU27=100)
Figures above 1 indicate higher price than the local overall average.

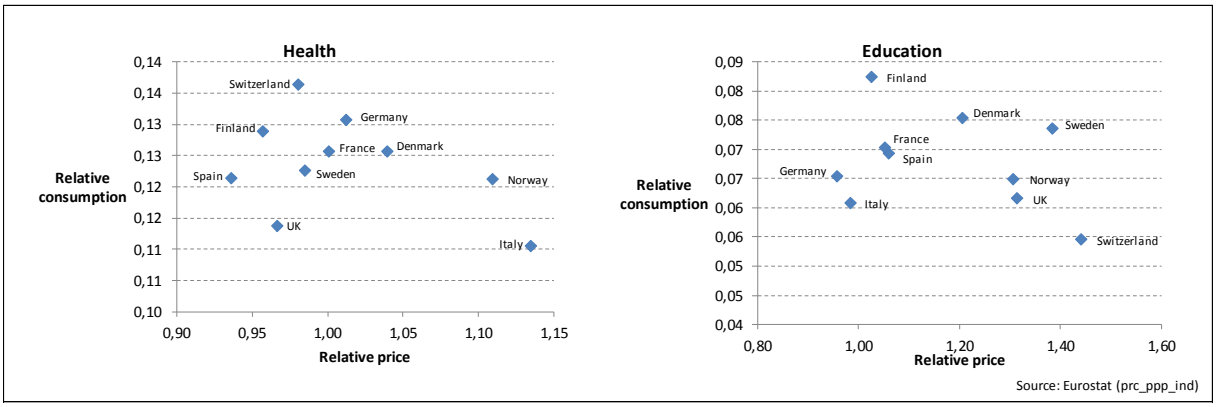


Figure 5.5(b): Relative consumption and relative prices on municipal goods and services in 2010 (EU27=100)
Figures above 1 indicate higher price than the local overall average.

Figure 5.5 (b) shows that Norway has one of the highest relative high prices on both health and education, while having one of the lowest relative consumption levels. Here, one should bear in mind the large uncertainty associated with measuring prices in these sectors (cf. section 3.1.3). If, say, the pricing on health in Norway is incorrectly measured to be too high, because productivity is underestimated, then the volume figure will be incorrectly too low as well. In addition, in most of the countries, including Norway, these municipal services are partly paid for by the government, and thus do not show the actual relationship between price and households consumption.

5.2 Wages

In order to find out how much households can actually afford, prices should be adjusted to households' earnings. Table 5.4 shows the annual earnings for an average employee[26].

[26] See appendix for the underlying PPPs

	Gross earnings * (PPS)			Taxes * (PPS)			Social Security * (PPS)			Net earnings * (PPS)		
	2000	2005	2009	2000	2005	2009	2000	2005	2009	2000	2005	2009
Denmark	29 023,31	30 619,95	34 025,27	9 372,42	9 210,00	9 809,31	3 450,40	3 320,30	3 639,19	16 200,50	18 089,65	20 576,78
Germany	32 289,25	37 468,78	38 690,74	7 330,43	7 789,47	8 008,37	6 619,30	8 027,69	7 979,97	18 339,53	21 651,63	22 702,41
Spain	20 373,66	22 625,02	24 722,15	2 749,99	3 154,59	3 733,49	1 293,73	1 436,69	1 569,85	16 329,94	18 033,74	19 828,05
France	25 260,10	27 900,53	28 857,02	3 884,98	4 281,43	4 046,21	3 387,38	3 794,47	3 953,42	17 987,74	19 824,63	20 857,41
Italy	21 741,65	22 787,65	26 191,56	4 274,88	4 237,62	5 315,18	1 998,05	2 094,19	2 485,58	15 468,72	16 455,85	18 390,81
Finland	22 375,32	26 524,29	30 279,58	6 087,29	6 624,04	6 885,15	1 572,51	1 684,89	1 909,91	14 715,52	18 215,35	21 484,52
Sweden	24 467,50	28 546,15	31 692,62	6 543,86	6 903,37	5 827,28	1 708,02	1 999,64	2 221,95	16 215,62	19 643,14	23 643,39
United Kingdom	34 072,83	40 416,66	40 012,68	5 926,98	7 122,65	6 474,92	2 866,71	3 729,43	3 659,18	25 279,14	29 564,58	29 878,59
Norway	26 715,46	33 592,91	37 330,78	6 117,18	7 129,67	7 836,85	2 083,81	2 620,25	2 911,80	18 514,48	23 842,99	26 582,14
Switzerland	29 445,46	33 512,40	36 387,78	2 916,76	3 385,28	3 619,21	1 928,68	2 027,50	2 201,46	24 600,03	28 099,61	30 567,11

* average full time employee, single person without children,
2010 not available
Source: Eurostat (earn_nt_net)

Table 5.4: Earnings, taxes and social security contributions for an average employee in Europe (EU27=100)

After adjusting for price and currency differences, the table shows that in 2009, the highest average gross wages were recorded in UK (PPS 40 013), Germany (PPS 38 691) and Norway (PPS 37 331). The lowest gross wages were recorded in Italy (PPS 26 192) and Spain (PPS 24 772). At the same year, the highest average taxes were paid in Denmark (PPS 9 809), Germany (PPS 8 008) and Norway (PPS 7 837), and the highest average social contributions were paid in Germany (PPS 7 980), France (PPS 3 953) and UK (PPS 3 659). Measured in net earnings though, Switzerland (PPS 30 567), UK (PPS 29 879) and Norway (PPS 26 582) had the highest earnings. The lowest average net earnings in 2009 were recorded in Spain (PPS 19 828) and Italy (PPS 18 391). The difference between gross and net earnings reflect that Germany had the highest taxes and social security contributions (PPS 15 988), higher than both in UK (58%), Norway (+49%) and Switzerland (+175%).

5.2.1 Wages and prices

Do wages have a strong impact on consumer prices? The Harrod-Balassa-Samuelson effect suggests that they have. In countries with high productivity level, GDP is high, wages are high, but prices are also high because the productivity difference is smaller for non-traded goods. In this section we want to explore this relationship further. In particular, we want to see whether a high wage level leads to high prices in all consumption categories, or whether there are differences across categories. As we are exploring to what extent the Harrod-Balassa-Samuelson effect can be seen via wages, we use wages measured in PPS, i.e. adjusted for differences in price levels.[27] If one only focused on the cost side, it would be relevant to consider the relationship between wages in a common currency, i.e. without price adjustment,

[27] This is the reason why gross wages are higher in the UK and Germany than in Norway. Without adjusting for price differences, wages are higher in Norway.

and category prices. Figures 5.6 (a) and (b) illustrate the relationship between average gross wages and prices on consumer goods and services. In case of Norway, there seems to be a clear positive relationship between wages and prices, with exceptions of housing and other communal services and communication. For housing and other communal services, Norway's relative price level is higher than in UK and Germany, but lower than in several other countries like Switzerland, Denmark, Finland and France. Within communication, prices in Norway are one of the lowest among all consumption groups. Both exceptions may partly be due to different government subsidization programs on these kinds of services (e.g. electricity and postal services). Also within municipal services like health and education (showed on figure 5.6 (b)), Norway has one of the highest relative prices and one of the highest corresponding wage levels. Thus, in Norway, the overall wage level seems to be well reflected in its correspondingly high prices. These prices seem to be especially high within nontraded goods like restaurants, hotels, miscellaneous goods and services, as well as in health and educational services, confirming the Harrod-Balassa-Samuelson effect.

In addition to wages, the final consumer prices are also influenced by other factors like differences in consumer tastes and demand, quantities produced as well as different taxation on goods and services.

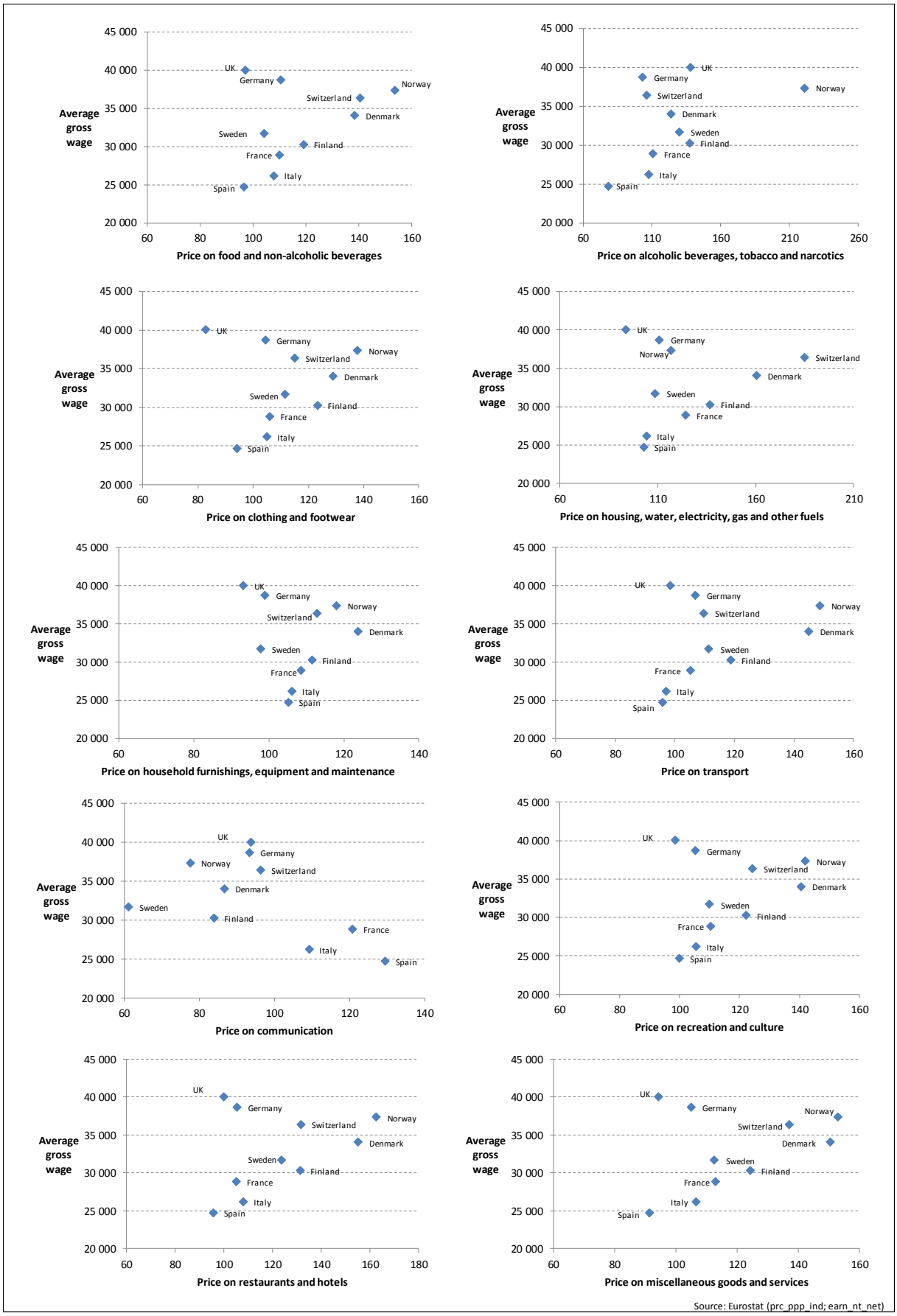


Figure 5.6(a): Average gross wages (PPS) and prices on consumption categories (PLI, EU27=100) in 2009

