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Parallel imports of pharmaceuticals in Denmark, Germany, Sweden and the UK, 2004-2009

An analysis of savings

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Executive summary

This study presents an overview of savings generated as a result of parallel imports (PI) in four long established PI markets - Germany, Denmark, Sweden and the United Kingdom in the years 2004-2009. The data for these markets were supplied by the EAEPC through country representatives (with additional data for Denmark from 2010) and constitutes a follow-up to a similar study undertaken in 2006[1].

The reports key findings are as follows:

- The total direct savings for the period 2004 to 2009 in the four countries amounted to €2.5 billion, corresponding to average annual direct savings from PI for the period of €418 million.

- Direct savings were at their highest in 2007 totalling €448.4m. The highest savings generated in any of the markets covered was in Germany in 2009, where total direct savings amounted to €289m.

- In the Scandinavian markets, indirect savings have increased since 2004, with these now contributing a larger share to total estimated savings: 46% in Denmark and 36% in Sweden in 2009, compared to 37% and 27% in 2004, respectively.

- Established non €-zone markets such as the UK and Sweden have seen the savings generated by PI on their domestic market decrease in recent years due to the appreciation of the € against the £ and the SKr respectively.

- The financial crisis has impacted on savings ratios. Manufacturers, under pressure from governments to keep healthcare costs down, have lowered prices, compressing PI margins and their contribution to savings. Separately, the impact of newly introduced health policies in Denmark and Sweden has encouraged manufacturers to lower their prices, thus diminishing the impact of savings sustained through PI.

- Government policy has had an effect on the impact of savings generated by PI and to whom eventual benefits will be accrued. In Germany, for example, the Government requires that a given percentage of the pharmacies' turnover comes from PI products, whilst in the UK, a clawback system provides incentives for pharmacies to dispense PI medicines to improve their margins.

[1] *The Economic Impact of Parallel Import of pharmaceuticals,* Ulrika Enemark, Kjeld Pedersen & Jan Sørensen, University of Southern Denmark, 2006.

Introduction

Parallel distribution in pharmaceuticals is an important concept, which is surrounded by controversy, partly due to differences in stakeholder interests and partly due to the limited attention given to the issue in the theoretical and empirical literature.

It is essentially an arbitrage business that takes advantage of the price differentiation practiced by the pharmaceutical industry; resulting in different prices for the same goods in different countries. The welfare effects of parallel distribution in pharmaceuticals have been long disputed but economic theory suggests that the short-term effects of allowing parallel distribution stimulates direct savings to purchasers of pharmaceuticals in importing countries as PIs are sold at a lower price than the originator price.

To the extent that the originator manufacturer responds to potential or actual competition from PI by changes in the pricing strategy of its medicines, additional short-term savings may occur. Indeed, the increased competitiveness of the market brought by PI may result in a decrease in originator price or a limit on price increases. In this case, savings will not only be limited to the consumption of PIs, but will also occur in relation to consumption of originator products. The magnitude of such indirect savings depends on the total volume of products in the market as well as the degree to which manufacturers respond to increased competitive pressure.

Depending on the arrangements for reimbursement, savings may benefit the user directly (e.g. when medicine co-payment is related to price) or indirectly through a reduction in third party drug expenditure, thus allowing resources to be used for other purposes of benefit to end users.

In this regard, the objective of this report is to study the development in savings due to PI, in the period 2004-2009 in four countries with mature markets for parallel distribution in pharmaceuticals: Denmark, Sweden, Germany and the United Kingdom. The aim is to analyse whether market penetration of parallel imported medicines has deepened in comparison with the previous study undertaken by Professor Pedersen in these four markets in 2006.

The 2006 study concluded that, in 2004, direct savings to patients and third party payers in the four mature PI markets amounted to €442 million, with indirect savings in Denmark and Sweden amounting to an estimated €25 million.

Methodology

There is an academic debate in the empirical literature as to whether PI does in fact generate savings. In 2006, Professor Pedersen undertook a study to assess two contradicting studies on this issue - the York and LSE studies. While the York study concluded that PIs generate savings, the LSE study, on the contrary, argued that benefits to patients and healthcare systems were negligible. Using a methodology similar to that of the York report, the 2006 study found that parallel distribution generates considerable savings[2]. This present report builds upon the findings of the 2006 report, using the same methodological approach to calculate savings in the four markets.

For Denmark, Germany and Sweden, direct savings were calculated by multiplying the actual quantities of PI products sold by the difference in retail price between originator and PI products. Only packages of the same size (or close to the same size) of originator companies were included, thus savings may be larger if originator products are replaced by PI of different sizes.

Calculations for direct savings are based on IMS or IMS-equivalent data from these four markets. Indirect savings were calculated by using savings generated by the price reductions of originators due to competition from cheaper PI versions of the same drug.

For Denmark and Sweden all PI products in the market as of 1st May each year, or those products which entered the market during that year, were included. For Denmark, the savings are calculated against the price list published every two weeks by the Danish Medicines Agency, DKMA. For Sweden the comparison is made with end of year originator prices in the previous year. In a situation with aggressive price competition in the previous year, this may result in an under-estimation of the savings actually related to PI.

For Germany, direct savings were calculated based on monthly data for quantity and the price at which PI are sold by the six largest PI companies (with a cumulated market share larger than 88% in 2007) and extrapolated to the entire market. Data were based on IMS (sales data), IFA (public databank of the German Pharmacy Association) and GAmSi (public databank of the Association of German health insurers). All prices used were pharmacy sales prices inclusive of VAT.

In the UK, the country's National Health Service (NHS) reimburses pharmacies an identical amount for the same products irrespective of whether they are originator or PI products. Savings are instead realised through a clawback system, in which the NHS retains a percentage from the prescription turnover of each pharmacy, which delivers the savings directly to the UK government's treasury. The clawback rate is 10.44%. Savings were therefore estimated based on the total sales of PI medicines and the realised clawback percentage for each year.

