

Barriers to productivity growth in the retail sector

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Authors:
Anders Oskar Kjøller-Hansen
Martin H. Thelle
Erik Lindén

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Chapter 1

Employment and productivity in the Danish retail sector

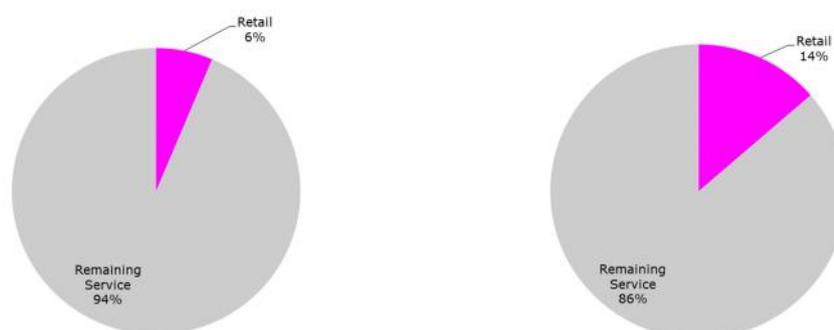
Retail is one of the largest subsectors of the private service in Denmark. In 2011, retail accounted for six per cent of total gross value added in the private service sector, and 14 per cent of the number of hours worked, cf. figure 1.

Correspondingly poor productivity performance in retail has significant impact on the Danish economy. Furthermore, retail is the bridge between private consumers and the rest of the economy and a productivity problem in retail means that households meet higher prices than they otherwise would when they go shopping.

Figure 1 Retail share total private service in 2011

GVA, share of total private service, 2011

Hours, share of total private service in 2011



Source: Statistics Denmark, NATE691, NAT18N

Employment in retail has increased more than in the private sector overall

Total employment in retail has increased from 189,000 in 1995 to 236,000 in 2011 corresponding to a 25 per cent increase over the period, cf. figure 2. In comparison, total employment in the private sector has increased by 7 per cent. The corresponding figures for total hours worked are 17 per cent in retail and 7 in the total private sector.

Box 1 Data sources and measuring productivity

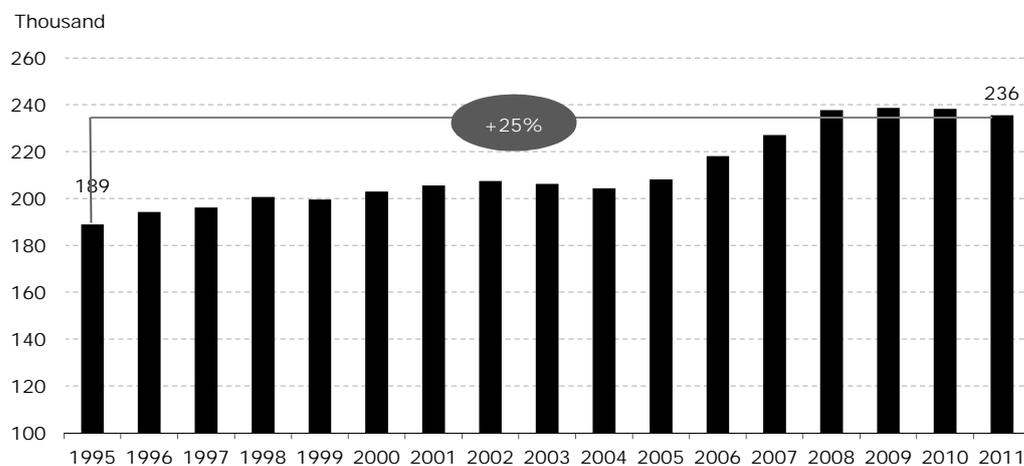
Productivity in this report is hourly labour productivity measured as gross value added per hour worked. This measure does not take into account the amount of other input factors used in production i.e. capital inputs. Preferably one would consider total factor productivity (TFP) which is a measure of how efficiently all measured input factors are used in production.

For the peer group comparisons for total retail sector productivity we use data from two sources. We use national accounts data from Eurostat of gross value added at basic prices and data on total hours worked. For the United States data is from the US Bureau of Labor Statistics. Data from both sources span the period from 1995-2010.

For the productivity development in retail subsectors in Denmark we use national accounts data from Statistics Denmark on gross value added and total hours worked by subsector. This data spans the period from 1995-2007. Likewise employment data for retail subsectors are from Statistics Denmark.

Source: Statistics Denmark, Eurostat National Accounts, the Danish Productivity Commission, US Bureau of Labor Statistics

Figure 2 Employment in retail has increased substantially since the mid-1990s and only declined slightly during the downturn



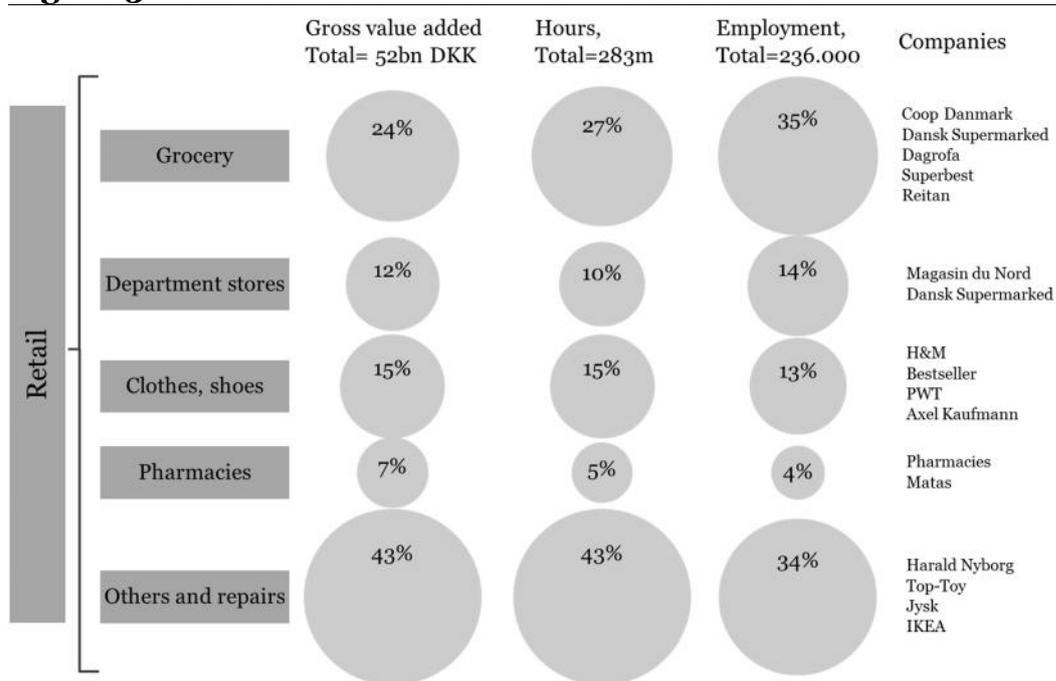
Source: Statistics Denmark, NAT18N.

