

Innovating into trouble: When innovation leads to customer complaints

ERC Research Paper 76

April 2019

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The Enterprise Research Centre is an independent research centre which focusses on SME growth and productivity. ERC is a partnership between Warwick Business School, Aston Business School, Queen's University School of Management, Leeds University Business School and University College Cork. The Centre is funded by the Economic and Social Research Council (ESRC); Department for Business, Energy & Industrial Strategy (BEIS); Innovate UK, the British Business Bank and the Intellectual Property Office. The support of the funders is acknowledged. The views expressed in this report are those of the authors and do not necessarily represent those of the funders.

ABSTRACT

This paper examines the unintended consequences of innovation. We show that innovative activity can have adverse outcomes in the form of increased customer complaints with the potential for reputational and financial damage. Complaints may arise directly from adverse reactions to innovative services or service failures where firms prioritise innovation. Our empirical analysis focuses on legal services in England and Wales. Survey data on innovation by legal service providers is matched with complaints data from the UK Legal Ombudsman. This allows us to identify causal links between innovation activity and subsequent customer complaints. Our analysis reveals that higher levels of innovation activity increase the probability and number of consumer complaints. We identify how firms can reduce the potential for consumer complaints by adopting collaborative innovation strategies and engaging in multi-functional teamworking. Our results have strategic, regulatory and policy implications.

Acknowledgements:

We are grateful to the Solicitors Regulation Authority and the Legal Services Board for supporting the Survey on Innovation in Legal Services. Valuable comments on earlier drafts of this paper were received from participants in DRUID 2018, Copenhagen, ISBE 2018, Birmingham and departmental seminars in University College Cork, University of Limerick and University of Kent. The analysis and interpretation in the paper is that of the authors alone.

Keywords: Innovation; legal services; customer complaints

JEL Codes: O31, O33

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1. INTRODUCTION

Definitions of innovation often stress its potential benefits in terms of ‘creating new value for customers and financial returns for the firm’¹. Here, we show that innovation can also have negative effects, causing an increase in customer complaints in the short-term with potentially negative financial and reputational consequences (Liao, Chou, and Lin 2015). Our analysis draws on the literatures on collaborative innovation and consumer complaining behaviour (CCB) which defines complaining behaviour as: ‘an action taken by an individual which involves communicating something negative regarding a product or a service to either the firm manufacturing or marketing that product or service, or to some third-party organizational entity’ (Jacoby and Jaccard 1981, p. 6). We compliment other studies which have looked at the role of consumer complaints in stimulating innovation (Christiansen et al. 2016), and how firms can benefit from customer complaint information as part of broader quality management or improvement activities (Leavengood, Anderson, and Daim 2014).

Prior research on innovation and customer complaints is relatively limited and has focussed primarily on individual complainants and their attitudes, cognition and motivation (Heidenreich, Kraemer, and Handrich 2016; Heidenreich and Kraemer 2015; Heidenreich and Handrich 2015; Talke and Heidenreich 2014). Less attention has been paid to how the strategies of innovating organisations, or the context in which innovation is taking place, may influence customer complaints. This is perhaps surprising as the early discussion of loyalty, exit and voice by Hirschman (1970) references industrial structure and organisational strategies as potential influences on complainant behaviour. For example, engaging with consumers or suppliers during an innovation process may help firms in improving how they match new products or services to customer needs and avoid customer complaints (Busse and Siebert 2018; Mattsson and Helmersson 2007; Schreier and Prugl 2008; Pedersen 2016).

Our empirical analysis focuses on legal services in England and Wales and is based on a 2015 survey of innovation by legal services providers matched with data on customer complaints between 2013 and 2017 provided by the Legal Ombudsman

¹ Advisory Committee on Measuring Innovation in the 21st Century Economy 2008, p. i.

(Legal Ombudsman 2015)². The legal services sector, which include the activities of solicitors, barristers and other legal professionals such as patent attorneys, conveyancers and will writers, plays an important economic and social role (Rickman and Anderson 2011). In economic terms, legal services play an ‘enabling’ role ensuring fair competition and enforcing property rights and contractual compliance (Legal Services Board 2011). In social terms, legal services are important in addressing criminality, and ensuring the maintenance of domestic and human rights. Fundamentally, however, legal service provision shares many of the standard attributes of other professional services - i.e. their intangible nature, inseparability, and extensive inter-activity between client and provider. In terms of the typology of service sectors developed by Miozzo and Soete (2001), legal services is characterised by the same type of buyer-supplier relationships as other ‘specialised suppliers’ of services (e.g. information technology).

We make three main contributions. First, we identify how innovation can lead to an increase in customer complaints through both direct and indirect mechanisms (Heidenreich and Kraemer 2015; Talke and Heidenreich 2014). Direct links may arise when innovations prove unacceptable; indirect links between innovation and customer complaints may occur when resource allocation to innovation leads to service failure. Second, we examine how firms can reduce the potential for complaints arising from both direct and indirect mechanisms by adopting collaborative innovation strategies (Busse and Siebert 2018; Mattsson and Helmersson 2007; Schreier and Prugl 2008; Pedersen 2016). Finally, we consider the potential value of team-working within an enterprise on the probability that innovating firms will face consumer complaints (Hirschman, 1970). Our results have strategic, regulatory and policy implications. In strategic terms our results suggest how legal services firms can de-risk innovation. In terms of legal services regulation, recent changes in the UK and internationally have sought to stimulate innovation, with some evidence of cost reductions (Engstrom 2013; Johnson, Yazdi, and Gelb 1993) and service improvements (Parker, Gordon, and Mark 2010; Roper et al. 2015). Our results suggest that these changes may also stimulate increases in consumer complaints emphasising the importance of dispute resolving organisations such as the Legal Ombudsman.

² The Legal Ombudsman is a statutory body in the UK which acts as investigator and arbitrator in situations where consumers have an unresolved complaint about some aspect of legal service provision (Huppertz and Mower 2014; Kucsko-Stadlmayer 2008).

The argument proceeds as follows. In section 2 we conceptualise the link between innovation and complaints (Heidenreich and Kraemer 2015; Talke and Heidenreich 2014). Section 3 develops related hypotheses. Section 4 describes our innovation survey and complaints data, our measurement approach and estimation strategy. Section 5 presents our main empirical results, with implications discussed in Section 6. Section 6 concludes.

2. CONCEPTUAL DEVELOPMENT – FROM INNOVATION TO CONSUMER COMPLAINTS

Innovation in products, services or business models can generate added value both for consumers and for innovating firms with behavioural models suggesting that levels of innovative activity will increase with the expected returns (Geroski 1990). Innovating firms may be able to achieve first mover advantages, high rates of return and an advantageous understanding of consumer attitudes. Innovation has also been strongly linked to firms' ability to succeed in export markets, further increasing returns on investment (Love and Roper 2015). For customers, innovation may create new product or service options or lead to unpriced or under-priced performance enhancements in existing products or services (Buiseret et al. 1995). Either may generate an increase in perceived value.