[2] Pedersen et al, 2006

Currency conversions in the study have been made using average annual exchange rates reported by the Central Banks of Denmark, Sweden and the UK and the ECB.

Additionally, an auditing company certified data from Denmark and Sweden, and cross-checking with official sources of information was undertaken on a sample basis, e.g. the Danish Medicine Agency and the Swedish Pharmaceutical Benefit Board (Deloitte 2004-09). In the case of Denmark, additional data provided for 2010 was assessed by the auditing firm Medica Consult[3].

[3] See website of the Danish PI association : http://pfldk.dk/

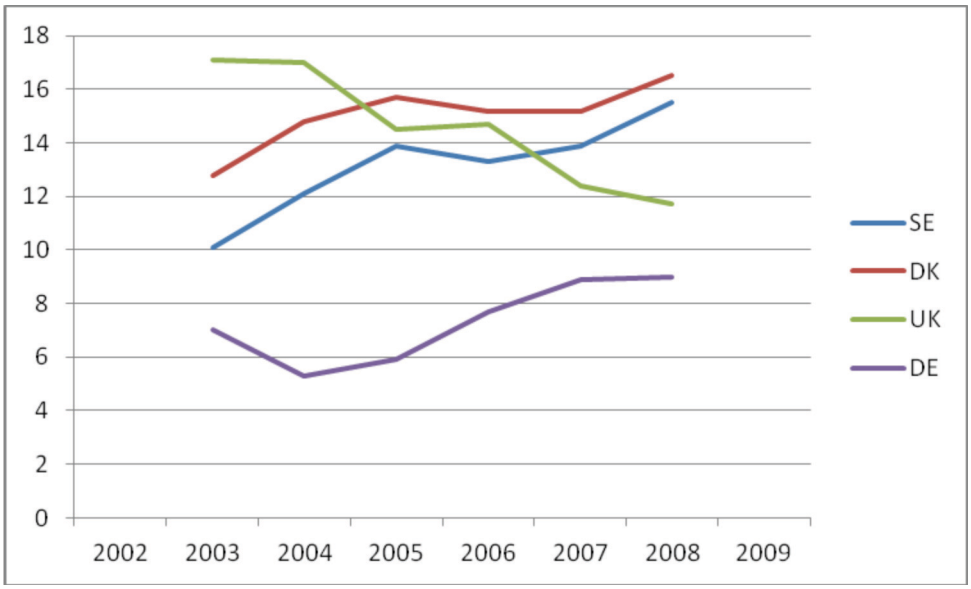
1. Analysis of results

1.1 Market penetration

The share of PI in Denmark, Germany, Sweden and the UK in 2003-2009 varied between 7% and 19% (EFPIA 2005-10). The UK market for many years has had the highest level of penetration of the four countries studied, with 17% in 2003. The PI market shares have, however, followed a downward trend since 2004 (see Figure 1) and in 2008 PI were estimated to account for 12% of the pharmacy market sales (excl. hospital market) (EFPIA 2010).

Likewise, PI has existed in Germany for several decades. In the period 1998-2009, the market shares of PI in the total pharmacy market sales increased from less than 2% to 11% and the average PI market share in Germany for the 20 drugs with the largest turnover is around one third. (VFA 2010)

Figure 1. Share of parallel imports in pharmacy market sales (excluding hospital markets) 2003-2008.



Source: EFPIA 2005-2010.

In Denmark, the first approval for PI was given in 1990 and since then marketing permission has been granted for 6-8,000 products in the country. During the period 1998-2004, the share of total drug expenditure spent on parallel imported products remained more or less constant at slightly above 12% of total sales of prescription and non-prescription drugs in the primary health care sector. Since 2004 this percentage has been increasing, reaching 16% in 2009 (Danish Medicines Agency 2010). The expenditure on parallel imported medicines in the hospital sector in the period covered amount to only 2% of total expenditures on drugs in the hospital sector (Danish Medicines Agency 2010).

The first parallel imported drug was available on the Swedish market in 1997 and sales have subsequently increased rapidly. A 2% market share in 1997 had increased to 6% by the following year. In the year 2000 the market share of parallel imported products was 9%, reaching 12% in 2006-07 (Fakta 2009). However, by 2009 it was back to 8% of total Swedish pharmaceutical sales (Fakta 2010), whilst the PI market shares of the 10 largest-selling PI substances in 2008 ranged between 37% and 95% market penetration (EAEPC data).

1.2 Direct savings

The total direct savings for the period 2004 to 2009 in the four countries amounted to €2.5 billion, corresponding to average annual direct savings from PI for the period of €418 million. The direct savings were highest in 2004 and 2007.

In 2004, the direct savings from PI of drugs in the four countries covered, amounted to an estimated €442 million. In 2005-06 the estimated direct savings were almost 10% lower than in 2004, but in 2007, savings climbed back above the 2004-level. The increase in savings did, however, not continue, and in 2009 the direct savings had declined to below 2005 levels, see Table 1.

Table 1. Estimated direct savings from PI 2004-09. In € Million.

