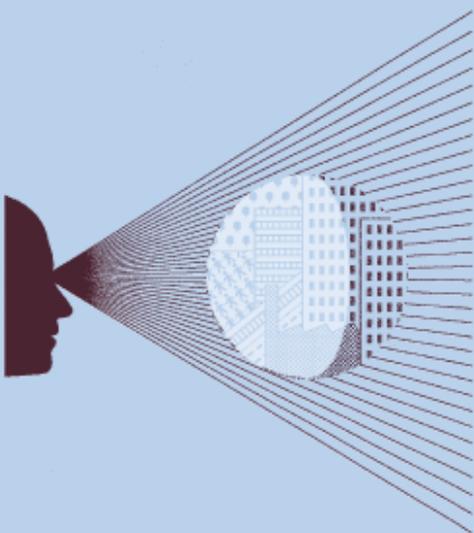


# The impact of a ban on the use of gender in insurance

December 7th 2011



# Executive summary

## Introduction

The EU Gender Directive (Council Directive 2004/113/EC) provides for equal treatment between men and women in the access and supply of goods and services. The Directive does not, however, prohibit insurers from using gender in the calculation of premiums and benefits, as it contains an exemption to this rule: under Article 5(2), Member States can opt out from banning the use of gender and can allow ‘proportionate differences’ in insurance premiums and benefits. All European national legislative assemblies chose to use the opt-out for life products—including life insurance and pension annuities.

On March 1st 2011, however, the European Court of Justice ruled that this time-unlimited opt-out provision was inconsistent with the European Charter (‘Test-Achats ruling’).

The Gesamtverband der Deutschen Versicherungswirtschaft (GDV), the German insurance association, asked Oxera to conduct an economic and objective study of the potential impact on consumers of a ban on gender-based pricing for insurance products (life and non-life) in Europe. This report presents the findings of that study. It demonstrates that it is possible to assess the potential impact on consumers of a ban on the use of gender and to provide quantitative estimates of the potential impact on premiums.

## Risk-based pricing

Insurers have to price insurance products on the basis of the risk of the insured. If insurers do not differentiate between different groups of individuals who perceive that they have different risk levels, economic efficiency can be lost through:

- ‘adverse selection’, which occurs if a uniform premium deters the low-risk group from buying insurance, while attracting more of the high-risk group. Setting premiums separately for the two groups leads to insurance adoption which is closer to an economically optimal level;
- ‘moral hazard’, which arises when insurance results in customers changing their risk behaviour—for example, if a uniform motor insurance premium for young drivers makes insurance for fast cars more affordable for an individual, which in turn leads to a change in risk-taking behaviour while driving.

Additional costs to insurance companies, which are likely to be passed on to consumers, can arise if restrictions are placed on risk-based pricing in insurance. These are dependent on the mechanics of insurance premium setting. Gender is a useful long-term and stable indicator of risk for insurance companies, which cannot easily be replaced.

The policy debate around the use of gender in insurance pricing often appears to be primarily concerned about ‘equal treatment’ of men and women—irrespective of the economic efficiency properties, some believe that differentiation on the basis of gender is not acceptable from a wider social point of view.

From an economic perspective, however, the use of gender-based pricing does produce ‘fair’ treatment since the gender that pays higher premiums also expects to receive higher benefits. This is the case with all of the insurance products that are considered in this report, as it is found that estimates of the net present value (NPV) of future benefits in gender-differentiated pricing are very similar for men and women (and the small differences in the

estimates may be due only to the estimation method). Banning gender pricing means that men, on average, will receive different lifetime benefits from women (for the same price).

## **Current use of gender in insurance pricing**

Risk-based pricing benefits consumers by giving them better incentives to adopt an appropriate level of insurance and by improving the economic efficiency of insurance provision. This conclusion is, however, dependent on premiums appropriately reflecting the risk profiles of different groups of consumers. This report therefore examines the current use of gender in insurance pricing, focusing on the question of whether the observed gender-differentiated insurance premiums (or pension benefits, in the case of annuities) reflect differences in risk.

There are significant differences between females and males in their mortality risk (affecting life insurance and pension annuities) and car accident risk, in all countries examined. The costs of providing the same level of insurance cover therefore differ between women and men, and these cost differences explain gender-differentiated prices.

Gender is used as a risk-rating factor only when it helps to price the risks covered and it is used in combination with other rating factors. For life insurance and pension annuity products, in most countries, gender is the second-most important factor used, after age. Where gender is not a reliable indicator of risk differentials, it is not used in pricing decisions (for example, as indicated by the differing importance of gender for motor insurance premiums according to age).

This report finds that:

- in all countries examined, women pay lower term life insurance premiums than men, owing to their lower mortality risk over the policy term period;
- for annuities, women receive a lower pension annuity payment each month than men for the same lump-sum annuity purchase price. However, since women live longer than men on average, this payment stream can generally be expected over a longer period of time, such that women receive the same expected lifetime annuity benefit as men (in NPV terms);
- in the case of motor insurance, gender-differentiated pricing is most pronounced for younger drivers (typically below the age of 25–30 in all countries examined), where young female drivers pay lower premiums for their car insurance. This is explained by the lower risk of young female drivers being involved in accidents and the resulting lower claims costs per policy sold.

In some countries, gender cannot be, or is not, used in motor insurance pricing, resulting in unisex premium rates. However, the unisex rates for young drivers appear to incorporate additional costs compared to gender-based pricing, because the profile of premiums by age appears to differ from the average risk profile. The profile of premiums by age is more similar to that for young men than that for young women.

One example of unisex pension annuity payments is the German Riester pensions. However, unisex rates are feasible due to a subsidy from the German government, which means that the product is still attractive to male customers despite unisex pricing.

## **The impact of a ban on the use of gender in insurance on consumers**

A ban on the use of gender in insurance pricing may have a number of unintended consequences for consumers and the insurance markets more generally. This means that those who promote unisex pricing on the grounds of fairness or other reasons would

nonetheless need to take into account the full consequences of a gender ban. They would need to weigh the perceived benefits against the efficiency costs resulting from a restriction of risk-based pricing, as well as against the wider distributional impacts and other aspects of fairness that may be compromised.

The most immediate effect of banning the use of a relevant risk factor on insurance pricing is through redistribution of premiums from the high-risk group to the low-risk group. Redistribution effects suggest that unisex pricing will result in significant increases in premiums for retiring men buying pension annuities, for all women buying life insurance, and for young women buying motor insurance. Based on the data available for selected countries:

- men (aged 65) could see a reduction in pension income from pension annuities of around 5% or more on average;
- women (aged 40) could see life insurance premiums rise by around 30% or more on average;
- young women (aged 20) could see motor insurance premiums rise by 11% or more on average.

Additional costs could arise from insurers applying a gender mix risk premium due to the risk of adverse selection. There could, in theory, also be additional sales/marketing costs due to a ban on the use of gender. Any additional risk premiums applied by insurers are likely to be passed on to consumers in the competitive insurance markets, since the costs would be common to all insurers.

In countries that have introduced unisex pricing for motor insurance products, increases in premiums for the low-risk gender were larger than the decreases in premiums for the high-risk gender, suggesting that premiums went up on average. This increase may reflect additional costs arising due to unisex pricing.

Such changes in premiums are likely to result in some changes in consumer demand, with this adverse selection resulting in less efficient adoption of insurance products. Adverse selection can lead to unintended wider social implications, including damaging incentives for people to save for their old age. Any policy which disadvantages the ‘third pillar’ of the pension provision system—private insurance—could be deemed to be inappropriate at this time.

# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
1.1	Background and objectives	1
1.2	Approach	2
1.3	Structure of report	3
<b>2</b>	<b>Risk-based pricing</b>	<b>4</b>
2.1	Principles of risk-based pricing	4
2.2	Risk-based pricing equates premiums to expected benefits	6
2.3	Risk-based pricing and economic efficiency	7
2.4	The mechanics of risk-based pricing	7
<b>3</b>	<b>Current use of gender in insurance pricing</b>	<b>9</b>
3.1	Insurance pricing in markets with gender pricing	10
3.2	Insurance pricing in markets with unisex pricing policies	21
<b>4</b>	<b>The impact of a ban on the use of gender in insurance on consumers</b>	<b>25</b>
4.1	Introduction	25
4.2	Impact on consumers from redistribution effects	26
4.3	Additional costs and impact on consumers	31
4.4	Empirical evidence on additional costs passed on to consumers	34
4.5	Adverse selection and changes in consumer demand	37
4.6	Further potential consequences of a ban on the use of gender	38
4.7	Overall impact on consumers	39
<b>A1</b>	<b>Glossary</b>	<b>40</b>
<b>A2</b>	<b>Collection of insurance premium data</b>	<b>41</b>
A2.1	Sources	41
A2.2	Generic policy-holder profile	41

## List of tables

Table 3.1	Life expectancy and annuity benefit (Netherlands example)	12
Table 3.2	Life insurance premiums and benefits (Germany example)	15
Table 3.3	Risk-rating factors used in pricing motor insurance	16
Table 3.4	Motor insurance premiums for men versus for women in European countries	18
Table 4.1	Redistribution effects for the monthly pension from a pension annuity	27
Table 4.2	Redistribution effects for life insurance premiums	29
Table 4.3	Redistribution effects for motor insurance premiums (drivers aged 20)	31
Table 4.4	Additional motor insurance premiums for drivers aged 20 relative to drivers aged 40	35
Table 4.5	Impact of unisex pricing on motor insurance premiums in Montana	36
Table A1.1	Brief glossary of key terms used in this report	40
Table A2.1	Price comparison websites used for premium data	41

## List of figures

Figure 2.1	A ban on the use of gender	6
Figure 3.1	Life expectancy by gender and age in France	11
Figure 3.2	Pension annuity payments and lifetime benefits by gender	12
Figure 3.3	Projected life expectancy by gender in France	13
Figure 3.4	Term life insurance premiums by gender and age in Spain	14
Figure 3.5	Mortality rates by gender and age in Spain	15
Figure 3.6	Motor insurance premiums in Germany by gender and age	17
Figure 3.7	Motor insurance claims in Germany by gender and age	19
Figure 3.8	Motor insurance claims in Italy by age (2008)	20
Figure 3.9	Motor insurance claims frequency and severity in France (2007)	21
Figure 3.10	Motor insurance quotes in Belgium and the Netherlands	22
Figure 3.11	Increase in motor insurance premiums: age 20 compared to age 40	23
Figure 3.12	Frequency of car accidents in Belgium by gender and age (2009)	24
Figure 4.1	NPV of expected benefits from a pension annuity in the Netherlands	27
Figure 4.2	Ratio of expected benefits to expected premiums for life insurance (Germany)	30

# 1 Introduction

The Gesamtverband der Deutschen Versicherungswirtschaft (GDV), the German insurance association, asked Oxera to conduct an economic study of the potential impact on consumers of a ban on gender-based pricing for insurance products (life and non-life) in Europe. This report presents the findings of that study.

## 1.1 Background and objectives

Like all companies, insurance companies set the prices for their products to reflect the costs of providing those products. The cost of providing insurance products is driven primarily by the amount of claims paid by insurance companies for those products. Consequently, the cost of supplying an insurance product to an individual is driven primarily by their likelihood of claiming and the likely amount of any claim made. Gender is one of the factors that has long been used by most European insurance companies (as well as insurance companies elsewhere around the world) to estimate the likely claims made by individuals buying insurance products.

The EU Gender Directive of December 13th 2004 (Council Directive 2004/113/EC) provides for equal treatment between men and women in the access and supply of goods and services. The Directive does not, however, prohibit insurers from using gender in the calculation of premiums and benefits, as it contains an exemption to this rule: under Article 5(2), Member States can opt out from banning the use of gender and can allow 'proportionate differences' in insurance premiums and benefits where the use of gender is a 'determining factor' in the assessment of risk 'based on the relevant and accurate actuarial and statistical data', provided that Member States ensure that such data is 'compiled, published and regularly updated'.

All EU Member States chose to use the opt-out for life products, including life insurance and pension annuities. Most EU Member States also chose to use the opt-out for general (non-life) insurance products.

On March 1st 2011, however, the European Court of Justice (ECJ) ruled that this time-unlimited opt-out provision from the EU Gender Directive was inconsistent with the European Charter ('Test-Achats ruling'). However, the Court has carefully avoided ruling on whether unisex pricing is required by the European Charter per se.

The ruling arose from a legal challenge from the Association Belge des Consommateurs Test-Achats ASBL, a Belgian consumer association, about whether the exemption is compatible with the prohibition on discrimination on the grounds of gender. The ECJ ruled that the (time-unlimited) exemption is invalid but allowed for a transition period for implementation up to December 21st 2012. National governments of Member States will be obliged to change their laws accordingly by this date.

In response to a Parliamentary Question by MEP Wieland on July 19th 2011 as to the impact on premiums, Commissioner Viviane Reding responded (on August 19th 2011) that: 'It is also not unlikely that the Court's judgment will have some effects on individual premiums...It is however too early to make any estimation regarding this matter.'<sup>1</sup>

<sup>1</sup> See <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+WQ+P-2011-007187+0+DOC+XML+V0//EN&language=EN>.

The GDV therefore asked Oxera to conduct an independent and objective economic study on the use of gender in insurance pricing in Europe, to help to inform the debate about the possible consequences of a ban on the use of gender in pricing for consumers.

The purpose of the study is to contribute to the understanding of the issues, and in particular to evaluate the impact that a ban on the use of gender as a risk-rating factor might have on insurers and consumers. Oxera also considers the importance of risk-based pricing for private insurance markets in general. This study demonstrates that it is possible to assess the potential impact on consumers of a ban on the use of gender and to provide quantitative estimates of the potential impact on premiums.

## 1.2 Approach

The main objectives of the study are to provide robust, evidence-based economic analysis to:

- explain why gender is currently used as a risk factor in insurance pricing, and why risk-based pricing is key to the functioning of private insurance markets;
- evaluate the impact of a ban on the use of gender on the industry, consumers and the wider market; and consequently to assess the cost of a ban for consumers and the wider society;
- inform the European Commission and others involved in this debate about the unintended consequences of a possible ban on the use of gender.

Gender is used in the provision of only those insurance products that cover risks which differ by gender—namely, accident risk, morbidity risk and mortality risk. This study covers three of the main products where such differentiation applies in the European insurance sector:

- **pension annuities**—which convert pension funds into a regular stream of payments from a given age over the remaining life of the policy-holder;
- **term life insurance**—which provides financial protection to beneficiaries in the event of the death of the insured person, as the insurer pays a lump sum of money if the insured person dies during the policy term in return for a stipulated premium paid at regular intervals;
- **motor insurance**—which, for this report, refers to motor third-party liability (MTPL) insurance, which covers the third-party liability risk associated with the insured car being involved in a traffic accident.

Gender is also currently used to price some other insurance products, particularly some health insurance and disability insurance products.

The Oxera study involved a number of work activities, including the following.

- Telephone interviews with nine major European private insurance companies and four European insurance associations in order to collect data and to discuss a series of questions about the potential impact of a ban on using gender in insurance pricing, and how insurance markets currently operate in countries which already have a ban on the use of gender (for motor insurance). The interviews collected data for seven EU Member States (detailed below).
- The collection of data on insurance premiums and average claims cost per policy from insurance companies, insurance associations, price comparison websites and other public sources; premium data for a specific, yet relatively typical, hypothetical customer was collected for the countries in the study using price comparison websites.

- Desk-based research into the data collected, including analysis of distribution effects to estimate a single hypothetical unisex price from individual gender price data.
- A literature study to identify relevant sources of information about, and assessments of, the role of gender in insurance pricing.
- Report-writing, bringing together all of the analysis into this report of the study.

Oxera focused the study on a selection of European countries, namely:

- Germany—included in the study because it is a major economy with good data availability;
- France—included in the study as another of the largest EU economies;
- Spain—included in the study due to some different characteristics of the insurance policies under consideration;
- Poland—included in the study as a major new EU Member State with different characteristics to its insurance market;
- Czech Republic—included in the study as another new EU Member State;
- the Netherlands—included in the study because a ban on the use of gender is in place for motor insurance products;
- Belgium—also included in the study because a ban on the use of gender is in place for motor insurance products.

The study did not collect a complete set of results for all of the selected European countries for all of the selected insurance products—suitable data was not available in all cases, particularly with regard to pension annuities, where the market is less developed in some countries than in others. While a complete survey for all products was outside the scope of the study, the study did find the same patterns in terms of premiums and claims for the products in all countries considered.

### 1.3 Structure of report

The rest of this report is structured as follows.

- Section 2 sets out the conceptual basis for the use of risk-based pricing by insurance companies, such that premiums are set to reflect expected benefits paid. The potential implications of measuring the degree of risk for insurance products are considered, as well as broader consideration of economic efficiency.
- Section 3 examines how gender forms a part of risk-based pricing policies used by European insurance companies in practice. The report presents evidence on the differential prices paid by men and women, and on what drives those price differences for the three products. The report also examines these questions for insurance markets where gender-based pricing is not in operation.
- Section 4 analyses what the impact on consumers and the wider society would be if gender were no longer used in pricing the three insurance products, including analysis of redistribution effects, changes to insurance companies' costs and pricing policies, efficient insurance market operation, and wider social effects. The report summarises with an assessment of the overall impact on consumers of a ban on gender-based pricing.