Innovation may not always be viewed as positive by consumers, however (Castellion and Markham 2013). Consumers may exhibit 'passive innovation resistance' – 'a pre-disposition to resist innovations that is caused by an individual's inclination to resist changes and satisfaction with the status quo prior to new product evaluation' (Heidenreich, Kraemer, and Handrich 2016, p. 2441). For example, Nov and Ye (2009) suggest that the effort which consumers anticipate in adopting digital technologies may drive passive innovation resistance, while Ellen et al. (1991) suggest that consumers content with a manual allocation mechanism in a specific task may be more reluctant to consider computerised options. Resistance to innovations may also be more specific. 'Active innovation resistance' represents a negative attitude based on innovation-specific factors that follows the deliberate evaluation of new products' (Heidenreich, Kraemer, and Handrich 2016, p. 2440). This effect may be strongest where innovation is more radical, although this itself may depend on individual cognition. For example, the radicalness of an innovation may increase active resistance when an individual's cognition favours stability but may reduce active resistance where individuals seek

novelty (Baumgartner and Steenkamp 1996).

Consumers' direct experience of a new innovation may also generate either a positive or negative reaction. Positive reactions may generate consumer value and commercial benefits for innovators. Negative reactions may result in a range of consumer behaviours. Hirschman (1970) suggested three alternatives: exit, voice and loyalty. Exit is an active response in which a negative consumption experience leads to consumers switching suppliers or reducing consumption. Voice is a similarly active outcome where a consumer actively engages with the service supplier to register their complaint and seek redress. Alternatively, where the negative experience is mild or where switching costs are particularly high, buyers may also show 'loyalty' despite poor or inadequate service.

For innovating firms, both 'exit' and 'voice' effects which occur as direct responses to the introduction of specific innovations have potentially negative consequences in terms of lost business and reputational damage. Other indirect effects may also arise if firms over-allocate resources to innovation leading to failures in service delivery. This reflects the tension in resource allocation between firms' operational, customer-facing and innovation activities (e.g. Von Stamm 2003). As Hortinha, Lages, and Lages (2011, p. 37), comment: 'the trade-off between customer orientation and technology orientation is of the utmost importance ... resources are limited, and firms must make choices in their allocation'. Similar trade-offs are evident between the effort invested in exploration and exploitation (Li et al. 2018). Recent studies also suggest short-term trade-offs between the adoption of advanced management techniques (Bourke and Roper 2016) and innovation and quality improvement management and innovation (Bourke and Roper 2017). For some firms this may be managed using techniques such as a balanced scorecard which guides resource allocation between multiple objectives. The evidence suggests that this type of formal managerial routine can be effective in terms of boosting financial performance and innovation (Malagueno, Lopez-Valeiras, and Gomez-Conde 2018), and short-term and longer-term innovation objectives (Frezatti et al. 2014). Such managerial routines may be beneficial for incremental innovation but may be inconsistent with more exploratory activities (Benner and Tushman 2003).

Firms may also seek to mitigate the risk of customer complaints through their approach to innovation. For example, there is now considerable evidence that partnering in innovation can help firms increase the market success of their innovation activity (Suh

and Kim 2012; Janeiro, Proenca, and Goncalves 2013). For many collaborative innovators – particularly in services - engaging customers or potential customers in the development of their innovation is a key source of insight (Storey and Larbig 2018; Love and Mansury 2007), with some studies suggesting that experienced lead users (Schuhmacher and Kuester 2012) and new customers (Lau, Tang, and Yam 2010) can provide particularly valuable information. Engaging with consumers as part of an innovation project may, in particular, help firms better assess the potential market for any innovation, the acceptability of different forms of innovation and so reduce the risk of encountering innovation resistance (Astebro and Michela 2005; Storey and Larbig 2018). Team-working during the innovation process may also enable more diverse knowledge to be focussed on an innovation challenge (Ancona and Caldwell 1992) and may enhance creativity and innovation quality (Shipton et al. 2005), particularly during the early stages of the innovation process (Love et al. 2011; Love and Roper 2004).

3. HYPOTHESES

Our hypotheses focus on the probability that a firm will experience customer complaints as either a direct or indirect result of their innovation activity. Our first and central hypothesis therefore reflects the relationship between the extent of firms' innovation activity and complaints. Both a direct (innovation resistance) and indirect (resource allocation) effect are possible here, both of which work in the same direction. In line with previous studies (Bourke and Roper 2016; 2017), we expect that introducing new ways of doing things will initially be disruptive to firm performance, as firms dedicate resources to innovation rather than routine functions. In the context of legal services, this short-term disruptive effect to firm performance may manifest in the form of customer complaints. Therefore, our first hypothesis states:

Hypothesis 1: Innovation and Customer Complaints

Higher levels of innovation activity will increase the probability of customer complaints in the short term.

Our second and third hypothesis focus on the potential moderating effects of customer engagement and team-working during the innovation process on the link between innovation and customer complaints. Innovation strategies which seek to reduce the probability of adverse customer reactions through consumer engagement have been described in industries as diverse as food (Busse and Siebert 2018; Mattsson and Helmersson 2007), extreme sports gear (Schreier and Prugl 2008) and health services

(Pedersen 2016). In services, evidence on the value of consumer engagement in innovation is, however, ‘inconclusive’, depending strongly on firms’ ability to absorb the insights provide by consumers and their flexibility in adapting service provision. (Storey and Larbig 2018). Consumer engagement may also have less positive effects by setting up unrealistic expectations which may, subsequently, exacerbate active innovation resistance (Witell et al. 2017). On balance, however, the evidence suggests that:

Hypothesis 2: Customer informed innovation

Customer engagement in innovation will moderate the effect of innovation on the probability of customer complaints.

Prior studies show that team-working during the innovation process can also contribute positively to successful innovation and, by inference, to reduced customer complaints. Teams may encourage experimentation and risk-taking which may contribute to the development of more radical innovations (Cabrales et al. 2008). Aspects of innovation teams which have received significant research attention are: diversity in terms of gender (Gonzalez-Moreno, Diaz-Garcia, and Saez-Martinez 2018), cultural background and functional expertise (Edmondson and Harvey 2018). Evidence on the effects of most aspects of team diversity on innovation success remains mixed, however (Edmondson and Harvey 2018). Inconclusive results may reflect the very different corporate environments in which teams operate with implications for individuals’ willingness to share knowledge (Cheung et al. 2016) and the variety in firms’ innovation challenges and objectives (Cabrales et al. 2008). It has been suggested that in terms of the functional dimension of diversity there is stronger evidence from meta-analyses (Bell et al. 2011; van Dijk, van Engen, and van Knippenberg 2012) of a positive link to innovation success (Edmondson and Harvey 2018). This suggests our third hypothesis:

Hypothesis 3: Team-working and innovation

Multi-functional team-working during the innovation process will moderate the effect of innovation on the probability of customer complaints.

