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A Policy Response to the E-Commerce Revolution: The Case of Betting Taxation

By D. Paton, D. Siegel and L. Vaughan Williams

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Abstract

A series of environmental changes in the 1990s, including the introduction of a national lottery, a reduction of trade barriers within the European Union, and the rise of Internet gambling, induced the U.K. government to initiate a large-scale review of the betting duty. As a result of this review, the U.K. government recently announced a significant reduction in the overall level of taxation on betting. It was also announced that the current general betting duty (GBD), levied as a proportion of betting stakes, will be replaced by a gross profits tax (GPT), based on the net revenue of bookmakers. We examine the economic rationale behind this decision and demonstrate how this policy initiative has broad implications regarding optimal levels of taxation for other sources of government revenue.

Outline

1. Introduction
2. Policy Perspectives on Gambling in the U.S., U.K., and Australia
3. Characteristics of U.K. Betting Markets
4. Changes in the Industry Environment
5. Evaluating Changes to Betting Tax Policy
6. Conclusion

Non-Technical Summary

In this paper, we examine the economic rationale for the recent review of policy towards betting taxation within the United Kingdom. A series of environmental changes in the 1990s, including the introduction of a national lottery, the reduction of trade barriers within the European Union and the rise of Internet gambling, induced the U.K. government to initiate a large-scale review of the betting duty. As a result of this review, the U.K. government recently announced a significant reduction in the overall level of taxation on betting. It was also announced that the current general betting duty (GBD), levied as a proportion of betting stakes, will be replaced by a gross profits tax (GPT), based on the net revenue of bookmakers.

It is interesting to note that the policy approach to gambling in the U.K. differs to that elsewhere in the world (for example, the U.S.A. and Australia) in that debate in the U.K. has been much more concerned with economic efficiency and less concerned with problem gambling . In 2000, over £8 billion was spent on betting in the U.K., generating more than £500 million in General Betting Duty. About 80% of this is generated off-course in licensed betting offices, a further 10% is on-course whilst, the remaining 10% comes from the rapidly expanding telephone and Internet gambling sector.

The recent trends within the industry outlined above suggest that betting markets in the U.K. are becoming increasingly competitive and pose a serious threat to the U.K. betting industry. Recent evidence suggests that the demand for betting in the U.K. is, indeed, relatively elastic with respect to the level of taxation and that the proposed reduction in betting tax will cause a significant boost to betting turnover. However, part of the increase in turnover is likely to be the result of expenditure switching away from the National Lottery.

Aside from the reduction in the overall level of taxation, the shift from General Betting Duty to a gross profits tax also has a clear economic rationale. A GPT (levied on net revenue from a bet) is equivalent to a tax on the price or and ad valorem tax. On the other hand, the current system (GBD) involves a tax on the quantity of bets placed and is equivalent to an excise duty levied on each unit of a good. There is a wide body of literature which argues that, for in the presence of some monopoly power and for the same tax revenue, an ad valorem tax will lead to a lower price and higher quantity than an excise duty and is, thus, preferable on the grounds of economic welfare. In the context of betting, we argue that the shift to a GPT will be relatively lighter on sectors subject to intense international competition (such as Internet betting) compared to higher-margin sectors (such as betting shops). The tax change will also mean that the industry is much better able to cope with further changes to the competitive environment as, if margins are squeezed, there will be an automatic adjustment to the tax liability.

In conclusion, the decisions to reduce the overall level of betting taxation in the U.K. and to switch from General Betting Duty to a Gross Profits Tax have been strongly influenced by standard micro-economic theory. Under the new tax regime, we predict that the U.K. betting industry will be better able to cope with further changes to the competitive and technological environments. The downside of the move to a GPT is that revenue stream from betting taxes is likely to be less stable than under GBD.

1. Introduction

Excise duties, mainly from petrol, alcohol, cigarettes and gambling, account for approximately 10% of U.K. government revenue. In recent years, actual revenues from such duties have been significantly less than projected revenues, due to shifts in tax and trade policies and technological change, which have induced substitution within and across national borders. One such policy initiative was the reduction in trade barriers within the European Union, which has exposed structural differences in excise duty rates across countries. For example, excise rates on alcohol, cigarettes, and petrol are considerably higher in the U.K. than in some neighbouring countries. In each of these cases, U.K. suppliers have become particularly vulnerable to competition from lower-tax countries. A related problem has been the growth of illegal imports, especially alcohol and cigarettes. These threats have led consumers and industry representatives to demand that the U.K. Government reduce excise duties.

Pressure to reduce betting duty has been particularly intense, due in part to the rapid rise of Internet gambling. Internet gambling allows U.K. bettors to avoid excise duty by placing wagers with offshore or overseas companies. Thus, the Internet poses a threat to government revenue streams and the competitiveness of the U.K. gambling industry. The prevailing sentiment among U.K. policymakers and practitioners is that such threats will become more severe, unless tax policies are substantially modified.

As a result of this review, the Chancellor of the Exchequer announced a major reduction in the overall level of betting taxation in his budget statement of April 2001. He also announced that 'General Betting Duty', levied as a proportion of betting stakes, would be replaced by a 'Gross Profits Tax' based on the net revenue of bookmakers. The Chancellor proposed a tax rate of 15% for fixed-odds and pari-mutuel bookmakers, 10% for sports spread bookmakers and 3% for financial spread bookmakers.

Although revenue from gambling constitutes the smallest of the four goods subject to excise duties, the consequences of this dramatic change in betting tax policy could have important implications for policy towards duties on petrol, alcohol and cigarettes. Also, similar policy debates on the taxation of gambling and the impact of e-commerce have emerged in other OECD countries, most notably Australia (e.g., Smith, 2000) and the U.S.