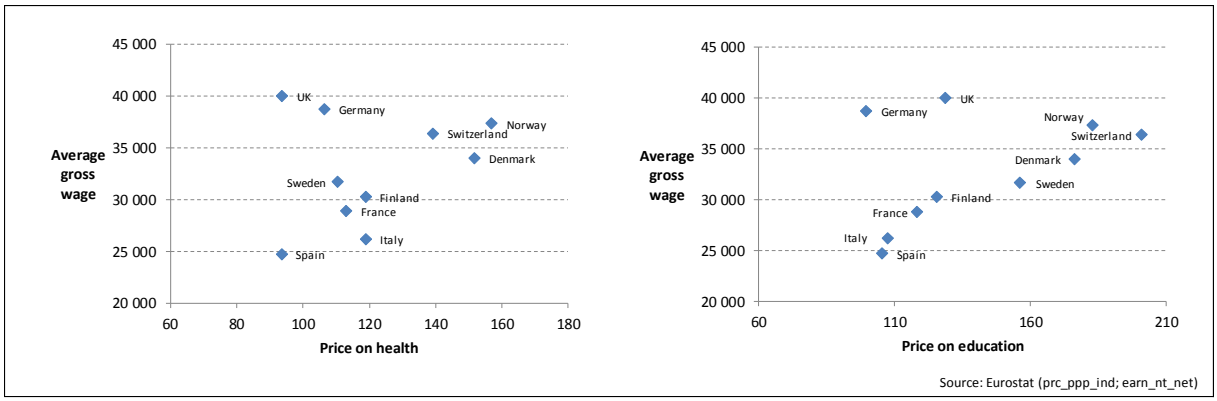


Figure 5.6(b): Average gross wages (PPS) and prices on municipal goods and services (PLI, EU27=100) in 2009

5.2.2 The effect of wages at the sectoral level

In the previous section, we saw that high wages as expected in general are associated with high prices for various consumption categories. In order to shed additional light on this effect, we now consider the relationship between sectoral wages and sectoral prices. Different mechanisms might give rise to different correlations. For example, a high price in one sector might be due to high wages in that sector, inducing a positive correlation. Alternatively, favorable supply conditions in one sector might lead to both high wages and low prices in the sector, implying that wages are negatively correlated with prices. Figure 5.7 (a) and (b) show the relationship between sectoral average gross wage and the corresponding prices[28]. Again, for several consumption categories like food, clothing and restaurants, there is a positive co-variation between sectoral gross wage level and the corresponding prices. Thus, within these sectors the wages seem to lead to high prices. In contrast, for the communication sector we observe that high wages go together with low prices, clearly evident not only for Norway, but also its neighboring country Sweden. The figure shows that in all ten economies the communication sector has the highest wages, varying between PPS 35 000 – 53 000. Here, Spain has the lowest average gross wage (PPS 35 013) and the highest prices (30 per cent above EU average), while Norway has one of the lowest prices (22 per cent below the EU27 average) and one of the highest wages (PPS 45 515). This observation might be influenced by the fact that in Norway, the government subsidizes postal services, making it possible to have low prices in spite of high wage levels. But it can also be argued that this negative correlation between wages and prices may be due to the higher level of productivity within this sector as

[28] Note that the sectoral categories are not exactly the same for the wage measures and the price measures

it also includes Information Technology services, where one would expect productivity growth to be high.

Within the communal sector like gas and electricity, Norwegian average wages are the second highest among all ten economies, but its corresponding prices are much lower than in many other countries. Thus, also in this sector, there seems to be a negative correlation between wages and prices, but here, relatively low prices are due to the governmental support to the suppliers rather than the cause of productivity advantages as may be the case for telecommunication services.

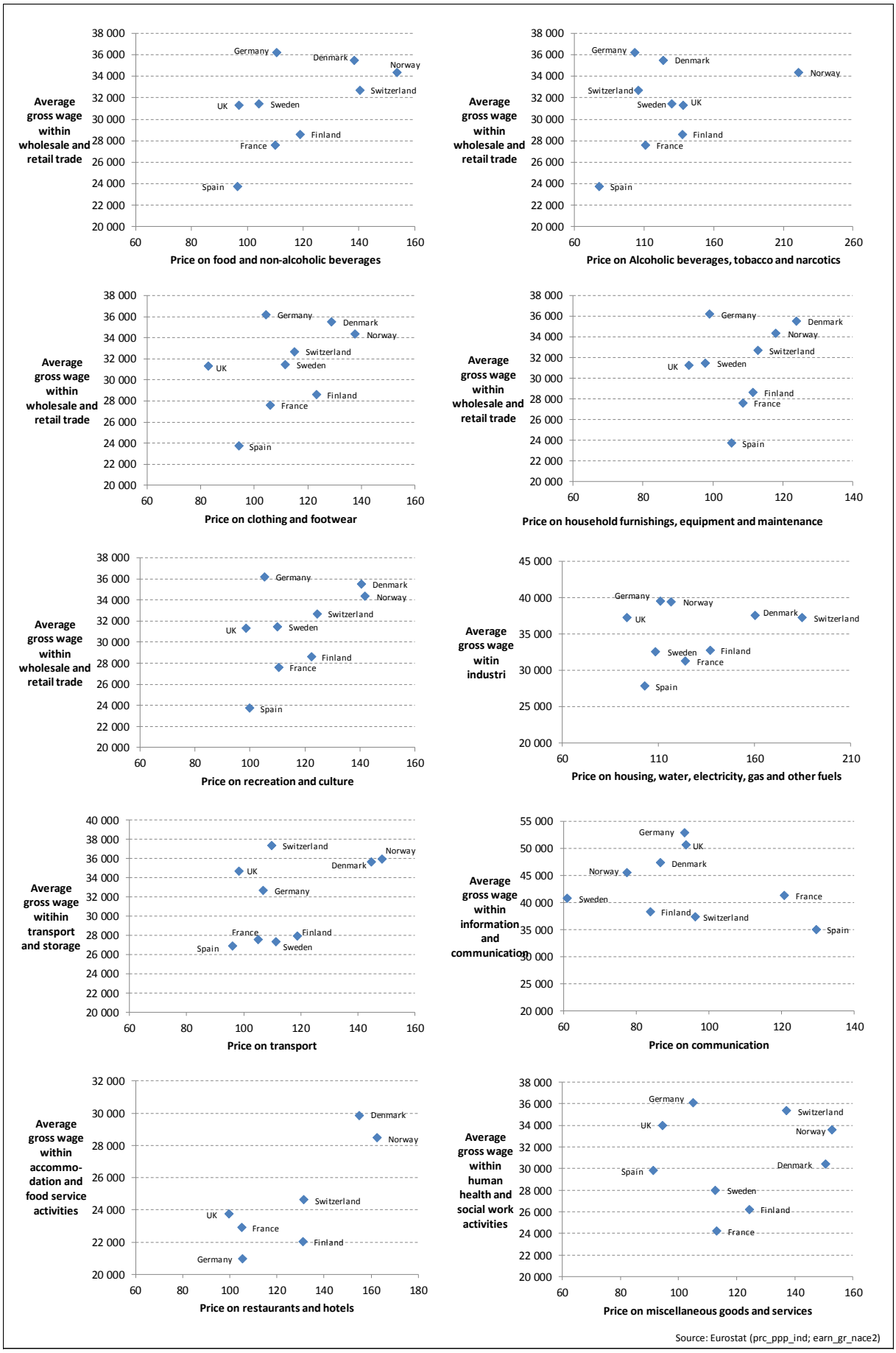


Figure 5.7(a): Sectoral wages (PPS) and prices on consumption categories (PLI, EU27=100) in 2009

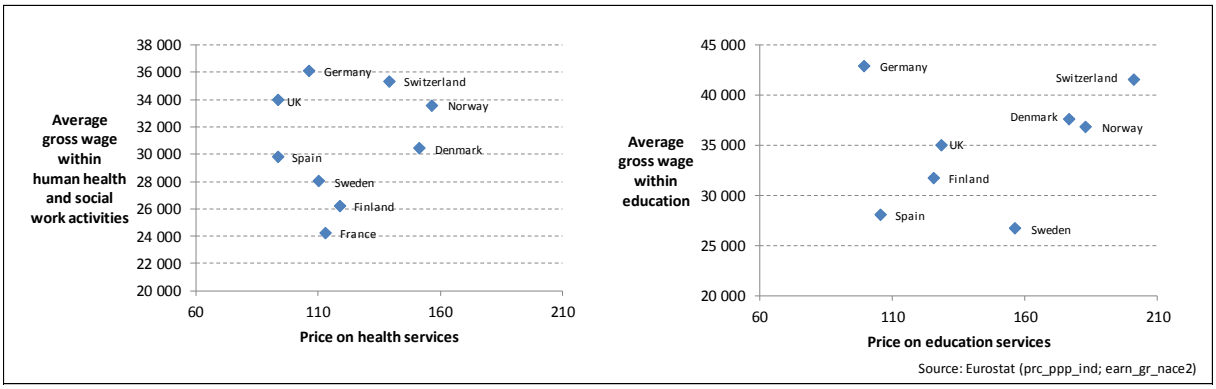


Figure 5.7(b): Sectoral wages (PPS) and prices within municipal services (PLI, EU27=100) in 2009

Although there doesn't seem to be any significant differences between the co-variation of gross average wages and sectoral wages against their corresponding prices, the sectoral approach might give a better indication of differences in tax levels on different goods and services as well as the level of government subsidization within each sector.