The retail sector is diverse and can be analysed in five different subsectors

The retail sector is highly heterogeneous since it is composed of all stores that sell products directly to private households. The retail sector is composed by everything from small corner stores (kiosks) to large specialized warehouses such as IKEA and Elgiganten, as well as highly regulated subsectors such as pharmacies. The retail sector can be analysed as five different subsectors, cf. figure 3. Dividing retail in to the five subsectors reveals that:

- The subsector “others and repairs” is the largest in terms of value added and total hours worked accounting for 43 per cent of the total of both value added and total hours worked. This subsector is composed of stores such as Harald Nyborg, IKEA and Top Toy.
- With regards to the number of employees, the “grocery” subsector is larger than “others and repairs” accounting for 35 per cent of the number of employees. This suggests that the number of part time employees is large in the “grocery” subsector.
- The “grocery” subsector accounts for 24 per cent of total valued added and 27 per cent of total hours worked.
- “Pharmacies” is the smallest of the subsectors and account for 7 per cent of total valued added in retail and 5 per cent of total hours worked suggesting that labour productivity is higher in pharmacies compared to the average in retail. This may among other things reflect economic rents created by the quantity restriction regarding the number of pharmacies.

Figure 3 Retail can be divided into five subsectors

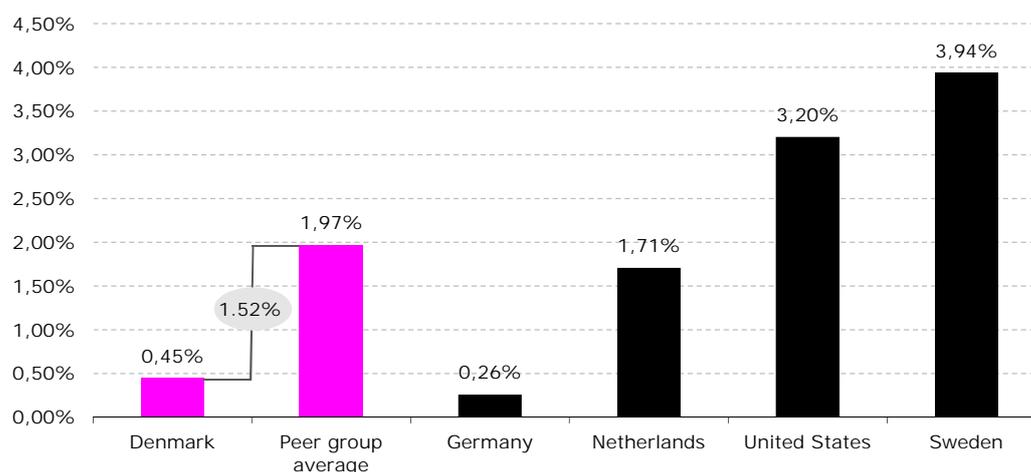


Note: Totals are 2011 figures. Shares of total are based on latest available data (2007).

Source: Statistics Denmark, NAT07, NAT18, McKinsey (2010)

Productivity in the Danish retail sector has developed poorly compared to peer countries since the middle of the 1990s

From 1995 to 2010, Denmark has performed significantly worse on productivity growth than peer countries. In fact average annual retail productivity growth in Denmark was 1.5 percentage points below a peer group average consisting of Germany, the Netherlands and Sweden, cf. figure 4. Looking at peer countries individually Sweden was the best performing country in the group with an average annual growth rate of 3.94%.

Figure 4 Productivity growth relative to peer group, 1995-2010

Note: Peer group consists of SWE, NLD, GER. Data covers NACE classification G47 "Retail trade, except of motor vehicles and motorcycles".

Source: Eurostat National Accounts, the Danish Productivity Commission, US Bureau of Labor Statistics

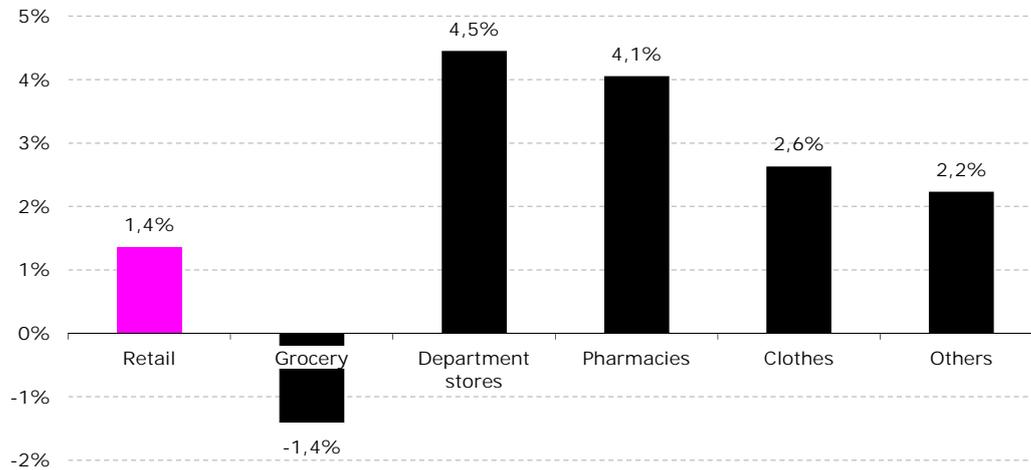
Large differences in productivity performance across subsectors

Between subsectors within retail in Denmark productivity growth also differed dramatically. From 1995-2007 (latest year with detailed subsector data) the grocery subsector saw declining labour productivity of negative 1.4 per cent per year on average, while department stores experienced large positive growth rates. The remaining subsectors "Pharmacies", "Clothes, shoes, etc." and "Others" experienced productivity growth rates between 2.2 and 4.1 per cent per year, cf. figure 5.

The pharmacy subsector is different from the remaining subsectors as it is subject to a quantity restriction set by the Danish Ministry of Health. In recent years it has been an objective to achieve scale efficiencies in the sector and hence reduce the number of pharmacies. Since 1995 the number of pharmacies has decreased from 337 to 316¹ while the number of packages of prescription drugs sold has increased from 40m to 58m indicating a substantial rise in demand that have contributed to high productivity growth².