(e.g., Goolsbee, 2001). Thus, legislators, academics, and practitioners in many nations will be closely monitoring the impact of this major shift in U.K. policy.

The purpose of this paper is to explore the economic rationale behind the U.K. government's response to the e-commerce revolution and assess its likely effects on tax revenue, the gambling industry, and consumers. In the following section, we contrast different policy perspectives on gambling in the U.S., U.K., and Australia. Section 3 provides some background information on the U.K. betting industry and the characteristics of these markets. The following section describes the key environmental changes that have provided an impetus for the shift in tax policy. Section 5 evaluates the proposed policy shift against several criteria, with a particular focus on economic efficiency. The final section consists of conclusions and suggestions for additional research.

2. Policy Perspectives on Gambling in the U.S., U.K., and Australia

There are salient differences in policy and social perspectives on the gambling industry in the U.K., U.S., and Australia, which we summarise in Table 1.

In the U.S., most of the major policy issues are resolved at the state level, since state legislatures have jurisdiction over most aspects of gambling. An important secular trend in the U.S. is that gambling, especially in the form of lotteries and electronic gaming devices (e.g., slot machines), has become much more socially acceptable. Eadington (1999) reports that gambling revenues have risen almost threefold over a 15 year period, rising from approximately $17 billion in 1982 to approximately $51 billion in 1997 (in constant dollars), with most of the increase attributed to the spread of lotteries and casinos. Most U.S. states now have lotteries, which are often used to fund politically popular education programs. In 1978, only one state, Nevada, allowed casino gambling. By 1999, 27 states had authorised some form of casino gambling.

The growth in casino gambling is mainly due to the rise of Native American (Indian) casinos and riverboat casinos. Indian casinos are assigned to a particular local tribe. Under U.S. law, these tribes are considered sovereign nations, and thus, do not pay taxes to states. While tribal casinos in remote, rural areas are typically quite small and unprofitable, those located near major metropolitan areas (e.g., New York City, Boston, Phoenix, Miami/Ft. Lauderdale,

and Minneapolis) yield high financial returns. Riverboats, which are subject to taxes, are especially popular in the Southern and Midwestern states.

Despite the growing popularity of gambling in the U.S., there is still strong religious opposition to this activity in many states and almost no support for legalising gambling on sporting events. For instance, only two U.S. states allow sports betting: Nevada and Oregon, and in Oregon, it is permitted only on a very limited basis. Thus, there is considerable variation within the U.S. in gambling activity and tax rates across regions and states.

In the U.K., gambling has become relatively socially acceptable and has rarely engendered any strong religious opposition. Regulation and taxation issues are resolved at the national level. Casinos are not as popular in the U.K. Finally, a major source of revenue growth in the U.K. industry is the rise in gambling on sporting events, including spread betting.

Perhaps the most striking difference between the U.S. and U.K. lies in the nature of the public policy debate regarding gambling. In the U.S., much of this debate focuses on the magnitude of externalities or third party effects that arise with an increase in gambling. Opponents of the gambling industry tend to focus on negative externalities, such as the social costs of problem gambling and associated criminal activity. Some religious groups also oppose expansion of gambling on moral grounds. Supporters of the industry contend that gambling can be used to promote economic development and tourism in depressed areas, such as Indian reservations and inner-city neighbourhoods. They also argue that legalisation of gambling can help states avoid tax revenue leakage to neighbouring states that allow such activity.

In 1996, the U.S. Congress mandated the National Gaming Impact Study Commission (NGISC), which recently released its final report (see http://www.ngisc.gov). The NGISC report focused mainly on the social and economic implications of the rise of gambling. It also contains a considerable amount of material on the pernicious influence of sports betting on the 'purity' of athletics, especially at the university level. The bottom line is that it is not likely that legalised sports betting will grow in the U.S.

In the U.K., many of the issues explored in the NGISC report are virtually absent from the public policy debate. Instead, the major focus appears to be on maintaining the viability

and competitiveness of the industry. Likely reasons for this difference are that U.K. firms have established a strong competitive position in this sector and there is a high level of social acceptability regarding gambling. However, it is important to note that this industry does not operate in a vacuum. Environmental and tax changes will have implications for the level of gambling activity and more importantly, for substitutes and complements. We consider these factors in subsequent sections of the paper.

As evidenced on Table 1, Australia falls somewhere in between the U.S. and the U.K. Policymaking occurs at both the state and national levels. Smith (2000) reports that in Australia, as in the U.S., states have become increasingly dependent on gambling taxes as a source of revenue. The author also finds that the growth in gambling tax revenue in Australia is being fuelled by casinos and electronic gaming devices. While gambling has traditionally been socially acceptable, bookmakers operate on-course only. In contrast to the U.S. and U.K., Australia has experienced more rapid growth in Internet gambling. Finally, although the primary focus of the public policy debate is on maintaining industry competitiveness, as in the U.K., there has been some consideration given to the issue of negative externalities resulting from gambling.

In the following section, we present background information on the U.K. betting industry and the characteristics of these markets.

3. Characteristics of U.K. Betting Markets

Over £8 billion was spent on betting in the U.K. in 2000, generating more than £500 million in General Betting Duty. The betting industry consists of three distinct sectors: off-course betting at licensed outlets (the dominant venue for betting), on-course betting (which is not subject to General Betting Duty), and betting by telephone (through deposit or credit accounts, or via debit cards). 80% of all betting turnover is generated off-course, in LBOs (Licensed Betting Offices), about 10% of turnover is on-course with the remainder consisting mainly of telephone betting. There is also a growing market for betting via the Internet and interactive betting through the television. Betting can be further sub-divided into fixed-odds betting with bookmakers, pool (parimutuel) betting with the Horserace Totalisator Board (the Tote), ‘spread betting’ and bet brokerage.

