A Formulaic Model of Community Rating in the Absence of Risk Equalisation with Applications to the Irish Private Health Insurance Market

Abstract
Ireland’s private health insurance market operates on the basis of community rating, whereby people pay the same premium for any given health insurance plan, irrespective of their risk status. In order to reduce the incentive for insurers to engage in risk selection by insurers, a risk equalisation scheme was introduced in 2003, but this was set aside by the Supreme Court in 2008. This raises questions about the sustainability of community rating in the Irish market. This paper examines the theoretical issues surrounding community rating in the absence of risk equalisation. A formal model is presented to show how, in a competitive market in the absence of a risk adjustment mechanism, high-risk consumers will, on average, pay more than low-risk consumers unless all insurers have similar risk distributions. The implications of the Irish Supreme Court decision are then discussed in this context.

Keywords: Private health insurance, community rating, risk equalisation

JEL classifications: D4, I13, I18

† Corresponding author: Brian Turner, School of Economics, University College Cork, Áras na Laoi, Gaol Walk, Cork, Ireland. Tel. +353 (0)21 490 2974. E-mail: b.turner@ucc.ie

*These Discussion Papers often represent preliminary or incomplete work, circulated to encourage discussion and comments. Citation and use of such a paper should take account of its provisional character. A revised version may be available directly from the author(s). Further working papers are available at http://www.ucc.ie/en/economics
A Formulaic Model of Community Rating in the Absence of Risk Equalisation with Applications to the Irish Private Health Insurance Market

1. Introduction

Ireland has a voluntary market for health insurance that is predominantly supplementary in nature. Despite universal entitlements to the public hospital system, approximately half of the population is covered by private health insurance. The market operates on the basis of community rating, whereby people pay the same premium for the same plan irrespective of the risk they represent to an insurer. Alongside this policy, open enrolment and lifetime cover also operate in the market, ensuring that anyone who applies for health insurance must be accepted and insurers cannot refuse to renew cover.

In order to support community rating, the Irish government brought forward a risk equalisation scheme in 2003. This scheme was challenged in the Irish courts on a number of grounds, one of which was that community rating as defined in the legislation only refers to community rating within plans and not community rating across the market for health insurance. The Supreme Court set aside the risk equalisation scheme, ruling that it was brought forward on the basis of an incorrect interpretation of community rating in the legislation.

This raises questions about the application of community rating in the Irish private health insurance market, which may in turn have implications for the design of community rating in other markets.

This paper examines whether community rating can effectively operate in the absence of risk equalisation, with a particular application to the Irish market. Section 2 provides a background to the market, outlines the controversy that has surrounded risk equalisation, and examines the legal challenges to risk equalisation and the focus on the definition of community rating. Section 3 presents a model of community rating, which shows that it breaks down in a market with competing insurers with differing risk profiles. Section 4 discusses the application of the model to the Irish health insurance market, and Section 5 discusses the findings of the paper and policy implications.

2. The Legal and Policy Context

2.1 Legislative Foundation

The Irish private health insurance market was established with the passing of the Voluntary Health Insurance Act, 1957. This Act set up the Voluntary Health Insurance Board (VHI) as a not-for-profit, State-backed monopoly provider of voluntary health

---

1 An earlier risk equalisation scheme was put in place in 1996 but was revoked in 1999 without payments having been made under the scheme (Turner & Shinnick, 2008).
insurance. Initially, this was designed to give the top 15 per cent of earners, who at that time were not entitled to free access to public hospitals, a means of covering their hospital expenses. However, since then access entitlements have been widened and now all Irish residents are entitled to treatment and accommodation in public hospitals either for free or subject to a modest copayment. Therefore, private health insurance in Ireland mostly provides supplementary cover (access to private hospitals, semi-private or private accommodation and faster access), although it also provides some complementary cover for primary care. \(^2\)

The market was opened up to competition following the passing of the European Third Non-Life Insurance Directive in 1992, which was reflected in the Health Insurance Act, 1994 (the 1994 Act) in Ireland.

In 1997, BUPA Ireland (a branch of the British United Provident Association) began selling health insurance in Ireland, and in 2004 VIVAS Health was established. Following takeover activity, these insurers are now trading as Quinn Healthcare and AVIVA, respectively. Having had a monopoly for 40 years, VHI (now trading as Vhi Healthcare) retains a majority of the market, although its market share has been eroded since the advent of competition. Recent survey evidence (HIA, 2010) suggests that VHI has 60 per cent market share, Quinn Healthcare 25 per cent and AVIVA 13 per cent, with the remaining 2 per cent accounted for by restricted membership undertakings. These are relatively small undertakings which provide health insurance for members of occupational or vocational schemes.

The 1994 Act, and associated regulations brought forward in 1996, gave legislative foundation to a number of principles that VHI had already been operating on a de facto basis. In particular, the 1994 Act enshrined in legislation what have become known as the three ‘pillars’ of the Irish private health insurance market – community rating, open enrolment and lifetime cover.

Community rating in the Irish context means that insurers are not permitted to vary premiums or benefits between individuals on the same health insurance contract, subject to some exceptions. These exceptions are for children aged under-18, for whom premiums may be waived or reduced, such that any reduced premium is no greater than 50 per cent of the adult premium; for full-time dependent students aged 18-23, for whom premiums may be reduced, such that any reduced premium is no greater than 50 per cent of the adult premium; and for members of a group scheme, for whom premiums may be reduced by up to 10 per cent. However, premiums may not be varied among insured persons falling into these categories.