¹ Danmarks Apotekerforening (2001) p. 23 and Danmarks Apotekerforening (2012) p. 82

² Danmarks Apotekerforening (2002) p. 20 and Danmarks Apotekerforening (2012) p. 73

Figure 5 Real productivity growth by subsector, 1995-2007

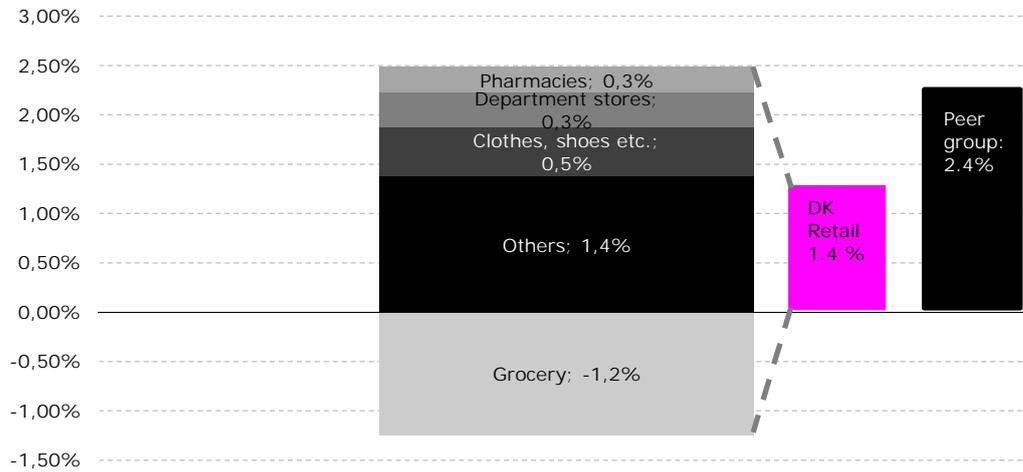
Note: CAGR in GVA per hour

Source: Statistics Denmark, NAT07, NAT18.

In the period from 1995 to 2007 overall productivity in the retail sector grew by 0.89 per cent per year on average while it grew 2.37 per cent on average in peer countries, cf. figure 6. Productivity growth in the period from 1995-2010 was only 0.45 per cent reflecting the poor productivity performance since 2007. Taking into account the size of subsectors and decomposing productivity growth into contributions from subsectors shows that:

- Grocery has due to its size and negative productivity development contributed negatively by 1.2 percentage points to overall retail productivity growth.
- The large category “others” have contributed with positive 1.4 percentage points.
- While pharmacies have seen productivity grow by 4.1 per cent on average per year its growth contribution is only 0.3 due to the relatively low number of hours worked compared to total retail.

Figure 6 Decomposition of productivity growth, 1995-2007



Source: Statistics Denmark, NAT07, NAT18, Eurostat National Accounts

Chapter 2

Barriers to productivity growth

One explanation for slow productivity growth in the Danish retail sector can be regulatory barriers, and while there are certainly other barriers and reasons for slow productivity growth, regulatory barriers is the focus of this report.

Regulatory barriers can limit entry and thereby reduce competition in the sector. Such impediments to competition can reduce the incentive to continually reduce costs, e.g. in order to gain competitive advantage or by having inefficient businesses replaced by efficient businesses.

Furthermore, regulation can lead to unnecessary costs and thereby reduce productivity. In this chapter we identify some important barriers that may affect productivity development in the Danish retail sector and draw on the productivity experience of European peer countries to estimate the potential effect of reducing barriers in Denmark.

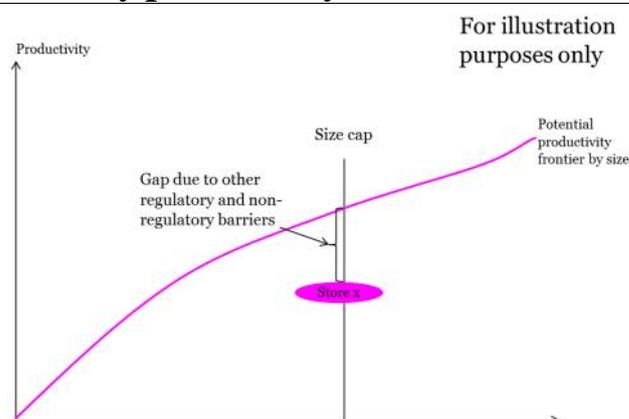
2.1 Barriers to productivity in the retail sector

While many aspects of the retail sector are regulated, a main law governing the sector is the zoning regulation. Generally it determines the size and location of new stores, cf. box 2. Its importance as a barrier to competition and productivity growth is recently discussed in several publications.³

Moreover, the impact of the zoning law is exemplified by the fact that all the 32 Føtex stores built between 2000 and 2010 have been at the size limit.⁴ In this way it may be useful to consider regulatory barriers to productivity growth that are related to economies of scale alone and treat those that have other effects on productivity separately, cf. figure 7. Specifically in chapter 4, we quantify the economic impact of a central barrier that has to do with scale i.e. zoning regulation.

³ ØEM (2009), McKinsey (2010), Konkurrencestyrelsen (2011).

⁴ McKinsey (2010) p. 140.

Figure 7 Productivity potential by outlet size

Source: Copenhagen Economics

A long list of barriers exists that are specific to subsectors within retail, cf. table 1. One such example is the license requirement to own and operate a pharmacy. This license requirement restricts entry and is a typical example of a rent creating barrier. Another example is the restriction on conditioning retail sale of fuels on sales of other products. Table 1 provides an overview of regulatory barriers categorised in to regulation which affect scale (zoning law) and regulation which have other effects (non-scale).

Table 1 Overview of regulatory barriers in the Danish retail sector

Barrier	Type	Subsectors affected	Economic type [Entry (e), cost (c), discriminatory (d)]	Economic effect	Source
Scale					
Outlet size	Scale	All outlets	c, e	Restrict domestic competition and international entry, and hinder economies of scale effects	Planloven
Location	Scale	All outlets	e	Entry barrier, reduce access to store locations and hence competition	Planloven
Non-scale					
Ban on conditioning retail sale of fuels with sale of other product categories	Marketing	Motor fuels	c	Restricting retailers leeway and affecting development of decisions on franchise concepts	Benzinforhandlerkontraktloven
Quantity regulation	License	Pharmacies	e	Less competition resulting in higher consumer prices	Apotekerloven
Location	License	Pharmacies	e	Less competition resulting in higher consumer prices	Apotekerloven
License to operate	License	Pharmacies	e	Barrier to entry reduce competition	Apotekerloven
Regulation on prices	Price	Pharmacies	c	Reduces competition among pharmacies, and may harm consumer prices	Apotekerloven
Required publication of wholesale rebates	Marketing	Pharmacies	c	Conscious parallelism among distributors affecting price setting	Lægemiddelloven

Regulations on prices and fees	Price	Printed media	c	Binding resale prices limits competition
Fixed prices	Price	Tobacco products	c	Government regulated prices restricts competition
Ban on advertising	Marketing	Tobacco products	c	Limit consumer behaviour and competition
International				
Uneven legislation concerning food across EU countries	Product	Grocery	e,d	Limits competition from international distributors and retailers with established distribution channels
Uneven regulation regarding labelling across the EU	Marketing	All outlets (mainly food and personal care products)	e,d	Uneven labelling about products ethical and beneficial characteristics restricts competition between goods and increase consumer information costs

Note: ¹Nordic competition authorities (2005) – Nordic Food Market, a taste for competition p.110

Source: Planloven, Apotekerloven, Konkurrencestyrelsen (2011), Detailhandelsforum (2012), McKinsey (2010), Produktivitetskommissionen

As a supplement to table 1 it is important to mention regulation on opening hours. Since 2000, laws regulating opening hours have gradually been liberalised and in October 2012 the law was changed so that now there are no restrictions on opening hours besides on public holidays. While this regulatory barrier has now been removed it has had an effect on productivity historically and may explain some of the productivity gap presented in chapter 1.