4. DATA AND METHODS

Our empirical analysis uses data on the legal services sector in England and Wales for which we have data on both innovation and customer complaints. Innovation data is taken from the 2015 Survey of Innovation in Legal Services (SILS) which is matched with administrative data on customer complaints provided by the Legal Ombudsman for England and Wales. The Survey of Innovation in Legal Services covered a structured sample of legal service providers whose primary business related to the provision of legal services.³ This includes barristers' chambers, solicitors and other legal service providers (OLSPs) including: patent and copyright agents, notaries, bailiffs, arbitrators, examiners and referees etc. SILS provides a representative view of innovation across the whole of the legal services sector (including those activities regulated and unregulated under the Legal Services Act 2007) in England and Wales (Roper et al. 2015).⁴ Sampling frames were provided by regulators (i.e. the Legal Services Board, Solicitors Regulation Authority) augmented with commercial databases for non-regulated sectors. Survey fieldwork was conducted by telephone between February and April 2015 and focussed on firms' innovation activities during the previous three years (see Figure 1). As part of the survey, respondents were asked explicitly whether data from their business could be matched with other publicly available data. Of the 1,500 overall respondents 1412 (94.2 per cent) agreed that their data could be matched with other publicly available data and in this case the company name was included in the survey record.

To investigate the link between innovation and customer complaints we focus on two indicators from the Survey of Innovation in Legal Services. First, a measure of the diversity of firms' innovation activity. This is a scale variable reflecting the percentage

³ The SILS survey covered Standard Industrial Classification (2007) 69.1 'Legal activities'. The definition of this is as follows: 'This division includes legal representation of one party's interest against another party, whether or not before courts or other judicial bodies by, or under supervision of, persons who are members of the bar, such as advice and representation in civil cases, advice and representation in criminal actions, advice and representation in connection with labour disputes. It also includes preparation of legal documents such as articles of incorporation, partnership agreements or similar documents in connection with company formation, patents and copyrights, preparation of deeds, wills, trusts, etc. as well as other activities of notaries public, civil law notaries, bailiffs, arbitrators, examiners and referees'.

⁴ Legal regulation in England and Wales derives from the Legal Services Act 2007. Regulated activities include: patent and trade mark attorneys, notaries, legal executives, licensed conveyancers and cost lawyers. Un-regulated activities include: will writers, bailiffs, arbitrators, examiners and referees etc. Legal services in Scotland and Northern Ireland have separate regulatory frameworks.

of six different types of innovation activity (i.e. service, service delivery, strategy, management systems, organisational change, marketing innovation) undertaken by the firm during the three years prior to the survey. The second innovation indicator is the percentage of sales derived from new or improved services at the time of the survey. This is a standard and widely used indicator and provides an indication of the quantitative importance of innovation to each firm.

As our measure of customer complaints, we use data provided by the Legal Ombudsman for England and Wales. The Legal Ombudsman was established by the Legal Services Act 2007 and provides a dispute resolution service covering legal service providers and claims management companies. Where legal service users have a complaint about the service they have received or the provision of that service they are first required to seek resolution with their legal service provider. Where no satisfactory resolution is achieved the complaint may then be referred to the Legal Ombudsman for consideration (Legal Ombudsman 2015).

When a complaint is referred to the Legal Ombudsman, the company involved is publicly identified, and after investigation, where the complaint is found to be valid a remedy – often some form of financial compensation – is proposed. Here, we use data on complaints handled by the Ombudsman in each year between 2013-4 and 2017-8 (Figure 1).⁵ The majority of complaints handled by the Ombudsman relate to residential and planning issues, family law, personal injury, wills and probate and crime.⁶ The reasons for more than half of all Ombudsman complaints include ‘delay/failure to progress’ (21.2 per cent), ‘failure to advise’ (18 per cent) and ‘failure to follow instructions’ (17.1 per cent). Other reasons for complaints include ‘failure to keep informed’ (9.8 per cent), ‘excessive costs’ (8.9 per cent), ‘costs information deficient’ (7.4 per cent) and ‘failure to reply’ (6.9 per cent).⁷ As illustrated in Figure 2, the number of complaints resolved by the Ombudsman has fallen from 7,440 in 2014-15 (t-1) to 6,127

5 Throughout the paper, t denotes the period 2015-16 which corresponds to the data collection for our innovation survey data, t+1 refers to 2016-7, t+2 refers to 2017-8 and t-1 refers to the period 2014-5.

6 See <http://www.legalombudsman.org.uk/raising-standards/data-and-decisions/#complaints-data>. Accessed: 4th January 2018.

7 See <https://www.legalombudsman.org.uk/wp-content/uploads/2014/09/what-were-complaints-about-2016-17.csv>. Accessed: 14th January 2019.

($t+2$).⁸ Over the period 2017-2018 ($t+2$), 6,127 complaints were resolved by the Ombudsman of which 67 per cent were upheld (Legal Ombudsman 2018).

Data on complaints against individual legal service providers was provided by the Ombudsman and matched using company name with the SILS data. Of the 1412 companies which could be matched, 155 had received one or more complaints during the 2017-2018 period (see Figure 3). This was a lower figure than previous years. For example, in 2014-15, 215 firms in our sample were subject to a complaint. The number of complaints per firm varied significantly, however, with the majority receiving only one complaint and one service provider, for example, receiving 16 complaints in 2015-16. The total number of complaints received by our sample of firms ranges from 369 in 2014-15 ($t-1$) to 240 in 2017-18 ($t+2$) (see Figure 2).

We use this complaints data to define two alternative indicators: the absolute number of complaints received by each firm and a binary indicator of whether any firm received one or more complaints. The absolute number of complaints provides an indication of the frequency with which complaints are received but may be related to the size of the legal services provider. The binary measure overcomes this issue at the potential loss of some explanatory power.

We adopt a two-stage estimation approach. First, to explore Hypothesis 1, we estimate a series of baseline models relating the number of complaints in each year to firms' innovation activities. The two alternative complaint indicators form our dependent variables C_{it+k} , with the innovation measure (I_{it}) as the key explanatory variables in our baseline models:

$$C_{it+k} = \beta_0 + \beta_1 I_{it} + \beta_2 C_{it-1} + \beta_3 Controls_i + \varepsilon_i$$

Where k takes integer values from -1 to 2. Hypothesis 1 suggests positive and significant values of β_1 as higher levels of innovation activity lead to an increase in complaints in the short term.