5.2.3 Relative wages and relative prices

So far, prices do seem to be linked to both average and sectoral gross wages. But exactly how strong is this relationship? Does high sectoral wage correspond to equally high prices? And how does the productivity in different sectors influence the price level?

Figure 5.8 (a) and (b) show the gross wage on a sectoral level relative to the overall average in the economy and the corresponding relative price.[29] Position above one indicates higher sectoral wage and/or price than their corresponding overall averages. This means that if high prices reflect high wage costs on a sectoral level, we would expect a positive correlation in the diagrams: if, say, food is especially expensive in Norway, wages would also be high in the food sector.

In seven out of twelve consumption categories (i.e. food and non-alcoholic beverages; alcoholic beverages, tobacco and narcotics; transport; restaurants and hotels; miscellaneous goods and services; health; education), the Norwegian relative price level is above its overall average, while the corresponding relative wage is below its corresponding average. This indicates that within these categories, the price level is actually higher than the corresponding sectoral wage level would suggest. Here alcohol and food (i.e. imported food) are highly taxed by the government, driving consumer prices on these groups upwards. While high

[29] Relative gross wage: defined as sectoral gross wage relative to average gross wage in general, relative price: defined as price on each consumption category relative to total price on AIC in general.

prices within restaurants and hotels are clearly due to the Harrod-Balassa-Samuelson effect, meaning that high productivity in one sector (Norwegian oil and gas sector) has pushed up wages, which again are transferred on prices in nontraded sectors like restaurants and hotels. On the other hand, within communication, housing and other communal goods and services, prices in Norway are below the overall average, while their corresponding sectoral wage levels are above the overall average gross wages. The price and wage relationship seems to be well correlated within categories including clothing and household furnishings, where both price and its corresponding sectoral wage is below the overall average.

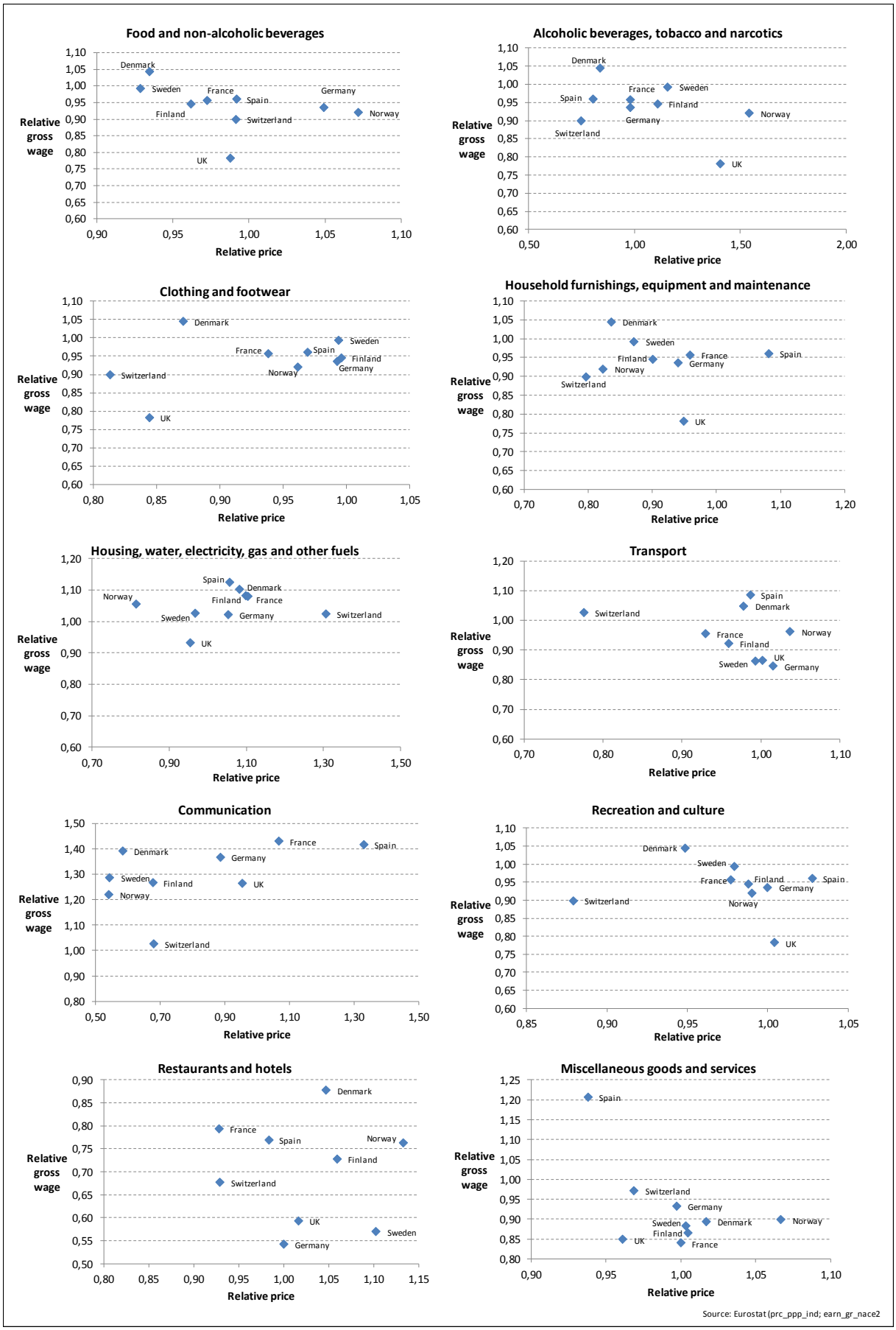


Figure 5.8(a): Relative wages and relative prices on consumption categories (PPS, PLI, EU27=100) in 2009. Figures above 1 indicate higher wage and/or price level than the overall local average.

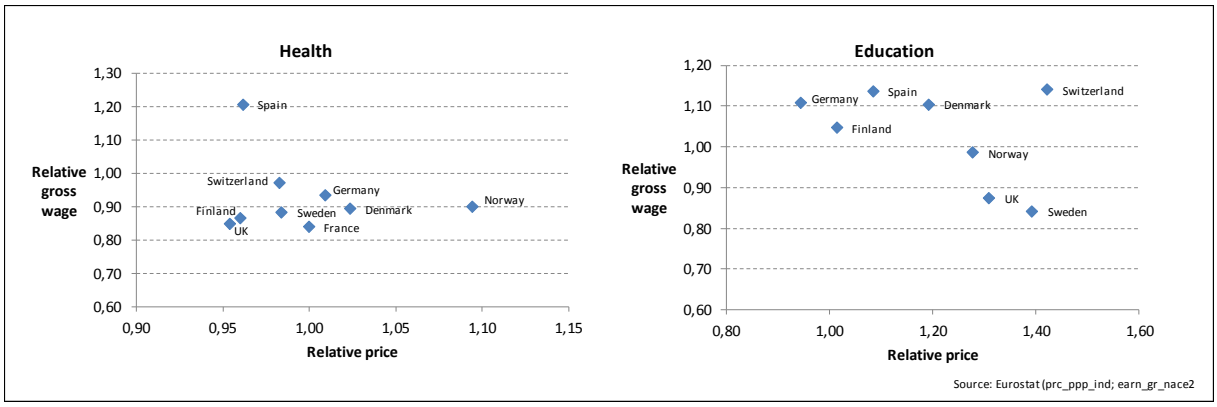


Figure 5.8(b): Relative wages and relative prices on municipal goods and services (PPS, PLI, EU27=100) in 2009. Figures above 1 indicate higher wage and/or price level than the overall local average.

Figure 5.8 (b) shows the relative wage and price relationship for municipal services within health and education. Here, prices on both health and education are above the overall average, but the corresponding sectoral wage is below the average overall gross wage. Thus it seems that health and education services are either overpriced or its corresponding sectoral wages are too low.

So far, we have seen that both average and sectoral gross wages influence consumer prices. What is the relationship between wages and consumption? And wages and country's income level, GDP? Figure 5.9 shows the results. Norway's high wage level corresponds to equally high consumption level and the income level and is, as expected, positively correlated to wages.

Again, due to the type of measurement used (PPS), gross wages are high measured in PPS for countries with lower price levels as shown in case of UK and Germany.

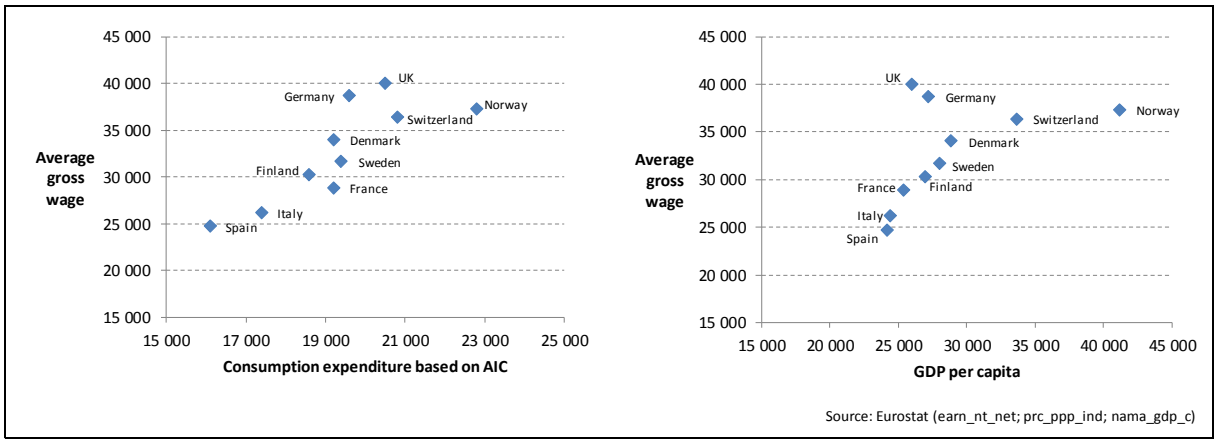


Figure 5.9: Average gross wages, consumption expenditure and GDP per capita (all in PPS) in 2009

5.2.4 Net wages and prices

Gross wages reflect labor costs for manufacturers. When manufacturers set the price of a good they take the cost of labor into account, as figures 5.6 and 5.7 confirmed. But how much can households actually afford, after deduction of taxes and social security?