Box 2 Zoning regulation in Denmark (Planloven)

The Danish zoning regulation with regards to retail has the purpose to secure a varied assortment of stores in smaller, medium sized cities as well as in each district in larger cities. Furthermore an objective is to ensure that stores are setup in places with access for all types of road users especially pedestrians, bikes and public transportation in order to secure a sustainable retail structure with limited distances to shopping points.

Generally the law regulates the possible location as well as the size of new stores. The law caps the store size at 3500m² for grocery markets, and 2000m² for other stores. In smaller cities and communities (population smaller than 40.000) the total floor space for retail purposes is capped as well.

Generally this has two effects. The first is on entry and exit due to the regulation on location, which limits competition in the retail sector. Second is the ability of stores to achieve scale effects due to the cap on store size.

Source: Bekendtgørelse af lov om planlægning (Planloven), kapitel 2d.

Summary of regulatory barriers

As presented in table 1 each subsector is regulated by different types of barriers. All sectors are for instance affected by zoning regulation, while only pharmacies are subject to license requirements, cf. figure 8. While some products that are sold in supermarkets, department stores and “other” outlets are subject to marketing and product regulation, for instance tobacco products, the grocery subsector is highlighted because its main product foods face uneven regulation across the EU which affects competition from foreign companies.

Figure 8 Summary of barriers by sector

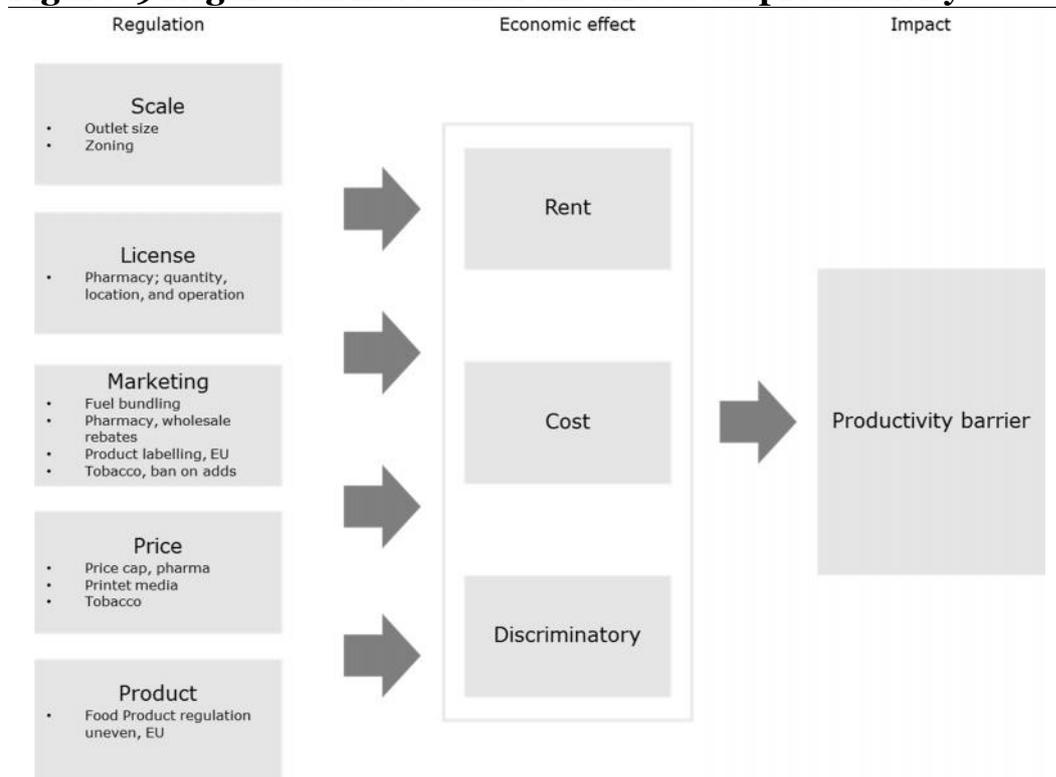
Sector/type	Scale	License	Price	Marketing	Product
Grocery	●			●	●
Department stores	●				
Pharmacies	●	●	●	●	●
Clothing, shoes etc.	●				
Others	●				

Source: Planloven, Apotekerloven, Konkurrencestyrelsen (2011), Detailhandelsforum (2012), Mckinsey (2010), Produktivitetskommissionen

2.2 Effect of barriers

The barriers identified in section 2.1 can be categorized into five different types according to how they affect the retail sector, cf. figure 8:

- Scale (e.g. zoning law)
- License (e.g. pharmacist are required to have a license to operate)
- Marketing (e.g. restrictions on conditioning sale of fuels with other goods)
- Price (e.g. binding resale prices on printed media)
- Product (e.g. food product regulation is uneven across the EU)

Figure 9 Regulation have different effects on productivity

Source: Planloven, Apotekerloven, Konkurrencestyrelsen (2011), Detailhandelsforum (2012), McKinsey (2010), Produktivitetskommissionen, Copenhagen Economics.

Furthermore the economic effect of these regulatory barriers can be divided into three economic types:

- *Rent-creating*: These are barriers that restrict entry and therefore create a rent for incumbents. One example is the quantity restriction in the pharmacy subsector which creates rent for license holders. Another is zoning law which restricts the access to good locations for retailers creating rent for incumbent stores.
- *Cost-creating*: These barriers raise the costs of participating in the market. Among others the required publication of wholesale rebates in the pharmaceuticals market, the cap on store size in the zoning law, and uneven legislation on labelling of products across the EU can be given as examples of cost-creating barriers.
- *Discriminatory*: discriminatory barriers provide some market actors with an advantage compared to others. Here uneven legislation across EU countries with regards to food products and food processing provides an example. This may make it harder for foreign companies to compete in the Danish market.

While a certain regulation can be categorised as being one of these economic types, they need not necessarily be mutually exclusive. For example location restrictions in the zoning law may be rent creating by restricting access to good locations, as well as cost creating by only allowing entry to locations which may be suboptimal from a cost perspective.

Productivity effects of zoning regulation in Denmark

The Danish zoning law (planloven) is a main determinant of the retail market structure in Denmark with its limitation to location and size of new stores, which prevents the entrance of efficient store formats such as hypermarkets, cf. box 1.

Its importance as a barrier to competition and productivity growth is recently discussed in several publications⁵.