The second stage of our estimation approach is designed to investigate Hypotheses 2 and 3 and involves partitioning the innovation term (I_{it}) to reflect firms' customer

⁸ The total number of Ombudsman complaints were accessed from the Annual Reports from the Legal Ombudsman for England and Wales (Legal Ombudsman 2017, 2016, 2018)

collaboration and team-working. For example, let x_{it} take value 1 if a firm engages with customers during their innovation activity and 0 otherwise. We then estimate:

$$C_{it+k} = \beta_0 + \beta_{11}I_{it} * x_{it} + \beta_{12}I_{it} * (1 - x_{it}) + \beta_2C_{it-1} + \beta_3Controls_i + \varepsilon_i$$

Hypothesis 2, which suggests that customer collaboration will reduce the effect of innovation on complaints implies that $\beta_{11} < \beta_{12}$. We estimate an analogous model for team-working. We include in all models a series of firm-level control variables derived from the innovation survey which we anticipate may influence complaints. In terms of firm characteristics, we include size and age, whether the organisation is selling services internationally and whether the firm's main competition is regional, national or international. Another group of controls relates to the areas of law in which organisations are operating. We also include whether the firm was subject to an Ombudsman complaint in the previous time period (see Table 1 for sample descriptives).

Estimation methods are suggested by the nature of our two dependent variables. Where we measure customer complaints using the absolute number of complaints received, zero inflated negative binomial estimators are used. Where customer complaints is measured using a binary complaints variable, probit models are used. The results prove largely consistent across both approaches.

5. EMPIRICAL RESULTS

Our first hypothesis suggests that higher levels of innovation will lead to more customer complaints. This is tested in our baseline models presented in Tables 2 and 3. In both tables, Models 1 – 4 are probit estimates of the probability of an Ombudsman complaint being made against a legal service provider in each year from $t-1$ to $t+2$ (Figure 1). Models 5-8 are zero-inflated negative binomial (ZINB) models. Here the dependent variable is the count measure of Ombudsman complaints. We include different innovation indicators in these models, in Table 2, the diversity of innovation is included as they key independent variable; and in Table 3 innovation sales, the percentage of sales derived from services which have been newly introduced or improved over the last three years, are included in the estimations. Across all models, the remaining independent variables are identical.

In Table 2 (models 1-4), we see that as the diversity of innovation increases the probability of a legal firm facing a Legal Services Ombudsman complaint also increases. This finding relates to the time period corresponding to the innovative activity (t) and the subsequent time period ($t+1$). Firms which introduce more types of innovation, as measured by the diversity of innovation variable, are more likely to face complaints. For instance, if a firm introduces a new type of innovation, they are approximately 13 per cent more likely to face a complaint in the current period (Table 2, Model 3).⁹ There remains a statistically significant probability that they will face a complaint in the subsequent time period ($t+1$), albeit the magnitude of this effect is somewhat reduced at 10 per cent (Table 2, Model 3). These results are both significant at the 1 per cent level. However, this link between innovation and complaints is no longer significant in $t+2$ (Table 2, Model 4). Therefore, looking at our results across time, we can see that innovative activity increases the probability of complaints in the short term, but that this disruptive effect dissipates overtime. These results are also supported by our ZINB estimations (Table 2, Models 5-8). A positive relationship between the number of complaints and innovative activity is evident in the short term (t and $t+1$), but this statistically significant relationship ceases in the longer term ($t+2$).

We also consider the models including our second indicator of innovation, innovation sales (Table 3), which also suggests increased probability of complaints in the short term. For instance, firms that have a higher percentage of sales from innovation are more likely to be subject to a complaint in the subsequent time period ($t+1$) (Table 3, Model 3). For every percentage increase in innovative sales in t , the probability of facing an Ombudsman complaint in $t+1$ increases by 1.4 per cent. This finding is significant at the 1 per cent level. Again, the probability of facing a complaint dissipates in $t+2$ (Table 3, Model 4). These results are also consistent across our ZINB estimations (Table 3, Models 5-8), with an increase in the number of complaints in the time period following firm innovation activity. Our findings demonstrate strong support for H1 that higher levels of innovation activity increases customer complaints in the short term.

⁹ Diversity of innovation activity is a scale variable reflecting the percentage of six different types of innovation activity. If a firm has one type of innovation activity, this variable takes a value of 16.7 per cent; two types of innovation activity a value of 33.3%, and so on. Therefore, when a firm introduces a new type of innovation, they are 13 per cent ($16.7\% \times 0.8\%$) more likely to face Ombudsman complaints.

Next, we test the potential moderating effect of (a) collaboration with customers and (b) multifunctional team-working on the relationship between innovation activity and customer complaints. To do so, we include interaction terms in our Probit analyses. Specifically, H2 suggests that customer engagement in innovation will reduce the probability that innovation leads to customer complaints. In Table 4, the models include innovation variables which are partitioned to reflect whether firms engaged in collaboration with clients as part of their innovation activity or not. Models 1-4 include the diversity of innovation indicator, and Models 5-8 include innovative sales. Interestingly, the positive relationship between innovation and complaints is stronger for firms which do not collaborate with clients compared to those which do (Table 4). These findings are statistically significant and consistent for both innovation indicators.

To test H3 that multi-functional team-working during the innovation process will reduce the probability of customer complaints, we include innovation variables in our models which are partitioned to reflect whether firms engaged in multifunctional team-working for innovation or not (Table 5). As expected, we find that multifunctional team-working for innovation moderates the innovation-complaints relationship. Focusing on Models 1-4 which include the diversity of innovation indicator, we see that innovating firms which do not engage in multifunctional team-working are more likely to face complaints than those who do, and the complaints are likely to extend over a longer time horizon (Table 5, Model 4). Interestingly, when the innovative sales – complaints relationship is considered (Table 5, Models 5-8), we see that multifunctional team-working negates the positive relationship between innovation and complaints entirely (Table 5, Model 7). Therefore, we find strong support for H2 and H3 that collaboration with clients and multifunctional team-working during the innovation process reduces the probability of customer complaints.

Finally, in terms of the control variables in our estimations, larger firms are more likely to face complaints and also a larger number of complaints (Tables 2 and 3). This finding is strongly significant across all models. In addition, there is some evidence that older firms are more likely to face complaints, although this relationship is not consistent across time periods. Exporting has no impact on the probability of facing a complaint or an increased number of complaints. In relation to market structure, legal services firms who consider their main competitors to be international are less likely to face consumer complaints and face less complaints than firms whose main competitors are regional. In addition, firms that were subject to complaints in the previous time

period are more likely to face a complaint(s) in the current time period.