Open enrolment means that insurers must accept any applicant, unless the person has committed fraud that caused, or could have caused, financial loss to an insurer. \(^3,4\) Three types of waiting periods are

\(^2\) For a discussion of the forms of private health insurance, see Mossialos & Thomson (2009).

\(^3\) Unless the person has committed fraud that caused, or could have caused, financial loss to an insurer.
permitted – an initial waiting period (for a first-time applicant or an applicant who has had a break in cover of 13 weeks or more), one for pre-existing conditions and one for upgrades in cover. Lifetime cover means that insurers may not refuse to renew cover for any insured person.\(^5\) In addition to these three ‘pillars’, regulations were brought forward in 1996 specifying a set of minimum benefits that any eligible health insurance contract must provide.

Regulations were also brought forward in 1996 specifying a risk equalisation scheme to operate between insurers. The aim of risk equalisation is to “equitably neutralise differences in insurers’ claim costs that arise due to variations in the health status of their members.” (HIA, 2009: 9) This is achieved by transfers of money from insurers with relatively low-risk membership profiles into a risk equalisation fund, from which money is received by insurers with relatively high-risk membership profiles. These regulations were revoked in 1999 during a period of consultation on the future of private health insurance, which led to the publication of a government White Paper in 1999 (Department of Health and Children, 1999).

Following on from this White Paper, the Health Insurance (Amendment) Act, 2001 (the 2001 Act) was passed. Among other provisions, this Act allowed for the Minister for Health and Children to introduce regulations specifying a new risk equalisation scheme. These were later introduced in 2003. It also made provisions for the establishment of The Health Insurance Authority (HIA), an independent statutory body to regulate the private health insurance market in Ireland, which was established on 1 February 2001.

2.2 **Risk Equalisation as a Source of Controversy**

Risk equalisation has been one of the main sources of controversy in the Irish private health insurance market since the introduction of competition in the 1990s. Although a risk equalisation scheme was in place when it entered the market, BUPA Ireland opposed it on the basis that it would, in its view, be forced to subsidise the State-backed dominant insurer. Monetary transfers under the 1996 scheme were not made by the time its enabling regulations were revoked in 1999.

The 2001 Act and the Risk Equalisation Scheme, 2003, made provision for monetary transfers to take place between insurers and a risk equalisation fund, to be administered by the HIA. Claim costs would be equalised up to a given level, known as equalised benefits, which broadly equated to the level of cover provided by the most popular plans in the market.

\(^4\) The original regulations, brought forward in 1996, specified that this applied only to those aged under-65 when first applying for health insurance, or applying after a break in cover of 13 weeks or more, but this stipulation was removed in revised regulations in 2005.

\(^5\) Unless the person has committed fraud or the insurer ceases to carry on health insurance business in the State.
Following a recommendation from the HIA, the Minister decided to commence payments under this scheme from 1 January 2006. BUPA Ireland immediately challenged the scheme in the Irish courts and a stay was put on payments under the scheme. It had already made a complaint to the European Commission that the scheme constituted illegal State aid, but the Commission ruled in 2003 that it did not. BUPA Ireland took the Commission to the European Court of First Instance, but in 2008 this Court dismissed BUPA Ireland’s challenge to the Commission’s decision.

In a High Court ruling in November 2006, BUPA Ireland’s challenge was dismissed, but BUPA Ireland appealed this to the Supreme Court. It also announced in December 2006 that it was withdrawing from the market and its business was taken over in April 2007 by Quinn Insurance, which already operated in other non-life insurance markets in Ireland. In July 2008, the Supreme Court overturned the High Court decision and set aside the Risk Equalisation Scheme, 2003. Its decision was taken on the basis of the definition of community rating in the 1994 Act, as amended.

2.3 Community Rating in the Irish Context

These cases in the Irish courts relating to risk equalisation have highlighted the importance of the definition of community rating in Irish legislation. One of the grounds for BUPA Ireland’s injunction against the Risk Equalisation Scheme, 2003 was that the promulgation of the scheme was *ultra vires* (beyond the powers of) the Minister, as community rating was operating in the market as prescribed by the Health Insurance Act, 1994, as amended. This was based on the presence of two conflicting definitions of community rating.

At the time of the Supreme Court decision, Section 7 of the 1994 Act, as amended, specified that insurers may not vary premiums or benefits among people on the same health insurance contract. It went on to state “A health insurance contract that complies with [the conditions outlined in an earlier paragraph within that Section] shall be known as a community rated health insurance contract and ‘community rating’ shall be construed accordingly.”

The Risk Equalisation Scheme, 2003 was brought forward under the terms of Section 12 of the 1994 Act, as amended. This Section noted that, in forming its decision on whether to recommend to the Minister to trigger payments, the HIA needed to take into account “the best overall interests of health insurance consumers” and it went on to note that this “includes a reference to the need to maintain the application of community rating across the market for health insurance and to facilitate competition between undertakings.” (Emphasis added)

BUPA Ireland argued that the only valid definition of community rating was that contained in Section 7, which defined community rating within plans, and that therefore the Section 12 definition was invalid, which would invalidate the entire scheme.
The High Court judge noted that the definition of community rating was central to the case. He ruled that the Section 12 definition was reasonable, and that the Risk Equalisation Scheme, 2003 was not invalid as a result.

On appeal, the Supreme Court agreed that the definition of community rating was central to the case, but decided that the Section 12 definition could not be construed so differently from the Section 7 definition. The Chief Justice suggested that, if the Oireachtas (parliament) had wanted such a different interpretation to be given to the Section 12 definition then it would have made that clear. Therefore, it was the Supreme Court’s view that Section 12 could only be interpreted as referring to the maintenance of community rated plans across the market.