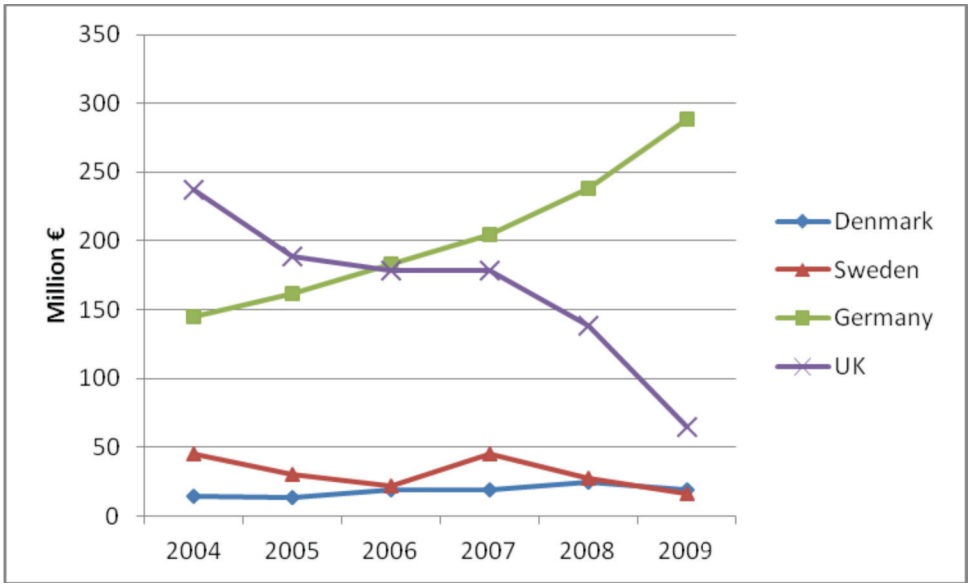
	2004	2005	2006	2007	2008	2009
Denmark	14,2	13,8	18,9	19,4	24,4	18,9
Sweden	45,3	30,3	22,1	45,4	27,4	16,7
Germany	145	162,0	183,3	204,7	238,0	289,0
UK	237	188,6	178,5	178,9	138,0	65,2
Total	441,5	394,6	402,9	448,4	427,5	389,8

(additionally, in Denmark, for 2010 direct savings were calculated at DKK129.7m/ €25.62m[4])

Direct savings varied dramatically between countries over time (see Figure 2), and have increased over the five-year period in Denmark and Germany and decreased in Sweden and in the UK. While direct savings doubled in Germany and increased by a third in Denmark, Sweden and the UK saw a reduction of around two thirds during the period 2004-2009. These differences can mainly be explained by the different regulatory environments in the four countries which provide different incentives for prescribers, dispensers and consumers and hence different demand for PI products. There are, however, other driving factors: The weakening of the currencies in Sweden and the UK in 2008-09 negatively affected the profitability of imports and the sourcing capability of parallel distributors. In Sweden a relatively aggressive price competition in 2008 resulted in low end of year prices, which are used for calculating the 2009 savings. If 2007 end of year prices had been used, then the estimated direct savings for 2009 would have increase by almost 10%.

[4] Press Release by the Danish Parallel Distribution Association, Parallelimportørforeningen Af Lægemidler**,** 13 May 2011, http://pfldk.dk/

Figure 1. Direct savings from parallel import of pharmaceuticals 2004-09.



In Sweden as well as in Denmark, the bulk of direct savings are derived from a narrow number of drugs, thus reflecting a very concentrated market, cf. Table 2. Furthermore, in 2004 the same four product groups[5] were in the top-five rankings of savings in both Denmark and Sweden.

Table 2. Percentage contribution of top ten and top five PI drugs to total direct savings, Denmark and Sweden 2004-09.

	Top ten drugs			Top five drugs		
	2004	2006	2009	2004	2006	2009
Denmark	70	75	63	60	56	49
Sweden	64	65		48	45	43

In 2004, half of the direct savings in Sweden were due to five drugs and ten PI product groups accounted for almost two thirds of the estimated direct savings, cf. Table 2. For Denmark the concentration appears to be even higher with 60% of savings being made on five products only. Over the years 2004 to 2009 there has, however, been a clear downward trend in the share of savings that can be attributed to the top five or top ten drugs. The direct savings thus rely on a broader set of products, possibly indicating a more diversified market.

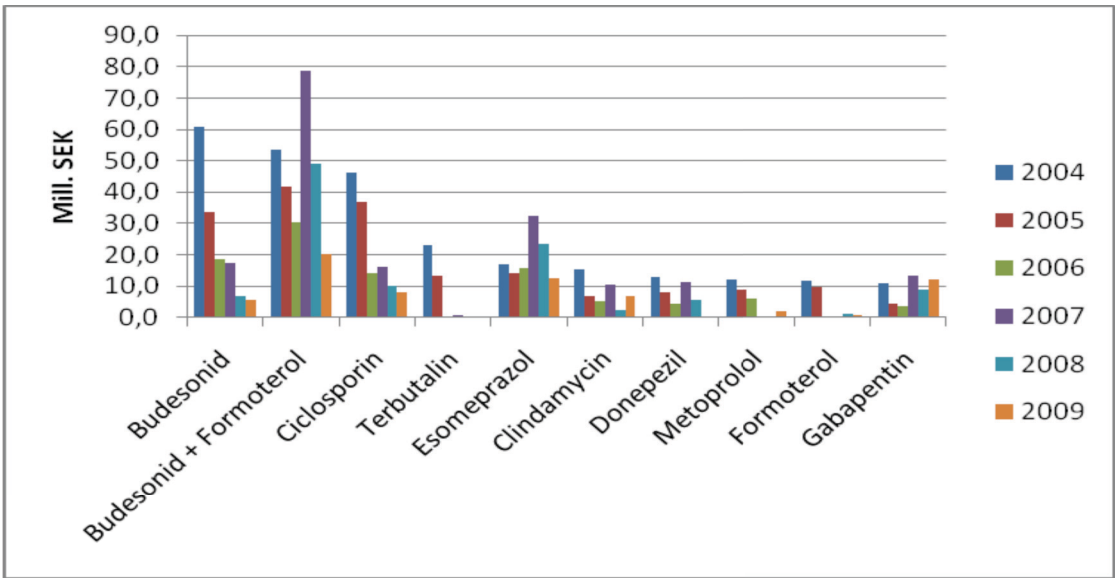
In both countries, three drugs have been among the top four 'savings generating' drugs during the period 2004-06 reflecting some stability in the market. Nevertheless, direct savings of specific products tend to reduce over time.

[5] A product group is defined by the six digit ATC code and includes products with same active ingredients but in different packages and concentrations.