The productivity inhibiting effects of zoning regulation include:

- Limited introduction of efficient store formats that allow the sector to achieve productivity improvements through economies of scale and through competitive pressure on existing store formats.
- Low entry and competitive pressure due to limited access to good existing store locations as well as new locations. Limits competition of both new foreign companies and potential domestic entrants.
- Little adoption of new technologies, because fixed costs of investing in IT solutions are relatively large for smaller store formats. Productivity gains related to adoption of IT may therefore partly be held back by zoning regulation.

Deregulating zoning restrictions could involve the following scale improvements⁶:

- Ease of administration of large stores compared to many smaller ones
- Larger sales per customer
- Eased supply management
- Share of space for check, administration, and entrance are lower.
- Stores outside city centres are able to reduce supply costs
- More hypermarkets may improve the case for investing in IT solutions such as electronic price tags and self-service check outs.

Zoning regulation and market structure in Denmark and Sweden

Achieving the aforementioned improvements may contribute to productivity growth in the Danish retail sector. But what is the potential impact on productivity from easing the regulation? Zoning regulation in Denmark and Sweden generally serve the same purpose⁷, but in the provisions governing the retail sector with respect to location and size of new stores the Swedish regulation leaves complete authority to local governments rather than regulating it centrally as in Denmark. This may make it easier for retailers to build large stores in Sweden than in Denmark, and hence contribute to the differences in the retail market structure between Sweden and Denmark. In Sweden each grocery store serves 2850 people on average while the same number is 1750 in Denmark, cf. table 2.

Table 2 DK has more stores and less IT enablement than peer countries

	Denmark	Sweden/peer

⁵ ØEM (2009), McKinsey (2010), Konkurrencestyrelsen (2011).

⁶ Detailhandelsforum (2012) p. 174

⁷ Plan- och bygglag (2010:900), Bekendtgørelse af lov om planlægning, nr 937 (2009).

		group
Persons per grocery outlet, 2007	1724	2857
Share of shoppers who visit grocery stores more than 3 times per week	61	35
Share of companies piloting self-service check-outs	38	77 ¹
Share of companies with electronic price labels	13	25 ²

Note: 1 and 2 are figures for a peer group consisting of Belgium, Finland, France, Germany, the Netherlands, Sweden and the UK

Source: McKinsey (2010), Detailhandelsforum (2012).

Remaining barriers are important as well

Much attention is given to zoning regulation since it is a main determinant of the overall retail market structure. Contrary the remaining identified barriers do not affect the sector to the same extent. The importance to productivity in individual subsectors should not be neglected. For example uneven regulation regarding food products and product labelling across the EU may contribute to lower competitive pressure from international retailers. Furthermore, the limitation on the number of pharmacies in a period of rising demand has contributed to more packages of prescription drugs being distributed by each pharmacy and hence to high productivity growth in this sector.

Non-regulatory barriers

Non-regulatory barriers may also impede productivity growth. These include market size and language barriers in Denmark, which may discourage large retail chains from entering the market. Regulation in the downstream supply chain may also impede productivity growth in the retail sector.

Chapter 3

Case: Retail productivity in Sweden since the early 1990s

The Swedish retail sector has experienced high productivity growth since the beginning of the 1990s. In 1995 Sweden entered the European Union and to integrate Sweden to the new competition law and regulation of the European Union a new competition authority was established. The new competition authority promoted a changed behaviour among policymakers in favour of more competition.⁸

The retail industry has experienced a large increase in productivity during the last 15 to 20 years and this development is rather a result of a change in the structure of the industry caused by a de facto “deregulation” of the market due to more favourable views on competition. The main factors behind the productivity increase are⁹:

- *Intensified national-, international- and potential competition.* Forced the industry to become more efficient, to modernize and adopt new technology. Foreign entrants include Norwegian firms Elgiganten and XXL Sport och Vildmark, German firms Media Markt and Lidl and Danish grocery discounter Netto.
- *Entry- and exit processes.* Unproductive firms are replaced by new highly productive firms
- *Economies of scope.* Small private businesses link up in large chains and become more efficient, by cooperating in purchase, distribution and marketing
- *Economies of scale.* Stores has adopted large format strategies and have become larger both in terms of size and numbers of products, e.g. IKEA, Elgiganten and XXL-sport och vildmark
- *Adoption of new IT-solutions.* Increase efficiency in logistics/distribution through adoption of new information- and communication technology, both in delivery to stores and to customers
- *Efficiency improvements in the chain of delivery.* Larger firms and the concentration of the industry have contributed to disintermediation. Information of demand are directly affecting production and delivery to stores as the whole value chain is in-house
- *New channels of competition.* E-commerce has increased the supply of products to the customers, and service has become a competition tool in stores

Changes in regulations of the Swedish retail market

Between 1992 and 1997 Sweden saw a temporary change in legislation of the zoning law.¹⁰ Before 1992 the municipalities – who administrate the zoning- and construction law in Sweden – had the possibility to oppose new more effective firms to enter the market. This possibility was used to protect the already established industry on the market. In 1992 a change in the legislation was made in order for planning to not restrict competi-

⁸ McKinsey, 2006 pp.119-120

⁹ Institutet för tillväxtpolitiska studier, 2006, McKinsey & Company, 2006 and Orth & Maican, 2012

¹⁰ McKinsey, 2006 pp. 117-118

tion and the municipalities lost some of the possibility to prohibit firms to establish their businesses. This increased the competition as new productive firms entered the market and replaced the less productive firms. In 1997 the pre-1992 legislation was reintroduced and the municipalities re-established their position, but the effects were now different to the situation before the change in legislation. The policy makers had changed their behaviour and found that entry of new firms was in favour to the municipalities, with lower price and higher supply of products. However, today the land use is still regulated, and the municipalities determine, when, where and how large new stores are allowed to be.¹¹

Deregulation of pharmaceuticals. Up until 2009 the pharmaceutical market was tightly regulated, and no entry to the market was allowed. In 2009 the market was deregulated and private firms entered the market. The main goals of the deregulation were to:

- Increase availability of pharmaceuticals
- Increase service
- Decrease price

Effect of the deregulation so far is that the number of pharmacies has increased in total, but the establishment has not increased the availability to the consumers. In May 2012 the number of new actors were approximately fifteen. The main entry has occurred in areas with a high population density, while there has been no entry in the country side. The total increase in the number of pharmacies is 22 per cent. This includes foreign entrants such as Norwegian Apotek 1 and German DocMorris.¹²

The structural changes and the temporary alleviation of the zoning law have resulted in tougher competition in the retail sector where low productivity firms have left the market and been replaced by firms with higher productivity. The number of firms that has left the market is higher than the number of new entrants. Therefore, fewer but larger stores now serve a larger proportion of the population in Sweden.¹³ In line with the decreasing number of stores the number of employees has increased. However, the number of employees has not increased at the same rate as the turnover in the industry, which means that fewer employees serve a large number of customers and the labour productivity has increased over time.¹⁴

There are significant differences in the effects of the structural change of the market in different areas of Sweden.¹⁵ In the period 1996-2009 the number of stores decreased by 16.2 per cent in city-areas with high population density while the number of stores decreased by 35.7 per cent in the areas with low population density in the country side.¹⁶ The sharp decrease in stores in the country side has resulted in a range of governmental programs focusing on a diversified retail sector even in areas with low population density. The programs have the objective to promote availability of public and commercial ser-

¹¹ Orth & Maican, 2012 p. 11

¹² Statskontoret, 2012, pp. 39-41

¹³ McKinsey, 2006 pp. 107

¹⁴ McKinsey, 2006, pp. 113-116

¹⁵ Tillväxtanalys, 2009, pp. 55-56

¹⁶ Detaljhandelsforum, 2012 pp. 131-139

vices to all consumers.¹⁷ Today these objectives are to be achieved by the requirement that each of Swedish regions (läns) have a “regional service program”. A central focus area is increased local participation in public tendering rounds and initiatives to promote access to grocery shopping¹⁸.