On this basis, the Court ruled that the Risk Equalisation Scheme, 2003, as adopted by the Minister, “was founded on an erroneous interpretation of subsection 10(iii) in s. 12. That is to say the scheme was introduced on the basis that community rating meant community rating across the entire insured population and not as defined in the Act.” The Court therefore determined that the introduction of the 2003 scheme was ultra vires the Minister, and it should be set aside.

The Health Insurance (Miscellaneous Provisions) Act, 2009 further amended the definition of community rating in the 1994 Act, reflecting the issues highlighted in the Supreme Court judgment. In particular, the 2009 Act specifies “The principal objective of the Minister and the [Health Insurance] Authority in performing their respective functions under this Act is to ensure, in the interests of the common good, that access to health insurance cover is available to consumers of health services with no differentiation made between them…in particular as regards the costs of health services, based in whole or in part on the respective age range and general health status of the members of any particular generation (or part thereof)…” This Act also amends the 1994 Act by entering a new definition of community rating in the latter, as well as defining a community rated health insurance contract as being one which complies with Section 7(1) of the 1994 Act (similar to the previous definition as discussed above). The definition of community rating in the 2009 Act is “measures which, whether in whole or in part, apply towards the achievement of the principal objective…[as outlined above]…”

It should be noted that this definition of community rating (which views community rating as a tool to achieve equal premiums across consumers, rather than a goal in itself – see Van de Ven (2010) for a discussion of this) could encompass risk-adjusted premium subsidies (Van de Ven et al, 2000), which would be an alternative tool to community rating in achieving the principal objective. It is also worth noting that the interim measures, discussed in Section 5, could be considered an example of risk-adjusted premium subsidies.

Following the setting aside of the Risk Equalisation Scheme, 2003 by the Supreme Court, concern was expressed that community rating could be undermined, implicitly at
least, by market segmentation. It is therefore instructive to examine whether community rating can survive in a multiple-insurer market without risk equalisation.

3 A Model of Community Rating

The basic principle behind community rating is that high-risk insured lives pay the same as low-risk insured lives. If there is only one insurer in the market, practicing community rating among its members, then inherently community rating applies across the market. However, if two insurers are operating in the market, each operating community rating among its own members, then community rating will only apply across the market if each insurer has the same proportion of high risk and low risks as the market average.

3.1 Formal Model

This can be demonstrated using a model of a health insurance market, first with a monopoly provider, then expanding into a competitive market with two insurers.

Firstly, a number of assumptions need to be made. The following is therefore assumed:

1. There are at total of $T$ insured lives in the market.
2. In the overall market, there are $H_T$ high-risk lives and $L_T$ low-risk lives. Therefore, the proportions of high-risk and low-risk people in the market are $H_T/T$ and $L_T/T$, respectively.
3. Premium per member = expected claim cost per member (in other words, for the sake of simplicity, we ignore the investment income, administrative loading and profit loading elements of a fair premium).
4. Claim costs for high-risk lives are $C_H$ per person, while claim costs for low-risk lives are $C_L$ per person, where $C_H > C_L$.

If there were only one insurer in the market (Insurer A), insuring all of the insured lives and operating community rating, then the community-rated premium will be the expected claim cost per insured person.

From the above assumptions, we can calculate this as

$$C_A = C_H \frac{H_A}{T_A} + C_L \frac{L_A}{T_A}$$

Now, let us expand this example to include two insurers, A and B, each operating community rating among its own members. In addition to the above assumptions, let us also assume:
5. Insurer A has $T_A$ members, while Insurer B has $T_B$ members, giving these insurers market shares of $T_A/T$ and $T_B/T$, respectively. Note that $T_A + T_B = T$.

6. Insurer A has $H_A$ high-risk and $L_A$ low-risk lives, while Insurer B has $H_B$ high-risk and $L_B$ low-risk lives. Note that $H_A + L_A = T_A$ and $H_B + L_B = T_B$. Note also that $H_A + H_B = H_T$ and $L_A + L_B = L_T$.

Now, we can see that Insurer A’s premium (which equals expected claim cost per member and which we denote $C_A$) is

$$C_A = C_H \cdot \frac{H_A}{T_A} + C_L \cdot \frac{L_A}{T_A} \quad (1)$$

Meanwhile, Insurer B’s premium (which we denote $C_B$) is

$$C_B = C_H \cdot \frac{H_B}{T_B} + C_L \cdot \frac{L_B}{T_B} \quad (2)$$

We can also see from this that, on average, high-risk insured lives will pay what could be termed the high-risk premium (HRP), which can be calculated as

$$HRP = C_A \cdot \frac{H_A}{H_T} + C_B \cdot \frac{H_B}{H_T} \quad (3)$$

Meanwhile low-risk insured lives will, on average, pay what could be termed the low-risk premium (LRP), which can be calculated as

$$LRP = C_A \cdot \frac{L_A}{L_T} + C_B \cdot \frac{L_B}{L_T} \quad (4)$$

If each insurer has the same proportion of high-risk and low-risk lives as the market average, then $H_A/T_A = H_B/T_B$ (=$H_T/T$) and $L_A/T_A = L_B/T_B$ (=$L_T/T$), and it can be seen from equations (1) and (2) that $C_A = C_B$.

Feeding this back into equations (3) and (4), and remembering from Assumption 6 that $H_A + H_B = H_T$ and that $L_A + L_B = L_T$ we can see that
Thus, it can be seen that $HRP = LRP$ and therefore, high-risk lives and low-risk lives pay the same premium, thus ensuring that community rating operates across the market as well as within each insurer’s insured group.