Figure 5.10 (a) and (b) show the relationship between average net wages and prices for all twelve consumption categories. For Norway, there is a strong positive relationship between net wage and its corresponding price level within most of the categories, including prices on health and education. Norwegian households are thus relatively well-off, also in net values. But, although Norway has one of the highest net wages together with the fact that it has the highest overall price level (cf. table 5.1), means that, on average, consumers in UK and Switzerland should be better off as their net wages are above Norway, while their prices are below Norway. On the other hand, within the communication sector, Norway's prices are below both UK and Switzerland and within housing and communal services, Norwegian prices are below Switzerland. As mentioned before, the latter observations are probably due to local political decision making. In addition, recalling figure 4.2, which shows that communal services is the largest expenditure post for an average household, prices within this sector will put relatively large pressure on households' budget.

However, and as mentioned before, the fact that wages on the figure are measured in PPSs, real wage levels (in local currency and/or in euros) in UK as well as most of the other countries are somewhat lower than the figure shows, and will most likely lead to a different outcome than shown on figures 5.10 (a) and (b).

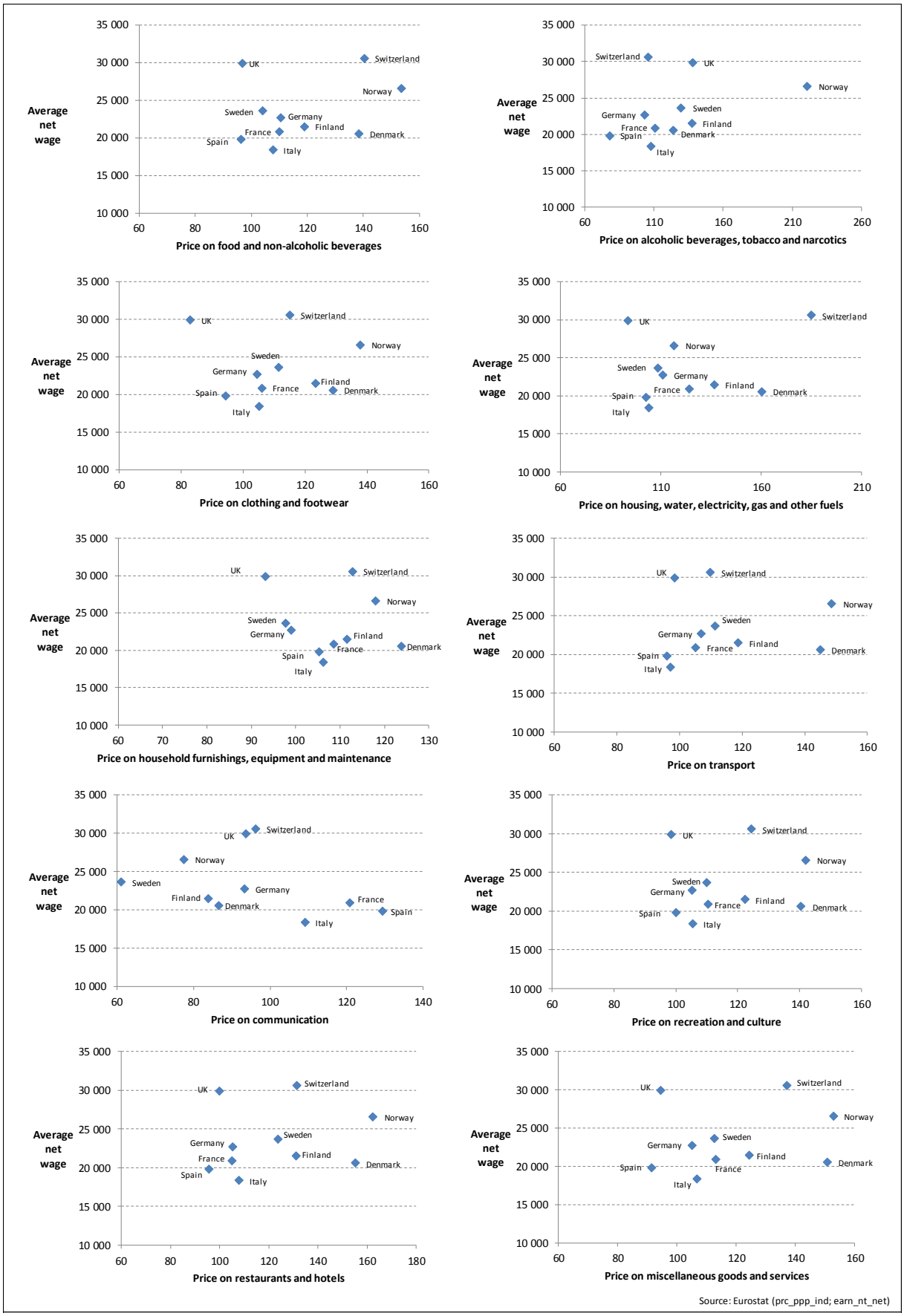


Figure 5.10(a): Average net wages (PPS) and prices on consumption categories (PLI, EU27=100) in 2009

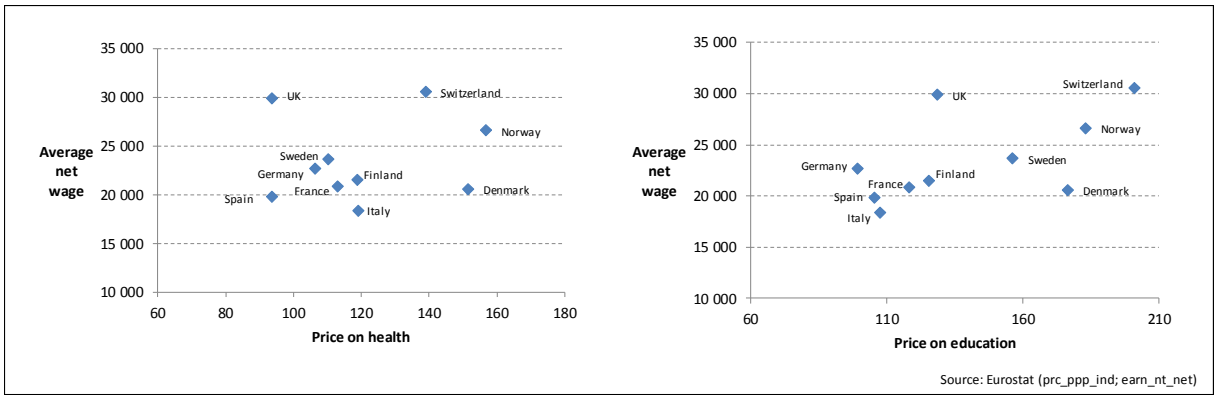


Figure 5.10(b): Average net wages (PPS) and prices on municipal goods and services (PLI, EU27=100) in 2009

So far, we can confirm that high wages are reflected in both high prices and in high consumption levels. But, will there be any differences when net wages are measured against consumption goods and services that households themselves must pay for? Thus, what is the outcome when net wages are measured against Households Final Consumption Expenditure and not against Actual Individual Consumption?

Figure 5.11 shows the results. In net values, Norway's position is somewhat weaker than in gross values, but the overall picture stays the same –high price level is well reflected in wages.

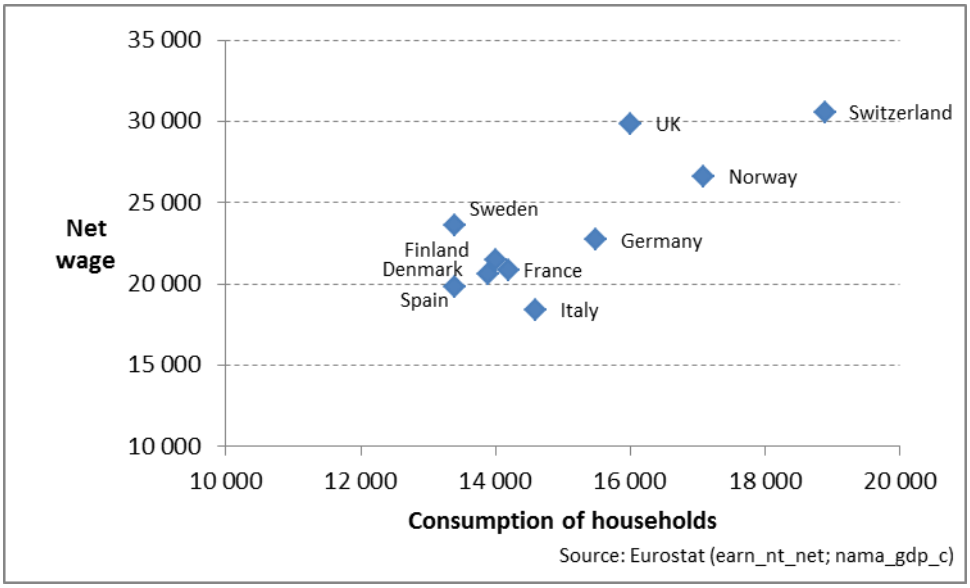


Figure 5.11: Average net wages and consumption paid by households only in 2009 (both in PPS)

6. Concluding remarks

In this thesis, I have looked at Norway's price level from the consumer side of the economy and compared it to other wealthy countries in Europe. The goal has been to explore to what extent Norway is as expensive as is commonly known.

The results show that prices are much higher in Norway for most of the consumption categories. But there are also some exceptions. These exceptions are the consumption categories including housing, water, electricity, gas and other fuels and the communication sector. The results show also that prices on traded goods face international competition, making them more flexible to price changes and leading to smaller price variations between the countries, while firms producing nontraded goods and services have the power to set their own price meaning that prices on these types of goods and services in wealthy countries are typically much higher. These results are also in accordance to Harrod-Balassa-Samuelson effect.

In order to find out citizens actual living standards, one should not only base the conclusions on GDP per capita figures, but also compare these figures relative to price level, as this will give a more realistic picture of the economic conditions in the country. If one looks at what it costs for an average citizen to live an average life, then Norway doesn't come out so bad. This is because high price levels correspond to equally high wages and lots of vital services like healthcare and education are provided through the state, which in other countries have to be paid for by the individual. Norway is indeed a very expensive country compared to many other countries, but citizens in those countries must themselves pay for health insurance, school fees etc. that citizens in Norway can get for free or at a very low cost.