Figure 3 shows the development in direct savings for the ten drugs that generated the largest direct savings in Sweden in 2004. Except for Ezomeprazol, Budsonid & Formetorol and Gabapentin, for which the direct savings have increased, savings generally decreased for all products in Sweden. A similar picture is found in Denmark.

While the ten products with the highest direct savings in 2004 accounted for 64% of savings, the same products accounted for only 39% of the savings in 2009. The top five products which generated the highest savings accounted for 48% of savings in 2004, but only 26% of savings in 2009. Combined with a continued relatively high overall market share, this would suggest a continuous shift to products with higher potential for arbitrage. The decrease in direct savings of a specific product over time may reflect either a downward response to the competitive pressure on originator prices, leaving fewer margins for maintaining the initial price difference or, alternatively, a price-following response by parallel importers, setting prices close to the originator price to increase surplus; or a combination of both.

Figure 3. Direct savings 2004-09 for products on the 2004-top ten savings list in Sweden.



1.3 Indirect savings

Indirect savings have been estimated in the cases of Denmark and Sweden, cf. Table 3. The balance between direct and indirect savings has shifted, with indirect savings contributing a larger share of total estimated savings, 46% in Denmark and 36% in Sweden in 2009, compared to 23% and 8% in 2007 at the lowest, but also higher than in 2004, when they were at 37% and 27%, respectively.

Table 3. Direct and indirect savings related to parallel import of medicine in Denmark and Sweden 2004-2009.

	2004	2007	2008	2009
Denmark				
Direct savings (millions DKK)	106	151	153	141
Indirect savings (millions DKK)	62	45	113	120
Indirect savings of total (%)	*37%*	*23%*	*42%*	*46%*
Sweden				
Direct savings (millions SEK)	411	422	263	177
Indirect savings (millions SEK)	150	35	121	100
Indirect savings of total (%)	*27%*	*8%*	*32%*	*36%*

(Additionally, in 2010, total savings in Denmark from PI, amounted to DKK 190.7m, with direct savings amounting to DKK 129.7m and indirect savings amounting to DKK 61m).

The ten parallel imported product groups that generated the largest direct and indirect savings in Denmark in 2009 are shown in Table 4. 63% of the direct savings are derived from only ten product groups. The indirect savings are even more concentrated, with half of all indirect savings being due to three products only and with ten product groups accounting for 80% of all indirect savings. In other words, the indirect savings seem to be due to a dramatic response to competitive pressure by a few original producers. As mentioned previously, the use of end-of-year prices for Sweden may result in an under-estimation of the savings. If end-of-2007 prices are used to estimate savings in 2009, indirect savings would increase by more than 130% and total savings (direct and indirect) would increase by 53%.

Table 4. Top ten list of products by ATC group with highest direct and indirect savings in Denmark, 2009.

Direct savings				Indirect savings			
ATC	Product group	Mill. DKK	Pct	ATC	Product group	Mill DKK	Pct
c09da01	Losartan and diuretics	17,8	13%	c09da01	Losartan and diuretics	20,8	17%
n05ah03	Olanzapine	17,3	12%	c09ca06	Candesartan	20,6	17%
c09ca01	Losartan	14,7	10%	c09ca01	Losartan	19,9	17%
r03ak07	Formetorol and other drugs for obstructive airway diseases	11,5	8%	c09ca04	irbesartan	8,4	7%
c09ca06	Candesartan	9,1	6%	n04ba03	Levodopa mm	7,9	7%
c09da03	Valsartan and diuretics	5,1	4%	a10ac04		4,8	4%
c10ax09	Exetimibe	3,6	3%	r03ba05	Fluticasone	4,1	3%
a10ac01	Insulin (human)	3,4	2%	c09da04	Irbesartan & diuretics	3,6	3%
c09da06	Candesartan and diuretics	3,3	2%	n04bx02	Entorpone	3,1	3%
r03ac12	Salmeterol	3,2	2%	r03ac12	Salmeterol	2,6	2%
	Subtotal	88,9	63%		Subtotal	95,8	80%
	Others	51,5	37%		Others	24,1	20%
	Total	140,4	100%		Total	119,9	100%

As can be noted from Table 4, some products are the source of both considerable direct and indirect savings. For example Losartan (ATC C09CA01) and diuretics (ATC C09DA01) are both at the top of each list accounting for total estimated savings of 35 million DKK and 39 million DKK respectively. Other product groups appear to give rise to predominantly one type of saving, e.g. either predominantly direct or indirect savings.

Table 5 shows the direct and indirect savings of three types of products (selected from Table 4), in terms of the mix of savings (high direct and indirect savings; high direct savings, low indirect savings; low direct savings, high indirect savings). The figures indicate that the response to competitive pressure from PI has been quite different across these product groups.

Table 5. Estimated direct and indirect savings for selected PI products. Denmark, 2009. Millions DKK