In fixed odds betting, wagers are settled at specific odds. This is the major form of betting in the U.K. In pool betting, winning bettors share the pool of all winning bets, net of fixed deductions. Within the off-course market, pool betting plays a very small role. In addition to straight win bets, there are a wide variety of other types of bets available. These include 'each way' bets, allowing the bettor to nominate win and place (usually in the first three), multiple bets on cumulative outcomes, and forecast bets which involve nomination of the first two or three past the post in the correct order.

Spread betting companies operate by establishing a market for uncertain outcomes, such as the price of gold or the number of goals in a football match. The market makers set a 'spread' regarding a specified outcome, and clients of these companies are invited to buy at the top end of the spread or sell at the bottom end. The outcome of the trade is calculated as the number of units by which the actual outcome differs from the level at which the trade is enacted. Spread or 'index' trades are available on numerous financial instruments, including stock market indices, various types of options, and futures on government bond, currencies, and commodities. Spread betting is still, however, a very small segment of the gambling industry, particularly in terms of the proportion of all bets placed, and the number of bettors involved. For example, it is estimated that revenue from spread betting makes up little more than 0.2% of general betting duty (Paton, Siegel and Vaughan Williams, 2000).

A form of betting which is even more novel than spread betting is 'bet brokerage' in which the bookmaker acts as an intermediary (for a small commission) to match up clients who lay and accept bets among themselves. This constitutes a very small percentage of total betting turnover.

Traditionally, this industry has been highly concentrated. Three large bookmaking chains dominate the off-course fixed odds market: Ladbrokes, William Hill, and Coral. These three firms account for 60% of the turnover in off-course licensed betting offices. Along with Tote Credit, they account for 90% of the telephone betting market. Recent efforts by Ladbrokes to acquire Coral suggest further consolidation is likely in this sector. There are currently five companies operating in the spread-betting sector: City Index, IG Index, William Hill Index, Sporting Index, Spreadex, and Cantor Index. The latter firm focuses almost exclusively on financial bets.

As shown in Table 2, based on figures derived from the Family Expenditure Survey, 60% of all U.K. households gambled in some manner in 1999, down from 75% in 1996. Columns 3 and 4 of Table 2 also reveal a slight decline in average household expenditures on gambling activities between 1996 and 1999.

Over 70% of wagers in betting offices are on horse racing. However, according to the 1998 Monopolies and Mergers Commission report on this industry, the share of football betting is increasing, especially by telephone, via the Internet, interactive TV and through spread betting. For example, in 1997, 4.3% of betting office turnover was on football compared to 8% of turnover by telephone (MMC, 1998, p.81). In the spread betting market, the majority of turnover is on football betting. Industry experts predict that football betting will also fuel the growth of Internet betting.

General Betting Duty (GBD) is currently levied on off-course betting turnover, at a rate of 6.75%. Bettors can pay this in advance, as a proportion of the stake, or as a proportion of any winnings. Horse race betting is also subject to a variable levy. The funds derived from this tax are used to assist the horse racing industry. Spread betting is currently subject to GBD, although this is conventionally levied on the stake placed on the 'tick' (the smallest incremental trading unit).

The issue of taxation of financial spread betting is different than taxation of sports spread betting, due to the special need in these financial markets to hedge bets in the conventional financial markets as part of the risk management procedures. A consequence of this financially oriented wager is that a losing trade for a client is often also, to a lesser extent, a losing trade for the bookmaker. Lastly, no duty is currently levied on 'bet brokerage' systems of betting.

Quarterly data for 1986-2000 on betting turnover are presented in Figure 1. These data are seasonally adjusted and an index for each series is presented. Five key events are denoted on the graph: the abolition of on-course duty at the end of March 1987, reductions in GBD in April 1992 and March 1996, the introduction of the National Lottery in November 1994, and the May 1999 announcement by Victor Chandler (a major firm in this industry) that it

was establishing operations in Gibraltar. It is clear that from a peak in 1989, there has been a gradual downward trend in turnover, with the sharpest decline in the early '90s.

In the following section, we describe changes in the environment that provided an impetus for changes in the U.K betting tax.

4. Changes in the Industry Environment

A major factor in the U.K. Government's ultimate decision to reduce the betting tax was the rapidly changing competitive environment in this industry, due mainly to the growth of e-commerce and the introduction of the National Lottery.

Three environmental changes have been especially important. First, there has been a substantial increase in recent years in the number of independent bookmakers offering Internet access to betting sites. In addition to losing market share, incumbent firms have also been harmed because consumers can more easily shop around, in order to find bookmakers offering the best odds on a particular wager. Thus, Internet access has greatly enhanced the information efficiency of this market, to the detriment of firms, and to the benefit of punters. The Henley Centre predicts that the share of Internet gambling in the market will increase from 2% in 2001 to 9% in 2005 (Paton et al, 2000), a trend which is likely to enhance competition in this industry.

A second key environmental change is that several large bookmakers have established offshore operations, mainly in order to avoid the U.K. betting duty. The first was Victor Chandler, the U.K.'s leading independent rails bookmaker, who set up a firm in Gibraltar. Although, Victor Chandler's Gibraltar operation was not subject to the betting duty, the firm originally charged bettors a 3% 'administration charge' on bets. Subsequent competition has forced many on-line companies to waive 'tax' on bets altogether, at least in the short-term. More recently, the largest bookmaking chains**,** including Ladbrokes, William Hill and Coral, have also developed offshore operations.