When comparing price levels across countries, one should remember that currency fluctuations have a large impact on market prices, when measured in a common currency like the euro. Since 2010, Norwegian krone has appreciated by 4,4 per cent, making nontraded goods even more expensive. Adjusting for the domestic inflation rate in the period, which was 1,2[30] and 2,7[31] per cent respectively as measured by the Consumer Price Index for Norway and the Euro area, the real appreciation in Norway has been $4{,}4 + 1{,}2 - 2{,}7 = 2{,}9$ per cent

[30] Annual, per Dec. 2011: http://www.ssb.no/kpi/
[31] Annual, per Dec. 2011: http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/2-17012012-AP/EN/2-17012012-AP-EN.PDF

since 2010. Thus, Norway has become an even more expensive country than in 2010, as compared to other European countries. This will have an effect for e.g. the tourists coming to Norway, but no direct effect for local citizens in Norway as the real appreciation is also reflected in higher wages.

In addition, although many surveys show that Norway is an expensive country, one has to keep in mind that the way surveys are constructed are often based on different consumption baskets reflecting different preferences. A person living in a large city as an expat could mean that the consumption basket excludes accommodation costs, which is a large expenditure post for locals, while another survey might include items like luxury car in the consumption baskets, which is hit very hard by Norway's tax structure on cars. All countries have different taxation rules on products as well as on labor force, which again will have an impact on wages and prices on different goods and services and thus on the final product price.

7. References

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8. Appendix

1. Calculation for equation in section 2.1, page 5:

Price effects of anticipated productivity shifts in both tradable and nontradable goods (eq.9, p.208 in the book):

$$\text{Tradable sector:} \quad Y_T = A_T F(K_T, L_T)$$

$$\text{Nontradable sector:} \quad Y_N = A_N G(K_N, L_N)$$

Where subscript T and N denotes traded and nontraded goods respectively, Y denotes output, A denotes productivity and F and G are production functions. Total domestic labor supply is fixed at $L = L_T + L_N$. Assumption of perfect international capital mobility ties domestic interest rate to world interest rate, denoted as r, which is thus the world interest rate in terms of tradables and also the marginal product of capital in the traded-goods sector.

The profit-maximizing firm in both sectors will maximize the following production functions:

$$\text{Tradable sector:} \quad \sum_{s=t}^{\infty} \left(\frac{1}{1+r}\right)^{s-t} \left[A_{T,S} F\left(K_{T,S}, L_{T,S}\right) - \omega_S L_{T,S} - \Delta K_{T,S+1}\right]$$

$$\text{Nontradable sector:} \quad \sum_{s=t}^{\infty} \left(\frac{1}{1+r}\right)^{s-t} \left[p_S A_{N,S} G\left(K_{N,S}, L_{N,S}\right) - \omega_S L_{N,S} - \Delta K_{N,S+1}\right]$$

Where $\Delta K_{i,S+1} = K_{i,s+1} - K_{i,s}$ and $i = T, N$. Denoting capital-labor ratios as $k_T \equiv \frac{K_T}{L_T}$ and $k_N \equiv \frac{K_N}{L_N}$, output per employer as $y_T = A_T f(k_T) \equiv A_T F(k_T, 1)$ and $y_N = A_N g(k_N) \equiv A_N G(k_N, 1)$, the first order conditions for capital and labor are:

$$\text{Tradable sector:} \quad A_T f'(k_T) = r \quad \text{and} \quad A_T[f(k_T) - f'(k_T)k_T] = \omega$$

$$\text{Nontradable sector:} \quad pA_N g'(k_N) = r \quad \text{and} \quad pA_N[g(k_N) - g'(k_N)k_N] = \omega$$

Then, as $Y = F(K, L) = F_K(K, L)K + F_L(K, L)L$, deriving zero-profit conditions for productivity leads to:

$$\text{Tradable sector:} \quad A_T f(k_T) = rk_T + \omega$$

$$\text{Nontradable sector:} \quad pA_N g(k_N) = rk_N + \omega$$

Log-differentiating for tradable sector, holding r constant, leads to:

$$\frac{dA_T}{A_T} + \frac{rk_T}{A_T f(k_T)} \frac{dk_T}{k_T} = \frac{rk_T}{A_T f(k_T)} \frac{dk_T}{k_T} + \frac{\omega}{A_T f(k_T)} \frac{d\omega}{\omega}$$

Then, denoting a small percentage change of logarithmic derivative as $\hat{X} \equiv d\ logX = \frac{dX}{X}$,

letting $\mu_{LT} \equiv \frac{\omega L_T}{Y_T}$ and $\mu_{LN} \equiv \frac{\omega L_N}{pY_N}$ be labor's share of the income generated in the traded and nontraded goods sectors respectively, the equation reduces to

Tradable sector: $\widehat{A_T} = \mu_{LT}\hat{\omega} \quad \Leftrightarrow \quad \hat{\omega} = \frac{\widehat{A_T}}{\mu_{LT}}$

Nontradable sector: $\hat{p} + \widehat{A_N} = \mu_{LN}\hat{\omega}$

Then, providing that the inequality $\frac{\mu_{LN}}{\mu_{LT}} \geq 1$holds, faster productivity growth in tradables than in nontradables will push up price on nontradables over time:

$$\hat{p} = \frac{\mu_{LN}}{\mu_{LT}}\widehat{A_T} - \widehat{A_N}$$

Because the rate of increase in p depends on wage growth, the effect is greater the more labor-intensive are nontradables relative to tradables.

2. Eurostat coding: How to look up statistics based on coding on the Eurostat homepage:

1. Go to the Eurostat homepage: http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home
2. Click on Search-button (at the top right corner)
3. Click on "Advanced search options"
4. Write in the code in "Eurostat code"
5. Click on "Search"

3. List of goods and services used in Actual Individual consumption:

Composition of actual individual consmuption according to ESA95 : basic headings

Food and non-alcoholic beverages		Alocholic beverages, tobacco and narcotics	
1	Rice	35	Spirits
2	Other cereals, flour and other cereal products	36	Wine
3	Bread	37	Beer
4	Other bakery products	38	Tobacco
5	Pasta products	39	Narcotics – reference ppp
6	Beef and veal	Clothing and footrwear	
7	Pork	40	Clothing materials
8	Lamb, mutton and goat	41	Men's clothing
9	Poultry	42	Women's clothing
10	Other meats and edible offal	43	Children's and infant's clothing
11	Delicatessen and other meat preparations	44	Other articles of clothing and clothing accessories
12	Fresh, chilled or frozen fish and seafood	45	Cleaning, repair and hire of clothing
13	Preserved or processed fish and seafood	46	Men's footwear
14	Fresh milk	47	Women's footwear
15	Preserved milk and other milk products	48	Children's and infant's footwear
16	Cheese	49	Repair and hire of footwear
17	Eggs and egg-based products	Housing, water, electricity, gas and other fuels	
18	Butter	50	Actual rentals for housing
19	Margarine	51	Imputed rentals for housing
20	Other edible oils and fats	52	Materials for the maintenance and repair of the dwelling
21	Fresh or chilled fruit	53	Services for the maintenance and repair of the dwelling
22	Frozen, preserved or processed fruit and fruit-based products	54	Water supply
23	Fresh or chilled vegetables other than potatoes	55	Miscellaneous services relating to the dwelling - referece ppp
24	Fresh or chilled potatoes	56	Electricity
25	Frozen, preserved or processed vegetables and vegetable-based products	57	Gas
26	Sugar	58	Liquid fuels
27	Jams, marmalades and honey	59	Solid fuels
28	Confectionery, chocolate and other cocoa preparations	60	Heat energy
29	Edible ice, ice cream and sorbet	Housing furnishings, equipment and maintenance	
30	Food products n.e.c.	61	Kitchen furniture

31	Coffee, tea and cocoa	62	Bedroom furniture
32	Mineral waters	63	Living-room and dining-room furniture
33	Soft drinks and concentrates	64	Other furniture and furnishings
34	Fruit and vegetable juices	65	Carpets and other floor coverings
66	Repair of furniture, furnishings and floor coverings	Transport	
67	Household textiles	84	Motor cars with diesel engine
68	Major household appliances whether electric or not	85	Motor cars with petrol engine of cubic capacity of less than 1200 cc
69	Small electric household appliances	86	Motor cars with petrol engine of cubic capacity of 1200 cc to 1699 cc
70	Repair of household appliances	87	Motor cars with petrol engine of cubic capacity of 1700 cc to 2999 cc
71	Glassware, tableware and household utensils	88	Motor cars with petrol engine with cubic capacity of 3000 cc and over
72	Major tools and equipment	89	Motor cycles
73	Small tools and miscellaneous accessories	90	Bicycles
74	Non-durable household goods	91	Animal drawn vehicles – reference ppp
75	Domestic services	92	Spare parts and accessories for personal transport equipment
76	Household services	93	Fuels and lubricants for personal transport equipment
Health		94	Maintenance and repair of personal transport equipment
77	Pharmaceutical products	95	Other services in respect of personal transport equipment
78	Other medical products	96	Passenger transport by railway
79	Therapeutic appliances and equipment	97	Passenger transport by road
80	Medical services	98	Passenger transport by air
81	Dental services	99	Passenger transport by sea and inland waterway
82	Paramedical services	100	Combined passenger transport
83	Hospital services – reference ppp	101	Other purchased transport services

Communication		125	Miscellaneous printed matter, stationery and drawing materials
102	Postal services	126	Package holidays
103	Telephone and telefax equipment – reference ppp	Education	
104	Telephone and telefax services	127	Pre-primary and primary education - reference ppp
Recreation and culture		128	Secondary education - reference ppp
105	Equipment for the reception, recording and reproduction of sound and pictures	129	Post-secondary non-tertiary education - reference ppp
106	Photographic and cinematographic equipment and optical instruments	130	Tertiary education - reference ppp
107	Information processing equipment	131	Education not definable by level - reference ppp
108	Pre-recorded recording media	Restaurants and hotels	
109	Unrecorded recording media	132	Restaurant services whatever the type of establishment
110	Repair of audio-visual, photographic and information processing equipment	133	Pubs, bars, cafés, tea rooms and the like
111	Major durables for outdoor recreation – reference ppp	134	Canteens
112	Musical instruments and major durables for indoor recreation – reference ppp	135	Accommodation services
113	Maintenance and repair of other major durables for recreation and culture	Miscellaneus goods and services	
114	Games, toys and hobbies	136	Hairdressing salons and personal grooming establishments
115	Equipment for sport, camping and open-air recreation	137	Electric appliances for personal care
116	Gardens, plants and flowers	138	Other appliances, articles and products for personal care
117	Pets and related products	139	Prostitution – reference ppp
118	Veterinary and other services for pets	140	Jewellery, clocks and watches
119	Recreational and sporting services	141	Other personal effects
120	Photographic services	142	Social protection – reference ppp
121	Other cultural services	143	Insurance – reference ppp
122	Games of chance – reference ppp	144	FISIM – reference ppp
123	Books	145	Other financial services n.e.c. - ref. PPP
124	Newspapers and periodicals	146	Other services n.e.c.