Another program is the “local service solutions”¹⁹ program, which focuses on coordination of public and commercial services by placing public service functions in for instance retail outlets.

Even though Sweden have not experienced large deregulations of the retail market during the last twenty years, the large structural changes of the market has improved the productivity in the retail sector. Still there are several regulations in Sweden that restrict entry to the market, cf. table 3.

Table 3 Remaining barriers in the Swedish retail sector

Barrier	Type	Subsectors affected	Economic type:		Economic effect	Source
			rent (r)	cost (c) discriminatory (d)		
Labour legislation(LAS)	Scale	All sectors		c	Decrease flexibility and possibility to adjust the workforce after season and demand	Lagen om anställningsskydd
Zoning legislation(PBL)	Scale	All sectors		c,r	May prevent large store formats, and related efficiency gains for new or expanding firms. Time and cost consuming to firms	Plan- och bygglag

Note: Opening hours is unregulated in Sweden. The only regulated market regarding product is the market of alcohol which is monopolised.

Source: Institutet för tillväxtpolitiska studier, 2006, McKinsey, 2006

¹⁷ Regeringens proposition, 2001/02:4

¹⁸ Regionala serviceprogra. ”Delredovisning” February 2010

¹⁹ ”Lokala servicelösningar”.

Chapter 4

Economic potential of deregulation

From 1995-2010 productivity grew by 3.5 percentage points less in Denmark than it did in Sweden on average and 1.5 percentage points less than the average of a peer group consisting of Germany, the Netherlands and Sweden, cf. figure 3. This chapter estimates the potential of 1) catching up with peer group productivity growth rates and 2) reviving productivity growth from removing the main barriers identified in chapter 2.

“Loss” of DKK 12.5bn from slow productivity growth in retail

If productivity performance had been at the same level as in the peer group output in the Danish retail sector would have been 25 per cent above the level it is today. This corresponds to approximately DKK12.5bn in 2010 (2005-prices), cf. box 3.

Box 3 Estimating the potential of achieving peer group productivity growth rates

The question answered is essentially what would gross value added in the Danish retail sector have been if gross value added per hour had grown at the same pace as in the average of a peer group consisting of Germany, the Netherlands and Sweden and total hours worked had developed as it actually have.

Such an estimate is naturally a simplification and the estimate should be seen as an illustration of the magnitude of the importance of productivity growth in the retail sector.

4.2 The impact of zoning regulation in the UK

A recent study from the Spatial Economics Research Centre at the London School of Economics estimate the effect of zoning regulation on total factor productivity in super markets in the UK.²⁰ They examine the impact of the introduction of more restrictive zoning regulation on productivity based on store level data from a single supermarket chain. The study uses the variation in restrictiveness in planning policy between local planning authorities across the UK and find that the introduction of stricter zoning regulation directly reduces productivity both by reducing store size and by forcing retail onto less productive sites. Using store level data from 2008 they suggest that planning policies have imposed a reduced of productivity by 20 per cent for new stores opened in 2006.

Their estimate have two components; the first component simulates what productivity would have been for a store opened in 2006 if productivity of new stores had continued to grow every opening year, at the same rate after planning policies were introduced as it did in the period between 1966-86.²¹ They then compare the productivity level of this simulated store with the productivity level of a representative store as it was actually was in 2006 and the authors attribute this difference in productivity to the zoning regulation. They find a difference in productivity of 16 per cent. The best fitting econometric model, con-

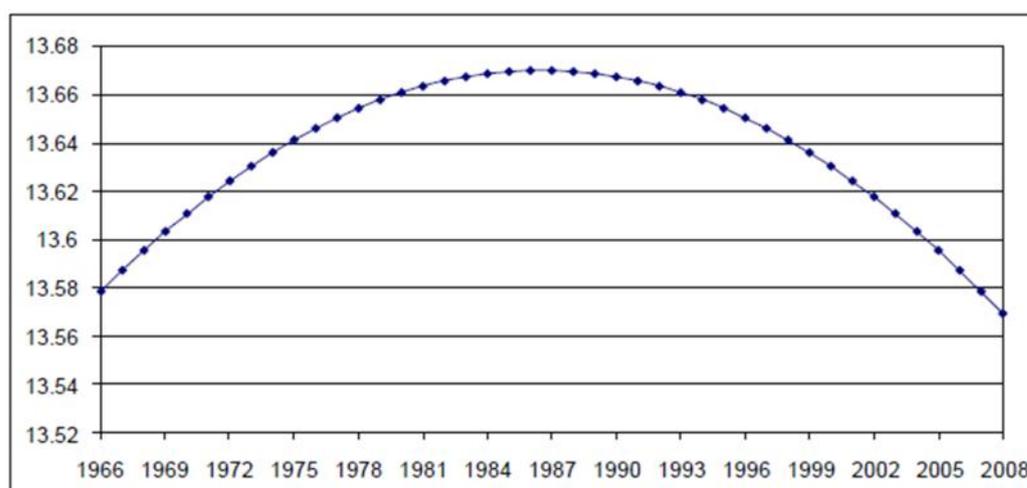
²⁰ Chesire, Hilber and Kaplanis, 2011

²¹ The productivity growth rate was 0.46 per cent per year in the supermarket chain used in the English study.

trolling for observable factors, between store age and productivity used in this first component is presented in Figure 10.