Concomitant with the growth in importance of e-commerce has been an increase in the number and availability of substitutes for betting. The most important of these is the National Lottery, introduced in November 1994, and subsequent National Lottery branded games such as Scratchards, the Thunderball draw and the National Lottery Extra draw.

Taken together, these environmental changes suggest that betting markets in the U.K. are becoming increasingly competitive. They also imply that U.K. bookmakers are now competing in a global market with lower entry barriers and greater substitution possibilities, populated by firms who are subject to a much lower tax burden. These trends pose a serious threat to the U.K. betting industry and, thus, to the tax base for betting duty. Based on these trends, we hypothesise that the demand for betting will be relatively elastic with respect to changes in the tax rate.

Unfortunately, there is very little evidence on the elasticity of demand for betting. Exceptions include the work of Suits (1977, 1979) who found that the demand for horse racing with respect to price in the U.S. was moderately elastic (-1.59). More recently, Paton, Siegel and Vaughan Williams (2001) report own-price elasticity estimates for U.K. betting that range from -1.19 to -2.50.[1]

A further motivation for the proposed tax reduction is its potential impact on the underground or shadow economy. In this context, we refer to illegal betting activity on which taxes are not paid. Schneider and Enste (2000) provide evidence of growth in the shadow economies of all OECD countries. In the U.K., the authors estimate that the percentage of GDP represented by the shadow economy has risen from 9.6% in 1989-90 to 13% in 1996-97. Unfortunately, Schneider and Enste cannot disaggregate these figures by type of activity, such as tobacco, alcohol, drugs, prostitution, and gambling, so we cannot determine how much gambling activity has actually gone underground. More generally though, Schneider and Enste attribute at least some of the rise in the shadow economy to increases in taxes on items such as alcohol and tobacco. It is interesting to note that the same individuals or groups that smuggle alcohol and tobacco, i.e., organised crime, can also potentially provide gambling services. This is certainly the case in the U.S.

The limited evidence that is available on elasticity of demand and the extent of the underground economy, together with the observed changes to the competitive environment suggest that, ceterus paribus, the proposed reduction in betting tax will lead to a large

[1]Several authors have analysed tax revenue from lotteries (e.g., Mikesell, 1994; Szakmary and Szakmary, 1995) or estimated the price elasticity of demand for lotteries (e.g., Gulley and Scott, 1993; Farrell and Walker, 1998; Farrell, Morgenroth and Walker, 1999; Farrell, Hartley, Lanot and Walker, 2000; Forrest, Gulley, and Simmons, 2000), generally finding an elasticity either close to or a little greater than one.

increase in turnover. If the overall tax burden on betting is not reduced, we expect a continuing decline in the U.K. betting industry and the tax base for betting duty.

One factor not considered thus far is the possibility that tax changes in a given gambling sector will affect tax revenue in other gambling markets and in related industries. The magnitude of such impacts will depend on the strength of substitution across different types of gambling and in related industries. There is some limited evidence on these effects in the U.S. and U.K. Anders, Siegel, and Yacoub (1998) found that the growth of Indian casinos, which are not subject to state taxes, destabilised sales tax revenue in Arizona. They also reported evidence of leakage from taxable sectors, such as restaurants and bars, to these non-taxable gambling establishments. In a similar vein, Siegel and Anders (1999) found that an expansion of riverboat gambling in Missouri was associated with a decline in revenue in other businesses in the entertainment and amusement sector. Finally, Siegel and Anders (2001) reported that an expansion in Indian casinos in Arizona was associated with a reduction in lottery revenues, especially for Lotto games. They did not, however, find evidence of substitution between horse and dog racing and lotteries. The strongest displacement effects were found for the big prize lottery games.

In the U.K., Paton, Siegel, and Vaughan Williams (2001) find significant evidence of substitution between betting demand and the U.K. National Lottery. They estimate a cross price elasticity of Lottery turnover with respect to betting, which falls in the range of +0.63 to +1.61. This finding implies that a reduction in the betting tax will also result in lower lottery revenue, as some punters substitute from the Lottery to betting.

In the following section, we examine the welfare implications of two alternative tax regimes.

5. Evaluating Changes to Betting Tax Policy

The consultation document issued by HM Customs and Excise (2000) on modernising betting duty asserts that potential changes to betting taxation should be judged against criteria that include allocative efficiency, distributional efficiency, industrial competitiveness and the maintenance of government revenue. We attempt in this section to provide a framework for evaluating the proposed changes against each of these criteria.

Conventionally, the quantity of output in betting markets is specified as the number of unit bets placed. Using £1 as the standard unit, the quantity of bets is equivalent to the total amount staked by punters. Further, the price of each unit bet is typically measured as the percentage of the stake that the punter expects to be returned in winnings. Based on this approach, the total revenue received by bookmakers is the amount they retain after paying out winnings (rather than the total amount of money received in stakes) and the so-called 'Gross Profits Tax' is, in fact, a tax on net revenue. Thus, it follows that General Betting Duty, levied as the percentage of stakes, is equivalent to a *commodity* (or unit or specific) tax. On the other hand, the Gross Profits Tax is effectively levied as a proportion of the price charged to betters and is equivalent to an *ad valorem* tax, levied as a proportion of the price charged to consumers.

Having established this, the economic analysis of the proposed policy shift in the U.K. reduces to a standard comparison of *commodity* and *ad valorem* taxes. Such a topic has been the subject of a long-standing literature dating back at least as far as Wicksell (1896). It is easy to show that under perfect competition, an *ad valorem* tax leads to the same price and quantity equilibrium and is welfare equivalent to an equal-yield commodity tax. Figure 2 illustrates the simple case of a linear industry demand curve and constant marginal costs. A commodity tax levied at a rate of c per unit bet shifts the marginal cost curve upwards. An *ad valorem* tax, levied at a rate of v% of the price, causes the average revenue curve faced by producers to swivel inwards around the intercept on the quantity axis. In both cases, the equilibrium price and quantity are (P^*, Q^*) and tax revenue is equal to c times Q^*.