Let us now assume that Insurer A has a higher proportion of high-risk lives (and thus a lower proportion of low-risk lives) than the market average. Thus, Insurer B has a lower proportion of high-risk lives and a higher proportion of low-risk lives than the market average. We can now state two further assumptions:

7. Insurer A has $H_A/H_T$ of the high-risk lives and $L_A/L_T$ of the low-risk lives.
8. Assumption 7 implies that Insurer B has $H_B/H_T$ of the high-risk lives and $L_B/L_T$ of the low-risk lives.
Note that now $H_A/H_T > H_B/H_T$ and $L_A/L_T < L_B/L_T$.

To examine the effects of this on $C_A$ and $C_B$, we need to revisit equations (1) and (2).

Before doing so however, it should be noted that if both insurers have the same proportion of high-risk and low-risk lives as the market average, then the proportion of high-risk lives accounted for by each insurer would equal the proportion of low-risk lives accounted for by that insurer. To put this more formally,

If $H_A/T_A = H_B/T_B (= H_T/T)$ and $L_A/T_A = L_B/T_A (= L_T/T)$ then $H_A/H_T = L_A/L_T (= T_A/T)$ and $H_B/H_T = L_B/L_T (= T_B/T)$.

To prove this, let us take the example of the high-risk lives with Insurer A. This can be calculated as the total number of insured lives in the market, multiplied by the proportion of the market insured with Insurer A, multiplied by the proportion of high-risk lives within Insurer A’s insured community. In other words,

$$H_A = T \cdot \frac{T_A}{T} \cdot \frac{H_A}{T_A}$$

Similarly,

$$H_B = T \cdot \frac{T_B}{T} \cdot \frac{H_B}{T_B}$$

$$L_A = T \cdot \frac{T_A}{T} \cdot \frac{L_A}{T_A}$$

$$L_B = T \cdot \frac{T_B}{T} \cdot \frac{L_B}{T_B}$$

Now, we can see that, if $H_A/T_A = H_B/T_B = H_T/T$ and $L_A/T_A = L_B/T_B = L_T/T$ then

$$H_A = T \cdot \frac{T_A}{T} \cdot \frac{H_T}{T_A} \Rightarrow \frac{H_A}{T_A} = \frac{T}{T_A} \cdot \frac{T_A}{T} \cdot \frac{H_T}{T} = \frac{H_T}{T}$$

$$H_B = T \cdot \frac{T_B}{T} \cdot \frac{H_T}{T_B} \Rightarrow \frac{H_B}{T_B} = \frac{T}{T_B} \cdot \frac{T_B}{T} \cdot \frac{H_T}{T} = \frac{H_T}{T}$$

$$L_A = T \cdot \frac{T_A}{T} \cdot \frac{L_T}{T_A} \Rightarrow \frac{L_A}{T_A} = \frac{T}{T_A} \cdot \frac{T_A}{T} \cdot \frac{L_T}{T} = \frac{L_T}{T}$$

$$L_B = T \cdot \frac{T_B}{T} \cdot \frac{L_T}{T_B} \Rightarrow \frac{L_B}{T_B} = \frac{T}{T_B} \cdot \frac{T_B}{T} \cdot \frac{L_T}{T} = \frac{L_T}{T}$$

Furthermore, if $H_A/T_A = H_B/T_B = H_T/T$ and $L_A/T_A = L_B/T_B = L_T/T$ then
Thus, we can see that, if $H_A/T_A = H_B/T_B$ and $L_A/T_A = L_B/T_B$ then $H_A/H_T = L_A/H_T$ and $H_B/H_T = L_B/H_T$.

Now, from equations (1) and (2), remember that

$$C_A = C_H \cdot \frac{H_A}{T_A} + C_L \cdot \frac{L_A}{T_A}$$

and

$$C_B = C_H \cdot \frac{H_B}{T_B} + C_L \cdot \frac{L_B}{T_B}$$

As we saw above, if both insurers have the same proportions of high-risk and low-risk lives as the market average (i.e. $H_A/T_A = H_B/T_B = H_T/T_t$ and $L_A/T_A = L_B/T_B = L_T/T_t$), then $C_A = C_B$. However, we are now assuming that Insurer A has a higher proportion of high-risk lives and a lower proportion of low-risk lives than the market average, while Insurer B has a lower proportion of high-risk lives and a higher proportion of low-risk lives than the market average.

Thus, $H_A/T_A > H_T/T > H_B/T_B$ and $L_A/T_A < L_T/T < L_B/T_B$. From Equations (5), (6), (7) and (8), we can see that this also implies that $H_A/H_T > T_A/T > L_A/L_T$ and that $H_B/H_T < T_B/T < L_B/L_T$.

It should be noted that, since $H_A + L_A = T_A$, then $H_A/T_A + L_A/T_A = 1$, or to put it another way, $L_A/T_A = (1 - H_A/T_A)$. In other words, $H_A/T_A$ and $L_A/T_A$ can be thought of as weights.

Using these observations, it can be seen that, compared with a situation where both insurers have the market average proportions of high-risk and low-risk lives, if Insurer A has a higher proportion of high-risk lives than the market average, then that increases the weight $H_A/T_A$, and consequently reduces the weight $L_A/T_A$. At the same time, the weight $H_B/T_B$ is reduced and the weight $L_B/T_B$ is increased.