6. DISCUSSION

Our empirical analysis centres on the little researched relationship between firm-level innovation activity and customer complaints. We find that higher or more intensive innovation activity (as measured by innovative sales and diversity of innovation) increases the probability of customer complaints. Therefore, our empirical analysis reveals how innovating firms can experience adverse outcomes, risking negative reputational and commercial consequences (Liao, Chou, and Lin 2015). Our findings suggest that incremental innovations may be subject to less customer complaints when customers' cognition favours stability (Baumgartner and Steenkamp 1996). We also must consider that our investigation focuses on legal services, a mature, traditional industry whose customers may be less receptive to innovative service provision. However, it is very important to note that we consistently see that this positive relationship between firm-level innovation activity and customer complaints dissipates over time. This is in line with many studies which have shown initial disruptive effects on firm performance from introducing new ways of doing things, but with benefits realised in the longer term (Bourke and Roper 2016; 2017).

Prior studies have shown that engaging with clients can help in identifying potential markets for particular innovations, the acceptability to customers and potential customers of the innovation and so reduce the risk of resistance (Astebro and Michela 2005). Our empirical analysis reveals similar benefits to firms when they engage with clients in their innovation activities, offsetting the risks of complaining behaviour. Specifically, we find that firms which introduce service innovations and actively engage clients in their innovation activities are less likely to face Ombudsman complaints. This is in line with previous studies which have shown that engaging consumers in the innovation process can help to overcome resistance (Schreier and Prugl 2008; Pedersen 2016; Mattsson and Helmersson 2007; Busse and Siebert 2018). In addition, Roper et al. (2015) previously highlighted the role of the client as a 'partner' in driving and developing service innovation in legal services. Previous studies have highlighted that firms often lack the ability to absorb the knowledge acquired in adapting service provision (Storey and Larbig 2018), however, our findings show that firms which engage with their clients for innovation are less likely to face customer complaints, indicating that they can successfully comprehend and facilitate clients

concerns and requirements in relation to innovation activities.

Previous studies increasingly reveal how team-working in the form of multi-functional or cross-functional teams is an important influence on firm innovation performance (Nakata and Im 2010; Tidd and Bodley 2002; Hipp and Grupp 2005). Our findings here corroborate the claim that team-working can enhance creativity and innovation quality (Shipton et al. 2005), as innovating firms which use multi-functional teams during the innovation process are less likely to face an customer complaints.

Our findings, particularly in relation to H2 and H3, suggest strategic implications for firms. Firms engage in innovation to improve service offerings, generate additional value for consumers and enhance firm performance and outcomes. However given the likelihood of increased customer complaints in the short-term for innovating firms, their innovation strategies must consider how to moderate the potential for disruption to customers. Our findings indicate that adopting strategies conducive to collaboration with customers and multifunctional team-working alongside innovation activities will reduce the potential for unhappy customers and related complaints.

7. CONCLUSION

This paper highlights unintended consequences faced by innovating firms. This contribution is possible due to the uniqueness of the matched data sources employed, affording us the opportunity to examine the relationship between innovation activity (2015 SILS dataset) and customers complaints (UK Legal Ombudsman 2013-2018 data). Our analysis reveals that higher levels of innovation activity increases the probability of customer complaints in the short term, although this disruptive effect dissipates over time.

In addition, we also identify how firms can reduce the potential for customer complaints by adopting collaborative innovation strategies with clients and engaging in multi-functional team-working. Prior empirical studies have shown that engaging consumers and employees across various functions in the innovation process can enhance creativity and innovation quality and help overcome customer resistance (Schreier and Prugl 2008; Pedersen 2016; Mattsson and Helmersson 2007; Busse and Siebert 2018; Shipton et al. 2005; Ancona and Caldwell 1992; Love and Roper 2004; Love, Roper, and Bryson 2011).

The strategic, regulatory and policy implications of our findings must also be considered. This is of particular importance given the recent regulatory changes in the UK and internationally to stimulate innovation. Initial examinations of these regulatory changes point towards cost reductions and service improvements (Engstrom 2013; Johnson, Yazdi, and Gelb 1993; Parker, Gordon, and Mark 2010; Roper et al. 2015). Our results highlight the potential implications for firms and regulatory agencies to such initiatives: Higher levels of innovative activity may generate additional value for consumers but our evidence suggests that more innovation will also lead to an increase in consumer resistance and complaints in the short-term. This emphasises the importance of organisations such as the Legal Ombudsman which can help to resolve any issues which arise between legal service providers and their customers. For legal service providers, our results suggest that engaging with customers and teamworking as part of their innovation activity can help to mitigate the risk of complaints and any potential reputational and commercial damage.

Our investigation of the risk of customer complaints for innovating firms is conducted in a single jurisdiction. Other jurisdictions, no doubt, have similar regulatory bodies which investigate consumers' complaints about legal services. Matching such complaint data with innovation survey data would enable replication studies to be undertaken; building on this paper's findings. It is also important to acknowledge that the complaints data used here may be a result of direct 'use' of a new service innovation or may be indirectly linked to other innovation activity within the firm. In addition, we must consider that our findings may be unique to legal services and not necessarily generalizable across other sectors. Traditionally considered a conservative sector, customers may be less appreciative of innovative activity within legal services. Notwithstanding the legal services context of our study, legal services shares many of the standard attributes - the intangible nature, inseparability, and extensive inter-activity between client and provider - of other professional services. Therefore, similar studies on customer complaining behaviour across different sectors are needed.