A more interesting case arises in the presence of imperfect competition, and many scholars have examined the relative incidence of each type of tax on consumers and producers. Several authors assess whether taxes will be 'over-shifted' or 'under-shifted' to consumers under a range of assumptions about market structure and interdependence of firms (Stern, 1987; Baker and Brechling, 1992; Delipalla and O'Connell, 2001).

Of more direct relevance to the current policy debate is the research assessing the relative impacts of each type of tax. There is a consensus in this literature that, in monopoly and oligopoly markets, an *ad valorem* tax generates a welfare-superior outcome relative to a

commodity tax (for example, Delipalla and Keen, 1992). Furthermore, Skeath and Trandel (1994) find that for any unit tax imposed on a monopoly, "there exists an *ad valorem* tax...that produces larger profit, tax revenue and consumer surplus" (p.53). The authors also show that this result generalises to all Cournot-Nash oligopolies as long as the tax level is greater than a critical value, dependent on certain market parameters.

Figure 3 illustrates this in the context of a pure monopoly. Tax revenue under the commodity tax is given by the equilibrium quantity, Q*, times *c*. Under the *ad valorem* tax, revenue is given by Q* times the difference between *AR* and *AR(v).* In order to achieve the same equilibrium price and quantity in each case, it is clear that *(AR - AR(v))* must be greater than *c* and that revenue under the *ad valorem* tax is higher. It directly follows that a revenue equivalent *ad valorem* tax will result in lower prices and higher turnover in equilibrium, than will a commodity tax.

The intuition behind these theoretical results is that an *ad valorem* tax (such as the GPT) provides an incentive for firms that have some price-setting ability to follow a low-margin/high-turnover strategy rather than the low-turnover/high-margin strategy encouraged by a commodity tax (such as GBD).

The majority of empirical applications of such models use data on cigarette taxes. For example, both Barzel (1976) and Johnson (1978) find that commodity taxes have a greater impact on cigarette prices in the US than *ad valorem* taxes. Although, Sumner and Ward (1981) re-examine the Johnson (1978) data and conclude that "there is no difference between the effects of specific and *ad valorem* taxes on cigarette prices" (p.1265), Delipalla and O'Donnell (2001) use data from a range of European countries to confirm that commodity taxes do indeed have a greater impact on prices.

In summary, the available theoretical and empirical evidence suggests that the proposed switch from GBD to a GPT will, at worst, have a neutral impact on allocative efficiency and welfare losses in the U.K. betting industry. The greater the level of monopoly power in the industry, the greater will be the efficiency benefits of a gross profit tax. Further, a key issue facing the U.K. betting industry is the threat of international competition from companies that operate off-shore and are able to avoid paying duty. This threat is

exacerbated by advances in technology, which stimulate the growth of telephone and Internet betting. In light of this, the GPT offers a considerable advantage to U.K. companies, relative to the turnover tax. With a turnover tax, if margins are squeezed due to competition, the level of duty payable is not altered. However, with a GPT, if margins are reduced, the level of duty is automatically lower. In other words, the GPT provides an automatic adjustment mechanism to companies in the face of changes to the competitive environment. In industry segments where competition is intense (e.g., Internet and telephone betting), the tax burden will be relatively light. In sectors that are characterised by less intense competition (e.g., licensed betting offices), the tax burden will be relatively high.

The corollary of the beneficial impact of a GPT on the competitiveness of U.K. firms is that changes to the competitive environment will lead to automatic adjustments in government revenue. This is because, that tax revenue from a GPT will depend on the price charged, which is itself determined by the market environment. An increase in competition will lead to a decrease in tax revenue. Thus, the *ad valorem* type tax is likely to lead to a much less secure stream of Government Revenue than the commodity type tax. In effect, the move to a GPT would shift the burden of risk away from the private sector and on to the Government.

Paton, Siegel, and Vaughan Williams (2001) outline a simple model of the U.K. betting market, in order to estimate the impact on prices and tax revenue of a switch from General Betting Duty to a Gross Profits Tax. Their analysis is based on a range of different assumptions regarding the extent of monopoly power and the magnitude of the demand elasticity with respect to tax. Some summary results of this model are reported in Table 3. The model requires estimates of price, quantity, and the elasticity of demand for betting with respect to deductions. During 1999, total U.K. betting turnover subject to General Betting Duty was £7.3 billion pounds, whilst the mean price for the whole industry is estimated to be close to 0.23 (23%). The authors use ‘high’ and ‘low’ elasticity scenarios and simulate the rates of a GPT which would be revenue equivalent to the current value of the commodity tax under different assumptions about the current level of monopoly power in the industry.