Thus, we can see that, when calculating $C_A$, since the weight on the higher number ($C_H$) has risen and the weight on the lower number ($C_L$) has been reduced, then $C_A$, the average premium paid by those with Insurer A, must rise. Similarly, when calculating $C_B$, the weight on the higher number ($C_H$) has fallen and the weight on the lower number
(C_L) has risen, therefore the overall figure C_B, the average premium charged to those insured with Insurer B, must fall. Therefore, C_A > C_B.

We can now examine the effect on the high-risk premium (HRP) and the low-risk premium (LRP). Remember from Equations (3) and (4) that

\[
HRP = C_A \frac{H_A}{H_T} + C_B \frac{H_B}{H_T} \quad \text{and} \quad LRP = C_A \frac{L_A}{L_T} + C_B \frac{L_B}{L_T}
\]

It should be noted that, since \( H_A + H_B = H_T \), then \( H_A/H_T + H_B/H_T = 1 \), or to put it another way, \( H_B/H_T = (1 - H_B/H_T) \). In other words, \( H_A/H_T \) and \( H_B/H_T \) can also be thought of as weights.

Since Insurer A has a higher proportion of high-risk lives than in the situation where both insurers have equal proportions, then we can now see that the weight \( H_A/H_T \) has risen while the weight \( H_B/H_T \) has fallen. Similarly, the weight \( L_A/L_T \) has fallen and the weight \( L_B/L_T \) has risen.

Thus, for the high-risk premium, we now have a higher weight attached to a higher number (since we have established that now \( C_A > C_B \)) and a lower weight attached to a lower number. Therefore, HRP must rise. Likewise, for the low-risk premium, we now have a lower weight attached to a higher number and a higher weight attached to a lower number. Therefore, LRP must fall.

Since HRP has risen and LRP has fallen, relative to a situation where both were equal, we can now conclude that HRP > LRP. In other words, on average, high-risk lives pay higher premiums than low-risk lives. This is in breach of the community rating principle.

Thus we can see that, if both insurers have similar proportions of high-risk and low-risk lives to the market average, then under the assumptions set out above, the premiums charged by both insurers will be equal and the average premiums paid by high-risk lives and low-risk lives will also be equal. However, if one insurer has a higher proportion of high-risk lives, and thus a lower proportion of low-risk lives than the market average (which inherently means that the other insurer has a lower proportion of high-risk lives and a higher proportion of low-risk lives than the market average), then the premium charged by the former will be higher, while the premium charged by the latter will be lower. The average premium paid by high-risk lives will therefore be higher, while the average premium paid by low-risk lives will be lower, thus meaning that community rating breaks down.
3.2 Determinants of the Magnitude of Imbalance Between High-Risk and Low-Risk Premiums

It can be seen from the above that the difference between the average premium paid by high-risk lives (HRP) and the average premium paid by low-risk lives (LRP) can be no greater – and in practice will be less – than the difference between the premiums charged by Insurer A and Insurer B. Recall that, from Equations (3) and (4),

\[
HRP = C_A \cdot \frac{H_A}{H_T} + C_B \cdot \frac{H_B}{H_T} \quad \text{and} \quad LRP = C_A \cdot \frac{L_A}{L_T} + C_B \cdot \frac{L_B}{L_T}
\]

We have already established that \(H_A/H_T\) and \(H_B/H_T\) can be thought of as weights. Similarly, \(L_A/L_T\) and \(L_B/L_T\) can also be thought of as weights. Thus it can be seen that both HRP and LRP are simply weighted averages of \(C_A\) and \(C_B\), with the weights being \(H_A/H_T\) and \(H_B/H_T\), and \(L_A/L_T\) and \(L_B/L_T\), respectively, for HRP and LRP.

In the extreme case, where Insurer A has all of the high-risk lives in the market and Insurer B has all of the low-risk lives in the market, then \(HRP = C_A\) and \(LRP = C_B\), thus \(HRP – LRP = C_A – C_B\). However, if both insurers have a mixture of high-risk and low-risk lives then \(HRP – LRP < C_A – C_B\).

Therefore, two factors that will determine the magnitude of the difference between the average premiums paid by high-risk and low-risk lives, are the difference in premiums between Insurer A and Insurer B, and the relative weights attached to those premiums, the latter of which are the proportions of high-risk and low-risk lives in the market that are with Insurer A and Insurer B.

We saw from Equations (5), (6), (7) and (8) above that, if \(H_A/T_A > H_T/T > H_B/T_B\) and \(L_A/T_A < L_T/T < L_B/T_B\), then \(H_A/H_T > T_A/T > L_A/L_T\) and that \(H_B/H_T < T_B/T < L_B/L_T\). The greater \(H_A/H_T – L_A/L_T\) is, the greater will be the relative weight put on \(C_A\) (which is higher than \(C_B\)) in the calculation of HRP compared with the calculation of LRP. Likewise, the greater \(H_B/H_T – L_B/L_T\), the smaller will be the relative weight put on \(C_B\) (which is lower than \(C_A\)) in the calculation of HRP compared with the calculation of LRP. Thus, the greater the difference between \(H_A/H_T – L_A/L_T\) and between \(H_B/H_T – L_B/L_T\), the greater will be the difference between HRP – LRP.

We can also see that the greater \(H_A/H_T – L_A/L_T\) is, the greater will be \(H_B/H_T – L_B/L_T\). To see this, note that

\[
H_B/H_T – L_B/L_T = (1 – H_A/H_T) – (1 – L_A/L_T)
= 1 – H_A/H_T – 1 + L_A/L_T
= – H_A/H_T + L_A/L_T
= (H_A/H_T – L_A/L_T)
\]

Therefore, if Insurer A has a higher proportion of the high-risk group than Insurer B, the increase in weight attached to \(C_A\) will be equal to the reduction in the weight attached to
CB, compared with a situation where Insurer A has the same proportion of high-risk lives as it does of low-risk lives.