## 2 Risk-based pricing

This section sets out the conceptual basis for the use of risk-based pricing by insurance companies and how gender forms a part of those risk-based pricing policies used by European insurance companies. The section considers the conceptual issues arising from limitations to risk-based pricing caused by a ban on the use of gender. This sets the framework for the following sections of the report, which will examine how gender is actually used and the potential implications of a ban on its use.

### Main findings of section 2: 'Risk-based pricing'

- Insurers have to price insurance on the basis of the risk of the insured.
- If insurers do not differentiate between different groups of individuals who perceive that they have different risk levels, economic efficiency can be lost through 'adverse selection' and 'moral hazard'.
- Adverse selection occurs as a uniform premium deters the low-risk group from buying insurance, while attracting more of the high-risk group. Setting premiums separately for the two groups leads to insurance adoption which is closer to an economically optimal level.
- 'Moral hazard' arises when insurance results in customers changing their risk behaviour—for example, if a uniform motor insurance premium for young drivers makes insurance for fast cars more affordable for an individual, which in turn leads to a change in risk-taking behaviour while driving.
- Risk-based pricing equates premiums to expected benefits and therefore, arguably, gender-based pricing does provide 'fair treatment'.
- The loss of economic efficiency due to uniform premiums can lead to additional costs, which are a focus of section 4 of the report.
- Losses are dependent on the mechanics of insurance premium setting; gender is a useful long-term and stable indicator of risk for insurance companies, which cannot easily be replaced.

### 2.1 Principles of risk-based pricing

Individuals purchase insurance in order to protect themselves from costs arising as a consequence of unfavourable events. For example:

- a pension annuity product ensures a steady income throughout an individual's retirement, irrespective of how long they live (the 'unfavourable event' in this case would be to live for longer than might be expected and therefore to run out of savings);
- term life insurance provides financial protection to beneficiaries, such as family members, in the event of the death of the insured individual during the term of the insurance coverage;
- motor insurance covers the costs arising from the individual's liabilities if they cause an accident and injure a third party.

In return for appropriate premiums, insurance companies compensate the loss incurred as a result of the adverse event. However, in order for private insurance markets to function, insurers need to earn sufficient income from premiums so that they can cover anticipated claims from the insured. This means that insurers must be able to calculate accurately the average expected loss, and charge a price for insurance accordingly.

There are two basic principles of private insurance provision which enable insurance (and annuity) markets to exist:

- **risk-based pricing**—insurers have to price insurance on the basis of the risk of the insured, including the probability of a claim being made against the policy and the likely cost of that claim;
- **risk solidarity within risk pools**—risk is shared between individuals within risk pools, and the premiums of those who are fortunate in the pool and do not suffer the unfavourable events contribute to meet the cost of those who do.

Risk-based pricing means that prices are cost-reflective in each risk pool, and cost-reflective pricing is efficient from an economic point of view—a large body of literature exists to demonstrate this.<sup>2</sup>

For the purposes of illustration, suppose that gender was the only factor that enabled the insurance company to distinguish the high-risk individuals (ie, individuals with high expected claims cost, such as young male drivers) and the low-risk individuals (such as female drivers). In markets with voluntary insurance, where consumers have a choice over their levels of insurance coverage, for any given insurance premium, the high-risk individuals demand more insurance coverage than the low-risk individuals, as high-risk individuals expect to receive more benefits from the policy than low-risk individuals.

If an insurer can use gender as a risk factor, it will charge a higher premium to the high-risk gender and a lower premium to the low-risk gender, in line with their expected claims cost. This outcome is efficient from an economic point of view, since premiums are cost-reflective, which encourages each risk group to purchase their optimal insurance cover. For example, young male drivers (high-risk) face higher premiums and therefore are encouraged to buy less insurance (eg, by driving a lower speed vehicle).

If gender cannot be used in pricing, the low- and high-risk individuals are grouped together and are charged an equal price based on the average risk in the group. Thus, premiums rise for the low-risk individuals and fall for the high-risk individuals. This leads to the so-called **adverse selection** problem, which has the following effects (see Figure 2.1).

- First, the low-risk individuals would pay a price that is higher than their own risk would indicate and, correspondingly, subsidise the individuals in the group that have higher-than-average risk.
- Second, this cross-subsidy may result in the low-risk individuals leaving the group as their own policies become too expensive. As they begin to leave, the average risk of the remaining individuals rises, and insurers have to increase the premiums in order to cover the now higher average expected claims cost. As more low-risk individuals drop out, prices rise further and this in turn may threaten the financial stability of the insurance activity and the insurer.<sup>3</sup>

<sup>2</sup> For an overview of moral hazard, adverse selection and the economics of insurance more generally, see Rees, R. and Wambach, A. (2008), 'The Microeconomics of Insurance', *Foundations and Trends in Microeconomics*, **4**, pp. 1–163.

<sup>3</sup> The seminal paper on adverse selection in insurance markets is Rothschild, M. and Stiglitz, J. (1976), 'An Essay on the Economics of Imperfect Information', *Quarterly Journal of Economics*, **90**, pp. 629–49.

**Figure 2.1 A ban on the use of gender**



Source: Oxera.

Adverse selection may be limited by compulsory requirements for some types of insurance—eg, motor insurance. Even with motor insurance, however, there remains some degree of consumer choice (and therefore scope for adverse selection)—for instance, in the extent of cover (eg, fully comprehensive cover, or insurance for fire and theft) or the choice of motor vehicle (faster vehicles typically attract higher premiums).

One further consequence of the lack of risk-based pricing is the potential increase in the **moral hazard problem**, which could be of particular concern in motor insurance. If premiums are lowered relative to cost-reflective premiums, moral hazard, in the form of excessive risk-taking by the insured, may rise, and overall risk levels may increase.

In the case of motor insurance, one might expect young men to pay lower premiums with unisex pricing because they would be effectively subsidised by young women who, on average, make fewer claims (see section 3 for evidence on this). Young men who engage in high-risk-taking driving behaviour (the reason why young men on average make more claims than young women) may then be able to afford to insure more powerful, and hence higher risk, vehicles. The reduction in premiums for young men could then mean reduced road safety. The moral hazard in this example is the encouragement of high-risk individuals to engage in even riskier behaviour.

Higher premiums may to some extent act as a signal to young drivers about their risk-taking behaviour. High premiums typically result in young drivers benefitting more from building up their no claims bonuses (eg, by driving carefully). Reducing the link between risk and premium levels (for instance, by banning the use of gender in pricing) reduces the effectiveness of these signals.

Of course, the problems of adverse selection and moral hazard will produce differing results in practice depending on the nature of private insurance markets and, in particular, the degree of 'noise' (variation between individuals within a group), additional insurance costs (in addition to the cost of claims) and legislation (such as a mandatory requirement for insurance). Oxera therefore examines insurance markets in practice in section 3.

Before moving on to empirical evidence, however, the study examines the concepts that have arisen in the policy debate on the use of gender in insurance pricing, including the concepts of 'equal treatment' and economic efficiency.

## 2.2 Risk-based pricing equates premiums to expected benefits

The policy debate around the use of gender in insurance pricing often appears to be concerned primarily about 'equal treatment' of men and women. Irrespective of the economic efficiency properties, some believe that differentiation on the basis of gender leads to different treatment which is not acceptable from a wider social point of view.

From an economic perspective, however, the use of gender-based pricing does produce ‘fair’ treatment because the gender that pays higher premiums also expects to receive, on average, higher benefits. This is the case with all of the insurance products that are considered in this report, since Oxera finds that estimates of the net present value (NPV) of future benefits are very similar for men and women (and the small differences in the estimates may be due only to the estimation method). Banning gender pricing means that men, on average, will receive different lifetime benefits from women, for the same price. Section 3 of this report presents empirical findings to support this conclusion.

## 2.3 Risk-based pricing and economic efficiency

One key economic principle applies irrespective of what views on equity or fairness are adopted: if gender is correlated with risk and improves the accuracy in insurers’ pricing models then the removal of gender as a rating factor cannot make the provision of insurance more efficient. Without efficiency gains, any improvement in market outcomes for some individuals can be achieved only by making others worse off. For example, if young women paid a lower price for insurance than young men because they have lower risk, and if prices were fully cost-reflective, in order for the provision of insurance to remain economically viable overall, the price paid by men could be reduced only if there were a corresponding increase in the price paid by women. In other words, the price reduction for one group needs to be subsidised by another group.

The removal of the gender factor from risk-based pricing may, however, reduce economic efficiency and hence drive up costs and the combined total premiums paid by men and women, such that €1 saved by one group needs to be compensated by more than €1 extra paid by the other group. Additional costs can arise for a number of reasons, including additional risk margins, compliance costs, additional marketing costs, distortions to the competitive process and other changes to the behaviour of insurers due to the reduction in risk-based pricing. In addition, behavioural responses to the changes in prices experienced by individuals will also change the overall welfare of consumers. It is these effects that are the main focus of this study.

The extent to which economic efficiency may be lost by a ban on the use of gender depends on the mechanics of risk-based pricing and the extent to which gender can be replaced as a risk factor, which is considered below.

## 2.4 The mechanics of risk-based pricing

As described in section 2.1, risk-based pricing means that insurers determine premiums for a policy-holder on the basis of the risk of a claim being made against the policy and the likely cost of that claim. In order to better understand the implications of altering the nature of risk-based pricing (by removing a factor such as gender), it is helpful to understand the mechanisms used by insurance firms to calculate their risk-based prices.

Insurance firms determine premiums for policy-holders based on a range of characteristics relevant to determining risk. This report explains those characteristics in detail for each of the selected insurance products in section 3, but here the focus is on life insurance because the relatively simple nature of the calculations used helps to highlight the mechanisms employed.

For life insurance, premiums are currently determined based on age, gender, pre-existing medical conditions and smoking habits. In a few cases insurance firms use the policy-holder’s postcode (ie, the geographic location of the policy-holder’s home) as an indicator of socio-economic status, but this is not common practice in Europe. Importantly, insurers need to use indicators of risk that are relatively stable over time (since term life insurance is a long-term product) and easy to measure.

Insurance actuaries use statistical analysis to create algorithms that translate all of the different information into a risk factor for the policy-holder that can then be translated into a premium quote. In the case of life insurance, mortality tables giving forecast mortality rates by age and gender are the primary source of this information.

Differences between the mortality rates of men and women are found in all countries included in this study, and scientific research indicates that the reasons underlying those differences are believed to be a combination of lifestyle and biological factors (see section 3 for further discussion). Gender is correlated with differences in risk-taking behaviour, physiology and disease which result in the observed differences in mortality risk.

This raises an important question with respect to the use of gender in life insurance: could risk-based pricing be based directly on indicators of risk-taking behaviour, physiology, disease, etc, instead of gender, which is a factor that individuals have no control over?

In principle, that might be feasible, but the mechanics and economics of risk-based pricing do not support it in practice. Information on behaviour, such as employment type or leisure activities, would be more expensive to collect and verify. Furthermore, term life insurance is a long-term product, and a person's job could change during the period of the term, potentially creating significant complications and inefficiencies in the provision of this product. Information would also need to be verified, to discourage customers from misreporting in order to reduce premiums.

It should also be noted that, if lifestyle factors could capture the risk differential that is currently captured by gender, the overall results for males and females would not change significantly—males as a group would still pay more per year for life insurance products than women as a group, although there could be more variation at the individual level caused by the respective lifestyles of each individual. Furthermore, scientific research shows that the longevity differences between women and men stem, at least partly, from biological factors (eg, physiological differences between women and men).<sup>4</sup> This would mean that it would probably be impossible to fully capture the impact of gender by using lifestyle factors. As shown in section 3, actuaries do not expect the difference in life expectancy between men and women to disappear in the foreseeable future.

In summary, therefore, trying to use lifestyle factors to replace gender as a risk-based pricing factor could create additional costs, would not necessarily be as stable an indicator of risk over time, and would require additional verification, which could be intrusive. Furthermore, it is likely to be impossible to fully capture the impact of gender by using lifestyle factors.

The focus of this study is, however, on the practical implications of a ban on the use of gender for consumers, rather than the appropriateness of gender as a determinant of premiums in theory. Section 3 therefore sets out evidence for how gender is used in practice, before section 4 considers the practical implications for consumers of unisex pricing.

<sup>4</sup> See section 3.1.1 for further details and references.

### 3 Current use of gender in insurance pricing

This section provides empirical data on the current use of gender in insurance pricing in selected European countries. This data is used in section 4 to assess the potential impact of a ban on the use of gender in insurance on consumers.

Risk-based pricing benefits consumers by giving them better incentives to adopt an appropriate level of insurance, and by improving the economic efficiency of insurance provision. This conclusion is, however, dependent on premiums appropriately reflecting the risk profiles of different groups of consumers. This section therefore examines the current use of gender in insurance pricing, focusing on the question of whether the observed gender-differentiated insurance premiums (or pension benefits, in the case of annuities) reflect differences in risk.

Evidence on products and countries with unisex insurance pricing is also examined, to assess the extent to which premiums diverge from risk ratings in those markets, to help to inform section 4 on the potential impact in other markets.

#### Main findings of section 3: 'Current use of gender in insurance pricing'

- There are significant differences between females and males in their mortality risk (affecting life insurance and pension annuities) and car accident risk in all countries examined. These differences are expected to persist into the future.
- The costs of providing the same level of insurance cover therefore differ between women and men, and these cost differences explain gender-differentiated prices.
- Gender is used as a risk-rating factor only when it helps to price the risks covered. It is used in combination with other rating factors. For life insurance and pension annuity products in most countries, gender is the second-most important factor used, after age. Where gender is not a significant indicator of risk differentials, it is not used in pricing decisions (for example, the differing importance of gender for motor insurance premiums according to age).
- In all countries examined, women pay lower **term life insurance** premiums than men, owing to their lower mortality risk over the policy term period.
- For annuities, women receive a lower **pension annuity** payment each month than men for the same lump-sum annuity purchase price. However, since women live longer on average, this payment stream can generally be expected over a longer period of time, such that women receive the same expected lifetime annuity benefit as men (in NPV terms).
- With **motor insurance**, gender-differentiated pricing is most pronounced for younger drivers (typically below the age of 25–30 in all countries examined), where young female drivers pay lower premiums for their car insurance. This is explained by the lower risk of young female drivers being involved in accidents and the resulting lower claims costs per policy sold.
- In some countries, gender cannot be, or is not, used in car insurance pricing, resulting in **unisex** premium rates for women and men. However, the unisex rates do not appear to reflect the average risk profiles of the male and female younger drivers. The profile of premiums by age is more similar to that for young men than for young women.
- One example of unisex pension annuity payments is the German **Riester pensions**, although this product is subsidised by the German government. Consequently it is still attractive to male customers despite unisex pricing and, because of this, unisex rates are feasible.

## 3.1 Insurance pricing in markets with gender pricing

Insurers take into account various risk factors in order to achieve risk-based pricing, and gender is one of them for a number of insurance products. Gender, combined with age, is an important risk factor in pension annuities, term life insurance and motor insurance, as the evidence from a number of European countries, presented below, suggests.

Evidence on insurance premiums and pension annuity payments suggests that, where these differ between women and men, gender-differentiated pricing reflects the differences in risk and hence the cost of providing the insurance cover. In particular, Oxera finds that:

- for pension annuities, the NPV of expected pension benefits is the same for men and women, as the higher monthly payments received by men are offset by the lower expected number of payments due to the lower life expectancy of men;
- for term life insurance, higher premiums for men are explained by the higher probability of men dying over a given period of time;
- for motor insurance, young men make more claims of higher average value than young women, which explains the differences in premiums; both premiums and claims become more similar between men and women around the age of 25–30.

Evidence on pension annuity benefits, term life insurance and car insurance premiums across a number of European countries is presented below. The evidence on claims, where available, and risks more generally, is also examined. This subsection focuses on countries and products where gender is used as a risk factor in insurance pricing.

### 3.1.1 Pension annuities

An individual can buy a pension annuity with an initial lump sum of money or through instalments paid over a certain number of years. The pension annuity converts the funds used to purchase the annuity into a regular stream of payments from a given age over the remaining life of the policy-holder. This product provides a stable income in old age, with annuity payments continuing until the death of the policy-holder, insuring them against the longevity risk—ie, the risk of outliving their wealth in the event of living longer than expected. Individuals can often choose other financial products instead of (or as well as) pension annuities, such as pure financial products which do not provide insurance against longevity risk, although, as discussed in section 4.5, there are social benefits derived from this form of insurance for old age.