8.1 Tables and figures

Section 4, page 10: Gross national savings in 2009:

Gross national savings in 2009 (1)
(% of gross national disposable income)

Norway	33,8	Belgium	22,3	Finland	19,0	Iceland	13,0
Switzerland	33,0	Slovenia	22,3	Poland	19,0	Lithuania	12,8
Latvia	26,3	Czech Republic	22,0	Bulgaria	18,0	United Kingdom	12,2
Estonia	24,9	Japan	21,7	Slovakia	17,5	Portugal	9,6
Austria	24,3	Germany	21,5	United States	16,7	Cyprus	9,4
Sweden	23,8	Denmark	21,3	France	16,3	Greece	2,6
Romania	23,2	Hungary	19,9	Italy	16,2		
Netherlands	22,7	Spain	19,6	Ireland	14,0		

(1) EU-27, Luxembourg and Malta, not available.

Source: Eurostat (nama_inc_c)

Table 5.1, page 17: How to calculate PLIs for AIC:

	Actual individual consumption Purchasing power parities (EU27=1)			Exchange rates to EUR				Price level on AIC (EU27=100) $AIC = \left(\frac{PPP}{Exchange\ rate}\right) * 100\%$		
	2000	2005	2010		2000	2005	2010	2000	2005	2010
Denmark	9,86438	10,8645	10,9478	Danish krone	7,4538	7,4518	7,4473	132	146	147
Germany	1,10253	1,02967	1,0369	Euro	1,0000	1,0000	1,0000	110	103	104
Spain	0,842378	0,905828	0,958994	Euro	1,0000	1,0000	1,0000	84	91	96
France	1,05562	1,08907	1,11432	Euro	1,0000	1,0000	1,0000	106	109	111
Italy	0,981748	1,07087	1,04567	Euro	1,0000	1,0000	1,0000	98	107	105
Finland	1,20354	1,23268	1,22788	Euro	1,0000	1,0000	1,0000	120	123	123
Sweden	10,7559	11,477	11,9707	Swedish krona	8,4452	9,2822	9,5373	127	124	126
United Kingdom	0,737985	0,756107	0,87438	Pound sterling	0,60948	0,68380	0,85784	121	111	102
Norway	11,1052	11,6454	12,4535	Norwegian krone	8,1129	8,0092	8,0043	137	145	156
Switzerland	2,26003	2,19347	2,08438	Swiss franc	1,5579	1,5483	1,3803	145	142	151

Source: Eurostat (prc_ppp_ind; ert_bil_eur_a)

Figure 5.2:

	Actual individual consumption (PLI)	GDP per capita (PPS)
Denmark	147	31 000
Germany	103,7	28 800
Spain	95,9	24 500
France	111,4	26 300
Italy	104,6	24 600
Finland	122,8	28 200
Sweden	125,5	30 100
United Kingdom	101,9	27 300
Norway	155,6	44 200
Switzerland	151	35 900

Source: Eurostat (prc_ppp_ind)

Figure 5.3 (a) and (b):

Price level indices (EU27=100)

	GDP per capita in PPS	Food and non-alcoholic beverages	Alcoholic beverages, tobacco and narcotics	Clothing and footwear	Housing, water, electricity, gas and other fuels	Household furnishings, equipment and maintenance	Transport	Communication	Recreation and culture	Restaurants and hotels	Miscellaneous goods and services	Health	Education
Denmark	31 000	136	125	124	158	123	143	97	136	153	150	153	177
Germany	28 800	110	99	103	108	99	106	83	104	104	103	105	99
Spain	24 500	94	80	92	104	102	94	149	99	94	89	90	102
France	26 300	109	109	105	123	108	105	121	106	103	112	112	117
Italy	24 600	106	104	104	104	105	94	103	106	107	106	119	103
Finland	28 200	113	136	123	138	113	119	81	124	129	123	118	126
Sweden	30 100	115	140	125	125	110	119	76	120	139	126	124	174
United Kingdom	27 400	102	142	89	97	98	102	93	100	104	98	99	134
Norway	44 200	165	237	143	126	133	155	95	156	178	167	173	204
Switzerland	35 900	149	112	125	195	123	115	107	133	142	146	148	218

Source: Eurostat (nama_gdp_c; prc_ppp_ind)

Figure 5.4 (a) and (b):

Price level indices in 2010 (EU27=100)

	GDP	Food and non-alcoholic beverages	Alcoholic beverages, tobacco and narcotics	Clothing and footwear	Housing, water, electricity, gas and other fuels	Household furnishings, equipment and maintenance	Transport	Communication	Recreation and culture	Restaurants and hotels	Miscellaneous goods and services	Health	Education
Denmark	137	136	125	124	158	123	143	97	136	153	150	153	177
Germany	105	110	99	103	108	99	106	83	104	104	103	105	99
Spain	93	94	80	92	104	102	94	149	99	94	89	90	102
France	113	109	109	105	123	108	105	121	106	103	112	112	117
Italy	105	106	104	104	104	105	94	103	106	107	106	119	103
Finland	119	113	136	123	138	113	119	81	124	129	123	118	126
Sweden	123	115	140	125	125	110	119	76	120	139	126	124	174
United Kingdom	100	102	142	89	97	98	102	93	100	104	98	99	134
Norway	146	165	237	143	126	133	155	95	156	178	167	173	204
Switzerland	143	149	112	125	195	123	115	107	133	142	146	148	218

Source: Eurostat (prc_ppp_ind)

Figure 5.5 (a) and (b):

Relative price in 2010 (in PLI, EU27=100)

	Food	AIC	Food/AIC	Alcoholic beverages, tobacco and narcotics	AIC	Alc./AIC	Clothing and footwear	AIC	Cloth./AIC	Housing, water, electricity, gas and other fuels	AIC	Housing/AIC
Denmark	130,5	147,0	0,89	125,3	147	0,85	123,8	147	0,84	158	147	1,07
Germany	110,7	103,7	1,07	98,7	103,7	0,95	103,3	103,7	1,00	108,2	103,7	1,04
Spain	93,8	95,9	0,98	79,8	95,9	0,83	92,4	95,9	0,96	104,1	95,9	1,09
France	110,2	111,4	0,99	108,8	111,4	0,98	104,6	111,4	0,94	122,8	111,4	1,10
Italy	107,3	104,6	1,03	103,5	104,6	0,99	103,6	104,6	0,99	104	104,6	0,99
Finland	110,9	122,8	0,90	136,1	122,8	1,11	123,0	122,8	1,00	137,7	122,8	1,12
Sweden	114,6	125,5	0,91	139,9	125,5	1,11	124,8	125,5	0,99	125	125,5	1,00
United Kingdom	101,1	101,9	0,99	142,3	101,9	1,40	88,9	101,9	0,87	96,7	101,9	0,95
Norway	162,5	155,6	1,04	237,0	155,6	1,52	142,8	155,6	0,92	126	155,6	0,81
Switzerland	151,8	151,0	1,01	111,9	151	0,74	125,3	151	0,83	195,4	151	1,29

	Household furnishings, equipment and maintenance	AIC	Furnish./AIC	Transport	AIC	Transp./AIC	Commu-nication	AIC	Comm/AIC	Recreation and culture	AIC	Recr./AIC
Denmark	122,8	147	0,84	142,6	147	0,97	97,4	147	0,66	136,4	147	0,93
Germany	99,1	103,7	0,96	106,2	103,7	1,02	83	103,7	0,80	104,4	103,7	1,01
Spain	101,5	95,9	1,06	94	95,9	0,98	149,1	95,9	1,55	98,8	95,9	1,03
France	107,6	111,4	0,97	104,6	111,4	0,94	120,6	111,4	1,08	106,4	111,4	0,96
Italy	105,0	104,6	1,00	94,3	104,6	0,90	103,1	104,6	0,99	106,2	104,6	1,02
Finland	112,7	122,8	0,92	118,7	122,8	0,97	81,2	122,8	0,66	124	122,8	1,01
Sweden	110,2	125,5	0,88	118,5	125,5	0,94	76	125,5	0,61	120,3	125,5	0,96
United Kingdom	98,0	101,9	0,96	102,2	101,9	1,00	93	101,9	0,91	100	101,9	0,98
Norway	133,3	155,6	0,86	154,6	155,6	0,99	94,5	155,6	0,61	155,9	155,6	1,00
Switzerland	122,9	151	0,81	114,5	151	0,76	107,4	151	0,71	132,6	151	0,88

	Restaurants and hotels	AIC	Rest./AIC	Miscella-neous goods and services	AIC	Misc./AIC	Health	AIC	Health/AIC	Education	AIC	Edu./AIC
Denmark	153,3	147	1,04	150,1	147	1,02	152,8	147	1,04	177,4	147	1,21
Germany	104	103,7	1,00	103,1	103,7	0,99	105	103,7	1,01	99,4	103,7	0,96
Spain	94,4	95,9	0,98	89,4	95,9	0,93	89,8	95,9	0,94	101,6	95,9	1,06
France	103,3	111,4	0,93	111,5	111,4	1,00	111,5	111,4	1,00	117,2	111,4	1,05
Italy	107,2	104,6	1,02	105,7	104,6	1,01	118,7	104,6	1,13	102,9	104,6	0,98
Finland	129,1	122,8	1,05	123,4	122,8	1,00	117,5	122,8	0,96	126,1	122,8	1,03
Sweden	138,6	125,5	1,10	125,6	125,5	1,00	123,6	125,5	0,98	173,7	125,5	1,38
United Kingdom	103,8	101,9	1,02	97,8	101,9	0,96	98,5	101,9	0,97	134	101,9	1,32
Norway	178,3	155,6	1,15	167,1	155,6	1,07	172,6	155,6	1,11	203,5	155,6	1,31
Switzerland	141,6	151	0,94	146,1	151	0,97	148,1	151	0,98	217,8	151	1,44

Source: Eurostat (prc_ppp_inc)

Relative consuption in 2010 (in PPS_EU27)