The difference between CA – CB will, in turn, be affected by the difference between the average claim costs for high-risk lives and the average claim costs for low-risk lives (i.e. CH – CL) and by the relative weights attached to those claim costs, which we can see from Equations (1) and (2) are the relative weights of high-risk and low-risk lives within each insurer’s insured population.

The greater the difference between CH – CL, the greater will be the difference between CA – CB. In practice, the difference between CH – CL can be very large. Berk & Monheit (2001) show that, for enrollees aged under-65 with employer-provided health insurance in the US in 1996, the top 5 per cent of enrollees had average health expenditures of around 100 times the average health expenditures of the bottom 50 per cent.

Likewise, the greater the difference between HA/TA – HB/TB (and thus the greater the difference between LA/TA – LB/TB), the greater will be the difference between the relative weights attached to CH and CL in the calculations of CA and CB. It should be noted that LA/TA – LB/TB = – (HA/TA – HB/TB), and thus an increase in absolute magnitude in one leads to a corresponding increase in absolute magnitude of the other. Therefore, if Insurer A has a higher proportion of high-risk lives than Insurer B, the increase in the weight attached to CH is equal to the reduction in the weight attached to CL, compared with a situation where both have the same proportions of high-risk and low-risk lives as the market average.

The above model can be extended to a market with more than two insurers, with similar results. Specifically, it can be shown that, if one or more insurers have a different risk profile than the market average, community rating does not apply across the market.

Risk equalisation can also be expressed in the context of the model. If we assume for simplicity that risk equalisation applies to all benefits paid, then we can calculate risk equalisation payments as follows:

We saw from equations (1) and (2) above that

\[ C_A = C_H \cdot \frac{H_A}{T_A} + C_L \cdot \frac{L_A}{T_A} \quad \text{and} \quad C_B = C_H \cdot \frac{H_B}{T_B} + C_L \cdot \frac{L_B}{T_B} \]

If each insurer has the market average risk profile, then premiums (denoted with a superscript M) would be

\[ C^M_A = C_H \cdot \frac{H_T}{T} + C_L \cdot \frac{L_T}{T} \quad \text{and} \quad C^M_B = C_H \cdot \frac{H_T}{T} + C_L \cdot \frac{L_T}{T} \]
Bear in mind that each insurer’s total premium income would be its premium per policyholder times the number of policyholders it insurers, i.e. $C_A T_A$ and $C_B T_B$.

Risk equalisation would involve each insurer making/receiving a contribution based on the difference between its risk profile and the market average risk profile. Therefore, the contributions made to/received from a risk equalisation scheme would be

$$RE_A = T_A (C_A - C^M_A)$$
$$= T_A \left[ C_H \cdot \frac{H_A}{T_A} + C_L \cdot \frac{L_A}{T_A} \right] - \left[ C_H \cdot \frac{H}{T} + C_L \cdot \frac{L}{T} \right]$$
$$= T_A \left[ C_H \left( \frac{H_A}{T_A} - \frac{H}{T} \right) + C_L \left( \frac{L_A}{T_A} - \frac{L}{T} \right) \right]$$

and

$$RE_B = T_B (C_B - C^M_B)$$
$$= T_B \left[ C_H \cdot \frac{H_B}{T_B} + C_L \cdot \frac{L_B}{T_B} \right] - \left[ C_H \cdot \frac{H}{T} + C_L \cdot \frac{L}{T} \right]$$
$$= T_B \left[ C_H \left( \frac{H_B}{T_B} - \frac{H}{T} \right) + C_L \left( \frac{L_B}{T_B} - \frac{L}{T} \right) \right]$$

It should be noted that, since risk equalisation is designed to be self funding, the payments into the fund should equal the payments from the fund in any given time period, in other words $RE_A = -RE_B$.

4 Application of the Model to the Irish Market

The above model can be applied to Ireland’s private health insurance market which, prior to the entry of BUPA Ireland, comprised a monopoly provider (VHI). Based on the model’s findings, it is reasonable to conclude that community rating was in operation, at least at each level of cover if not across the market. However, the application to the market is particularly relevant in the context of the Supreme Court ruling on the Risk Equalisation Scheme, 2003, which allows for community rated plans but not for community rating across the market for health insurance.

This is similar to the situation outlined in the model, with the slight difference that, instead of a number of insurers operating community rating within their insured

---

6 At the end of VHI’s monopoly era, it offered five plans, each with a different level of cover. Currently plans in the market provide six different levels of cover for hospital accommodation, which is the main differentiating factor. (See Turner & Shinnick, 2008 for further details of cover levels.)
populations, the Irish case takes the form of a number of health insurance plans offered by competing insurers, each of which operates on a community rated basis, but without risk equalisation. There may be some informal risk adjustment between plans offered by the same insurer but there is no risk equalisation operating between insurers.

Extending the above model to this situation, it can be seen that, in the absence of some form of risk adjustment, although each plan in the market is community rated, community rating will not operate across the market. The result of this is that high-risk insured lives end up paying, on average, higher premiums than low-risk insured lives.

Since the setting aside of the Risk Equalisation Scheme, 2003, the only way that community rating could operate across the market for health insurance in Ireland is if each plan available in the market had exactly the same risk profile as the market average. This is theoretically possible, but highly unlikely.