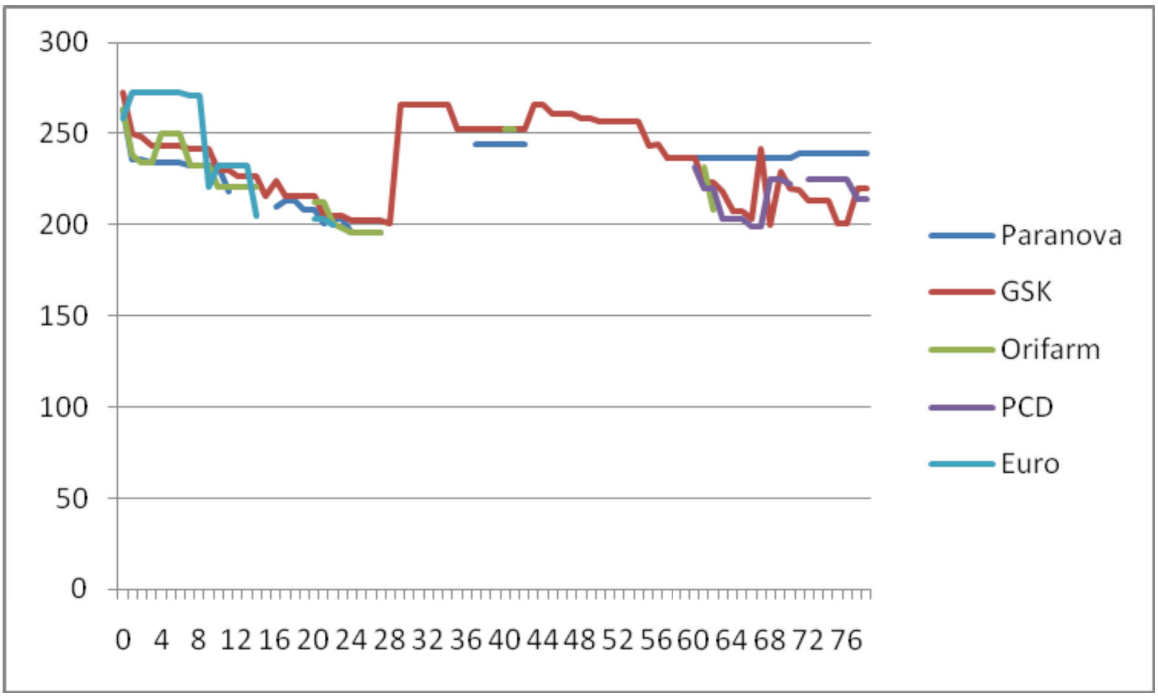
ATC		Direct savings	Indirect savings
c09da01	Losartan and diuretics	17,8	20,8
c09ca01	Losartan	14,7	19,9
n05ah03	Olanzapine	17,3	0,8
r03ak07	Formetorol and other drugs for obstructive airway diseases	11,5	0,9
c09ca04	Irbesartan	2,4	8,4
n04ba03	Levodopa &	0,1	7,9
r03ba05	Fluticasone	1,1	4,1

For the first group we expect that the originator price has been reduced in response to increased competition from the parallel imported medicine, not always all the way down to the level of the price for the parallel imported medicine and in some cases the parallel importers have responded by also reducing their prices. For the second group, the originator price may largely be unaffected by the entry of the parallel imported products. For the third group we expect that the originator price has been reduced in response to competition and the PI product has subsequently either left the market or chosen to follow the originator price.

An examination of the price development of selected products in this product group largely supports this interpretation. Figure 4 and 5 show the development in the price of Flixotide Inhalation Powder (250µg/dos 60dos+diskh) and Stalevo Tablets FC (12,5+50+200mg 100 pcs) belonging to the product groups Fluticasone and Levodopa. In both cases the PI companies put their price just below that of the originator price (GSK; Orion). The originator price has subsequently been reduced and the PI price has also subsequently decreased.

In the case of Flixotide, at the beginning of 2007 three PI companies competed against the originator. The originator initially reduced the price from 273 DKK to 250 DKK and then gradually down to 200 DKK, i.e. a reduction of 27%, as the PI companies followed suit. Only one PI company was left towards the end of 2007 and when it left the market, GSK increased the originator price back to its initial level. When a couple of PI companies re-entered the market, GSK appeared to intend to go through the same process; it was again forced to make significant price cuts.

Figure 4. Development in the fortnightly price (in DKK) of Flixotide Inhalation Powder (250µg/dos 60dos+diskh)supplied by different suppliers 2007-2009.



Note: Fortnightly observations 1= 5/1 2007.

2. Country specific analysis

2.1 Denmark

There is in principle free pricing for pharmaceutical products in Denmark but since medicine is heavily subsidised by the government, the reimbursement system is of major importance to the profitability of the pharmaceutical sector. The Danish Medicines Agency determines reimbursement levels and general reimbursement is granted for products "with a certain and valuable therapeutic effect when used for a well-defined indication" (Ministry of Health and Protections 2008). Furthermore, the price of the product must be "proportionate to the effect compared to other reimbursable drugs" (MHP 2008) and in order to justify a price at launch, the company launching the drug can voluntarily submit a pharmaco-economic evaluation to the national authorities (justifying the price).

The increase in PI savings in Denmark from 2005 onwards has been stimulated by three changes that occurred in April 2005.

Firstly, the scope for generic substitution of originator products was increased. From a previous situation in which doctors could indicate that substitution was allowed, the pharmacy had from then onwards to always inform the patient about a cheaper alternative and offer a low cost alternative product, unless the doctor prescribing the medicine had specifically indicated "no substitution" on the prescription. In this scenario in Denmark, the patient can still decide against substitution but will have to pay the price difference.

Secondly, the reference price for the reimbursement of drug costs was changed from a European average price to the price of the cheapest comparable product on the Danish market. Until 1st April 2005 reimbursement was based on the Average European Price[6] (AEP) or the lowest price in the substitution product group marketed in Denmark. As of 1st April 2005, the reimbursement price within groups of the same generic medicines albeit across different brands is calculated on the basis of the cheapest product in the group marketed in Denmark and the patient only receives reimbursement according to the cheapest product, even if a more expensive brand is prescribed. Additionally, as of February 2006, substitution across package size has also been allowed.

Finally, the incentives to propose substitution and, in general, to keep cheaper drugs in stock depends on the formula for the pharmacist's price margin. The final factor stimulating the use of PI, therefore, has been the gradual introduction over a three-year period of a new formula for the pharmacist's price margin which addresses the previous mismatch between financial incentives (highest profits on the most expensive drugs) and the obligation to substitute medicine stimulates substitution.

[6] The AEP is the average of the prices in 11 EU states (Austria, Belgium, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway Sweden and the UK), plus Iceland, Norway and Liechtenstein.

Overall, the regulatory environment has supported an increased use of PIs but other factors are also important. The decrease in direct savings from 2008 to 2009 is also influenced by the expiry of the patent period for products that have been major contributors to direct savings in the past, e.g. Esomeprazol and pantoprazol.