Food and non-alcoholic beverages	Total real expenditure (PPS)	Food/Total expenditure	Alcoholic beverages, tobacco and narcotics	Total real expenditure (PPS)	Alcohol/GDP	Clothing and footwear	Total real expenditure (PPS)	Cloth./GDP	Housing, water, electricity, gas and other fuels	Total real expenditure (PPS)	Hous./GDP
1 600	19 900	0,08	600	19 900	0,03	700	19 900	0,04	3 800	19 900	0,19
1 700	19 900	0,09	500	19 900	0,03	800	19 900	0,04	3 800	19 900	0,19
2 000	17 300	0,12	500	17 300	0,03	800	17 300	0,05	2 600	17 300	0,15
2 100	19 900	0,11	500	19 900	0,03	700	19 900	0,04	3 700	19 900	0,19
2 100	18 100	0,12	400	18 100	0,02	1 200	18 100	0,07	3 400	18 100	0,19
1 900	19 400	0,10	700	19 400	0,04	700	19 400	0,04	3 400	19 400	0,18
1 900	20 400	0,09	500	20 400	0,02	700	20 400	0,03	3 800	20 400	0,19
1 400	21 100	0,07	400	21 100	0,02	1 100	21 100	0,05	3 800	21 100	0,18
2 100	23 100	0,09	400	23 100	0,02	1 000	23 100	0,04	4 100	23 100	0,18
2 000	22 000	0,09	900	22 000	0,04	800	22 000	0,04	3 600	22 000	0,16

Household furnishings, equipment and maintenance	Total real expenditure (PPS)	Furnish./GDP	Transport	Total real expenditure (PPS)	Transport/GDP	Commu-nication	Total real expenditure (PPS)	Comm./GDP	Recreation and culture	Total real expenditure (PPS)	Recr./GDP
900	19 900	0,05	1 700	19 900	0,09	400	19 900	0,02	1 800	19 900	0,09
1 000	19 900	0,05	2 100	19 900	0,11	500	19 900	0,03	1 600	19 900	0,08
600	17 300	0,03	1 700	17 300	0,10	300	17 300	0,02	1 300	17 300	0,08
900	19 900	0,05	2 200	19 900	0,11	400	19 900	0,02	1 700	19 900	0,09
1 100	18 100	0,06	2 100	18 100	0,12	400	18 100	0,02	1 100	18 100	0,06
800	19 400	0,04	1 600	19 400	0,08	500	19 400	0,03	1 800	19 400	0,09
800	20 400	0,04	1 900	20 400	0,09	700	20 400	0,03	2 000	20 400	0,10
800	21 100	0,04	2 400	21 100	0,11	400	21 100	0,02	2 400	21 100	0,11
1 100	23 100	0,05	2 400	23 100	0,10	700	23 100	0,03	2 500	23 100	0,11
1 100	22 000	0,05	1 900	22 000	0,09	700	22 000	0,03	2 000	22 000	0,09

Restaurants and hotels	Total real expenditure (PPS)	Rest./GDP	Miscella-neous goods and services	Total real expenditure (PPS)	Misc./GDP	Health	Total real expenditure (PPS)	Health/GDP	Education	Total real expenditure (PPS)	Edu./GDP
600	19 900	0,03	3 800	19 900	0,19	2 500	19 900	0,13	1 500	19 900	0,08
900	19 900	0,05	3 100	19 900	0,16	2 600	19 900	0,13	1 300	19 900	0,07
2 400	17 300	0,14	1 800	17 300	0,10	2 100	17 300	0,12	1 200	17 300	0,07
1 100	19 900	0,06	2 700	19 900	0,14	2 500	19 900	0,13	1 400	19 900	0,07
1 500	18 100	0,08	1 700	18 100	0,09	2 000	18 100	0,11	1 100	18 100	0,06
900	19 400	0,05	3 000	19 400	0,15	2 500	19 400	0,13	1 600	19 400	0,08
700	20 400	0,03	3 400	20 400	0,17	2 500	20 400	0,12	1 500	20 400	0,07
1 600	21 100	0,08	3 100	21 100	0,15	2 400	21 100	0,11	1 300	21 100	0,06
900	23 100	0,04	3 600	23 100	0,16	2 800	23 100	0,12	1 500	23 100	0,06
1 500	22 000	0,07	3 300	22 000	0,15	3 000	22 000	0,14	1 200	22 000	0,05

Source: Eurostat (prc_ppp_ind)

Table 5.4: As wages measured in PPSs are based on PPPs, the following table gives an indication of PPPs on different consumption groups:

	Purchasing power parities in 2010 (EU27=1)												
	Actual Individual Consumption	Food and non-alcoholic beverages	Alcoholic beverages, tobacco and narcotics	Clothing and footwear	Housing, water, electricity, gas and other fuels	Household furnishings, equipment and maintenance	Transport	Communi-cation	Recreation and culture	Restaurants and hotels	Miscellaneous goods and services	Health	Education
Denmark	10,9478	9,71975	9,33264	9,21641	11,7684	9,14833	10,6218	7,25053	10,1616	11,4141	11,1751	11,3828	13,2103
Germany	1,0369	1,10675	0,986862	1,03275	1,0823	0,991017	1,06217	0,830163	1,0441	1,03964	1,03101	1,05011	0,993516
Spain	0,958994	0,938306	0,798465	0,924109	1,04069	1,01511	0,939841	1,49132	0,987615	0,944241	0,893679	0,898322	1,01641
France	1,11432	1,10219	1,08834	1,04551	1,2277	1,07575	1,04587	1,20632	1,06448	1,03335	1,11501	1,1153	1,17172
Italy	1,04567	1,07305	1,03537	1,03558	1,03951	1,05037	0,942907	1,03086	1,06247	1,07158	1,05717	1,18688	1,02916
Finland	1,22788	1,10948	1,36104	1,22994	1,3773	1,12678	1,18657	0,812475	1,2396	1,29091	1,23401	1,17465	1,26092
Sweden	11,9707	10,9297	13,3472	11,9055	11,9198	10,5096	11,298	7,24505	11,4723	13,214	11,9744	11,7893	16,5694
United Kingdom	0,87438	0,867004	1,2205	0,7629	0,829637	0,841008	0,877014	0,798121	0,857422	0,890552	0,839381	0,844991	1,14961
Norway	12,4535	13,0083	18,9684	11,428	10,0886	10,6703	12,3773	7,56198	12,4793	14,2747	13,3729	13,8176	16,2914
Switzerland	2,08438	2,09475	1,54454	1,72931	2,6969	1,69605	1,58019	1,48184	1,83061	1,95413	2,01717	2,04415	3,00674

Source: Eurostat (prc_ppp_ind)

Figure 5.6 (a) and (b):

	Gross earnings in 2009 (PPS)	**Price level indices in 2009 (EU27=100)**											
	Single full time emlpyee without children	Food and non-alcoholic beverages	Alcoholic beverages, tobacco and narcotics	Clothing and footwear	Housing, water, electricity, gas and other fuels	Household furnishings, equipment and maintenance	Transport	Communi-cation	Recreation and culture	Restaurants and hotels	Miscella-neous goods and services	Health	Education
Denmark	34 025	138	124	129	160	124	145	87	141	155	151	152	177
Germany	38 691	111	103	105	111	99	107	93	105	105	105	106	100
Spain	24 722	97	78	94	103	105	96	130	100	96	91	94	106
France	28 857	110	111	106	124	109	105	121	111	105	113	113	119
Italy	26 192	108	108	105	104	106	97	109	106	108	107	119	108
Finland	30 280	119	138	123	137	112	119	84	122	131	124	119	126
Sweden	31 693	104	130	112	109	98	111	61	110	124	113	110	156
United Kingdom	40 013	97	138	83	94	93	98	94	99	100	94	94	129
Norway	37 331	154	221	138	117	118	149	78	142	162	153	157	183
Switzerland	36 388	140	106	115	185	113	110	96	124	132	137	139	201

Source: Eurostat (prc_ppp_ind; earn_nt_net)

Figure 5.7 (a) and (b):

Sectoral gross wages in 2009 (PPS)

	Wholesale and retail trade; repair of motor vehicles and motorcycles	Industry (except construction)	Human health and social work activities	Transportation and storage	Information and communication	Education	Accommodation and food service activities
Denmark	35 509	37 519	30 414	35 625	47 297	37 569	29 852
Germany	36 190	39 498	36 096	32 694	52 916	42 899	20 977
Spain	23 730	27 799	29 837	26 850	35 013	28 076	19 017
France	27 603	31 226	24 240	27 548	41 247	:	22 896
Italy	:	:	:	:	:	:	:
Finland	28 615	32 729	26 233	27 929	38 330	31 702	22 038
Sweden	31 455	32 500	28 005	27 348	40 778	26 689	18 065
United Kingdom	31 284	37 280	33 980	34 627	50 565	34 963	23 735
Norway	34 344	39 414	33 566	35 907	45 515	36 791	28 461
Switzerland	32 694	37 255,8	35 349,2	37 331,9	37 331,9	41 496,1	24 611,1

Single full-time employee without children. Enterprises for 10 or more employees; Norway: 1+ employees.
Switzerland: figures for 2008. Italy not available
Source: Eurostat (earn_gr_nace2)

Price level indices in 2009 (EU27=100)

	Food and non-alcoholic beverages	Alcoholic beverages, tobacco and narcotics	Clothing and footwear	Housing, water, electricity, gas and other fuels	Household furnishings, equipment and maintenance	Transport	Communi-cation	Recreation and culture	Restaurants and hotels	Miscella-neous goods and services	Health	Education
Denmark	138	124	129	160	124	145	87	141	155	151	152	177
Germany	111	103	105	111	99	107	93	105	105	105	106	100
Spain	97	78	94	103	105	96	130	100	96	91	94	106
France	110	111	106	124	109	105	121	111	105	113	113	119
Italy	108	108	105	104	106	97	109	106	108	107	119	108
Finland	119	138	123	137	112	119	84	122	131	124	119	126
Sweden	104	130	112	109	98	111	61	110	124	113	110	156
United Kingdom	97	138	83	94	93	98	94	99	100	94	94	129
Norway	154	221	138	117	118	149	78	142	162	153	157	183
Switzerland	140	106	115	185	113	110	96	124	132	137	139	201

Source: Eurostat (prc_ppp_ind)

Figure 5.8 (a) and (b):

Relative price in 2009 (PLI)