In the case of perfect competition, equilibrium price and quantity are unchanged with a switch to a GPT and the revenue equivalent GPT rate is equal to 29.3% (= t/P^* where t is the current level of GBD and P* is the current equilibrium price). For every other assumption with regards to monopoly power, the equilibrium price is decreased and quantity increased on a move to a revenue equivalent GPT regime. In fact, there is a good deal of evidence (see Monopolies and Mergers Commission, 1998) that bookmakers in the off-course market have significant market power. Using the mid-point assumption for the monopoly power coefficient, Paton et al (2000) find the simulated revenue equivalent GPT rate to lie between 0.252 and 0.271. This implies a reduction in equilibrium price to between 0.215 and 0.213 and an increase in betting turnover of between 17 and 25%.[2]

The proposal to introduce GPT at a rate of 15% represents a significant reduction in the overall burden of taxation on betting. This implies an even lower equilibrium price and, consequently, a further boost to turnover. Despite this, the proposed rate of duty almost certainly implies a significant decrease in government revenue from betting. It is clear that the proposed overall reduction in the tax burden will lead to a significant decrease in government tax revenue from betting. However, given the rapid change in technology and growth of competition, it is likely that maintaining the status quo would also result in a significant decrease in tax revenue. Indeed, if the tax reduction is successful in boosting consumer demand and in reducing the off-shore operations of U.K. bookmakers, the long term level of government revenue may be greater than under the 'no action' scenario.

Another issue that arises from our analysis of the impact of tax changes is substitution. It is reasonable to assume that a decline in the price of betting, arising from a switch to an *ad valorem* type tax and/or from a decrease in the overall level of taxation, will reduce the demand for substitute products. As noted in the previous section, Paton, Siegel and

[2] Paton, Siegel, and Vaughan Williams (2001) show that this assumption implies that just over four pence out of each pound bet is taken as monopoly profits. The figures used imply that a typical £1 bet in an off-course shop would be broken down as follows:

returned to bettor	0.77
tax	0.0675
levy plus costs (including a normal profit)	0.12
monopoly profits.	0.0425

Analysis of profit margins within the industry using published accounts data and that supplied by Customs and Excise suggests that the largest bookmakers have a profit margin about 4 percentage points higher than

Vaughan Williams (2001) find evidence of a high degree of substitution between the National Lottery and betting markets. Thus, any decrease in betting taxes is likely to lead to a decrease in government revenue from the lottery (which is currently taxed at a rate of 12% of sales).

A natural extension of this analysis is to examine substitution and revenue impacts beyond gambling. Understanding these substitution effects is critical to providing an accurate estimate of the global impact on tax revenue of a reduction in betting duty, since several potential substitutes for gambling constitute significant sources of tax revenue for the U.K. government. Thus, it would be interesting to examine the impact of a change in a gambling tax on the demand for alcohol and tobacco.

One possible further area of concern relates to distributional or equity across firms, specifically, whether, the shift to a GPT will adversely affect smaller firms. We consider two issues here. The first is the possibility that larger bookmakers can exploit economies of scale and may have lower costs than small firms. The second is the fact that large bookmakers in the U.K. attract a higher proportion of high margin business than do small bookmakers.

Considering the cost differential first, tax models can easily be extended to a case in which large firms have lower costs than small firms. The large firms set the market price at a level sufficient to give them monopoly profits. Small firms only achieve normal profits and are effectively sheltering under the monopoly price set by the larger firms. As we have seen, the switch to a GPT is likely to lead to a lower equilibrium price relative to GBD. In this case, it is indeed possible that the switch would result in bankruptcy for several small, marginal bookmakers. This can be viewed as the failure of inefficient firms, in the face of increasing competition. On the other hand, increased concentration may have a countervailing negative impact on long-run efficiency. Also, there might be important social and political considerations that make the exit of small bookmakers undesirable.

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smaller bookmakers. If we take mean profit margins for the latter to be representative of a normal rate of return, this provides some support for this assumption.

The issue of small bookmakers attracting more low margin business is less ambiguous. As argued above, a GPT is effectively a tax on margins or prices. Low-priced betting products will attract a lower rate than high-priced products. Consequently, the shift to a GPT, other things being equal, is likely to benefit small firms relative to the larger firms. For example, consider two £1 bets. The first is offered by large bookmakers and returns 50 pence to the bettor before tax. The second is offered by a small bookmaker and returns 90 pence. Under a turnover tax of 10%, both firms will pay a tax of 10 pence and tax revenue is 20 pence. The gross profits from the two bets are 60 pence, so a GPT of 33.3% would be required to maintain revenue. At such a rate, the large firm would have to pay tax of 16.7 pence and the small firm only 3.3 pence. On balance, there seems insufficient evidence to support concerns that the small bookmakers will be relatively worse off under the new policy regime.

6. Conclusion

The U.K. government has explicitly decided to base its betting taxation policy on economic criteria, such as reducing allocative inefficiency and maintaining competitiveness. This contrasts significantly with the approach taken by other countries such as the U.S. and Australia, where an assessment of the social costs of gambling has played an important role in the consideration of policies regarding betting activity.

The decision to reduce the overall level of betting taxation in the U.K. demonstrates an awareness of the fact that market conditions in the betting industry have fundamentally changed in recent years. Also, the switch from General Betting Duty (GBD) to a Gross Profits Tax (GPT) appears to have been directly influenced by economic theory on betting taxation. Specifically, the current method of levying duty on stakes is equivalent to a *commodity* tax, whilst the proposed alternative of a GPT is equivalent to an *ad valorem* tax. Assuming the existence of at least some monopoly power in the betting industry, the proposed switch to a GPT is likely to lead to lower prices and enhanced consumer welfare, compared to a situation in which GBD is retained. The intuition behind this result is that by levying the tax on margins instead of turnover, producers with at least some market power have an incentive to reduce their price. Further, the switch will re-enforce the proposed cut

in the overall level of taxation in improving the ability of U.K. betting firms to compete in an increasingly competitive environment.

Under this new tax regime, we predict that the U.K. betting industry will be better able to cope with further changes to in the competitive and technological environments. The downside of the move to a GPT is that the revenue stream from betting taxes is likely to be less stable than under GBD. In effect, the risk burden will be shifted from the private to the public sector. Given the rapid pace of technological change, more intense global competition, and their desire to shelter firms in this industry from the deleterious effects of these environmental changes, there seems to be little alternative to the Government assuming this additional risk.