In practice, it has already been confirmed that insurers operating in the market have different risk profiles. Under the Risk Equalisation Scheme, 2003, the HIA had a role in advising the Minister on whether or not to commence risk equalisation payments. Specifically, if a measure called the Market Equalisation Percentage (MEP), which is equal to the amount of monetary transfers under risk equalisation expressed as a percentage of the claims paid in the market subject to risk equalisation, were below 2 per cent, no transfers would be made. If the MEP were between 2 per cent and 10 per cent, the HIA would be required to make a recommendation to the Minister on whether or not payments should be triggered, while if it were above 10 per cent then the Minister would commence payments, unless, having consulted with the HIA the Minister felt that the commencement of risk equalisation payments would not be in the best overall interests of health insurance consumers (HIA, 2008a).

For each of the six-monthly periods from 1 July – 31 December 2003 to 1 January – 30 June 2005, the MEP was found to lie between 2 per cent and 10 per cent (HIA, 2005). If each plan had the same risk profile as the market average, then each insurer would, by definition, have the same risk profile as the market average, and the MEP would be equal to zero. Since this was not the case, it can be concluded that risk profile differences were evident and that therefore community rating was not operating across the market.

It should be noted that some of the simplifying assumptions made in formulating this model have implications for the applicability of the model in a real-world setting.

---

7 The MEP can also be expressed in terms of the model presented in this paper. Assuming that all benefits were to be equalised (for the sake of simplicity), and assuming that Insurer B is the net contributor to the risk equalisation fund, the MEP could be expressed as

\[
\text{MEP} = \frac{T_B (C_B - C_B^M)}{C_A T_A + C_B T_B}
\]
Firstly, Assumption 3 held that premiums were based entirely on expected claim costs. In reality, premiums will also reflect investment income, administrative expenses and profit loadings (Harrington & Niehaus, 2003). In practice, these are almost certain to differ between insurers. For example, BUPA Ireland’s management expenses in 2006 represented approximately 6.8 per cent of earned premium (Financial Regulator, 2007), while VHI’s operating expenses in the financial year ending February 2007 represented 7.4 per cent of earned premium on its health insurance business (VHI, 2010).

If each insurer had the same proportions of high-risk and low-risk lives as the market average, then \( H_A / T_A = H_B / T_B = H_T / T \) and \( L_A / T_A = L_B / T_B = L_T / T \), and we have seen above that if this is the case then \( H_A / H_T = L_A / L_T \) and \( H_B / H_T = L_B / L_T \). Thus, we can see from Equations (3) and (4) that the weights attached to each insurer’s premiums would be the same in the calculation of HRP as they would in the calculation of LRP. In other words, although premiums might differ between insurers due to differences in investment income, administrative expenses or profit loading, the high-risk premium would still be equal to the low-risk premium, and thus community rating would operate across the market.

However, if one insurer has a higher than average proportion of high-risk lives and another insurer has lower than average proportions of high-risk lives, then the only way that the high-risk premium would equal the low-risk premium is if the premium of the former insurer were actually lower than the premium of the latter insurer, due to better investment of premium income, lower administrative costs, lower profit loadings or a combination of all three, and if the differences in premiums and proportions were such that they exactly cancel each other out. This situation is highly unlikely.

Secondly, Assumption 4 implies that \( C_H \) and \( C_L \) are the same across insurers. Again, this is not necessarily the case in practice. Claim costs for high-risk and/or low-risk lives might differ between insurers for reasons such as differing payment agreements between insurers and healthcare providers or different disease management practices between healthcare providers.

The effects of \( C_H \) and \( C_L \) differing between insurers would be the same as the effects of differing investment income, administrative expenses or profit loadings, as above.

Thirdly, the model assumes that there are two discrete risk types, high-risk lives and low-risk lives. In practice, there are as many risk types as there are insured persons, although insurers tend to group insured persons with similar characteristics into risk classes, so the number of risk classes will be less than the number of insured persons but likely greater than two.

One could envisage a situation where one insurer has higher proportions of some high-risk classes but lower proportions of other high-risk classes, and higher proportions of some low-risk classes but lower proportions of other low-risk classes than the market average. These may, to some extent, cancel each other out.
However, due to other factors, such as plan coverage, provider coverage, length of time in the market, or switching behaviour, it is more likely that insurers that attract higher proportions of one high-risk class would also attract higher proportions of other high-risk classes, while insurers that attract higher proportions of one low-risk class would also attract higher proportions of other low-risk classes. Again, it would be unlikely for the relaxation of the assumption of two risk types to exactly negate the effect of differing proportions of different risk types on the maintenance of community rating across the market. It is far more likely that differential risk profiles between different insurers would lead to a breakdown of community rating across the market.

5 Discussion and Policy Implications

Community rating within plans in the Irish context could be described as quite a pure form of community rating. However, it is not, to continue with such terminology, 100 per cent pure, as it allows for exceptions, such as for children aged under-18, dependent students aged 18-23 and members of group schemes.

A pure form of community rating across a competitive market for health insurance cannot operate in the absence of some form of risk adjustment mechanism, as shown by the model presented in this paper. However, the ‘impurities’ in community rating in Ireland mean that perhaps an ‘impure’ form of risk equalisation might suffice in the Irish context. Indeed, it has been argued that a risk adjustment mechanism need not be perfect, but just sufficient to ensure that the costs to insurers of engaging in risk selection outweigh the benefits (Van de Ven, 2010; Van de Ven et al, 1994).