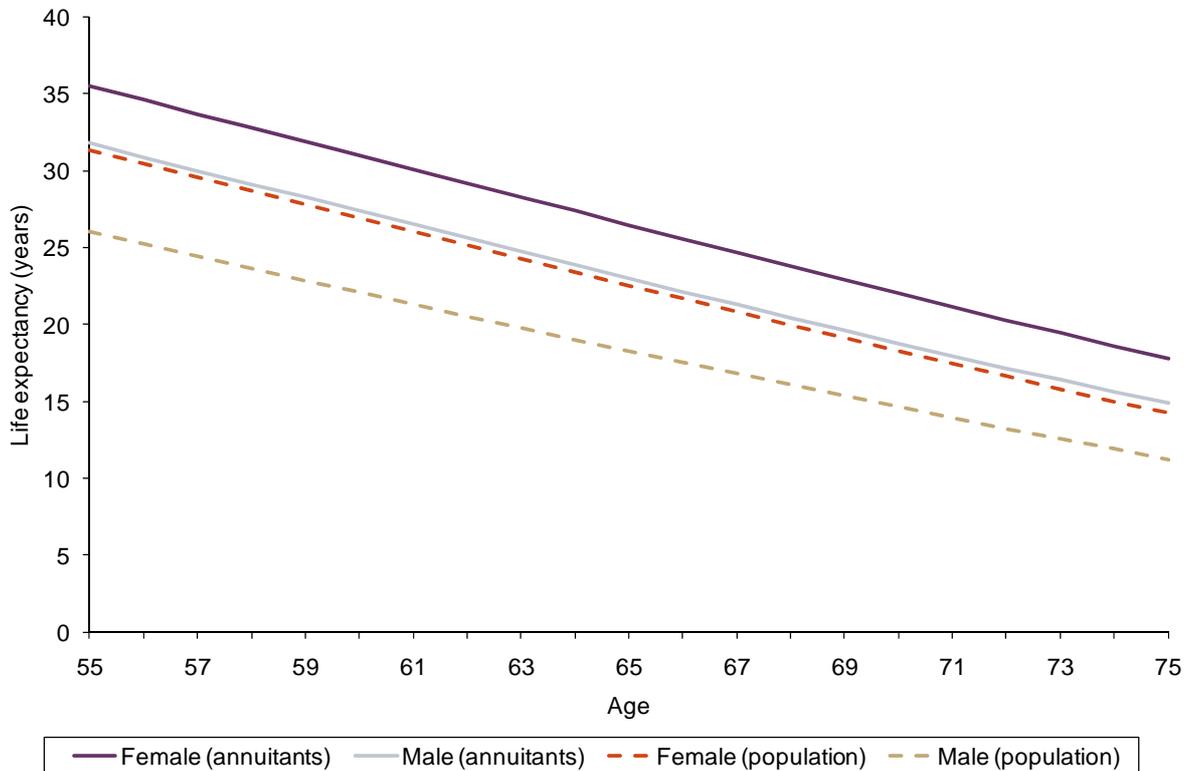
In practice, annuity products can vary significantly. Annuities can be purchased at retirement (immediate annuities), or in the form of deferred annuities during the insured person's working years (deferred annuities); it is the latter type of annuity that is more common in the European countries considered in this report.<sup>5</sup> Annuities can differ along other dimensions, such as death benefit guarantees and with-profit bonus payouts. However, for the purposes of this report, the key feature of the majority of annuity products on the market is that they provide insurance against longevity risk by guaranteeing a regular payment until the death of the annuitant.

Pension annuities are therefore priced based on similar principles to other insurance products. The 'price' of the annuity is the amount that has to be paid to deliver a given level of regular pension payments that the annuitant receives. For any given level of regular payment per month, the main driver of the annuity price is the expected longevity of the individual, and this is estimated based on age, gender and, often, medical conditions. Expected future interest rates also can influence the level of annuity payments.

<sup>5</sup> For a recent overview of annuity markets see Rusconi, R. (2008), 'National Annuity Markets: Features and Implications', OECD Working Papers on Insurance and Private Pensions No. 24.

There is a well-documented link between gender and longevity, with women at age 65 expected to live around three to four years longer than men at 65. Figure 3.1 shows life expectancy in France (in terms of how many more years a person will live, having reached a certain age) for women and men. Two sets of data are shown—life expectancy based on the whole population of France based on recent demographic data, and expected life expectancy of annuitants born in 1946.<sup>6</sup> This shows that there is a persistent gap in life expectancy between males and females. A similar pattern in life expectancy by age and gender is observed for other countries.

**Figure 3.1 Life expectancy by gender and age in France**



Source: Oxera analysis of INSEE and FFSA data.

Differences in longevity between women and men are reflected in the annuity payments. Using data from the Netherlands on a 65-year-old annuitant as an example, Table 3.1 shows that the average annual annuity payment on a €200,000 pension fund would be €13,732 for a man and €11,882 for a woman (see the Appendix for details on the collection of premium data). Thus, on average, men can expect to receive a higher monthly annuity payment than women for the same pension fund. This is because females are expected to live longer than men, so the same pension fund needs to be converted into a longer stream of regular annuity payments. As Table 3.1 shows, a 65-year-old female annuitant is expected to live 3.4 years longer than a male annuitant, hence her €200,000 pension fund has to be distributed across 3.4 more years, resulting in lower monthly pension payments from the annuity. However, the total (discounted) annuity benefit is quite similar for women and men (the last column in the table), and the small difference in NPV estimates may be due only to the

<sup>6</sup> The two datasets are calculated on different bases and are not directly comparable with each other. They both show the same trend over age, however. Insurance companies also report that the life expectancy of annuity customers tends to be longer than the overall average life expectancy, presumably due to some self-selection (eg, individuals who know their life expectancy is shorter than average avoid buying annuities) as well as socio-economic differences in life expectancy (richer individuals are more likely to buy an annuity and wealth is correlated with longevity).

estimation method.<sup>7</sup> This shows that women and men receive equal lifetime benefits from an annuity, and that any differences in annual (or monthly) annuity payments for men and women are consistent with differences in their life expectancies.

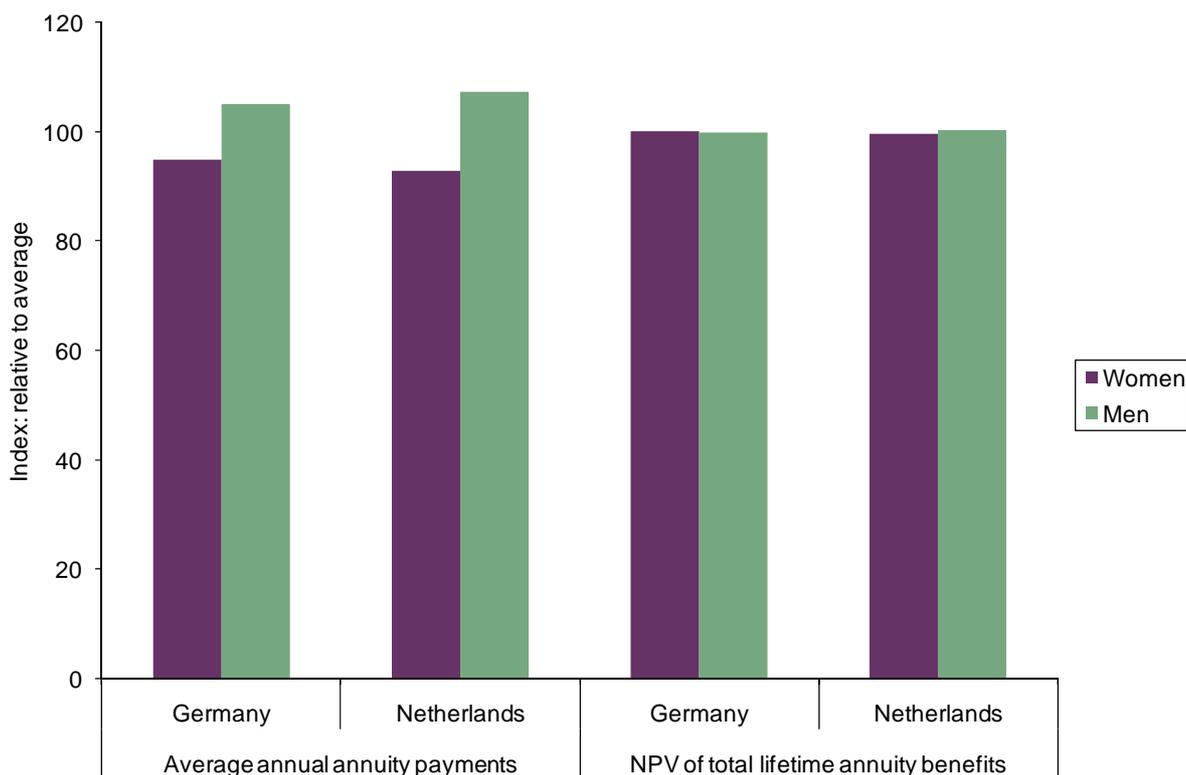
**Table 3.1 Life expectancy and annuity benefit (Netherlands example)**

	Number of years expected to live	Annuity value (€)	Annual annuity payment (€)	Total annuity benefit (€)	NPV of annuity benefit (€)
<b>Male</b>	17.5	200,000	13,732	240,244	182,807
<b>Female</b>	20.9	200,000	11,882	248,471	181,732

Note: This table shows the average annual annuity payments for a 65-year-old woman and a 65-year-old man and life expectancy at 65. All data is for the Netherlands. The total annuity benefit is calculated as the simple product of the annual annuity payment and the number of years expected to live. The NPV refers to the present value of the annuity payments, discounted at an annual rate of 3% (the approximate long-term Dutch government bond yield in August 2011).  
Source: Oxera calculations.

Figure 3.2 summarises the evidence on average annuity payments and total benefits by gender for the Netherlands and Germany. Lifetime total annuity benefits, appropriately discounted, are the same for women and men (the right-hand side of the chart), while annual payments differ across genders due the differentials in life expectancy (the left-hand side of the chart).

**Figure 3.2 Pension annuity payments and lifetime benefits by gender**



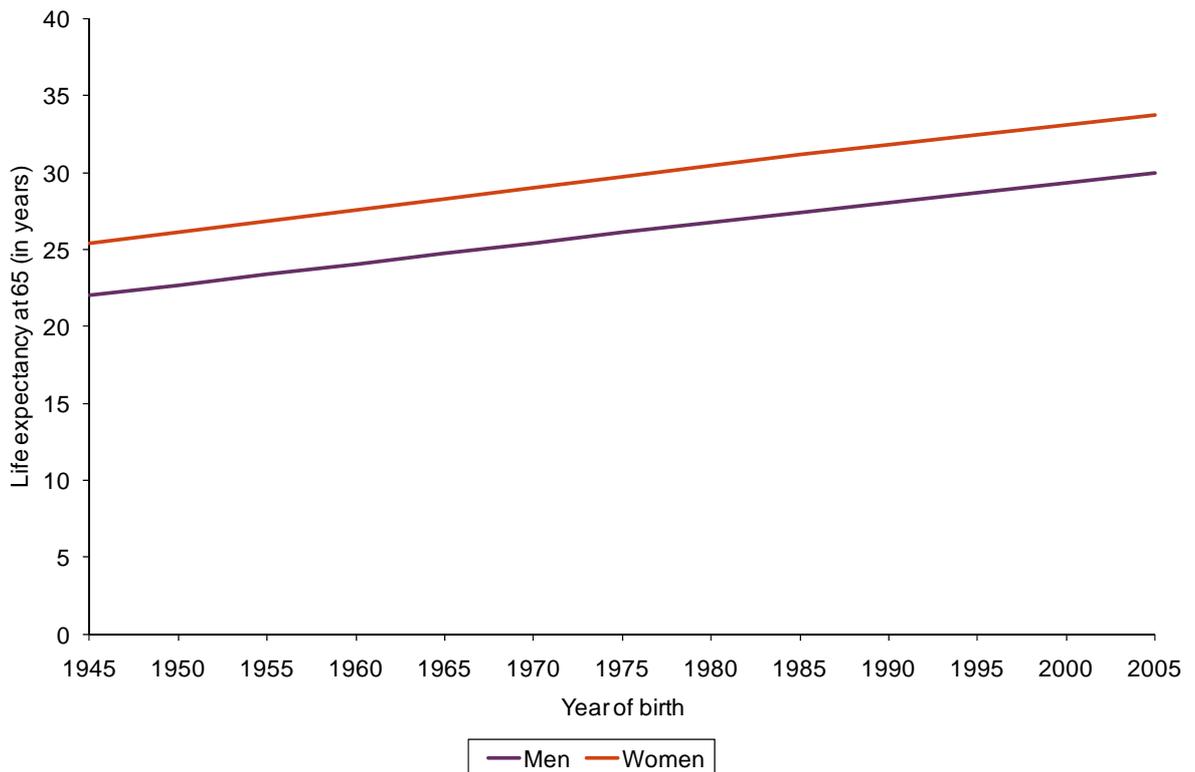
Note: Lifetime annuity benefits are discounted at an annual rate of 3% for both Germany and the Netherlands.  
Source: Oxera calculations.

<sup>7</sup> In particular, the mortality rates used are unlikely to be exactly the same as those used by insurance companies, and the common assumption for the discount rate (3%) is also likely to vary from that used by insurance companies. This difference in NPVs is immaterial given these margins of error.

The existence of gender differences in life expectancy is well documented, and the reasons underlying those differences are believed to be a combination of biological and lifestyle factors.<sup>8</sup> While there have been historical changes in the extent of the gender gap in life expectancy, due to differential impacts of changes in lifestyle and medical treatment, actuaries do not expect the gender gap to disappear in the near term (as shown below for France).

Figure 3.3 shows projections of life expectancy by gender and date of birth of 65-year-old pension annuitants in France. Two trends in particular are notable. First, life expectancy is expected to rise over the next 60 years, with a 65-year-old pension annuitant born in 2005 expected to live around eight years longer than one born in 1945. Second, the gender difference in life expectancy (around 3.4 to 3.8 years) is expected to persist in the years to come.

**Figure 3.3 Projected life expectancy by gender in France**



Source: Oxera analysis of TGH05 and TGF05 actuary mortality tables.

In summary, the study finds that differences in monthly pension payments from pension annuities for women and men are explained by differences in life expectancy—over their expected lifetimes, women and men can expect to receive the same total payment in NPV terms. This difference in life expectancies is not expected to disappear in the foreseeable future.

### 3.1.2 Term life insurance

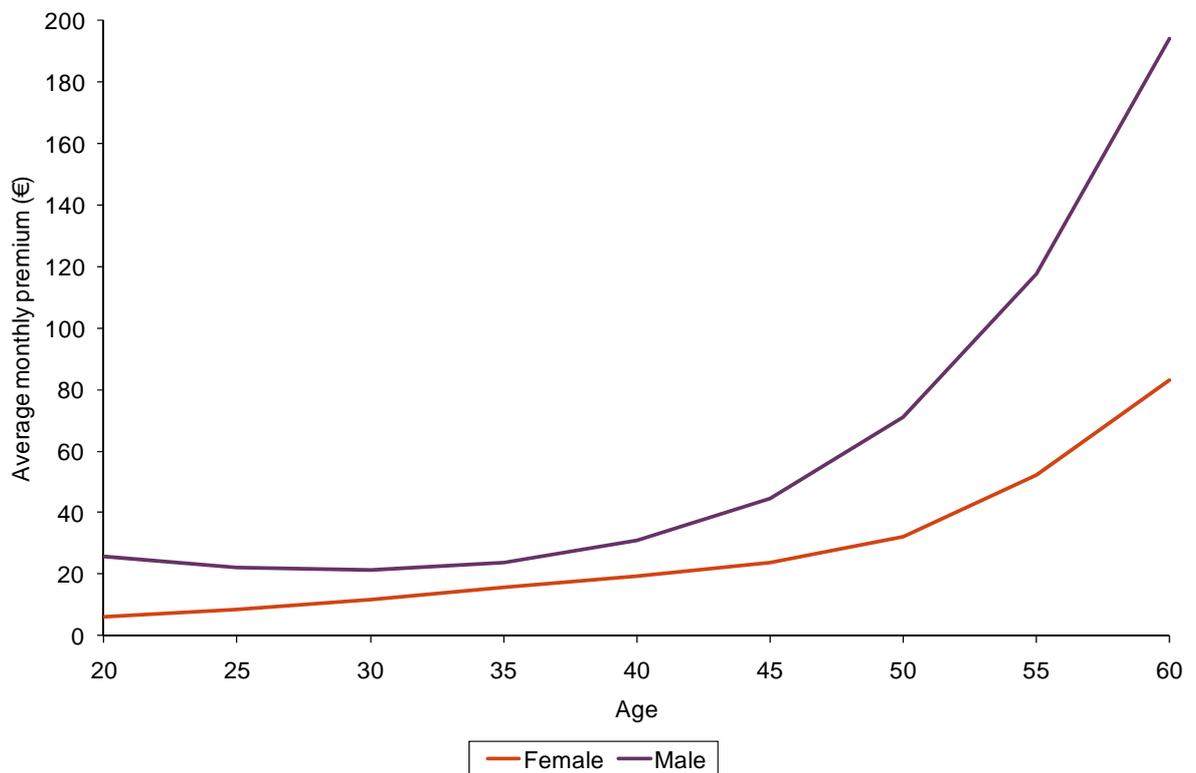
Life insurance is used to provide financial protection to beneficiaries in the event of the death of the insured person. This section focuses on term life insurance, which provides coverage for a specified term of years. Typically, the insurer pays a lump sum of money if the insured person dies during the policy term. In return, the insured person pays a stipulated premium at regular intervals. Basic term life insurance policies do not accumulate cash value.

<sup>8</sup> For a discussion and a literature review see, for example, Office of National Statistics (2005), 'Sex differences in mortality: a comparison of the United Kingdom and other developed countries', *Health Statistics Quarterly*, **26**, pp. 6–16.