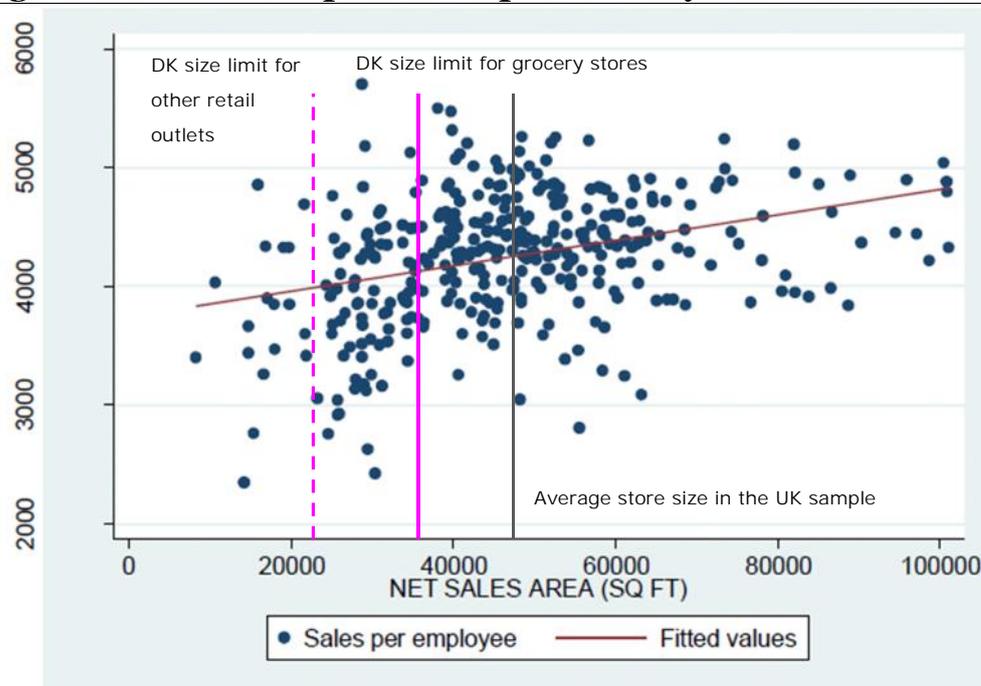
The second component contributes with 4 percentage points and is an estimate of the impact of increasing land prices and reduced store size in the more restrictive planning areas. Here the counterfactual is the average predicted productivity assuming that all stores faced the lowest regulatory restrictiveness observed in the sample. They compare this counterfactual with a representative store located in a planning area with average restrictiveness and find a difference in productivity of 4 per cent. Combined this yields a total negative effect on productivity of the zoning regulation of 20 per cent on a store opened in 2006.

Figure 10 Fitted relationship between productivity and year of opening



Source: Chesire, Hilber and Kaplanis (2011)

Another way to illustrate the effect of the planning policy is to examine the relationship between store size and productivity. The simple relationship between productivity and store size for the stores used in the English study is shown in Figure 11. The vertical lines show the size restrictions in the Danish zoning regulation and the average store size in the UK sample. The mean floor space of the stores in the UK sample is 46710 sq. feet or 4340 m². The maximum store size allowed by the Danish zoning regulation is 3500 m² or approximately 37500 sq. ft., which is lower than the mean store size in the UK supermarket chain. This suggests that the Danish zoning regulation is stricter than the zoning regulation in the UK at least with respect to size of outlets.

Figure 11 Relationship between productivity and store size

Source: Chesire, Hilber and Kaplanis (2011), Planloven

In the UK restrictions on out-of-town retail, developments started to emerge in 1988. “Town Centre First Policies”, as it is called, in their current form were introduced in 1996. The policy forces developers to demonstrate that the local area needs more shopping space and furthermore to demonstrate that there is no suitable site in the town centre. The suitability of sites is determined by Local Development Plans. In this way the planning system is managing the specific sites for development much as the zoning regulation is in Denmark. Effectively the regulation prohibits out-of-town superstores.²²

In Denmark the specific provisions regarding retail were enacted in the zoning regulation in 1997, i.e. one year later than in the UK.²³ This suggests that the accumulated effect of the zoning regulation could be nearly the same in Denmark as in the UK. We assess the economic effect of zoning regulation using the estimates from the UK.

4.3 Long term productivity gain of 13 per cent in the grocery retail sector

When applying the estimate from the UK in calculating the effect of zoning regulation in Denmark several factors are important to keep in mind.

First, the estimated effect is accumulated over a 20-year period and the counterfactual supermarket would therefore not be 20 per cent more productive than a supermarket

²² LSE Centre Piece (2011) p. 27.

²³ Miljøministeriet (2002) p. 9.

opened before 2006 as the effect on the newest grocery outlets is larger than on outlets opened when the zoning laws was first introduced. This also implies that the effect of the zoning law is increasing over time according to the UK study. Hence the time horizon in which a 20 per cent productivity gain could be achieved is uncertain. Here we examine three scenarios with different transition periods of 7 years, 15 years and 20 years respectively. The length of this transition period would depend on the rate at which the grocery retail sector adapts to the new regulatory environment, and be influenced by among other things how and whether domestic and foreign retailers choose to compete in the hyper-market segment.

Second, it is not straightforward what share of the retail sector is affected. The UK study estimates the effect on the average grocery outlet in a chain of grocery stores. Here we assume that the regulation affect the store formats *supermarkets* (35 per cent of revenue) and *superstores* (23 per cent of revenue)²⁴. Together these store formats account for 58 per cent of grocery retail revenue and thus we assume that the gains could be realised in 58 per cent of the sector.²⁵

The UK study included two effects. One was an average effect on productivity and the other a location effect.²⁶ We assume that the location effect of 4 per cent also appears in the discount segment which accounts for 29 per cent of grocery retail revenue in Denmark.

Based on these assumptions the total long-term effect of removing the regulation would be a productivity gain of 13 per cent in the grocery retail sector. Depending on the speed at which this potential can be reaped this corresponds to between DKK 0.5bn and DKK 1.6bn in 2020, cf. Table 4. For further details on the calculation, please refer to Box 4.

Table 4 Effect in 2020 under three scenarios

	Scenario 1	Scenario 2	Scenario 3
Productivity index in 2020, 100=base scenario	113	106	104
DKK billion (2005-prices)	1.6	0.8	0.5

Note: Scenario1: 7-year transition period, Scenario2: 15 year transition period, Scenario3: 20 year transition period. The effect is calculated using number of hours worked in 2010 and the productivity index for 2020 calculated under the three scenarios.

Source: Statistics Denmark, Chesire, Hilber and Kaplanis (2011), McKinsey (2010), Copenhagen Economics

²⁴ Supermarkets operate between 400 and 2500 sq.m and superstores operate between 2500 and 5000 sq.m. McKinsey (2010) p. 124

²⁵ These store formats account for a much larger share of sales.

²⁶ This effect was the difference between the least restrictive areas and the average restricted area.

Box 4 Calculating the potential

The estimate of the effect of zoning regulation in the UK had two components. First an average effect of 16 per cent (we call this the size effect) and second a location effect of 4 per cent between the average and the least restrictive planning area (we call this the location effect).