An example of a less-than-pure form of risk adjustment is that operated in The Health Insurance Plan of California (The HIPC), as described by Shewry et al (1996). Within The HIPC a risk assessment value (RAV) is calculated for each health plan, based on its enrollee mix compared with the overall enrollee mix of The HIPC. The RAV of The HIPC as a whole is always 1.0. Risk adjustment is implemented when at least one health plan has an RAV that is at least 5 per cent above or below that of The HIPC (i.e. below 0.95 or above 1.05) and adjusts until the RAV of the outlier plan returns to within 5 per cent of the RAV of The HIPC.

Although parliamentary debates in Ireland suggest that there is broad political support for the idea of community rating across the market, it is unclear whether a less than pure form of community rating would be acceptable. However, the Supreme Court ruling on the Risk Equalisation Scheme, 2003, highlights the need to have a precise definition in legislation of the type of community rating that is desired. In this regard, it is interesting to note the significant change to the definition of community rating contained in the 2009 Act (see Section 2.3).

---

8 Even if some risk adjustment mechanism were used it is likely that community rating across the market would still not operate perfectly, as no perfect risk adjustment mechanism has yet been devised.
However, the conclusions of the model remain valid, including that differences in risk profiles between insurers, or between plans, will, in the absence of some risk adjustment mechanism, lead to high-risk consumers paying more, on average, than low-risk consumers.

Following the setting aside of the Risk Equalisation Scheme, 2003, the Minister announced interim measures to be put in place for three years, while work is carried out on a new risk equalisation scheme. According to the Minister, the Government was of the opinion that, in the absence of some method of supporting the cost of health insurance for older consumers, such consumers could face significant increases in prices or reductions in benefits. She went on to state “If that happened, the chances we could ever re-establish a community rated market would have been severely diminished.” (Department of Health and Children, 2008).

The interim measures, which are not designed to fully equalise claim costs between insurers, comprise two elements. The first is a levy on health insurers for each person they insure, which in 2011 was €205 for each adult and €66 for each child aged under-18. The second element is increased tax relief for older consumers, on a sliding scale (see Table 1). This is in addition to the 20 per cent tax relief available to all purchasers. The 2009 and 2010 figures allowed for increased tax relief for consumers aged 50 and over, but the 2011 figures only apply to consumers aged 60 and over. The measures are designed to be revenue neutral.

Since tax relief on health insurance premiums is deductible at source, consumers pay the net premiums and insurers then claim back the tax relief for all of their members from the Revenue Commissioners. The additional tax relief will therefore accrue to the insurer.

Table 1 Additional Tax Relief Available Under Interim Measures

<table>
<thead>
<tr>
<th>Age</th>
<th>60-69</th>
<th>70-79</th>
<th>80+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional tax relief</td>
<td>€625</td>
<td>€1,275</td>
<td>€1,725</td>
</tr>
</tbody>
</table>

The combination of the interim measures means that VHI, with a higher proportion of older members, will receive more money in additional tax relief than it has to pay in the levy, while Quinn Healthcare and AVIVA, with lower proportions of older members, will have to pay more money in the levy than they will receive in additional tax relief.9

However, the current hiatus might allow a renewed debate on the type, or level, of community rating that is desired in the Irish private health insurance market. In the

---

9 The HIA estimates that VHI will benefit by €70m in 2011, while the measures will cost Quinn Healthcare and AVIVA €37m and €33m respectively. See http://debates.oireachtas.ie/dail/2011/01/13/00019.asp.
interim, following the Supreme Court judgment, it is clear that community rating is not operating across the market. Instead, it is only mandated to operate within plans, thus leading to a situation that could be described as ‘communities rating’ rather than community rating – each plan being a distinct community.

Therefore, while high-risk consumers are paying the same as low-risk consumers for the same plan, on average high-risk consumers may be paying more than low-risk consumers for similar levels of cover. The Supreme Court judgment increases the possibility of risk segmentation, which would be detrimental to community rating in the Irish market. This problem was alluded to by the Minister when introducing the interim measures discussed above. Thomson & Mossialos (2007) note that a large number of heterogeneous plans could potentially lead to confusion among consumers, mitigating the benefits of competition.

Evidence suggests that this problem may exist in Ireland and has accelerated since the Supreme Court judgment. HIA (2008b) notes that the number of products available in the market stood at five in 1996, 18 in 2003 and over 100 by 2008. Since then the number of available products has doubled to over 200 currently, with many of these plans targeted at consumers at different life stages.

This raises another issue. Given the large number of plans available in the market, with differing levels of cover, is it feasible to operate community rating across the market for health insurance? It was suggested by BUPA Ireland (2002) that the market might benefit from having one standardised, community rated plan, providing minimum benefits, to be offered by all insurers as the cheapest plan available. Such a standardised plan might form the basis for a future solution to the problem of trying to effectively operate community rating across the market in the presence of multiple insurers offering multiple plans. Van de Ven & Ellis (2000) argue that a standardised plan is better than minimum benefits as it provides less opportunity for insurers to engage in market segmentation. It might also make any risk equalisation scheme more straightforward, as the benefits to be equalised would be similar.

In the meantime, as this paper has demonstrated, community rating within plans is very different from community rating across the market. In this context, the Supreme Court decision to set aside the Risk Equalisation Scheme, 2003 has significant implications for the operation of community rating in the Irish private health insurance market. This has already led to some changes, in the form of interim measures, pending the introduction of a new risk equalisation scheme. This opportunity should now be taken to review how community rating is to operate in the market, as this will have implications for the design of any future risk equalisation scheme. The findings of the model are also relevant for other health systems where community rated health insurance is either operating or being considered.
References


HIA (2005): *Staff Report to the Members of The Health Insurance Authority in relation to its statutory functions and duties regarding risk equalisation*. Dublin: The Health Insurance Authority