The probability of the insured person dying is the most critical factor in pricing life insurance policies. The probability of death is usually estimated based on a person's age, gender, pre-existing medical conditions, smoking habits and, sometimes, their postal address as an indicator of socio-economic status. Term life insurance products are relatively homogeneous in nature across Europe.<sup>9</sup>

Figure 3.4 shows the market average monthly premium that men and women in Spain would pay for a ten-year term life insurance policy of €200,000 taken out at different ages (holding other factors constant). This data, from a Spanish price comparison website, shows that men pay more for term life insurance than women, and the gap widens significantly from the age of around 45 (see the Appendix for details on the collection of premium data). Data from other countries reveals a similar pattern in terms of term life insurance premiums, with male premiums being higher than female premiums, and the gap widening significantly from the age of around 45.

**Figure 3.4 Term life insurance premiums by gender and age in Spain**



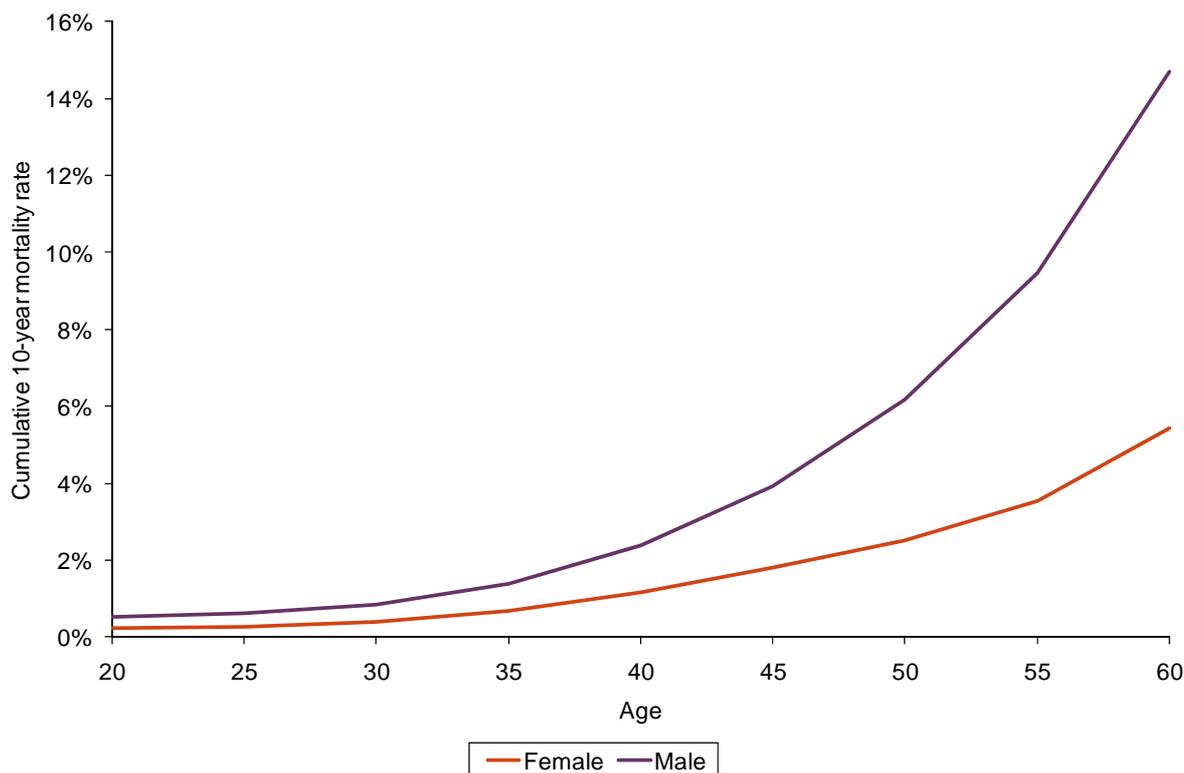
Note: The period of coverage of the term life insurance products is ten years.

Source: Oxera analysis of premiums data from a Spanish price comparison website (<http://www.rastreator.com>).

Both age and gender are key factors for estimating the probability of a person dying, as is evidenced by a range of mortality statistics. Mortality rates are crucial in pricing term life insurance according to the risk of the insured. Figure 3.5 below shows cumulative mortality rates by gender and age in Spain. This graph is strikingly similar to the premiums data chart above, and illustrates how mortality rates, and hence the risk of the insured, is reflected in term life insurance pricing. A similar pattern of mortality by gender and age is also observed for other European countries. Thus, there is a clear correlation between mortality rates and term life insurance premiums in European countries, since gender is a relevant risk factor in pricing term life insurance.

<sup>9</sup> There are, however, differences in the determinants of demand for life insurance products between European countries. The take-up of various types of life insurance products also differs between European countries—eg, in terms of group contracts, and ancillary add-ons, such as disability coverage. For example, group life insurance contracts are a relatively small proportion in countries like France and Germany, whereas around a half of all term life insurance contracts are group contracts in Poland.

**Figure 3.5 Mortality rates by gender and age in Spain**



Note: Mortality rates are calculated as the cumulative probability of dying over a ten-year period starting from the age indicated on the horizontal axis.  
 Source: Oxera analysis of Eurostat data.

The similarity of mortality rates by age and gender to the pattern of term life insurance premiums suggests that the gender-based differentials in premiums can be explained by differences in the risks and costs of insurance provision. As in the case of pension annuities, this is best illustrated by comparing the expected total premiums to expected benefit from the life insurance, appropriately discounted. Table 3.2 illustrates this using premiums data from five large German insurance companies and the German mortality rates.

Table 3.2 shows that average monthly premiums for a ten-year term life insurance worth €200,000 are nearly €10 higher for 40-year-old men than for 40-year-old women in Germany. The total expected premium paid over the ten-year period amounts to €3,101 for men and €2,135 for women, discounted by 3% annually, and taking into account their probabilities of dying during that period. However, since men have higher mortality rates, they also have a higher probability of dying during the ten-year period, and thus their insurance contracts are more likely to receive a payout—the expected present value of the insurance is around €2,900 for men and €1,900 for women. Men pay more in premiums than women, but also have a higher expected benefit, taking into account their higher mortality rate.

**Table 3.2 Life insurance premiums and benefits (Germany example)**

	Monthly premium (€)	NPV of premiums paid (€)	NPV of benefits received (€)	Ratio of benefits to premiums
<b>Male</b>	30.09	3,101	2,914	94%
<b>Female</b>	20.66	2,135	1,892	89%

Note: Monthly premiums for a ten-year term life insurance contract for a 40-year-old person are based on a median quote from five large life insurance companies in Germany. Annual discount rate of 3% and mortality tables DAV-2008-T have been used to calculate the expected value of premiums and benefits.  
 Source: Oxera calculations.

The last column in Table 3.2 shows the ratio of expected benefits to premiums. While there is a difference in the ratios for men and women, this difference is much smaller than the difference in gross monthly premiums and any male–female differential could be due to the exact mortality tables used by the insurance companies to calculate the premiums. For example, differences in male and female smoking rates or other relevant rating factors could lead to a differential between male and female ratios of expected benefits to premiums presented in Table 3.2.<sup>10</sup>

In summary, the study finds that differences in life insurance premiums for women and men are explained by differences in mortality rates—men pay higher premiums because their chance of dying (and hence claiming) over the term period is higher than for women. As with life expectancy, insurance actuaries do not expect this difference to disappear in the foreseeable future.

### 3.1.3 Motor insurance

This report examines the MTPL insurance, which covers the third-party liability risk associated with the insured car being involved in a traffic accident in the European countries considered in this report. There are differences across countries in how motor insurance policies work, and they are typically more diverse in nature than life insurance and pension annuity products and involve more risk factors.

Insurance companies price motor insurance policies according to an estimate of the expected claims cost of the policy (the likelihood of a claim multiplied by the likely size of the claim). In the case of motor insurance, one of the most important risks determining expected claim cost is the risk that the vehicle is involved in a traffic accident. Table 3.3 summarises the risk-rating factors typically used in the statistical analysis of risk, and ultimately in the pricing of motor insurance.

**Table 3.3 Risk-rating factors used in pricing motor insurance**

Characteristics of the main driver (and other drivers)		Vehicle characteristics	Environmental factors	Policy factors
Age	Length licence held	Vehicle type	Location	Policy type
Gender	Type of licence	Engine size	Overnight parking	Policy duration
Marital status	Accidents/claims in the past	Car alarms		No claims discount
Occupation	Driving convictions	Annual mileage		Excess
		Accident history		

Source: Oxera.

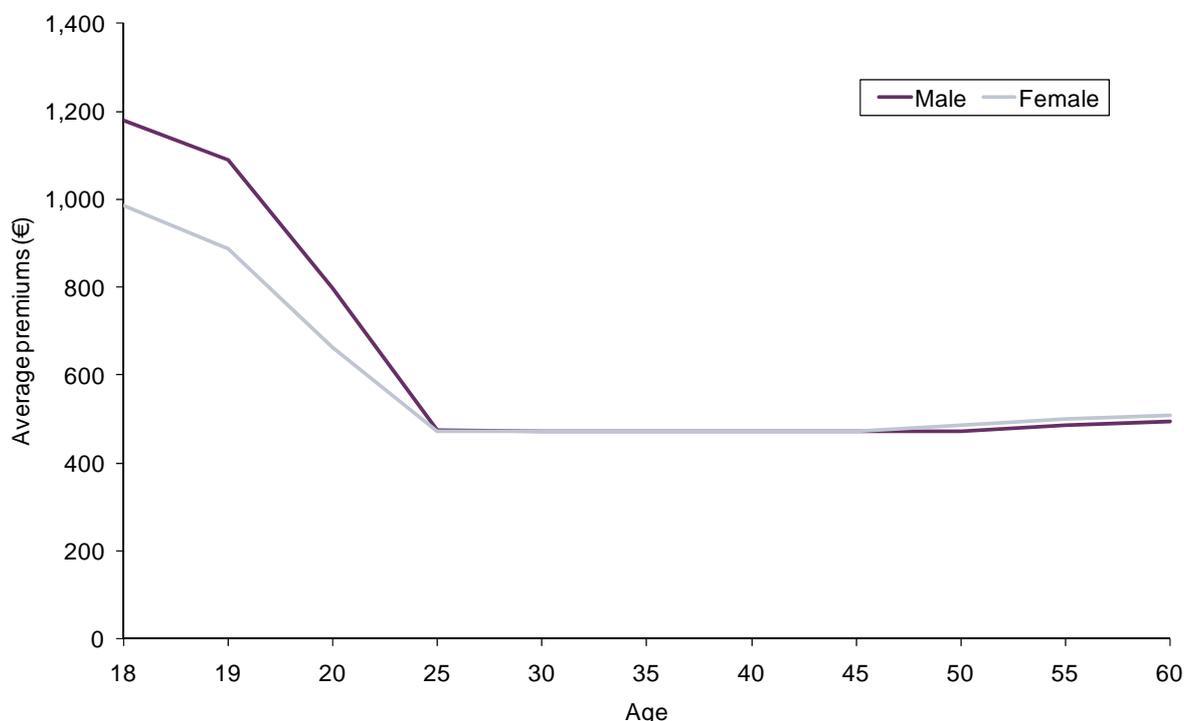
Since it is the car that is insured, insurance companies do not necessarily know who will be driving the car and hence the precise risk associated with the driver. For example, a young male driver could be driving a parent’s car, which is insured in the name of the parent; however, the risk that the car is involved in an accident (and hence the claims cost) is higher if the driver is the young male rather than a 40–50-year-old person. Hence, in order to assess the risk more accurately, insurance companies often ask for the names of other drivers for the car, in particular any drivers younger than 25 years old. The extent to which under-25-year-old drivers influence insurance premiums varies between countries in this study.

While there is a wide range of factors affecting motor insurance pricing, one can examine the impact that the gender of the main driver has on prices by comparing prices for a motor insurance product with identical entries for all factors except for gender and age. For this

<sup>10</sup> Insurance premiums presented in the table are for non-smokers, but the mortality rates are for both smokers and non-smokers. Furthermore, the mortality rates are the aggregate actuarial mortality rates, whereas individual insurance companies could use mortality tables based on the death statistics of their life insurance customers. To the extent that the relatively wealthy will be more likely to take out life insurance, there may also be a difference between the mortality rates of insured persons and the mortality rates for the whole population.

study, reputable price comparison websites were used to collect this data for motor insurance (see the Appendix for details). An illustration of the resulting market prices available for males and females is shown in Figure 3.6, which reports the average of the price quotes for MTPL insurance in Germany, obtained from a price comparison website, by gender and age (holding other factors constant).

**Figure 3.6 Motor insurance premiums in Germany by gender and age**



Source: Oxera analysis of premiums data from a German price comparison website (<http://www.check24.de>).

It is clear that gender does affect motor insurance premiums in Germany, but the relationship is also related to age. Young men pay significantly higher premiums than young women, but men and women in their 40s pay similar premiums.<sup>11</sup> This result is common across European motor insurance markets with gender pricing.

Table 3.4 shows the results from analysing price comparison website data from a number of European countries where gender is allowed to be used as a factor in motor pricing. The table shows ratios of average female and male premium quotes at the ages of 20 and 40, and ratios of premiums at 20 to premiums at 40 for men and for women.

The second and third columns of the table show by how much male premiums exceed female driver premiums on average: this indicates the degree to which gender is used in pricing motor insurance. In France, Germany, Italy and Spain, 20-year-old men pay 19–41% more than 20-year-old women drivers for insuring their car, whereas the premiums are equal at the age of 40 in all countries but Spain.

<sup>11</sup> At age 40, approximately 60% of the insurance companies included in the price analysis for Germany quoted exactly the same price for men and women. They therefore do not appear to use gender as a risk factor for 40-year-olds for the specified insurance product, but they all used gender as a risk factor for 20-year-olds.

**Table 3.4 Motor insurance premiums for men versus for women in European countries**

Country	% by which the premium for men exceeds that of women		% by which the premium at age 20 is higher than the premium at age 40	
	Age 20	Age 40	Men	Women
France	20	0	68	35
Germany	19	0	60	40
Italy	30	0	178	116
Spain	41	18	107	123
<b>Average</b>	<b>27</b>	<b>5</b>	<b>103</b>	<b>79</b>
UK	60	12	132	50

Note: The table shows by how many percentage points the ratio exceeds 100%. Data for the UK is not directly comparable with other countries due to source (see source note below) and policy differences (in particular, UK motor insurance policies cover only named drivers).

Source: Oxera calculations based on quotes from price comparison websites. UK data is taken from Oxera (2010), 'The Use of Gender in Insurance Pricing', as the UK was not a focus of this study. Data for Poland and the Czech Republic was excluded as insurance is purchased primarily through agents on a different basis to that presented in price comparison websites.

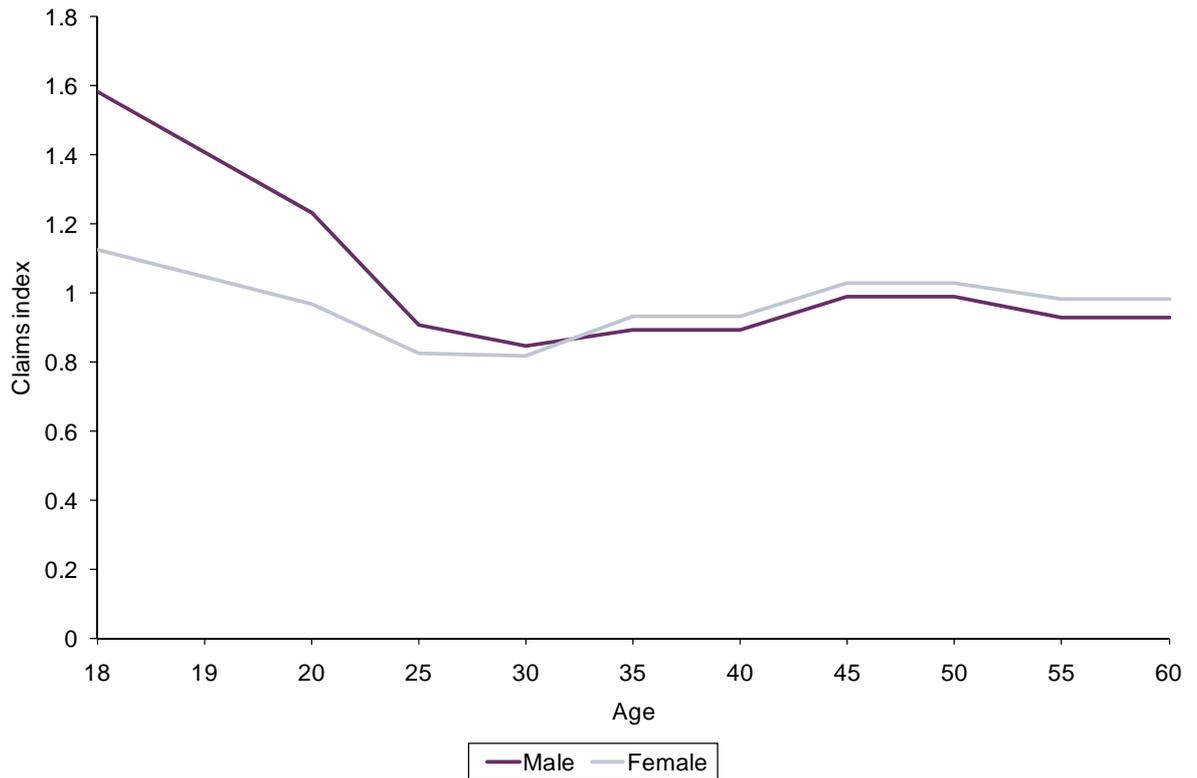
The two right-most columns in Table 3.4 show by how much motor insurance premiums for 20-year-olds are higher than for 40-year-olds, on average. Quotes obtained from price comparison websites indicate that 20-year-old drivers have 60–178% higher car insurance premiums; however, there are significant differences across countries. In countries with gender-differentiated insurance quotes the ratio for men is higher than for women (except for Spain, for which the reverse is true, based on quotes from only three insurance companies). This implies that 20-year-old male drivers are relatively more risky than 20-year-old female drivers, if compared with their older counterparts.