The political motivation for the proposed policy changes in the U.K. arises partly from the fact that the betting industry has been especially vulnerable to the growth in e-commerce. However, given the well-publicised pressure for changes to other excise duties such as that on petrol, the policy switch with regards to betting may have far reaching consequences for other sectors of U.K. economy.

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Table 1: Comparison of Gambling Public Policy Issues in the U.K., U.S., and Australia

Aspect of Gambling	U.K.	U.S.	Australia
Level of Policymaking	National Level	Mainly State Level	State and National Levels
Social/Cultural Attitudes Towards Gambling	Traditionally has Been Socially Acceptable	Has Recently Become More Socially Acceptable; Strong Religious Opposition to Legalised Gambling in Some States; Strong Opposition to Sports Betting	Traditionally Has Been Socially Acceptable; Bookmakers on Course Only
Key Trends	Growth in Internet Gambling; Growth in Sports Betting; Rise of the National Lottery	Rapid Growth in Casinos (Indian Casinos and Riverboats)	Rapid Growth in Internet Gambling
Focus of Public Policy Debate	Maintaining Industry Competitiveness; Maintaining Tax Revenues	Emphasis on Positive/Negative Externalities of Gambling; Use of Gambling to Promote Economic Development/Tourism (Especially in Poor Communities)	Maintaining Industry Competitiveness; Some Emphasis on Negative Externalities

Table 2: Incidence and Household Expenditure on of Gambling by Type: 1996 & 1999

Type of Gambling	% Households Gambling		Mean Weekly Household Expenditure on Gambling (£)	
	1996	1999	1996	1999
Betting	21	16.4	0.69	0.66
Bingo	6.5	5.1	0.42	0.39
Pools	18.4	4.8	0.37	0.11
National Lottery	68.6	52.2	2.23	1.82
Scratch cards	6.2	6.4	0.1	0.10
Irish Lottery	-	1.4	-	0.05
All	74.8	60	3.77	3.14

Source: *Family Expenditure Survey 1999, 1996, Office of National Statistics, U.K.*

Table 3: Revenue Equivalent (RE) Gross Profits Tax (GPT) Rates: High and Low Elasticity

	Assumption Regarding Market Structure	Revenue Equivalent GPT rate	Price (Current)	Price (GPT)	Quantity (Current)	Quantity (GPT)
High Elasticity	Perfect Competition	0.293	0.230	0.230	7.30	7.30
	Monopolistic Competition	0.252	0.230	0.215	7.30	9.12
	Monopoly	0.248	0.230	0.213	7.30	9.32
Low Elasticity	Perfect Competition	0.293	0.230	0.230	7.30	7.30
	Monopolistic Competition	0.271	0.230	0.213	7.30	8.55
	Monopoly	0.266	0.230	0.207	7.30	8.92

Notes:
(i) The high and low elasticity estimates are -1.09 and -0.67 respectively, measured with respect to total deductions.
(ii) The monopoly power assumptions relates to the monopoly power coefficient discussed in Paton, Siegel and Vaughan Williams (2000) and which ranges from 1 to 2. 'perfect competition' corresponds to a coefficient of 1, 'monopolistic competition' to a coefficient of 1.5 and monopoly to a coefficient of 2.
(iii) Revenue figures are in £ billion per year. Current Quantity is total betting turnover in the U.K. for 1999 in billions of pounds. Price is the average proportion of a £1 bet that is retained by the bookmaker (including deductions).