Figure 1: Timing of innovation survey and complaints data

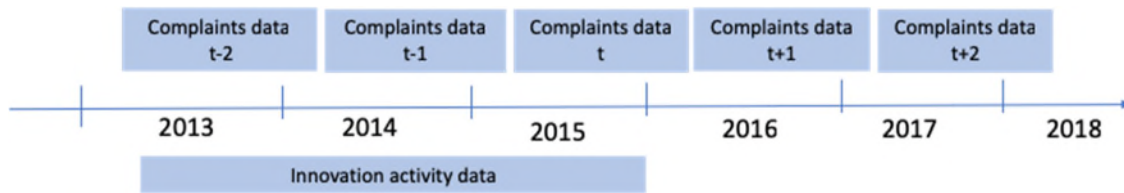
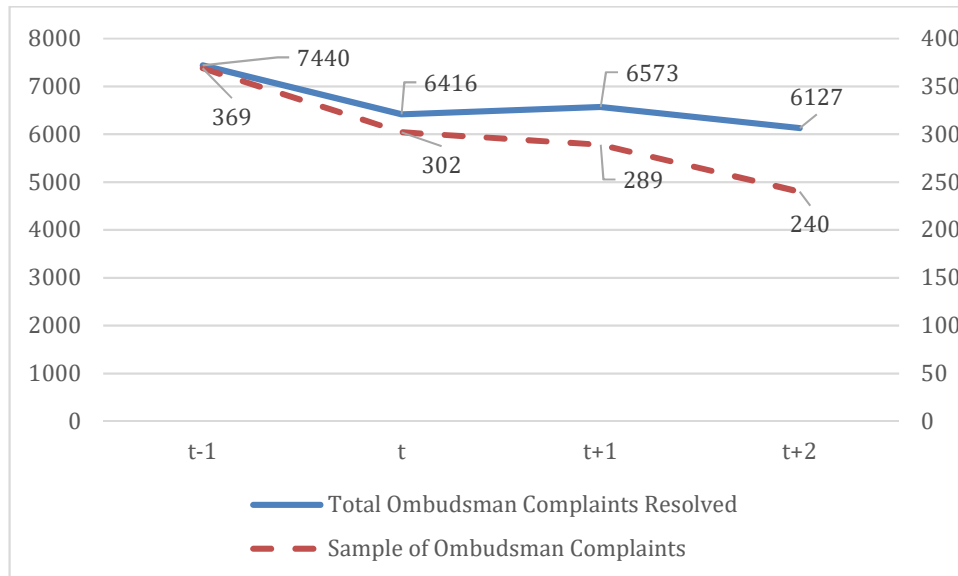
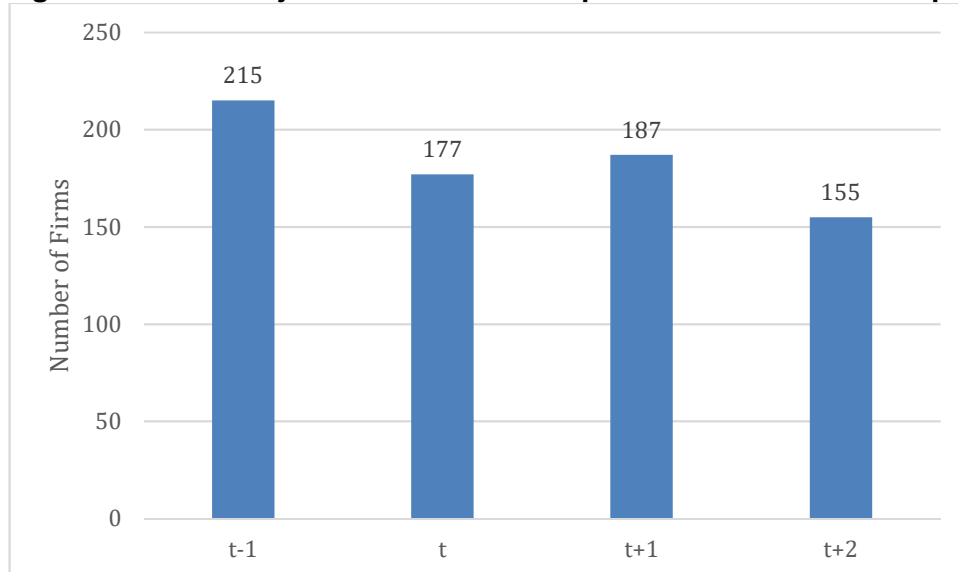


Figure 2: Resolved Ombudsman Complaints 2014-2018



Note: t denotes 2015-6, t+1 to 2016-7, t+2 to 2017-8; and t-1 to 2014-5.

Figure 3: Firms subject to consumer complaints in estimation sample



Note: t denotes 2015-6, t+1 to 2016-7, t+2 to 2017-8; and t-1 to 2014-5. N= 1,412

Table 1: Sample descriptives

	Obs.	Mean.	SD.
Ombudsman complaints variables			
Ombudsman complaint t-2(d)	1,102	0.16	0.36
Ombudsman complaint t-1(d)	1,102	0.18	0.38
Ombudsman complaint t (d)	1,102	0.16	0.37
Ombudsman complaint t+1(d)	1,102	0.17	0.38
Ombudsman complaint t+2 (d)	1,102	0.14	0.35
Ombudsman complaints t-2 (count)	1,102	0.28	0.91
Ombudsman complaints t-1 (count)	1,102	0.30	0.92
Ombudsman complaints t (count)	1,102	0.27	0.92
Ombudsman complaints t+1 (count)	1,102	0.26	0.79
Ombudsman complaints t+2 (count)	1,102	0.22	0.77
Innovation variables			
Diversity of innovation (%)	1,051	29.45	27.97
Innovative sales (% of sales)	1,060	5.55	14.67
Competition variables			
Facing regional competition (d)	1,102	0.64	0.48
Facing national competition (d)	1,102	0.29	0.45
Facing international competition (d)	1,102	0.05	0.22
Firm characteristics			
Exporting firm (% of sales)	1,087	5.63	15.54
Firm size (number of employees)	1,101	45.40	169.85
Firm age	1,099	18.10	11.65
Legal Activity			
Property-related and planning (d)	1,102	0.25	0.43
Criminal (d)	1,102	0.10	0.30
Wills, Trust & Probate (d)	1,102	0.05	0.22
Personal Injury (d)	1,102	0.07	0.26
Family (d)	1,102	0.10	0.29
Commercial and Intellectual Property (d)	1,102	0.08	0.28
Immigration (d)	1,102	0.05	0.21
Other (d)	1,102	0.30	0.46
Barristers' chambers (d)	1,102	0.12	0.33
Other Legal Service Provider – regulated (d)	1,102	0.06	0.24
Collaboration & team-work variables			
Collaboration for innovation (d)	1,102	0.33	0.47
Team-work (d)	1,102	0.25	0.43

Notes and sources: Variable definitions in Annex 1. Observations are weighted. Source: Survey of Legal Service Providers

Table 2: Probit and Zero-inflated Negative Binomial Estimations: Complaint(s) – Diversity of Innovation