This evidence thus shows that, on average, young male drivers pay more for motor insurance than young female drivers, but prices tend to be the same for both sexes from around age 25–30, depending on the country. Data on claims, presented below, shows that motor insurance claims follow a very similar pattern, indicating that the higher premiums are needed to cover the higher claims costs of young male drivers.

Figure 3.7 below shows a motor insurance claims cost index for Germany by gender and age. There is a clear difference in claims cost by both gender and age. Claims costs are highest for 18-year-old males, and they fall with age for both men and women. At the age of 25, claims costs are similar between males and females, and they are at a level of older drivers. This pattern is very similar to the data on premiums in Figure 3.6—this clearly demonstrates that premiums differ by gender (and age) because claims costs differ in the same manner.<sup>12</sup>

<sup>12</sup> Note, however, that this claims index cannot be directly compared to the premiums data from the price comparison website, since the quoted premiums are for a specific car, driver, etc, whereas the claims index is aggregated over different insurance policies.

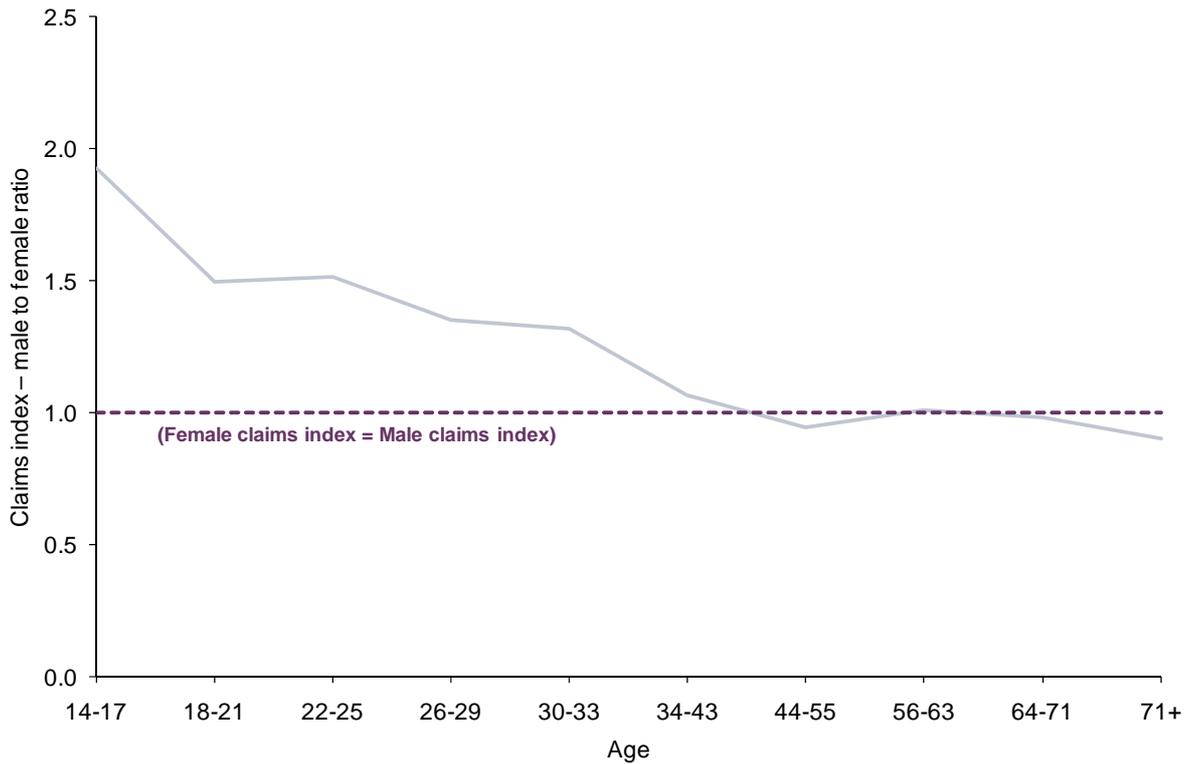
**Figure 3.7 Motor insurance claims in Germany by gender and age**



Source: GDV.

Figure 3.8 shows the male to female ratio of a claims index from Italy. The ratio of around 1.5 for the ages from 18 to 21 indicates that men at that age tend to have 50% higher claims than women of the same age. Similar to in Germany, young male drivers have significantly higher claims than young female drivers, whereas the risk becomes more similar for the two genders starting from their mid-thirties.

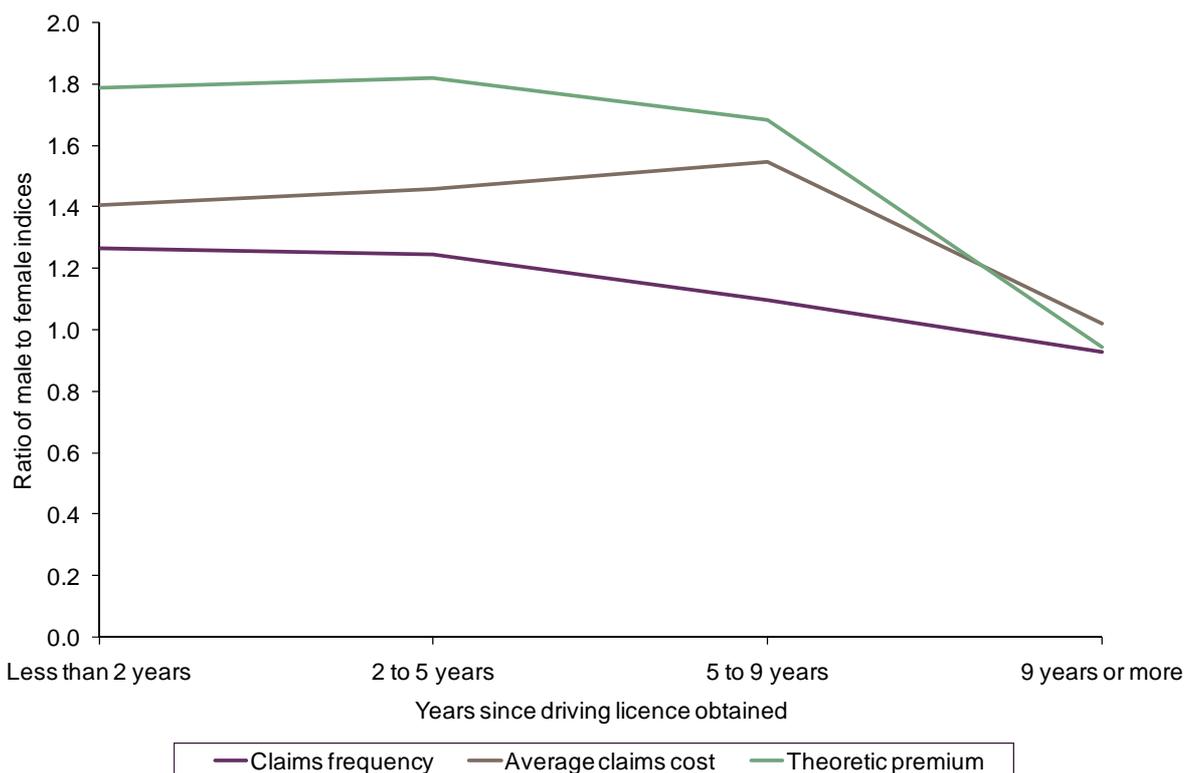
**Figure 3.8 Motor insurance claims in Italy by age (2008)**



Source: ANIA.

Figure 3.9 shows how claims frequency and average claims cost indices differ between women and men in France by the length of period since obtaining a driver's licence (which would be highly correlated to age of the driver). For example, focusing on drivers who have held a driving licence for under two years, male drivers have around a 30% higher frequency of claims index (relative to the overall average) than women (a ratio of 1.3). They also have around a 40% higher average claims cost index, indicating that the cost of covering their insurance claims is significantly higher. This leads to a theoretical premiums index (where theoretical premium is claims frequency multiplied by average cost of claims) being around 80% higher for men than for women in this category of drivers. Thus, this evidence from France shows that relatively inexperienced male drivers have both a higher frequency and a severity of claims than women in the same category. Gender differences are negligible for experienced drivers (which would be from the age of around 30 years). This is consistent with gender-differentiated pricing observed from motor insurance quote data for France, presented in Table 3.4.

**Figure 3.9 Motor insurance claims frequency and severity in France (2007)**



Source: Oxera calculations based on data from FFSA.

Thus, evidence shows that young men are more likely to make a claim (and a larger claim) than young women, and therefore motor insurance premiums are higher for young male drivers than for young women. Gender differences in terms of risk tend to disappear at around age 25 or later, depending on the country, and so do differences in premiums. Therefore, evidence suggests that differences between the sexes in terms of motor insurance premiums can be fully explained by the expected claims costs.

## 3.2 Insurance pricing in markets with unisex pricing policies

While gender is a valid risk factor and is used in pricing pension annuities and term life and motor insurance, there are countries in which unisex pricing is the norm for certain products. This report examines the cases of unisex motor insurance pricing in Belgium and the Netherlands, where gender-differentiated pricing is currently banned, and the German Riester pension annuity product, where unisex pricing is supported by a government subsidy. The evidence presented below shows that, while it is possible to implement unisex insurance or pension pricing, such policies are costly for consumers or for governments (in the case of subsidies to consumers).

### 3.2.1 Riester pension in Germany

The Riester Rente is a unisex-priced pension annuity product offered throughout Germany, whereby men and women receive equal amounts of monthly pension for each euro paid for the annuity. Regular monthly contributions by subscribers are topped up by the state and, in some cases, further supported through tax credits.

As shown in section 3.1, expected lifetime payments from the annuity can be estimated using longevity tables. Using German actuary tables of longevity for pension products, the NPV of lifetime payments from a Riester pension for men can be seen to be 87% of that for women—ie, 13% lower (this is using an annual discount rate of 3%). Thus, although monthly

income from a Riester pension is the same for men and women, men receive less over their lifetime due to their lower life expectancy.

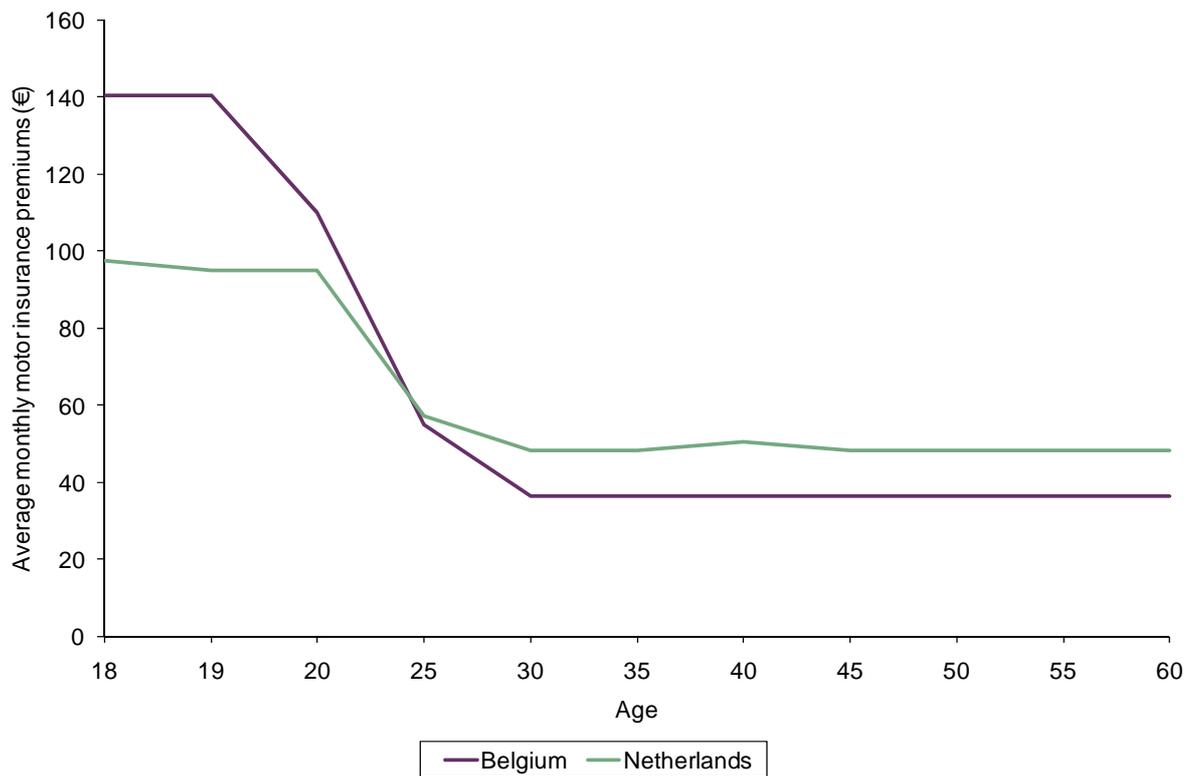
This is likely to make the Riester pension product unattractive for men, since they receive smaller lifetime benefits than women. However, men still have an incentive to subscribe to the unisex-priced Riester Rente, since the benefits in the form of state contributions and tax credits outweigh the effects from unisex pricing—these can range between 26% and 92% of the total savings performance, depending on marital status, number of children and income.<sup>13</sup>

The Riester Rente can therefore not be used as an example of successful unisex pricing in a private insurance market, since it receives significant government subsidy. Although the unisex pricing works, and men purchase Riester pensions despite the lower lifetime benefits they receive from this product, this outcome is highly unlikely to be feasible without the government subsidy.

### 3.2.2 Motor insurance in Belgium and the Netherlands

Belgium and the Netherlands mandated unisex pricing for motor insurance in 2008. This means that gender is not used in setting motor insurance prices. Figure 3.10 shows average premiums by age in Belgium and the Netherlands, based on online quotes. This data shows that, while gender is not used in motor insurance pricing, age is a very important factor, with quotes for younger drivers being at least twice as high as for drivers aged 30 or older.

**Figure 3.10 Motor insurance quotes in Belgium and the Netherlands**



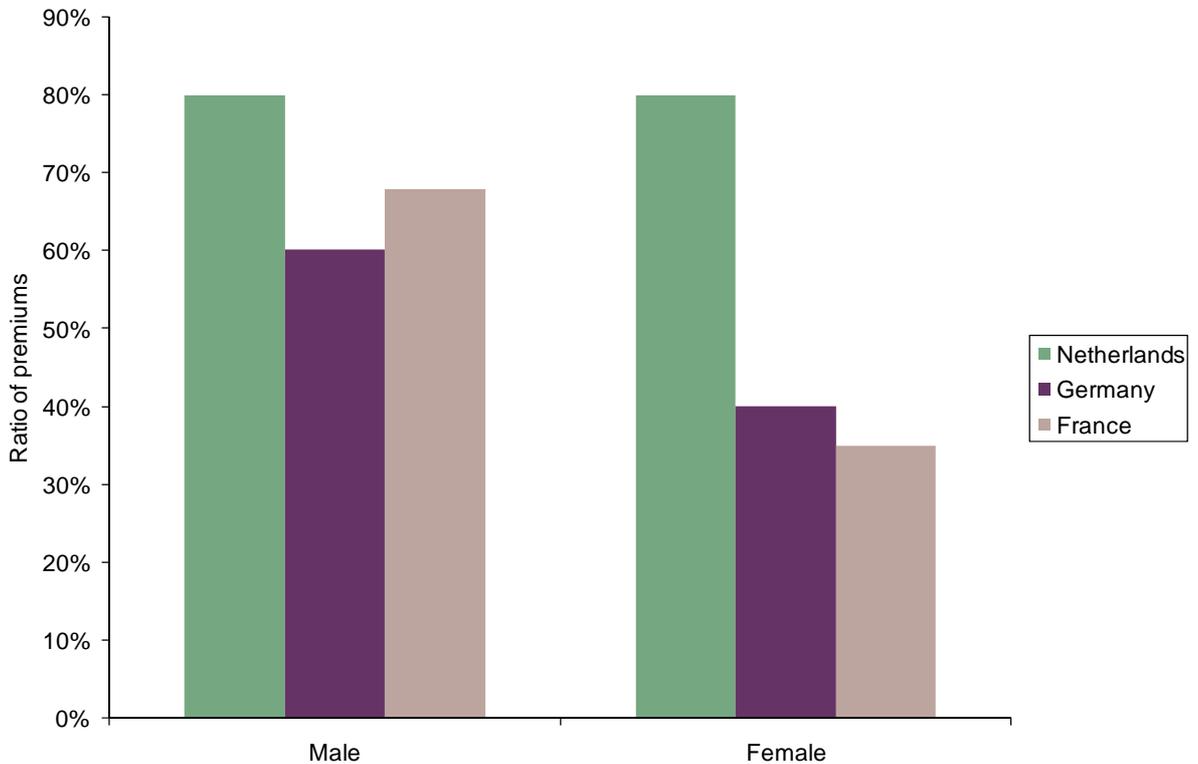
Source: Oxera calculations based on quotes from price comparison and insurance company websites.