2.2 Germany

Germany is the only country of the four with a consistent upward trend in the direct savings from PI. This is partly explained by the fact that the share of the total turnover in the market in 2004 was unusually low. Since April 2002, pharmacists have been obliged, through an agreement between the health insurers and the pharmacy association, to dispense a given quota of parallel imported drugs. The mandatory share for the dispensing of PI was reduced at the end of 2003 (from 7% to 5%)[7] and wholesalers and pharmacies are obliged to comply with maximum distribution margins that are calculated based on manufacturers' sales prices. Pharmacies are allowed a price margin of 3% in addition to a fixed prescription fee. Pharmacists therefore do not have direct financial incentives to dispense parallel imported drugs but if the sales of foreign sourced drugs do not meet the quota, the reimbursement from the health insurers to the pharmacies is automatically reduced by such an amount necessary to generate the required 10% savings within the 5% quota fulfilment. This contribution from PI to the overall savings has not been calculated (such calculations proves difficult as the respective data are owned by the health insurers and are not public) but in any rate these savings will be additional to the amounts presented in Table 1.

Furthermore, on 1st January 2004, the parallel importers' mandatory discount to health insurers on the ex-factory price was temporarily increased from 6% to 16% resulting in PI companies having to withdraw approximately 33% of their PI products from the market, because they could not sustain the cost increase (estimate by BAI).

In addition to a reversion to the original 6% mandatory discount in 2005, a number of other changes in regulation have been stimulating the demand for PI in Germany. These include the new reimbursement/reference pricing system, introduced in 2004 in which there is a move from generic reference pricing to therapeutic reference pricing, i.e. drugs with similar therapeutic effects are classified together, even if they do not contain the same active molecule, which means that patented drugs will also be subject to reference pricing, thus penalizing innovations that are minor compared to existing drugs, thereby providing a stronger incentive to use less expensive drugs.

Furthermore, a new set of regulations allows insured individuals to be exempted from co-payment when they buy drugs with a selling price 30% below the reference price, again providing a strong incentive to demand less expensive drugs.

[7] I.e as of January 2004, if the price of a parallel imported product is more than 15% cheaper than the original (for values < 100€) or if the price difference exceeds 15 € (for values > 100 €), then the pharmacist is required to dispense the parallel imported product - amounting at least up to 5% of the turnover which can be "replaced" by PI.

As of 2006, a new "carrot and stick" system has provided for a strong incentive to prescribers to take costs into account. Average costs per diagnosed case are recorded and doctors exceeding the average price will be penalized financially on an individual basis[8], whilst doctors with costs below average will receive a bonus. The idea behind this approach was to stimulate prescription cost awareness and to increase the prescription of less costly drugs. Whilst this may stimulate PI demand (in the field of patent protected drugs) it may also increase competition from generics.

Finally, in 2007, the VAT on pharmaceutical products was increased from 16% to 19%, thereby explaining part of the increase in direct savings, since the calculation of savings was based on pharmacy sales prices inclusive of VAT.

On 1 January 2011, medicine pricing rules changed again in Germany, as part of an effort to rein in exploding costs for Germany's massive public health insurance system. It now requires pharmaceutical companies to negotiate prices for new drugs with health insurers, limiting their previous freedom to set prices. Under the new legislation, drug companies will still be able to freely set a price for a new drug but it will only apply during the first twelve months of the drug's introduction on the market. During that time, the companies have to prove that the drug provides some form of added clinical benefit compared to existing drugs or it will be included in a reference-pricing scheme. A 16% rollback on prices and a three-year price freeze have already been introduced.

2.3 Sweden

The largely downward trend in direct savings from PI in Sweden should be seen in the context of pharmaceutical-benefit reforms as well as in the general price development in the market.

A new pharmaceutical benefit act in October 2002[9] introduced new regulation for reimbursement, the use of cost-effectiveness analysis for determining the reimbursement level of pharmaceuticals and mandatory substitution in favour of the lowest-cost (generic) alternative.

To assess the reimbursement levels a Pharmaceutical Benefits Board (LFN) was established. Both original manufacturers and PI were able to set prices freely, but reimbursement levels for patient costs were to be determined by the LFN. It was decided by the LFN to undertake a retrospective review of the cost-effectiveness of the more than 2000 products on the reimbursable list in 2002. The review started in late 2003 and ended in 2010. The first of these reviews has resulted in some drugs being excluded from the reimbursable list, some being maintained, and some being maintained with limited reimbursement (e.g. Nexium) (Wessling et al 2006).

[8] Average prescribing cost exceeded by 10-20% will result in a 20 % cofinancing of the excess drug bill by the prescribing doctor, cost excess of 20-30% will result in a 30 % cofinancing by the doctor and excess of more than 30% will result in 50% co-financing. (Vaselle and Caseau)

[9] http://www.tlv.se/Upload/English/ENG-act-2002-160.pdf

The use of a cost-efficiency analysis helps to relate the reimbursement price paid to the societal value of the product but does not necessarily result in the lowest possible price. Such is the aim of the substitution policy. For several years the Swedish state-owned pharmacies have been encouraged to dispense the lowest priced equivalent product when possible. However, as of October 2002, substitution with the cheapest generically equivalent[10] drug has become mandatory. Prescribed drugs may be substituted with parallel imported, parallel distributed (in the case of EMA approved drugs) or generic drugs. This was followed up in the spring of 2003 by mandatory stock-keeping by pharmacies of the cheapest alternative drug. However, if the doctor prescribing the medicine thinks substitution could be harmful to the patient, he/she has the possibility to disallow substitution of the prescription drug (Anell & Persson 2005).