	Food and non-alcoholic beverages	AIC	Food/AIC	Alcoholic beverages, tobacco and narcotics	AIC	Alc./AIC	Clothing and footwear	AIC	Cloth./AIC	Household furnishings, equipment and maintenance	AIC	Furnish./AIC
Denmark	138,4	148,1	0,935	123,9	148,1	0,837	129	148,1	0,871	123,8	148,1	0,836
Germany	110,5	105,3	1,049	103,4	105,3	0,982	104,5	105,3	0,992	99	105,3	0,940
Spain	96,5	97,3	0,992	78,2	97,3	0,804	94,3	97,3	0,969	105,3	97,3	1,082
France	110	113,1	0,973	111	113,1	0,981	106,1	113,1	0,938	108,5	113,1	0,959
Italy	107,9	106		107,9	106		105,1	106		106,2	106	
Finland	119,1	123,8	0,962	137,5	123,8	1,111	123,3	123,8	0,996	111,5	123,8	0,901
Sweden	104,2	112,2	0,929	129,8	112,2	1,157	111,5	112,2	0,994	97,8	112,2	0,872
United Kingdom	97	98,2	0,988	138	98,2	1,405	82,9	98,2	0,844	93,2	98,2	0,949
Norway	153,6	143,3	1,072	220,8	143,3	1,541	137,8	143,3	0,962	118	143,3	0,823
Switzerland	140,3	141,5	0,992	106	141,5	0,749	115,1	141,5	0,813	112,8	141,5	0,797

	Housing, water, electricity, gas and other fuels	AIC	Housing/AIC	Transport	AIC	Transport/AIC	Commu-nication	AIC	Comm./AIC	Recreation and culture	AIC	Recr./AIC
Denmark	160,3	148,1	1,082	144,9	148,1	0,978	86,6	148,1	0,585	140,5	148,1	0,949
Germany	110,9	105,3	1,053	106,9	105,3	1,015	93,3	105,3	0,886	105,3	105,3	1,000
Spain	102,9	97,3	1,058	96	97,3	0,987	129,5	97,3	1,331	100	97,3	1,028
France	124,2	113,1	1,098	105,2	113,1	0,930	120,8	113,1	1,068	110,5	113,1	0,977
Italy	104,2	106		97,1	106		109,2	106		105,5	106	
Finland	136,8	123,8	1,105	118,8	123,8	0,960	83,9	123,8	0,678	122,3	123,8	0,988
Sweden	108,6	112,2	0,968	111,4	112,2	0,993	61	112,2	0,544	109,9	112,2	0,980
United Kingdom	93,7	98,2	0,954	98,4	98,2	1,002	93,7	98,2	0,954	98,6	98,2	1,004
Norway	116,7	143,3	0,814	148,6	143,3	1,037	77,5	143,3	0,541	141,9	143,3	0,990
Switzerland	184,9	141,5	1,307	109,8	141,5	0,776	96,3	141,5	0,681	124,4	141,5	0,879

	Restaurants and hotels	AIC	Rest./AIC	Miscellaneous goods and services	AIC	Miscell./AIC	Health	AIC	Health/AIC	Education	AIC	Edu./AIC
Denmark	155,1	148,1	1,047	150,6	148,1	1,017	151,6	148,1	1,024	176,5	148,1	1,192
Germany	105,3	105,3	1,000	105	105,3	0,997	106,3	105,3	1,009	99,5	105,3	0,945
Spain	95,7	97,3	0,984	91,3	97,3	0,938	93,6	97,3	0,962	105,6	97,3	1,085
France	105	113,1	0,928	113,1	113,1	1,000	113,1	113,1	1,000	118,5	113,1	
Italy	108	106		106,7	106		119	106		107,6	106	
Finland	131,2	123,8	1,060	124,4	123,8	1,005	118,9	123,8	0,960	125,7	123,8	1,015
Sweden	123,7	112,2	1,102	112,6	112,2	1,004	110,4	112,2	0,984	156,2	112,2	1,392
United Kingdom	99,8	98,2	1,016	94,4	98,2	0,961	93,7	98,2	0,954	128,6	98,2	1,310
Norway	162,4	143,3	1,133	152,9	143,3	1,067	156,8	143,3	1,094	183	143,3	1,277
Switzerland	131,5	141,5	0,929	137,1	141,5	0,969	139,1	141,5	0,983	201,2	141,5	1,422

Source: Eurostat (prc_ppp_ind)

Relative wage in 2009 (PPS)

	Wholesale and retail trade; repair of motor vehicles and motorcycles	Gross earning	Wholesale gr. wage/Avr.gr. wage	Industry (except construction)	Gross earning	Industri gr. wage/Avr.gr. wage	Human health and social work activities	Gross earning	Human h. gr. wage/Avr.gr. wage
Denmark	35 509	34 025,27	1,044	37 519	34 025,27	1,103	30 414	34 025,27	0,894
Germany	36 190	38 690,74	0,935	39 498	38 690,74	1,021	36 096	38 690,74	0,933
Spain	23 730	24 722,15	0,960	27 799	24 722,15	1,124	29 837	24 722,15	1,207
France	27 603	28 857,02	0,957	31 226	28 857,02	1,082	24 240	28 857,02	0,840
Italy		26 191,56			26 191,56	0,000		26 191,56	0,000
Finland	28 615	30 279,58	0,945	32 729	30 279,58	1,081	26 233	30 279,58	0,866
Sweden	31 455	31 692,62	0,993	32 500	31 692,62	1,025	28 005	31 692,62	0,884
United Kingdom	31 284	40 012,68	0,782	37 280	40 012,68	0,932	33 980	40 012,68	0,849
Norway	34 344	37 330,78	0,920	39 414	37 330,78	1,056	33 566	37 330,78	0,899
Switzerland	32 694	36 387,78	0,898	37 255,8	36 387,78	1,024	35 349,2	36 387,78	0,971
	Transportation and storage	Gross earning	Transp.gr. wage/Avr.gr. wage	Information and communication	Gross earning	Inform. gr. wage/Avr.gr. wage	Education	Gross earning	Edu. gr. wage/Avr. Gr. wage
Denmark	35 625	34 025,27	1,047	47 297	34 025,27	1,390	37 569	34 025,27	1,104
Germany	32 694	38 690,74	0,845	52 916	38 690,74	1,368	42 899	38 690,74	1,109
Spain	26 850	24 722,15	1,086	35 013	24 722,15	1,416	28 076	24 722,15	1,136
France	27 548	28 857,02	0,955	41 247	28 857,02	1,429		28 857,02	0,000
Italy		26 191,56	0,000		26 191,56	0,000		26 191,56	0,000
Finland	27 929	30 279,58	0,922	38 330	30 279,58	1,266	31 702	30 279,58	1,047
Sweden	27 348	31 692,62	0,863	40 778	31 692,62	1,287	26 689	31 692,62	0,842
United Kingdom	34 627	40 012,68	0,865	50 565	40 012,68	1,264	34 963	40 012,68	0,874
Norway	35 907	37 330,78	0,962	45 515	37 330,78	1,219	36 791	37 330,78	0,986
Switzerland	37 331,9	36 387,78	1,026	37 331,9	36 387,78	1,026	41 496,1	36 387,78	1,140
	Accommodation and food service activities	Gross earning	Accom. gr. wage/Avr. gr. wage						
Denmark	29 852	34 025,27	0,877						
Germany	20 977	38 690,74	0,542						
Spain	19 017	24 722,15	0,769						
France	22 896	28 857,02	0,793						
Italy		26 191,56	0,000						
Finland	22 038	30 279,58	0,728						
Sweden	18 065	31 692,62	0,570						
United Kingdom	23 735	40 012,68	0,593						
Norway	28 461	37 330,78	0,762						
Switzerland	24 611,1	36 387,78	0,676						

Single full-time employee without children. Enterprises with 10 or more employees; Norway: 1+ employees
Switzerland: figures for 2008; Italy not available.
Source: Eurostat (earn_gr_nace2)

Figure 5.9:

Figures in 2009 (PPS)			
	Gross earning	Real expenditure per capita for AIC	GDP per capita at market prices
Denmark	34 025,27	19 200	28 900
Germany	38 690,74	19 600	27 200
Spain	24 722,15	16 100	24 200
France	28 857,02	19 200	25 400
Italy	26 191,56	17 400	24 400
Finland	30 279,58	18 600	27 000
Sweden	31 692,62	19 400	28 000
United Kingdom	40 012,68	20 500	26 000
Norway	37 330,78	22 800	41 200
Switzerland	36 387,78	20 800	33 700

Source: Eurostat (earn_nt_net; prc_ppp_ind; nama_gdp_c)

Figure5.10 (a) and (b):

	Net earnings in 2009 (PPS)	**Price level indices in 2009 (EU27=100)**											
	Single full time emlpyee without children	Food and non-alcoholic beverages	Alcoholic beverages, tobacco and narcotics	Clothing and footwear	Housing, water, electricity, gas and other fuels	Household furnishings, equipment and maintenance	Transport	Communi-cation	Recreation and culture	Restaurants and hotels	Miscella-neous goods and services	Health	Education
Denmark	20 577	138	124	129	160	124	145	87	141	155	151	152	177
Germany	22 702	111	103	105	111	99	107	93	105	105	105	106	100
Spain	19 828	97	78	94	103	105	96	130	100	96	91	94	106
France	20 857	110	111	106	124	109	105	121	111	105	113	113	119
Italy	18 391	108	108	105	104	106	97	109	106	108	107	119	108
Finland	21 485	119	138	123	137	112	119	84	122	131	124	119	126
Sweden	23 643	104	130	112	109	98	111	61	110	124	113	110	156
United Kingdom	29 879	97	138	83	94	93	98	94	99	100	94	94	129
Norway	26 582	154	221	138	117	118	149	78	142	162	153	157	183
Switzerland	30 567	140	106	115	185	113	110	96	124	132	137	139	201

Source: Eurostat (prc_ppp_ind; earn_nt_net)

Figure 5.11:

Figures in per capita in 2009 (PPS)		
	Net earning	HFCE
Denmark	20 576,78	13 900
Germany	22 702,41	15 500
Spain	19 828,05	13 400
France	20 857,41	14 200
Italy	18 390,81	14 600
Finland	21 484,52	14 000
Sweden	23 643,39	13 400
United Kingdom	29 878,59	16 000
Norway	26 582,14	17 100
Switzerland	30 567,11	18 900

Source: Eurostat (earn_nt_net; nama_gdp_c)