Comparisons of premiums across unisex- and gender-based countries show that young women drivers in Belgium and the Netherlands pay relatively higher premiums than their

<sup>13</sup> A single person with no children and an annual income of €15,000 who makes the minimum annual contribution of €446 would receive a state top-up of €154, bringing the total savings performance to €600. In this case, the Riester benefits would be 26% of the total savings performance. A couple with two children and an annual income of €5,000 who make the minimum annual contribution of €60 would receive a state top-up of €678, bringing the total savings performance to €738. In this case, the Riester benefits would be 92% of the of the total savings performance.

counterparts in countries where gender is used for motor insurance pricing. Figure 3.11 illustrates that premiums for 20-year-old drivers, both male and female, are about 80% higher than premiums for 40-year-old drivers in the Netherlands.<sup>14</sup> This ratio is closer to the ratio for male drivers in the countries with gender-differentiated pricing (ie, 60–70%) than to the ratio for female drivers (ie, 35–40%). While there are a variety of factors that could potentially lead to these ratios being different across countries, this evidence could be indicative of young female drivers having to pay motor insurance premiums that are close to the high rates young males would pay, despite them being lower-risk.

**Figure 3.11 Increase in motor insurance premiums: age 20 compared to age 40**

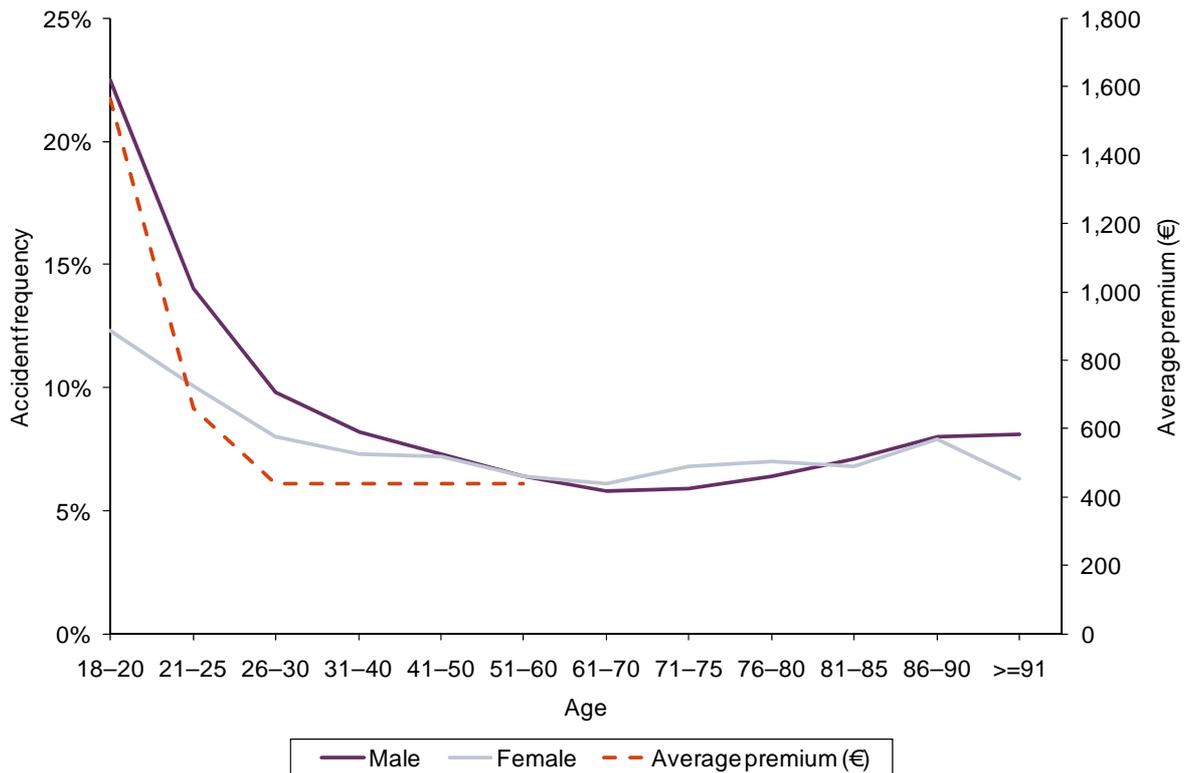


Source: Oxera calculations based on quotes from price comparison websites.

Irrespective of unisex pricing, however, the claims risk still differs between young women and men drivers. Figure 3.12 plots data on the frequency of car accidents in Belgium in 2009; frequency of accidents is a key driver of expected claims costs. At the age of 20, male drivers are 60% more likely to be involved in a traffic accident than female drivers. This demonstrates that gender (and age) remains correlated with risk in a system of unisex pricing.

<sup>14</sup> Data for Belgium is not shown, since there were only three quotes available online for 20-year-old drivers. Based on this small sample, 20-year-old drivers pay on average 134% more than 40-year-old drivers.

**Figure 3.12 Frequency of car accidents in Belgium by gender and age (2009)**



Source: Assuralia.

Figure 3.12 also plots unisex insurance premium quotes by age, and it is evident that the pattern of prices resembles much more the pattern of accident frequency of male drivers. It shows that car accident frequency among 20-year-old male drivers is 2.4 times that of the accident frequency among 31–40-year-old males, whereas this ratio is about 1.7 for female drivers. The 20-to-40 ratio of average insurance quotes is around three, which is much closer to the male ratio for accident frequency than to the female ratio. While such a comparison comes with important caveats, nevertheless, the Belgium data is indicative of the unisex insurance premiums for young drivers being more in line with the higher risk of young male drivers than with some average of risks or the lower young female driver risk. This is consistent with the analysis of unisex pricing for motor insurance in the Netherlands.

Overall, therefore, the study finds that unisex motor insurance premiums for young people in the Netherlands and Belgium appear to be higher than the average of young male and female premiums that one might expect given the level of premiums for older drivers. This may be an indication of additional costs arising due to unisex pricing, which is the focus of section 4.

## 4 The impact of a ban on the use of gender in insurance on consumers

### 4.1 Introduction

The previous section demonstrated that gender is an important risk-rating factor for pension annuities, term life insurance and motor insurance policies. This section investigates what the impact of a ban on the use of gender in insurance could be for consumers and the wider society. The section examines:

- **the impact on consumers from redistribution effects**—ie, redistributing premiums between men and women, assuming that the total of premiums remains the same;
- **the additional costs and impact on consumers**—a ban on the use of gender in pricing may result in additional costs being incurred by insurance companies, which will ultimately be borne by consumers due to the competitive nature of insurance markets;
- **the empirical evidence on additional costs passed on to consumers**—data from countries that have implemented unisex pricing for insurance products provides an indication of the overall impact of redistribution effects and any additional costs passed on to consumers;
- **the adverse selection and changes in consumer demand**—the potential impact on the demand for insurance products of unisex pricing;
- **the further potential consequences of a ban on the use of gender**—including the functioning of private insurance markets and wider social consequences, such as changes to behaviour due to the supply and pricing of insurance products.

A ban on the use of gender in insurance pricing may have a number of potential unintended consequences on consumers and the insurance markets more generally. This means that those who promote unisex pricing on the grounds of fairness or other reasons would nonetheless need to take into account the full consequences of a gender ban. They would need to weigh the perceived benefits against the efficiency costs resulting from a restriction of risk-based pricing, as well as against the wider distributional impacts and other aspects of fairness that may be compromised. This section aims to present arguments and evidence to support these considerations.

#### Main findings of section 4: ‘The impact of a ban on the use of gender in insurance on consumers’

- Redistribution effects suggest that unisex pricing will result in significant increases in premiums for retiring men buying pension annuities, for all women buying life insurance, and for young women buying motor insurance. Based on the data available for selected countries:
  - men (aged 65) could see a reduction in pension income from pension annuities of around 5% or more on average;
  - women (aged 40) could see life insurance premiums rise by around 30% or more on average;
  - young women (aged 20) could see motor insurance premiums rise by 11% or more on average.
- Additional costs could arise from insurers having to apply a gender mix risk premium due to the risk of attracting the higher-risk gender group; there could in theory also be additional sales or

marketing costs due to a ban on the use of gender.

- Any additional risk premiums applied by insurers are likely to be passed on to consumers in the competitive insurance markets, since the costs would be common to all insurers.
- In countries that have introduced unisex pricing for motor insurance products, increases in premiums for the low-risk gender were larger than the decreases in premiums for the high-risk gender, suggesting that premiums went up on average; this increase may reflect additional costs arising due to unisex pricing.
- Changes in premiums are likely to result in some changes in consumer demand, with adverse selection resulting in less efficient adoption of insurance products.
- Adverse selection can lead to unintended wider social implications, including damaging incentives for people to save for their old age.

## 4.2 Impact on consumers from redistribution effects

The most immediate effect of banning the use of a relevant risk factor on insurance pricing is through redistribution of premiums from the high-risk group to the low-risk group. In the case of gender, two risk pools are effectively combined and premiums are recalculated such that they cover the totality of the costs of the two risk pools. Ignoring any potential supply responses or behavioural changes, and focusing on the first-order redistribution effect only, the result will be a change in the price and cross-subsidy between the two risk pools, with the direction and extent of the cross-subsidy depending on the product and relative size of the two risk pools. Since a ban cannot make the provision of insurance more efficient (rather, any restriction of a relevant rating factor will make it less efficient), benefits for one group of consumers can be achieved only at a cost to others.

The redistribution effects of unisex pricing for each of the products are discussed in more detail below.

### 4.2.1 Pension annuities

Section 3.1 showed that, in all the countries considered in this report, women have greater life expectancy than men. In the context of pension annuities, it is longevity risk that matters, hence females represent the higher-risk group. Thus the first-order impact of banning the use of gender in annuity pricing is that males would receive a lower annuity payment for a given pension pot.

Insurance companies reported to the study that the gender mix for pension annuities is more balanced than for life insurance in terms of the numbers of men and women buying policies, although there is an imbalance in the size of pension pots (male pension pots are on average larger than female pension pots). This imbalance is decreasing over time, however (due to increased female participation in the labour market in many countries). On the basis that the focus is on future purchases of pension annuities, Oxera has assumed that 50% of total pension annuities (in terms of value) for single individuals are purchased by men.

On the basis of this assumption for the typical gender mix, as well as the other assumptions outlined in section 3 for the pension annuity analysis,<sup>15</sup> Table 4.1 presents the potential redistribution effect of unisex pricing for pension annuities for two European countries.<sup>16</sup>

The redistribution effects for pension annuities are smaller than those for life insurance, because the difference between average life expectancies for men and women at age 65 are less pronounced than the differences between mortality rates for men and women at age 40.

<sup>15</sup> In summary, the analysis was for a fixed nominal pension annuity product for a single individual aged 65 without any payment protection. Some differences in policy structure occur between countries and companies, however, which explains the price variation between countries included in the table.

<sup>16</sup> As noted in section 3, the limited development of private pension annuities in many European countries limited the availability of data.

It should be emphasised that this analysis considers only the impact of redistributing the cost of insurance, and does not consider other drivers of cost, which are considered further below.

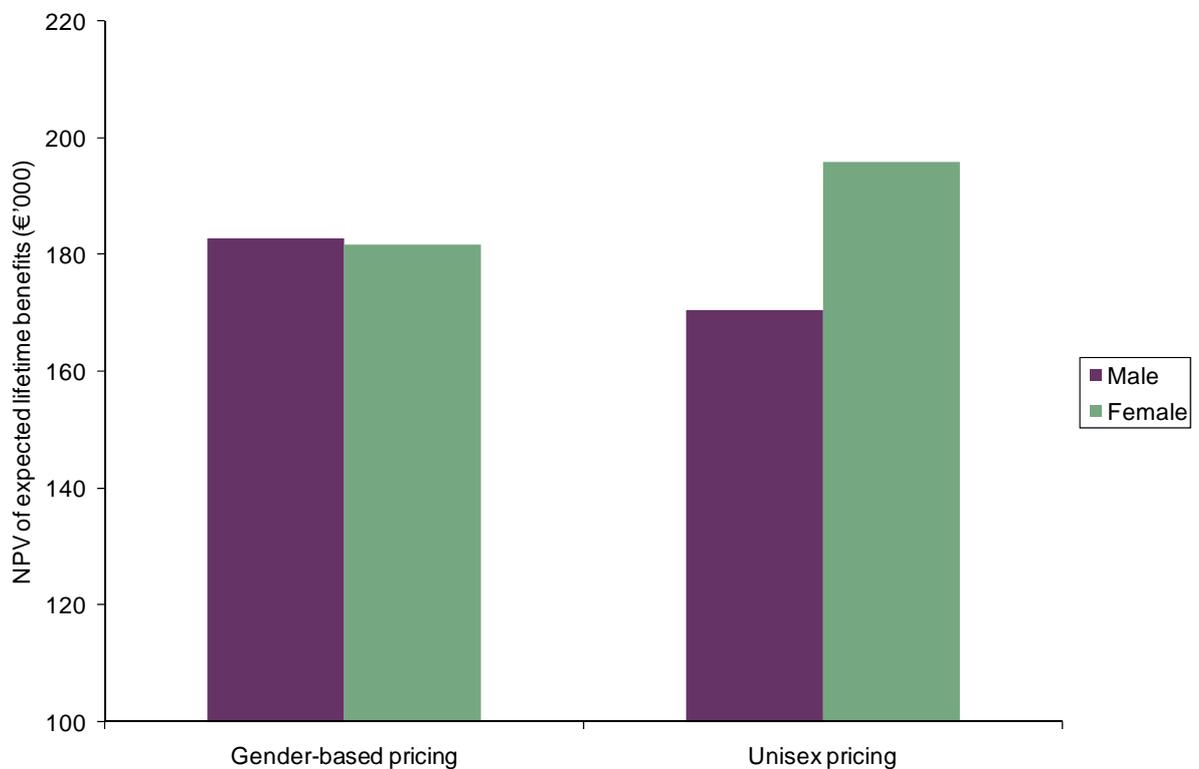
**Table 4.1 Redistribution effects for the monthly pension from a pension annuity**

Country	Gender-based		Unisex	% change in pension	
	Men	Women		Men	Women
Germany	867	783	825	-5	+5
Netherlands	1,144	990	1,067	-7	+8
<b>Average</b>	<b>913</b>	<b>818</b>	<b>866</b>	<b>-5</b>	<b>+6</b>

Note: Average of countries calculated using country population weights.  
Source: See Appendix.

Unisex pension annuity payments will result in significant differences in the lifetime expected annuity payouts for men and women. Section 3.1 showed that, under gender-differentiated annuity income, women and men receive equal expected lifetime payout from their pension annuity—even though the monthly or annual payment differs, the total that men and women receive over their remaining lifetime is the same, due to differences in life expectancy. Figure 4.1 shows that this would no longer be the case with unisex annuity pensions, using the Netherlands as an example (see section 3 for the details used for this example). With unisex annuity pension payments, men would receive significantly less in total annuity payouts over their lifetime than women, as their average life expectancy is shorter than that of women. This means that the net present value of expected benefits is less for men than women with unisex pensions, making the pension annuity products less attractive to men.

**Figure 4.1 NPV of expected benefits from a pension annuity in the Netherlands**



Notes: The chart shows the NPV of the expected future pension payments from a pension annuity, which depends on life expectancy and the discount rate (assumed to be 3%). Unisex policies are assumed to result in pension payments that are the average of current male and female pension payments. Currently, differences in pension payments between men and women are nearly entirely explained by differences in life expectancy, as the

NPV of future benefits is very similar (see the left-hand side of the chart). With unisex pension payments, the differences in life expectancy result in a significant difference in the NPV of future benefits (see the right-hand side of the chart).

Source: Oxera analysis of data from price comparison websites and longevity tables.

While the percentage price changes from redistribution effects are smaller for pension annuities, there is still scope for them to lead to issues of adverse selection as consumers have some degree of choice to purchase other products with their pension pots or to choose lump-sum payment options upon retirement. The risk of adverse selection is considered further in section 4.5.

#### 4.2.2 Term life insurance

Evidence on mortality rates in the selected European countries, presented in section 3.1, demonstrated that men have, on average, a higher probability of death than women, for any given age. Thus, for the purposes of term life insurance pricing, men are the higher-risk group. The main first-order impact on life insurance of a unisex pricing requirement would be that females pay more and males pay less, depending on the gender mix in the portfolio.