	Probability of a complaint Ombudsman complaints (d)				Number of complaints Ombudsman complaints (count)			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	t-1	t	t+1	t+2	t-1	t	t+1	t+2
Diversity of innovation	0.004 (0.002)	0.008*** (0.002)	0.006*** (0.002)	0.003 (0.002)	0.005 (0.003)	0.012*** (0.004)	0.008*** (0.003)	0.003 (0.003)
National Competition	-0.279* (0.156)	-0.331* (0.186)	-0.092 (0.154)	0.025 (0.163)	-0.246 (0.233)	-0.989** (0.388)	-0.405* (0.222)	-0.018 (0.230)
International Competition	-3.404*** (1.165)	-1.324** (0.656)	-1.814* (0.998)		-2.876*** (0.801)	-3.482* (1.900)	-2.691** (1.082)	-4.452*** (0.583)
Exporting firm	0.000 (0.006)	-0.004 (0.008)	-0.001 (0.007)	0.001 (0.008)	-0.002 (0.009)	0.006 (0.008)	0.000 (0.012)	0.012 (0.011)
Firm size	0.009*** (0.002)	0.009*** (0.002)	0.005*** (0.001)	0.015*** (0.003)	0.005*** (0.001)	0.008*** (0.004)	0.003** (0.002)	0.010** (0.004)
Firm size – squared	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000** (0.000)
Firm age	0.017*** (0.006)	0.009 (0.006)	0.013** (0.006)	0.011 (0.007)	0.030*** (0.009)	0.013 (0.011)	0.013 (0.010)	0.015 (0.010)
Property-related and planning	0.121 (0.181)	0.192 (0.186)	0.098 (0.185)	0.213 (0.202)	0.13 (0.263)	0.124 (0.297)	0.215 (0.233)	0.191 (0.245)
Criminal	0.408 (0.251)	0.038 (0.253)	0.162 (0.244)	0.478* (0.252)	0.388 (0.341)	0.002 (0.435)	0.22 (0.393)	0.476 (0.336)
Wills, Trust & Probate	0.051 (0.329)	-0.519* (0.306)	0.327 (0.281)	0.246 (0.337)	-0.157 (0.436)	-1.643 (1.415)	0.271 (0.337)	0.147 (0.393)
Personal Injury	0.36 (0.257)	0.094 (0.311)	-0.143 (0.212)	0.690** (0.280)	0.441 (0.359)	-0.46 (0.543)	-0.231 (0.371)	0.421 (0.357)
Family	0.463** (0.234)	0.319 (0.234)	0.498** (0.236)	0.295 (0.235)	0.662** (0.305)	0.555 (0.342)	0.562* (0.293)	0.383 (0.364)
Commercial & IP	-0.156 (0.362)	-0.479* (0.270)	-0.08 (0.260)	-0.067 (0.279)	-0.722 (0.603)	-1.734 (1.131)	-0.371 (0.439)	-0.58 (0.483)
Immigration	0.353 (0.333)	0 (0.285)	0.682** (0.295)	0.205 (0.315)	0.436 (0.517)	-0.11 (0.520)	1.176*** (0.378)	0.574 (0.435)
Barristers' Chambers		0.224 (0.190)	-0.277 (0.182)	-0.171 (0.247)	-14.905*** (0.179)	0.396 (0.278)	-0.400* (0.240)	-0.04 (0.279)
Complaint t ₂ (d)	0.647*** (0.161)							
Complaint t ₁ (d)		0.791*** (0.161)						
Complaint t ₀ (d)			0.759*** (0.172)					
Complaint t ₁ (d)				1.090*** (0.161)				
Complaints t ₂					0.355*** (0.066)			
Complaints t ₁						0.366*** (0.066)		
Complaints t ₀							0.262*** (0.034)	
Complaints t ₁								0.416*** (0.148)
Constant	-1.873*** (0.201)	-2.060*** (0.198)	-1.946*** (0.193)	-2.371*** (0.211)	-2.240*** (0.414)	-2.412*** (0.402)	-1.882*** (0.427)	-2.443*** (0.521)
N	912	1034	1034	985	1034	1034	1034	1034
Chi- Squared	119.769	171.588	132.523	203.935	11545.694	117.012	106.086	477.425
P-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R- squared	0.171	0.224	0.146	0.237				
BIC	666.354	570.719	698.051	512.231	538.197	433.443	493.966	390.111

Notes and sources: Observations are weighted. * denotes significant at 10 per cent, ** at 5 per cent and *** at 1 per cent. Marginal values are reported for Models 1-4. Observations are dropped from Models 1 & 4 due to collinearity. Reference categories include: regional competition; other solicitors, other legal service providers. Source: Survey of Legal Service Providers.

Table 4: Probit Estimations: Collaboration Partitions

	Probability of a complaint Ombudsman complaints (d)				Probability of a complaint Ombudsman complaints (d)			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	t-1	t	t+1	t+2	t-1	t	t+1	t+2
Diversity of innovation* collaboration	0.003 (0.003)	0.007** (0.003)	0.005** (0.002)	0.004 (0.003)				
Diversity of innovation* no collaboration	0.005 (0.003)	0.013*** (0.004)	0.009*** (0.003)	0.003 (0.004)				
Innovation Sales* collaboration					0.004 (0.004)	0.000 (0.004)	0.008* (0.004)	0.001 (0.005)
Innovation Sales* no collaboration					0.000 (0.006)	0.006 (0.005)	0.017*** (0.006)	0.003 (0.008)
National Competition	-0.277* (0.156)	-0.322* (0.186)	-0.083 (0.154)	0.024 (0.163)	-0.266* (0.157)	-0.337* (0.178)	-0.15 (0.162)	0.139 (0.160)
International Competition	-3.423*** (1.168)	-1.315* (0.686)	-1.838* (1.037)		-3.120*** (1.191)	-1.352** (0.662)	-1.068** (0.515)	
Exporting firm	0 (0.006)	-0.004 (0.008)	-0.001 (0.007)	0.001 (0.008)	-0.001 (0.006)	-0.003 (0.007)	0.003 (0.006)	0.001 (0.008)
Firm size	0.009*** (0.002)	0.009*** (0.002)	0.005*** (0.001)	0.015*** (0.003)	0.010*** (0.002)	0.010*** (0.002)	0.016*** (0.002)	0.016*** (0.003)
Firm size – squared	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Firm age	0.017*** (0.006)	0.009 (0.006)	0.014** (0.006)	0.011 (0.007)	0.017*** (0.006)	0.009 (0.006)	0.006 (0.007)	0.013* (0.007)
Property-related and planning	0.122 (0.181)	0.197 (0.186)	0.094 (0.183)	0.213 (0.202)	0.149 (0.179)	0.152 (0.182)	0.158 (0.198)	0.405** (0.183)
Criminal	0.408 (0.251)	0.046 (0.253)	0.162 (0.246)	0.478* (0.251)	0.485* (0.248)	-0.001 (0.241)	0.254 (0.244)	0.659*** (0.229)
Wills, Trust & Probate	0.054 (0.330)	-0.483 (0.305)	0.339 (0.279)	0.244 (0.340)	0.119 (0.316)	-0.608* (0.311)	0.385 (0.254)	0.471 (0.299)
Personal Injury	0.352 (0.259)	0.029 (0.284)	-0.177 (0.216)	0.694** (0.278)	0.456* (0.261)	0.181 (0.333)	-0.16 (0.233)	0.862*** (0.267)
Family	0.464** (0.234)	0.333 (0.236)	0.503** (0.236)	0.295 (0.235)	0.529** (0.232)	0.16 (0.229)	0.558** (0.237)	0.454** (0.213)
Commercial & IP	-0.159 (0.362)	-0.506* (0.267)	-0.084 (0.263)	-0.066 (0.280)	-0.085 (0.345)	-0.562** (0.265)	-0.217 (0.290)	0.052 (0.258)
Immigration	0.339 (0.327)	-0.081 (0.296)	0.647** (0.297)	0.213 (0.300)	0.42 (0.333)	0.105 (0.257)	0.576** (0.284)	0.39 (0.275)
Barristers' Chambers		0.25 (0.192)	-0.255 (0.184)	-0.172 (0.247)		0.342* (0.191)	-0.360* (0.185)	-0.258 (0.275)
Complaint t-2 (d)	0.646*** (0.160)				0.708*** (0.159)			
Complaint t-1 (d)		0.787*** (0.160)				0.855*** (0.157)		
Complaint t (d)			0.746*** (0.175)				0.703*** (0.181)	
Complaint t+1 (d)				1.092*** (0.161)				1.091*** (0.161)
Constant	-1.880*** (0.205)	-2.111*** (0.200)	-1.975*** (0.195)	-2.367*** (0.218)	-1.871*** (0.195)	-1.834*** (0.206)	-1.879*** (0.207)	-2.533*** (0.160)
N	912	1034	1034	985	923	1043	1043	993
Chi- Squared	120.393	170.875	130.343	207.646	117.161	162.434	163.157	251.463
P-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R- squared	0.172	0.23	0.149	0.237	0.177	0.206	0.173	0.247
BIC	673.026	573.791	703.331	519.09	669.998	593.136	687.815	514.921