A pharmacy margin that is determined by a percentage of the price stimulates the sale of the more expensive drugs and the formula for calculating the pharmacy sales price in Sweden depends on a percentage price mark up and a fixed fee. Since 2003, the percentage price mark-up has been decreased[11] and the fixed fee increased, resulting in a relatively small difference in profit to pharmacies, depending on the price of the medicine. As of July 2009, reforms introduced in Sweden for the regulation of the pharmacy market further increased the incentive to sell the cheapest drug. However, at the same time, gains from parallel distribution have been included in the pharmacies' profit margins and the savings passed on to the general public measured in pharmacy sales prices are expected to be lower. Pharmacies have increasing incentives to negotiate and increase trade with parallel importers, thus increasing the competitive pressure in the market, as a consequence driving forward the increase in indirect savings. This competitive pressure is currently being further stimulated by the deregulation of the monopoly held by the Apoteket AB (the exclusive pharmaceutical retailer) with the introduction of independent pharmacies in July 2009 (Socialstyrelsen 2009).

The direct savings from PI depend on the difference between the originator price and the PI price as well as on the volumes sold. This price difference is likely to be reduced as the originator price is reduced in the home market (but not necessarily in the export market). A number of factors including the above-mentioned pharmaceutical benefit reform have stimulated a downward trend in average originator prices in Sweden in recent years. Medicine prices have generally decreased with 15% over the period 2002 to 2005, primarily due to the ending of the patent period for a number of top-selling drugs[12], which has opened up the market for generic products that compete with brand drugs (PI as well as original). Without price decreases for these patent-expired drugs, the decrease would, however, still have been 4%. The pharmaceutical benefit reform is estimated to have resulted in considerable savings and the general decline in the market for branded drugs has also reduced the potential savings from PI and may explain the downward trend for PI, despite a regulatory environment that is stimulating for PI. Another, additional

[10] I.e. with the same active ingredient.

[11] For example, for pharmacy purchase prices between 75 and 300 SKK the percentage mark-up was 8% in 2003 and 3% in 2006, while the fixed fee increased from 32.30 to 44.00 SKK. For other price ranges see www.lfn.se/LFNTemplates/Page_578.aspx .

[12] E.g. Zocord, Losec, Cipramil, Plendil, Zoloft.

explanatory factor is the unfavourable development to PI in the exchange rate of Swedish Krone against the € and the £ in the years 2008-9.

2.4 United Kingdom

In the UK, doctors are 'encouraged', but not legally obliged, to write a prescription for the generic version of a medicine and to prescribe cheaper therapeutically equivalent products. In this regard, in the UK, about 80% of prescriptions are written for generic medicines. If the prescription is for a branded drug, the pharmacist may only substitute the brand for a PI and a generic prescription can be filled by any drug containing the active ingredient. With no mandatory substitution, the decision to substitute is strongly influenced by these financial incentives.

Full reimbursement is given for drugs on the so-called 'positive list' (the Drug Tariff). The reimbursement price is regulated through the Pharmaceutical Price Regulation Scheme (PPRS) – an agreement between the Department of Health and the ABPI (manufacturers). The PPRS is one of the main instruments used by the Department of Health to control NHS medicine expenditures and the scheme has two main components, profit controls and price controls. Essentially there is free pricing for new active substances, but the PPRS seeks to limit the overall profit a manufacturer may make, after allowing for certain costs, including R&D costs. Price increases on existing products must be negotiated and agreed with the British government. The PPRS is renewed every five years, the last time being in January 2009 when a 7% cut was imposed as part of the 2005 negotiations for companies with sales of branded prescription medicines to the NHS worth more than above £1 million in 2004. Companies do have the flexibility to target products in cutting prices in order to reach an average decrease of 7% - the so-called price modulation system. Prices were frozen throughout 2005 and a review of the PPRS in 2008 resulted in a revision with effect from January 2009 of a 5% targeted price reduction for the ensuing five-year period, starting with a 3.9% price reduction in February 2009 (Department of Health 2008).

The price cuts in the 2005 & 2009 PPRS have had important effects on the UK's competitiveness, compared with other EU Member States. Historically, UK pharmaceutical prices have been higher than most of the rest of Europe, but the voluntary price decreases affected through PPRS have brought British medicine costs down to a relative position only in the upper half of prices across Europe. By far the most significant effect on UK price competitiveness in this period however has been the decline in Sterling value compared with the Euro, as the UK economy has first been affected by the global downturn and latterly the slow pace of its recovery.

In early 2008, the £/€ exchange rate hovered around the £1/€1.40 mark; by the end of the year, Sterling had fallen to effective parity with the Euro, in essence a devaluation of some 29% and in the interim period (2009-2011), Sterling has struggled to recover even one third of that fall. This has had two effects:

a) UK prices compared to those in the Eurozone countries have become relatively cheaper, and this has fed the increasing UK parallel export market

b) The cost of imported goods has risen correspondingly, making PI less attractive and contributing to a reduction in that market by around 40%

It is this latter issue which has impacted most strongly on the savings generated by PI in later years.

The drop in direct savings does, however, reflect on the other hand an increase in indirect savings. This is illustrated by the case of Cozaar (originator: MSD), which is one of the leading products in the UK market and in 2007 had a considerable PI market share. In August 2007, MSD cut prices substantially on all packages and by up to a third on some, resulting in considerable savings to the NHS, estimated at £30 million[13].

Additionally, pharmacists and wholesalers in the UK have strong incentives to substitute brands with PI. The pharmacies are reimbursed the full list price of the domestic brand drug regardless of whether they dispense a brand sourced from domestic suppliers of an imported drug or not. However, under the assumption that pharmacies are able to obtain discounts and to buy PI, the British government adjusts reimbursement to each pharmacy through a clawback. On the basis of a discount enquiry from a representative sample across the NHS, the government will decide upon a level of reimbursement reduction by which it recovers a share of the savings which the pharmacist can enjoy from the competitive market. This clawback is applied across the board, whether the pharmacist uses PIs and generics or not and currently stands at average of around 10% of the price of the medicine. Consequently, the pharmacist will have a strong incentive to purchase his supplies from the cheapest possible source. If the cheapest source is a parallel imported product he or she will invariably choose this source of supply, if such supplies are available.