Insurance companies reported to the study that, typically, life insurance portfolios are heavily skewed towards men, both due to a higher proportion of men having life insurance policies and male policies being larger, on average, than female policies. Evidence collected suggested that term life insurance policies can vary from 60% to 80% male (in terms of the total value of policies). Reliable data for individual countries was not available, and in the absence of such data, it was decided to apply an assumption that term life insurance portfolios are 65% male (ie, 65% of the total premiums paid for single term life insurance policies are for male policies, and the remaining 35% are for female policies).

On the basis of this assumption for the typical gender mix, as well as the other assumptions outlined in section 3 for the life insurance analysis,<sup>17</sup> Table 4.2 presents the potential redistribution effect of unisex pricing for life insurance for five European countries. The percentage increase in the premiums for women is greater than the percentage reduction in premiums for men, due to the predominance of male premiums in the portfolio (resulting in the unisex premium being closer to the male premium than the female premium).

The extent of the price changes varies by country, depending on the degree to which premiums currently differ between men and women (premiums cannot easily be compared between countries, however, due to differences in policy design). The increase in female premiums could be very significant for some countries, where the gap between premiums is currently very large.

<sup>17</sup> In summary, this analysis considered a ten-year term life insurance product for men and women aged 40, excluding disability payments and other forms of personal insurance. Some differences in policy structure occur between countries and companies, however, which explains the price variation between countries included in the table.

**Table 4.2    Redistribution effects for life insurance premiums**

Country	Gender-based		Unisex	% change in premiums	
	Men	Women		Men	Women
Spain	30.8	19.3	26.8	-13	+39
Germany	30.1	20.7	26.8	-11	+30
Netherlands	23.8	20.9	22.8	-4	+9
Czech Republic	44.5	23.0	37.0	-17	+61
Poland	37.1	23.0	32.1	-13	+40
<b>Average</b>	<b>31.9</b>	<b>20.9</b>	<b>28.0</b>	<b>-12</b>	<b>+34</b>

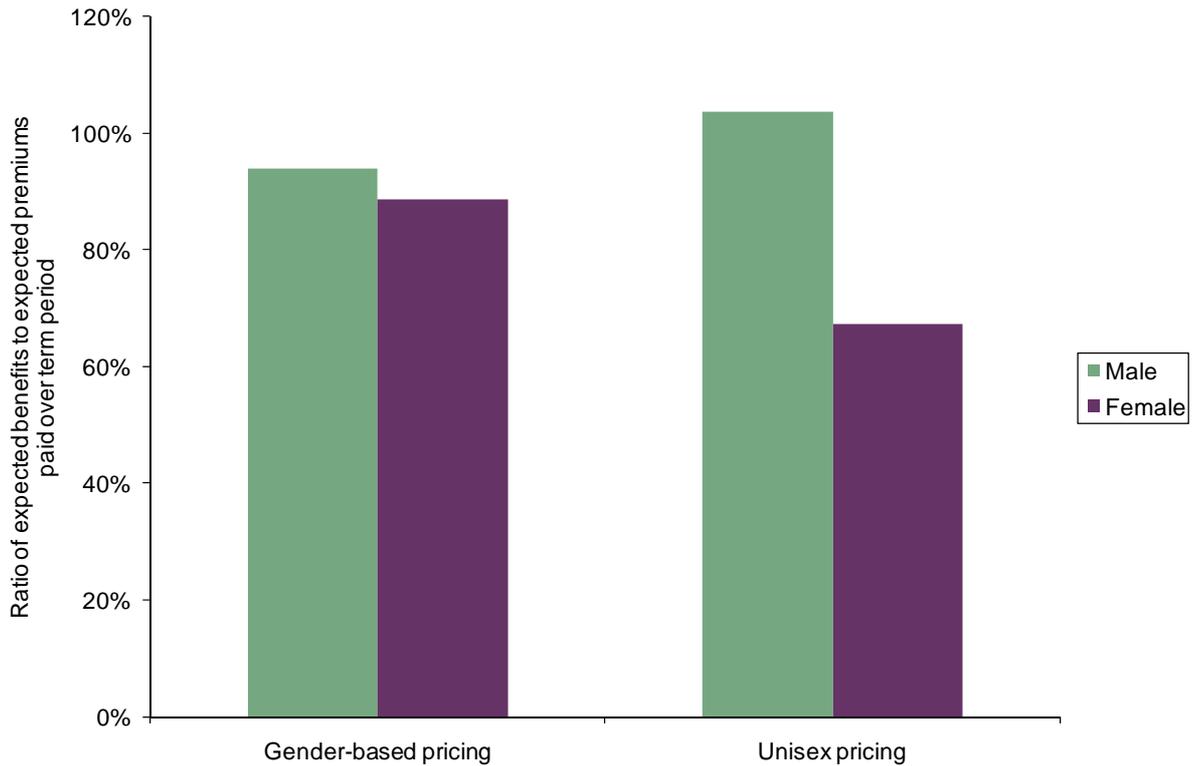
Note: Differences in policies mean that values should not be compared across countries. All figures are in euros, with assumed exchange rates versus the euro of 25 for the Czech koruna and 4.4 for the Polish zloty. The overall average of countries is calculated using country population weights.

Source: See Appendix.

The change in premiums that men and women pay for life insurance as a result of unisex pricing will lead to changes in expected benefits versus expected costs of purchasing term life insurance. Section 3.1 showed that gender-differentiated premiums mean that women and men will pay and receive similar amounts from their life insurance, taking into account their differing mortality rates. With unisex pricing, men are expected to pay less over the term of the life insurance than women, due to their higher probability of dying, but are expected to receive the same payout as with gender-differentiated pricing.

Figure 4.2 illustrates this using data from Germany. As discussed in section 3.1, expected benefits from term life insurance relative to the expected total premiums paid are similar or the same for women and men under gender-differentiated pricing, due to the differences in mortality rates. With unisex pricing, male premiums can be expected to fall, and female premiums to rise. This would lead to a situation in which expected benefits from term life insurance relative to expected premiums paid would be significantly higher for men than for women, as reflected in Figure 4.2. Clearly, this makes term life insurance much less attractive to females, as they can expect to receive less for the same expected payment of premiums.

**Figure 4.2 Ratio of expected benefits to expected premiums for life insurance (Germany)**



Source: Oxera analysis based on data from price comparison websites and the German actuary mortality tables (DAV).

This simple analysis is conducted on the basis of a static gender mix—with such significant price changes, one would expect the gender mix to move more towards the favoured gender—ie, for there to be more males in the portfolio. This would further exacerbate the distributional effects presented here. The risk of adverse selection is discussed further below.

### 4.2.3 Motor insurance

Motor insurance claims and road accident data from various European countries, presented in section 3.1, showed that young male drivers (below the age of around 25) are a significantly higher-risk group than young female drivers. The redistribution impact of a ban on the use of gender as a rating factor would therefore be that young females would pay more, whereas young males would pay less.

Data received for the study indicated that the proportions of young men and young women in motor insurance portfolios are close to 50% on average. On this basis, it has been assumed that 50% of young person motor insurance policies (in terms of number of policies) are purchased by men.<sup>18</sup>

On the basis of this assumption for the typical gender mix, as well as the other assumptions outlined in section 3 for the motor insurance analysis, Table 4.3 presents the potential redistribution effect of unisex pricing for motor insurance for young people (age 20). It shows that, in the three countries for which motor insurance premiums were analysed, premiums would be set to rise by about 11% for young women and fall by about 9% for young men,

<sup>18</sup> Across the whole population, the percentage of male policy-holders was reported to be more like 65% in many European countries, but data collected from portfolios in Germany and France pointed towards a gender mix closer to 50% male for drivers under age 25. The assumption of 50% young men is probably a slight under-estimate for some countries, but would seem to be a prudent assumption given the results of the limited data available.

based solely on redistribution effects. As the study explores below, however, there may be additional drivers of premiums other than redistribution effects.

**Table 4.3 Redistribution effects for motor insurance premiums (drivers aged 20)**

Country	Gender-based		Unisex	% change in premiums	
	Men	Women		Men	Women
Germany	798	662	730	-9	+10
France	1,079	920	999	-7	+9
Spain	994	734	864	-13	+18
<b>Average</b>	<b>936</b>	<b>763</b>	<b>850</b>	<b>-9</b>	<b>+11</b>

Note: Average of countries calculated using country population weights.  
Source: See Appendix.

This section has presented evidence on how insurance premiums may change based simply on the redistribution of current total premiums between men and women, assuming no additional costs or changes to behaviour. In the next section, the report considers whether there would be reasons for premiums to differ from the outcomes described above.

### 4.3 Additional costs and impact on consumers

The impact of the removal of a relevant risk-rating factor goes beyond the pure redistributive effects. It restricts the way in which insurers price risks and requires adjustments in the supply of insurance, with adverse consequences for consumers, who would ultimately bear any cost increases or other supply-side adjustments due to the competitive nature of insurance markets.

There are two main aspects of the supply-side response to the ban on the use of gender.

- **Direct costs.** At the first level, a ban on the use of gender as a rating factor imposes compliance costs on insurers in the form of system changes, re-pricing, reprinting of documents, etc. These are mainly one-off costs, but could be significant. There may also be an increase in ongoing costs, such as marketing and distribution.
- **Portfolio mix effect.** Significant costs may arise with respect to pricing risks and the unintended adverse consequences that result from the less accurate pricing of risks in insurers' portfolios. The uncertainty of the gender mix adds a new element of risk to the insurance business, and consequently could require additional economic capital to be set aside to cover this risk. This is particularly significant for long-term products, such as pension annuities and life insurance, where the claims costs take many years or decades to emerge.

The subsequent impact on consumers will depend on the degree to which any additional costs to insurers are passed on in the form of higher premiums. This section also considers this aspect for a competitive market where additional costs are likely to fall on all insurance companies, and therefore be passed on to consumers.

This sub-section of the report therefore looks at:

- one-off compliance costs in the transition period;
- sales and marketing costs;
- gender mix risk premiums;
- pass-through and impact on consumers.

### 4.3.1

#### **One-off compliance costs in the transition period**

The removal of gender as a risk factor in setting insurance premiums will result in one-off compliance costs for insurance companies, which will need to: (i) alter their systems for determining premiums that do not include gender; and (ii) manage the transition from gender to unisex pricing. This section reviews evidence on the potential extent of these two types of cost.

##### **Cost of altering systems**

Discussions with European insurance companies suggest that the potential extent of one-off compliance costs for altering systems varies considerably between companies, but for most companies such costs are not likely to drive up premiums significantly.

Costs are likely to be incurred in changing sales platforms (such as websites), IT systems, actuarial pricing calculations and a variety of portfolio management procedures. The extent of any compliance costs depends on the current state of these systems, in particular:

- companies that have flexible and sophisticated systems designed to allow for rapid re-pricing of products tend to expect compliance costs to be limited, since their systems are already designed to alter, add or remove risk factors with little cost;
- companies with older, less flexible systems could face more significant costs in altering them.

Few estimates of possible costs were available for the study, although the few cost estimates provided by insurance companies were not particularly material compared to the overall total level of insurance premiums. Furthermore, if compliance costs vary according to the nature of IT systems, one might not expect costs to be passed on to consumers to a significant degree in a competitive market.

##### **Cost of managing the transition from gender to unisex pricing**

For term life insurance and pension annuities, customers tend to buy policies only once in their lifetime and therefore one might expect there to be few problems from the transition of existing customers from gender to unisex pricing, as the agreed premiums for the existing insurance contract should remain in place. In the interviews, however, a number of insurance companies expressed considerable uncertainty about the application of the legislation in this regard, and stated that they needed guidance on how the rules would apply in terms of existing contracts versus new contracts.

There would also be transitional issues for motor insurance, where customers typically renew policies every year. Insurance companies indicated concern as to whether existing customers would continue to be able or want to renew contracts based on previous premiums when premiums for new contracts are radically different. For example, young women would want to avoid the new higher premiums for young women by renewing contracts based on previous rates, if this were possible, whereas young men would seek new contracts to enjoy the new lower premiums for young men. Consequently, the total premiums received by the insurance company would be lower if it set new unisex premiums to be the weighted average of the previous gender-based premiums. The insurance companies would therefore need to raise overall premiums for new contracts to offset this loss of premiums. However, this depends on insurance companies needing to honour existing gender-based premiums in the case of renewal, and some of the interviewees were unsure whether this would be the case.

This outcome is also consistent with the gender mix risk premium issue described in section 4.3.3.

### 4.3.2

#### **Sales and marketing costs**

Unisex pricing creates an incentive to insurance companies to attract the lower-risk gender as customers, since claims paid to the lower-risk gender are lower on average, while the

premiums given unisex pricing are the same. If some insurance companies actively target the lower-risk (and hence more profitable) gender through higher levels of targeted sales and marketing expenditure, other insurance companies may be forced to either accept a higher proportion of the higher-risk gender (which increases their average cost, which in turn increases their premiums) or also engage in increased sales and marketing expenditure (which also increases their costs and hence average premiums).

In theory, at least, an insurance company should be willing to spend as much as the difference in expected claims on attracting the lower-risk gender. Except for in the UK,<sup>19</sup> however, there is little evidence that large insurance companies target customers by gender, and there was little evidence from the interviews that insurance companies are considering adopting such policies. A number of respondents did note, however, that some niche insurance companies do target particular groups (eg, nurses) and they could increasingly indirectly target gender in a unisex pricing world due to the higher premiums for the lower-risk gender (ie, the change to unisex pricing has increased the potential profitability of this indirect targeting). The survey evidence suggests that the larger companies may not do this, but a growing number of niche companies could, drawing custom away from larger companies.

Even though sales and marketing is a discretionary form of expenditure for insurance companies, this dynamic of niche companies targeting the lower-risk gender could result in higher overall premiums for consumers. The main players in the market (the larger companies), which effectively set prices, would end up having portfolios that are skewed towards the higher-risk gender as the niche companies take a significant proportion of the lower-risk gender custom. The large companies would therefore charge unisex premiums that reflect their higher-risk gender mix, and would therefore charge premiums that are higher than the weighted average of current gender-based premiums. If niche companies were able to capture much of the demand from the lower-risk gender then unisex premiums would drift upwards towards the original higher-risk-gender-based premiums.

The extent to which this might happen is ultimately an empirical question—see section 4.4 for the empirical evidence collected.

### 4.3.3 Gender mix risk premium

With a ban on the use of gender in insurance pricing, the gender mix of an insurance portfolio becomes an additional risk factor for the insurance company. For example, at present an insurance company does not worry about the gender mix of a life insurance portfolio, since men pay higher premiums in proportion to their risk of mortality. But with unisex pricing, male customers will effectively become more costly for the company than female customers, and the proportion of males buying policies will become a risk factor for the company. Additional risk factors can result in additional risk premiums being required.

For motor insurance, the gender mix risk may be less material, since insurance products are renewed every year (allowing for re-pricing), and the differences in claims between genders largely disappear by the time drivers reach the age of 25. But for term life insurance and pension annuities, insurance companies are locking themselves into much longer contracts, which heightens the risk of a disadvantageous gender mix. For example, if a company was to offer a 20-year term life insurance product at a unisex price and then found that all of its customers were men, it could be stuck with a loss-making portfolio for 20 years.

Many of the insurance companies interviewed indicated that they believed that such a risk premium could be quite significant and could result in unisex prices being significantly closer to the current premiums for the higher-risk gender. This was considered to be particularly the case where currently the higher-risk gender makes up the majority of customers. Life

<sup>19</sup> For example, 'Sheilas' Wheels' is an insurance brand in the UK that is explicitly targeted at women, including services such as 'handbag cover'.

insurance is one example of this, where men make up the majority of customers and currently pay higher premiums due to a higher mortality risk.

As with any business, additional risk can create additional costs for a business either due to higher returns being required by investors or additional costs to mitigate the risk of default. For insurance companies, additional capital can be required in response to increased risk, which creates additional cost. The extent to which additional capital might be required in this case is uncertain.

Empirical evidence from countries with unisex pricing, as described in section 4.4, is used to assess the potential for risk premiums in the case of unisex pricing.

#### **4.3.4 Pass-through and impact on consumers**

Any additional costs faced by insurance companies due to a ban on the use of gender may ultimately be borne by consumers if insurance companies are able to pass on those costs through higher prices.

Insurance markets are generally considered quite competitive in nature, particularly where relatively standard products are on offer and consumers are able to quickly compare prices of different suppliers, such as through the use of price comparison websites. This is generally the case for the products considered in this study, since the common generic policy types have been focused on, and data taken from, price comparison websites, indicating their availability and effectiveness.

One would expect that firms in a competitive market are ‘price-takers’ in that they need to set premiums at the competitive level in order to win business. As such, any specific costs that they face cannot be reflected in premiums, since premiums are determined only by costs that are common across all insurance companies. Consequently, in the context of this study, one would expect that:

- one-off compliance costs would generally not result in premium increases, since they are significant only for a few insurance companies;
- sales and marketing costs could, in theory, be passed through to consumers if a significant number of niche players were to draw away the lower-risk gender from the main insurance companies (that effectively set prices);
- risk premiums for gender mix risk would be common to all insurance companies, and could therefore, in principle, be passed on to consumers in a competitive market.

Since unisex pricing already occurs in some European insurance markets, the study was able to examine the potential impact from empirical evidence. The next section of the report therefore looks at this empirical evidence for any such additional costs in insurance markets where unisex pricing policies are already in place.