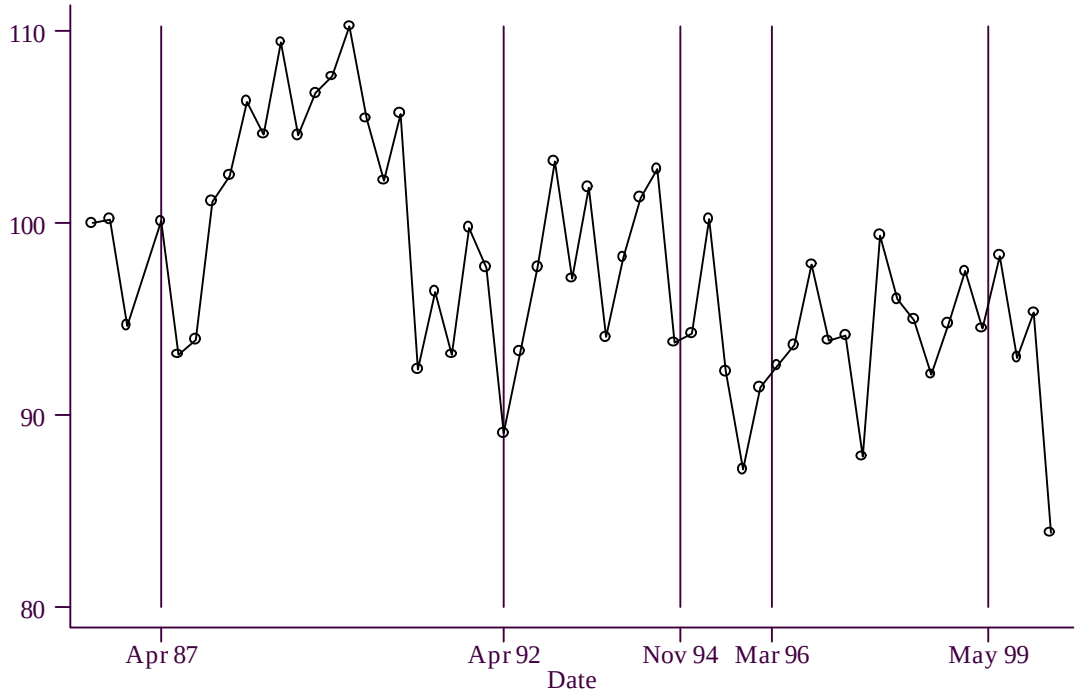


Fig 1: Trends in Off-Course Betting Turnover: 1986 - 2000

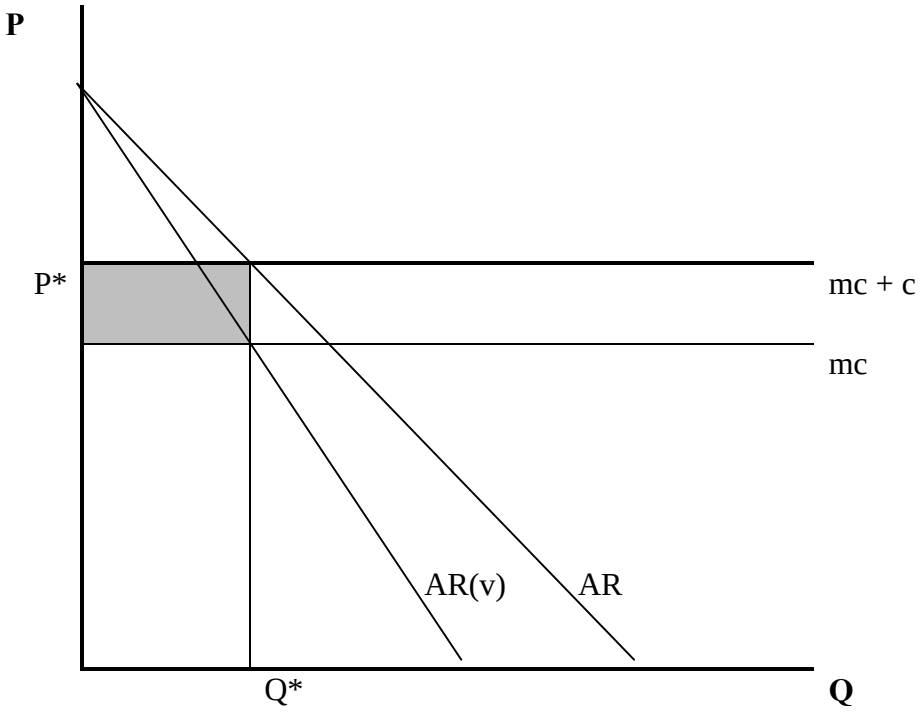
Notes

(i) Source is HM Customs and Excise.

(ii) The indicated events are as follows:

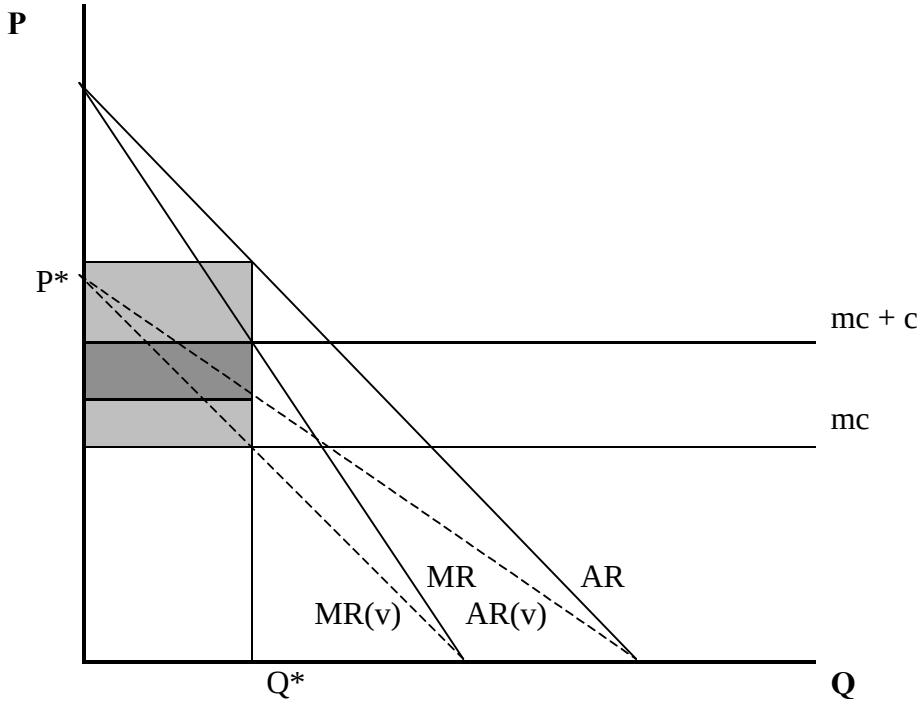
April 1987: abolition of on-course duty.
April 1992: reduction in general betting duty.
November 1994: Introduction of the National Lottery
March 1996: Reduction in general betting duty
May 1999: Victor Chandler moves to Gibraltar.

Fig 2: Impact of Commodity and *Ad Valorem* Taxes under Perfect Competition



where P^* = the equilibrium price under a *commodity* tax or an *ad valorem* tax.
Q^* = the equilibrium price under a *commodity* tax or an *ad valorem* tax.
= tax revenue from *commodity* or *ad valorem* tax

Fig 3: Impact of Commodity and *Ad Valorem* Taxes under Monopoly



where P^* = the equilibrium price under a *commodity* tax or an *ad valorem* tax.
Q^* = the equilibrium price under a *commodity* tax or an *ad valorem* tax.

= tax revenue from commodity tax

= tax revenue from ad valorem tax.