[13] Based on an assumption about constant quantity of sales and a clawback rate of 10%.

Conclusion

This study helps demonstrate that PI has contributed to savings in all the markets covered, with some variances over the years and across markets. The main findings can be summarised as follows:

- Due to new medicine regulations set in place and the onset of the financial crisis, savings have been decreasing over time while direct savings have continued to play an important role in all the markets covered. Direct savings in the five-year period reached a total of €2.5bn, averaging annual direct savings of €418m.

- Additionally, PI had a knock-on effect in reducing the prices of originator drugs in both Denmark and Sweden and in both countries, indirect savings have increased as a percentage of overall savings generated by imports.

- Separately, Government policies encouraged an uptake of PI in Germany, leading to five years of sustained increases in direct savings through PI. Policies in place in Denmark and Sweden have also obliged pharmacists in these countries to provide the cheapest version of a drug available, which have contributed to the positive effect on savings.

- Savings across the markets were at their highest in 2007 and have subsequently subsided on average. This can be explained by the onset of the financial crisis, affecting manufacturers production decisions as well as the appreciation of the £, DKr and SKr against the €, making PI less of a viable commercial activity. Separately, the impact of newly introduced health policies in Denmark and Sweden encouraged manufacturers to lower their prices, thus diminishing the impact of savings sustained through PI.

Therefore, for the five-year period 2005-2009, PI has continued to offer savings for the EU's four established markets, with indirect savings playing an increased role as a total of all savings.

Bibliography

Anell A, Persson *U. Reimbursement and clinical guidance for pharmaceuticals in Sweden*. Eur J Health Economics 2005; 6:274-9.

Die Arzneimittelindustrie in Deutschland, VFA 2010 Statistics

Enemark U, Møller Pedersen K, Sørensen J. *The Economic Impact of Parallel Import of Pharmaceuticals.* CAST—Centre for Applied Health Services Research and Technology Assessment. Odense: University of Southern Denmark 2006. http://static.sdu.dk/mediafiles//Files/Om_SDU/Centre/CAST/PDF_filer/parallel_import_rapport_13_06_1430_opdateret_final2.pdf

Health Care in Denmark, Ministry of the Health and Prevention (MHP). Copenhagen, August 2008. Available on-line: http://www.sum.dk/Aktuelt/Publikationer/Publikationer/~/media/Filer%20-%20Publikationer_i_pdf/2008/UK_Healthcare_in_dk/pdf.ashx

Independent auditor's review report on Statement of end users' savings when purchasing pharmaceuticals imported in parallel instead of purchasing directly imported pharmaceuticals (Sweden), Deloitte. (Odense July 2007, for 2005-6; Odense May 2005 for 2004)

Independent auditor's review report on Statement of end users' savings when purchasing pharmaceuticals imported in parallel instead of purchasing directly imported pharmaceuticals (Denmark), Deloitte. (Odense April 2007, for 2005-6; April 2005 for 2004)

Kanavos P, Costa-i-Font J, Merkur S, Gemmill M; *The economic impact of pharmaceutical parallel trade in European Union member states: A stakeholder analysis.* LSE Health and Social Care, London School of Economics and Political Science, 2004 http://archives.who.int/prioritymeds/report/append/829Paper.pdf

Läkemedelsförsäljningen I Sverige – analys och prognos. Socialstyrelsen Sverige, November 2007 samt April 2009. (www.socialstyrelsen.se)

Letter to PPRS scheme members and prospective scheme members on agreement reached on 2009 Pharmaceutical Price Regulation Scheme negotiations. Department of Health, UK November 19, 2008.

Lundin D, Jacob J, Engström A. *Generikareformen pressade läkemedelspriserna. Läkartidningen* 2007, nr. 9, vol 104, p. 680-81.

Medicinal Products Statistics, Denmark, 2002-2006. Danish Medicines Agency Copenhagen 2007.

Medicinal Products Statistics, Denmark, 2005-2009, Danish Medicines Agency . Copenhagen 2010.

Moïse P, Docteur E., Pharmaceutical pricing and reimbursement policies in Sweden. OECD Health Working Papers no. 28. OECD, July 2007.

Pekantchin V. *Economic effects of Germany's reference pricing policy for drugs. Research Paper*, Institut Economique Molinari, Brussels, December 2006.

Pharmaceutical market and health care 2011. www.lif.se/pdf/Fakta_2010.pdf, *Fakta2010, Läkemedelsindustriföreningen LIF.*

Swedish Pharmaceutical market and health care. 2006. www.lif.se/pdf/Fakta_2005.pdf, *Fakta 2005, Läkemedelsindustriföreningen LIF.*

The pharmaceutical industry in figures. Key data 2005, 2006, 2007, 2008, 2009. EFPIA 2006, 2007, 2008, 2009, 2010. Brussels 2010

The Pharmaceutical Price Regulation Scheme, Office of Fair Trading London February 2007.

Vaselle AA et Cazeau B. *Les évolutions du financement de la protection sociale et la réforme du système de santé en Allemagne*. Rapport d'information N° 439 Sénat, session ordinaire de 2005-2006, Annexe au procès-verbal de la séance du 29 juin 2006.

VFA 2008 Statistics on the Pharmaceutical Market. VFA www.vfa.de

Wessling A, Lundin D. *The review of drugs against diseases caused by stomach acid.* Pharmaceuticals Benefits Board, Sweden January 2006. (www.lfn.se/upload/Genomgangen/engelsk_slutrapport_magsyra_final.pdf)

West P, Mahon J. Et al *Benefits to payers and patients from parallel trade*. York Health Economics Consortium., 2003
http://archives.who.int/prioritymeds/report/append/8210ParallelTradeReport.pdf

http://pfldk.dk/ (17/11/2011)

http://www.tlv.se/Upload/English/ENG-act-2002-160.pdf (17/11/2011)