### **4.4 Empirical evidence on additional costs passed on to consumers**

Section 4.3 set out why one might expect unisex premiums to be higher than the weighted average of gender-based premiums. The extent of any increase is ultimately a question for empirical analysis, and hence in this section evidence is presented on unisex premiums for insurance markets where a ban on the use of gender is already in place. The results of section 3.2 are interpreted, and evidence from other studies summarised, to show that there is indeed empirical evidence that unisex premiums are higher than one would expect from redistribution effects alone.

#### **4.4.1 Unisex premiums in the Netherlands and Belgium**

Section 3.2.2 set out analysis of unisex pricing for motor insurance in the Netherlands and Belgium, which provides some interesting results for the potential implications of unisex pricing on the overall level of premiums.

The key conclusion was that unisex prices for drivers aged 20 appear to be more consistent with the higher premiums for young men in countries with gender-based pricing than they are consistent with the lower premiums for young women. Consequently, the overall level of premiums for young people appears to be higher in unisex pricing countries than the gender-based pricing countries.

Table 4.4 summarises the evidence for six European countries. Premiums vary considerably among the four countries with gender-based pricing but, on average, young male (aged 20) premiums are 103% higher than premiums for males aged 40, while young female premiums are 79% higher than premiums for females aged 40. The average for the Netherlands and Belgium (unisex pricing), on the other hand, is 107% for both male and female drivers.

**Table 4.4 Additional motor insurance premiums for drivers aged 20 relative to drivers aged 40**

Country	Premium at age 20 relative to age 40	
	Men	Women
France	68%	35%
Germany	60%	40%
Italy	178%	116%
Spain	107%	123%
<b>Average (gender-based)</b>	<b>103%</b>	<b>79%</b>
Netherlands	80%	80%
Belgium	134%	134%
<b>Average (unisex)</b>	<b>107%</b>	<b>107%</b>

Note: The table shows by how many percentage points the ratio exceeds 100%.  
Source: Oxera analysis based on premium data (see Appendix).

If premiums for young drivers in unisex pricing countries follow a profile more similar to that of the higher-risk gender (young males in this case) then this may be evidence that additional costs have driven up premiums in a unisex pricing regime.

There are limitations to the conclusions that one can draw from this, however, as this analysis does not compare premiums before and after the introduction of unisex pricing. This comparison would allow a more precise determination of the impact of the change. Such a comparison has been made in other studies, however, as described below.

#### 4.4.2 Other studies of the impact of unisex pricing

Data on motor premiums from countries where unisex pricing has (or had) been introduced offers compelling evidence on the redistribution effects associated with a ban on the use of gender. In particular, the motor insurance cases of Belgium and the US States of Michigan and Montana are reviewed below.

- **Belgium:** Belgium implemented unisex pricing for motor insurance in late 2007. MTPL insurance premiums data shows that, as a result of unisex pricing, premiums increased by 7–15% for young women (under 30 years old) in 2008, and premiums decreased by 3–4% for young men.<sup>20</sup> These effects are greater than one might expect from redistribution effects alone, given the assumptions about gender mix, as the increase in young female premiums was found to be between two and four times greater than the decrease in young male prices.

<sup>20</sup> CEA response to the European Commission questionnaire on the follow-up to the Test-Achats ruling (C-236/09) – Forum on the implementation of Article 5 of Directive 2004/113/EC.

- **Montana:** On October 1st 1985, the US State of Montana put into effect a law banning the use of gender and marital status in determining motor insurance rates. A 1987 survey of 12 leading insurers found that all young female drivers and young married male drivers (below the age of 25) had to pay substantially higher premiums for their motor insurance since the ban was introduced.<sup>21</sup> At the same time, premiums for unmarried young male drivers decreased. This redistribution effect is shown in Table 4.5.

**Table 4.5 Impact of unisex pricing on motor insurance premiums in Montana**

Age and marital status	Change in motor insurance premiums	
	Men	Women
Age 23, unmarried	27–28% decrease	18–20% increase
Age 23, married	26–29% increase	56–59% increase

Source: National Highway Traffic Safety Administration (1987), 'Unisex auto insurance rating: How auto insurance premiums in Montana changed after elimination of sex and marital status as rating factors'.

In effect, the lower-risk customers within the group of young drivers—women and married men—cross-subsidised the higher-risk customers—unmarried men—following the introduction of a ban on the use of gender and marital status. Motor insurance premiums for older age groups were largely unaffected by the ban, as one would expect based on the European claims data presented in section 3.

The overall impact on average premiums for young people depends on the gender and marital mix of policy-holders, which was not available. Based on an assumption of 20% of the age 23 population being married<sup>22</sup> and the assumed ratio of 50% male and 50% female drivers at age 23, the overall increase in the average premium would be about 5%.

- **Michigan:** The US State of Michigan banned the use of gender and marital status in motor insurance pricing in 1981. A survey of insurers in Michigan, conducted by the Michigan Insurance Bureau in 1981, revealed that unisex pricing had resulted in redistribution effects, particularly for drivers under the age of 25.<sup>23</sup> Motor insurance premiums for young women increased by 21%, whereas young male drivers saw their premiums fall by 15%. Once again, one observes the expected redistribution effects associated with a ban on the use of gender plus some potential for additional costs being realised.

#### 4.4.3 Summary of empirical evidence

It is difficult to place a firm estimate on the likely extent of additional costs being passed on to consumers, but empirical evidence from motor insurance in the Netherlands and Belgium in particular does suggest that the unisex premiums are significantly higher than the weighted average of gender-based premiums.

These results also have implications for the two life products. Arguably, the extent of additional costs could be greater for life insurance and pension annuities, since these products are not compulsory (as opposed to motor insurance). Additional costs passed on to consumers could mean that:

<sup>21</sup> National Highway Traffic Safety Administration (1987), 'Unisex auto insurance rating: How auto insurance premiums in Montana changed after elimination of sex and marital status as rating factors'.

<sup>22</sup> US Census Bureau data for the midwest in 1996.

<sup>23</sup> Michigan Insurance Bureau (1981), 'Unisex Auto Rating: The Michigan Experience'.

- as the gender mix for life insurance is skewed towards men, unisex life insurance premiums may end up being much closer to the current higher male premiums than the female premiums;
- the combined effects of adverse selection and moral hazard could result in little improvement in pensions from annuities for women, while reducing old-age provision by men.

The potential impact of these changes on consumer demand and wider social implications is discussed below.

## 4.5 Adverse selection and changes in consumer demand

As described in section 2.1, adverse selection arises in insurance markets when higher-risk customers are effectively subsidised by lower-risk customers, and this leads to the proportion of higher-risk customers increasing in the portfolio relative to lower-risk customers. In this section the potential extent of adverse selection is considered in terms of potential changes in consumer demand.

The problem of adverse selection is potentially greater for life insurance and pension annuities than it is for motor insurance, as the latter is mandatory for drivers whereas the former have more scope for changes in demand as consumers adopt alternative products.

The main concern for life insurance would be that women, who are taking an increasing role in providing financial support to the family unit, are discouraged from buying policies by the potentially relatively large increases in premiums that could result from unisex pricing. With women making up only a relatively small minority of (single) policies of many life insurance portfolios, there may be a concern about adverse selection leading to even greater proportions of men, and hence unisex premiums being set close to the current male premiums. This could lead to even more women finding term life insurance to be poor value for money and hence not purchasing it.

The differences in mortality rates between men and women aged 40 (for example) are considerable (particularly in Poland and the Czech Republic in this study), and hence unisex prices could produce such significantly poorer value for money for women that women could end up being largely excluded from this market in some countries.

The difference between men and women is less stark for pension annuities, but in this case customers perhaps perceive that close substitutes are available and hence the impact on consumer demand could also be significant. Men, who would be disadvantaged by unisex pricing, may face a reduction in benefits of only around 5%, but this reduction could still be material given that they can choose to buy financial products other than pension annuities.

While there are other options for old age provision, pension annuities are the only commonly used option that provides insurance for longevity risk—ie, a lifetime income guarantee. As discussed further in section 4.6.2, although pension annuities may be preferable from a social point of view, since they provide a guaranteed lifetime income, individuals often choose to divert pension savings into other financial products or for more immediate consumption purposes. For example, individuals may divert pension funds from buying an annuity to:

- taking out a proportion as a tax-free lump sum, allowable in many EU countries;
- buying annuity products with more upfront payments to reduce the impact of longevity (eg, avoiding any inflation of pension payments over time);
- saving less into their pension fund in the first place, and instead increasing current spending or funding other asset purchases, such as housing or equity investments. To

the extent that pension savings are encouraged by taxation advantages, gender-neutral pricing will reduce (and could eliminate) that tax advantage for the disadvantaged gender, which would tend to negate the effectiveness of this policy instrument.

This could have profound effects on the uptake of voluntary pension products, as discussed below. It should be noted that alternative financial products cannot fully replace the functions of pension annuities, particularly with regard to providing a guaranteed lifetime income irrespective of longevity.

For motor insurance, adverse selection remains a problem for individual insurance companies, even if mandatory cover requirements mean that it is not a problem for the market as a whole. An individual insurance portfolio with a high proportion of young male drivers could be placed at a competitive disadvantage, as it will not be able to rebalance the portfolio without offering lower rates to higher-risk young male drivers. This issue would support the expectation that insurance companies engage in additional marketing activities to help rebalance portfolios, although (as discussed before) there is little indication that such actions will be taken.

Furthermore, while motor insurance is mandatory at a minimum level, consumers still decide on whether to take additional cover, what sort of vehicle to buy, and whether to own a vehicle in the first place. For example, at the margin one would expect some young women to be put off car ownership by the higher insurance premiums of unisex pricing. For young men, lower premiums may encourage drivers to purchase faster, more powerful vehicles that require more expensive insurance policies, although this effect may be limited by the relatively small reductions in premiums likely to occur for young men.

## **4.6 Further potential consequences of a ban on the use of gender**

### **4.6.1 Potential impact on the functioning of the insurance market**

In extremis, adverse selection can result in private insurance markets becoming unworkable and insurance provision no longer being available. This study did not find evidence suggesting that a ban on the use of gender would be likely to lead to the collapse of insurance provision for the three products examined. While gender is an important risk factor, differences between men and women are generally not large enough to make insurance provision impossible under a unisex price requirement. There was found to be a risk of adverse selection and changes in consumer demand, but not of the complete exit from the market of large groups of former customers.

In the course of the interview process, one insurance company did note concern about the potential viability of some disability insurance products in Germany given a ban on gender, due to significantly different rates of specific disabilities among men and women. While the study did not examine these policies, it can be noted that if differences by gender in average claims per policy are sufficiently large then unisex pricing could put the viability of the product at risk, particularly for the lower-risk gender. At least some change to the nature of products, and potentially the elimination of some specific products, could result from the ban. But this result is not likely for the generic products considered in this study.

### **4.6.2 Wider social consequences**

To the extent that a ban on the use of gender leads to changes in consumer demand through adverse selection, there could be implications for wider social issues. For example:

- a reduction in women buying life insurance would reduce financial security for families as women become increasingly important in terms of family financial provision;
- policies for ensuring that people save for their old age could unintentionally be put at risk by unisex pricing, threatening to worsen old-age poverty in the future;

- there could be some inappropriate incentives for young men arising from reductions in their motor insurance premiums, although the study finds that this effect is likely to be very limited.

The potentially adverse impact on incentives for people to save for their old age should be considered in the wider context of European pension policies. Provision for old age is typically considered in terms of three ‘pillars’, ie: (1) state pensions; (2) occupational pensions; and (3) personal pensions and other savings. Ageing societies and other fiscal pressures are forcing societies to place less reliance on state pensions (pillar 1), and, with occupational pensions being limited in some countries as well, there is an increasing reliance on pillar 3 for the future. Any policy that inadvertently reduces incentives for households to save for their retirement would seem to be particularly inappropriate at this time.

## 4.7 Overall impact on consumers

Overall, the main impact on consumers will come from changes in premiums due to the requirement of unisex pricing. There are likely to be additional costs that are passed on to consumers, which would mean that unisex prices will be higher than the weighted average of gender-based prices. The study therefore finds that:

- women (aged 40) could see life insurance premiums rise by around 30% or more on average;
- men (aged 65) could see a reduction in pension income from pension annuities of around 5% or more on average;
- young women (aged 20) could see motor insurance premiums rise by 11% or more on average.

The extent of additional costs is uncertain, but empirical evidence suggests that these additional costs could be significant and result in unisex prices being significantly closer to the current gender-based high-risk gender price than the weighted average of current prices.

There may also be unintended social consequences arising from the ban, particularly with regard to individuals providing for their old age. Any policy which disadvantages the ‘third pillar’ of the pension provision system—private insurance—could be deemed to be inappropriate at this time.

Table A1.1 Brief glossary of key terms used in this report

Term	Description
<b>Adverse selection</b>	Adverse selection occurs when insurance companies are unable to set premiums according to risk factors which are known to customers, and therefore attract more high-risk customers than low risk-customers
<b>Gender-based pricing</b>	Insurance companies are able to use gender as a factor in determining premiums when there is objective evidence that claims cost per policy varies by gender
<b>Gender mix risk premium</b>	If insurance companies cannot use gender in setting prices despite claims cost varying by gender, they may have to apply a risk premium to insure against an unfavourable gender mix in the portfolio (ie, more of the high-risk gender than expected)
<b>Moral hazard</b>	Moral hazard occurs when insurance results in the insured party changing their risk-taking behaviour in a way that increases the risk for the insurer—eg, driving carelessly with motor insurance
<b>Motor third-party liability (MTPL) insurance</b>	The compulsory minimum level of motor insurance, which covers only liability to third parties in the event of an accident
<b>Net present value (NPV)</b>	The present value of a stream of future payments, discounted from future values using a suitable discount rate
<b>Pension annuity</b>	An insurance contract that provides a guaranteed regular income for the lifetime of the policy-holder
<b>Redistribution effect</b>	The change in premiums due to the redistribution of the same total amount of premiums between groups (eg, men and women), without any change in the average premium
<b>Riester Rente</b>	A certified savings product in Germany which is subsidised by the state to encourage provision in old age. For the private annuity products of the Riester Rente, unisex pricing is required
<b>Risk-based pricing</b>	Insurance pricing which is dependent on the risk characteristics of the policy-holder, which determine the expected claims cost
<b>Term life insurance</b>	An insurance contract which provides a fixed payment in the event of the death of the policy-holder over a fixed term period, during which the policy-holder must maintain regular payments (except in the event of death)
<b>Unisex pricing</b>	Insurance companies are required to charge the same premiums to men and women (who otherwise have the same risk characteristics as used by the insurance company, such as age)

## A2 Collection of insurance premium data

For this study, Oxera collected data on insurance premiums from the seven selected EU Member States using price comparison websites, which provide quotes from many companies on a broadly comparable basis. Oxera created a profile for a broadly generic prospective policy-holder and collected data on the premiums offered by insurance companies, in order to calculate an average premium. Premium data was collected for different ages and genders of the generic policy-holder. In this appendix, an outline of this data collection method is provided.

### A2.1 Sources

Table A2.1 sets out the sources used in collecting the premium data, for the seven countries and three products. It should be noted that Oxera was unable to find suitable data sources for some countries, primarily due to the stage of development of either the relevant insurance market or price comparison websites. In the case of Belgium and Poland, some data had to be collected directly from insurance companies.

**Table A2.1 Price comparison websites used for premium data**

	Pension annuities	Life insurance	Motor insurance
Germany	www.aspect-online.de	www.check24.de	www.check24.de
France			www.assuremieux.com
Spain		www.rastreator.com	www.asesorsegueros.com
Netherlands	www.independer.nl	www.independer.nl	www.independer.nl
Belgium			Collected from individual companies directly
Poland		Collected from individual companies directly	www.wygodnie.pl
Czech Republic		www.pojisteno.cz	www.srovnovac.cz

### A2.2 Generic policy-holder profile

In order to collect comparable premium data, generic profiles for a prospective policy-holder were created. The generic profiles are outlined as follows.

- For pension annuities, a single policy of a value of €200,000, bought by an individual aged 65 who is married, does not smoke and does not require inflation protection.
- For term life insurance, a single policy for a ten-year term of a value of €200,000, bought by an individual aged 40 who is married, does not smoke and does not require critical illness protection.
- For motor insurance, a single, third-party liability insurance policy (no theft cover), for a Ford Focus 1.6 2004, driven by a single, employed, business consultant driving 5,000km per year and keeping the car at home on the drive. The policy-holder has had a licence since the age of 18, has two years' no claims premium and lives in a large city (eg, Berlin for Germany). Other details were required by some websites.

Park Central  
40/41 Park End Street  
Oxford OX1 1JD  
United Kingdom

Tel: +44 (0) 1865 253 000  
Fax: +44 (0) 1865 251 172

Stephanie Square Centre  
Avenue Louise 65, Box 11  
1050 Brussels  
Belgium

Tel: +32 (0) 2 535 7878  
Fax: +32 (0) 2 535 7770

Thavies Inn House  
7th Floor  
3/4 Holborn Circus  
London EC1N 2HA  
United Kingdom

Tel: +44 (0) 20 7822 2650  
Fax: +44 (0) 20 7822 2651