We calculate the potential in 2020 in three steps:

- First we determine the share of the grocery retail sector which is affected by changing zoning regulation. We suggest that the supermarket and superstore segments, constituting 58 per cent of the sector, are affected by both the size effect and the location effect of the zoning regulation. Furthermore, we assess that the discount segment, 29 per cent of the sector, is affected by the location effect, but not by the size effect as discounters usually operate at store sizes below the limit in the zoning regulation (part of the discount segment could be affected if consumers substituted away from the discount segment to larger and cheaper supermarkets/superstores). We assume that neither the hypermarket segment (7 per cent) nor the convenience segment (5 per cent) is affected by the zoning regulation.
- Second we calculate a productivity index for the grocery retail sector without zoning regulation. Each of the grocery retail segments is assumed to have index 100 initially. For each sub segment we calculate an index without zoning regulation assuming that the effects are as determined in step 1. Based on segment shares we calculate the impact on the total grocery retail sector. This is calculated for three different transition periods for effects to be achieved. We call these scenario1, scenario2, and scenario3. In scenario1 there is full effect in 2020, in scenario2 half of the impact is achieved in 2020 and in scenario 3 one third of the effect is achieved in 2020. The long term effect, equivalent to scenario1, is estimated to be 13 per cent or index 113.
- Third we estimate the impact in DKK by calculating the difference between GVA corresponding to each of the three scenarios and a baseline with index 100 for 2010 grocery retail productivity. We use the number of hours worked in grocery retail in 2010.

We arrive at a long term impact in scenario1 of DKK 1.6billion.

Source: Eurostat, McKinsey (2010), Copenhagen Economics.

If productivity gains of this magnitude were not only achieved in the grocery subsector, but also in other subsectors the potential effect of deregulation would be higher. It is likely that changes to the zoning regulation would reach beyond the grocery subsector. The current zoning law in Denmark is also limiting the entrance of out-of-town shopping centres and non-grocery retailers of for instance furniture and electronic equipment. Hence our estimate is conservative and underestimates the impact of the change.

The estimates are naturally subject to uncertainty. First, we assume that the effects of zoning regulation are the same in Denmark and the UK. This might not be the case, and since the UK zoning regulation appears to be less strict than the Danish, this might contribute to an underestimation of the impacts. Second, the time horizon during which the retail sector can adapt to the less strict zoning regulation is uncertain, and changes may occur more rapidly than in the above scenarios.²⁷ Third, the estimate is static in the sense that it does not consider what will happen to the use of input factors such as labour if

²⁷ The replacement of existing retail stock and entry of new firms is considered a main driver of US retail productivity growth during the 1990s; see Haltiwanger et al (2005).

zoning regulation was removed. This would likely be lower as retailers will substitute away from this input factor.

This being said there are reasons why the potential could be even bigger. First, when calculating the counterfactual in the UK study, productivity is assumed to grow at a rate similar to the rate before zoning regulation was introduced in the UK. The productivity performance of the U.S. grocery retail sector suggests that productivity could in fact have grown even faster. From 1990 to 2000, total factor productivity (TFP) grew by 3 per cent per year on average in the U.S. retail sector.²⁸ Second, the estimate applies the average level of regulatory restrictiveness of all stores in the sample. In Denmark the size-cap is set by central government and may therefore reflect a stricter regulatory environment than in the average in the UK as suggested in Figure 11.

Remaining regulatory barriers cannot alone explain the productivity gap

In chapter 2 we identified a range of barriers that may impede productivity growth in the retail sector, cf. table 1. Of these, zoning regulation seems to be the most significant barrier. Still the total gap in productivity growth between Denmark and peer countries cannot be accounted for by the zoning regulation alone. Neither can the removal of all identified barriers be expected to deliver peer country productivity growth rates. First the list of regulatory barriers is not exhaustive and secondly other barriers such as general business regulation and framework conditions play an important role as well. These include, but are not limited to, country specific barriers such as country size, language barriers, wage levels, taxation, environmental regulation etc.

Political objectives must be taken into account

One of the objectives of the zoning regulation is to limit the travel distance to retail stores. Relaxing the zoning regulation and adoption larger store formats could imply longer distances to the nearest outlet. A recent estimate is that the establishment of 10-25 hypermarkets together with 80 new superstores will result in the closing of 300 to 800 smaller outlets.²⁹

Opponents of a deregulation of the zoning law argue that a deregulation may lead to adverse effects in terms of abandoned midtowns, negative environmental impact, and a risk of market concentration.³⁰ A forum of interest organisations from the retail sector, consumer organisations (*Detailhandelsforum*) has delivered a report to the Minister for Growth and raised the concern that competition may in fact decline following a deregulation and entrance of hypermarkets as the large Danish grocery conglomerates may be the only actors in the hypermarket segment. *Detailhandelsforum* suggests that increased competition would require that foreign chains enter Denmark and that due to the limited market potential large international chains may not be willing to pursue the investment and hence that there are no guarantees that foreign chains would enter the market if the zoning law was deregulated³¹.

²⁸ Blanchard (2003) p. 9

²⁹ McKinsey (2010)

³⁰ *Detailhandelsforum* (2012) p. 186

³¹ *Detailhandelsforum* (2012) p. 183

Whether this concern is valid is not straightforward. For instance Slovakia which has approximately the same population as Denmark is home to both Carrefour and Tesco hypermarkets. Furthermore foreign retailers who operate with discount store formats such as Lidl and Aldi (German) are present in Denmark, cf. table 4. In addition the Danish Competition and Consumer Authority has recently argued that the zoning regulation practically provides Bilka with a position as the only company operating within the hypermarket segment since Bilka currently operates 15 stores between 6,500 m² and 15,000m² and entry is restricted into this segment.³²

Table 5 European presence of international grocery retailers

	Large scale formats		Discount/small scale formats	
	Carrefour	Tesco	Lidl	Aldi
Germany			x	x
France	x	x	x	x
UK		x	x	x
Italy	x		x	
Spain	x		x	x
Poland	x	x	x	x
Greece	x		x	
Hungary		x	X	x
Belgium	x		X	x
Portugal	x		X	x
Czech Republic		x	X	
Sweden			X	
Denmark			X	x
Slovakia	x	x	X	

Source: CE analysis based on company websites.

4.4 Conclusion

There is a significant economic potential to the benefit of Danish consumers from closing the productivity gap between Denmark and peer countries in the retail sector. If the Danish retail sector had experienced productivity growth rates similar to those in peer countries since 1995 valued added in retail would have been DKK 12.5bn higher than it was in 2010.

Achieving peer country productivity growth rates is not straight forward, but the Danish zoning regulation seem to be a main barrier to achieve this goal due to its effects on entry and realizing economies of scale in the retail sector.

One instrument in closing the productivity gap could be to decentralize the zoning laws and give more authority in decisions on location and size of new stores to local govern-

³² The Danish Competition and Consumer Authority (2011) p. 58

ments. Whether this will increase productivity is naturally uncertain as it depends on the decisions of local authorities. It may though contribute to productivity gains of the types seen in Sweden since 1995, as identified in section 2.3, i.e. the adoption of more productive store formats, increased deployment of new technologies, introduce more competition both locally and from international markets and contribute to the development of more efficient supply chains.

We estimate that removing zoning regulation could contribute between DKK0.5bn and DKK 1.6bn in 2020 in the grocery retail subsector alone.

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