Notes and sources: Observations are weighted. * denotes significant at 10 per cent, ** at 5 per cent and *** at 1 per cent. Marginal values are reported for Models 1-4. Observations are dropped from Models 1, 4, 5 & 8 due to collinearity. Reference categories include: regional competition; other solicitors, other legal service providers. Source: Survey of Legal Service Providers.

Table 5: Probit Estimations: Team-work Partitions

	Probability of a complaint Ombudsman complaints (d)				Probability of a complaint Ombudsman complaints (d)			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 7
	t-1	t	t+1	t+2	t-1	t	t+1	t+2
Diversity of innovation* teamwork	0.003 (0.003)	0.005* (0.002)	0.007** (0.003)	-0.002 (0.003)				
Diversity of innovation* no teamwork	0.004 (0.003)	0.011*** (0.003)	0.005* (0.003)	0.007** (0.003)				
Innovation Sales* teamwork					-0.001 (0.005)	-0.003 (0.005)	0.009 (0.006)	-0.006 (0.007)
Innovation Sales* no teamwork					0.005 (0.004)	0.005 (0.004)	0.013*** (0.004)	0.005 (0.005)
National Competition	-0.279* (0.157)	-0.322* (0.187)	-0.096 (0.155)	0.043 (0.162)	-0.276* (0.158)	-0.345* (0.180)	-0.15 (0.162)	0.129 (0.161)
International Competition	-3.427*** (1.191)	-1.293* (0.673)	-1.796* (0.990)		-3.166*** (1.202)	-1.335** (0.664)	-1.059** (0.505)	
Exporting firm	0.000 (0.006)	-0.004 (0.008)	-0.001 (0.007)	0.001 (0.008)	-0.001 (0.006)	-0.003 (0.007)	0.003 (0.006)	0.001 (0.008)
Firm size	0.009*** (0.002)	0.010*** (0.002)	0.005*** (0.001)	0.016*** (0.003)	0.010*** (0.002)	0.010*** (0.002)	0.016*** (0.003)	0.017*** (0.003)
Firm size – squared	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Firm age	0.017*** (0.006)	0.009 (0.006)	0.013** (0.006)	0.011 (0.007)	0.017*** (0.006)	0.009 (0.006)	0.005 (0.007)	0.012* (0.007)
Property-related and planning	0.118 (0.180)	0.179 (0.186)	0.1 (0.185)	0.211 (0.203)	0.146 (0.179)	0.15 (0.182)	0.157 (0.198)	0.402** (0.184)
Criminal	0.406 (0.251)	0.03 (0.254)	0.162 (0.243)	0.496** (0.250)	0.491** (0.249)	0.006 (0.240)	0.256 (0.244)	0.667*** (0.230)
Wills, Trust & Probate	0.053 (0.331)	-0.484 (0.308)	0.319 (0.284)	0.315 (0.338)	0.105 (0.320)	-0.605* (0.311)	0.395 (0.257)	0.466 (0.303)
Personal Injury	0.355 (0.254)	0.045 (0.300)	-0.139 (0.213)	0.662** (0.276)	0.439* (0.257)	0.182 (0.338)	-0.132 (0.225)	0.855*** (0.263)
Family	0.462** (0.234)	0.305 (0.231)	0.498** (0.235)	0.298 (0.235)	0.526** (0.231)	0.159 (0.228)	0.564** (0.237)	0.445** (0.215)
Commercial & IP	-0.157 (0.362)	-0.502* (0.271)	-0.084 (0.256)	-0.055 (0.273)	-0.069 (0.345)	-0.555** (0.264)	-0.229 (0.279)	0.079 (0.252)
Immigration	0.35 (0.331)	-0.028 (0.291)	0.683** (0.295)	0.178 (0.317)	0.428 (0.336)	0.123 (0.259)	0.575** (0.286)	0.401 (0.277)
Barristers' Chambers		0.283 (0.192)	-0.288 (0.184)	-0.085 (0.257)		0.348* (0.191)	-0.367** (0.182)	-0.218 (0.272)
Complaint t-2 (d)	0.649*** (0.161)				0.703*** (0.159)			
Complaint t-1 (d)		0.799*** (0.160)				0.850*** (0.157)		
Complaint t (d)			0.762*** (0.172)				0.704*** (0.179)	
Complaint t+1 (d)				1.103*** (0.160)				1.093*** (0.160)
Constant	-1.876*** (0.204)	-2.098*** (0.203)	-1.937*** (0.191)	-2.450*** (0.212)	-1.866*** (0.196)	-1.834*** (0.207)	-1.878*** (0.206)	-2.528*** (0.160)
N	912	1034	1034	985	923	1043	1043	993
Chi- Squared	120.169	164.373	134.61	225.282	117.373	162.902	167.747	252.768
P-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R- squared	0.171	0.229	0.147	0.247	0.178	0.207	0.17	0.249
BIC	673.12	574.256	704.834	513.733	669.668	592.808	689.818	513.62

Notes and sources: Observations are weighted. * denotes significant at 10 per cent, ** at 5 per cent and *** at 1 per cent. Marginal values are reported for Models 1-4. Observations are dropped from Models 1, 4, 5 & 8 due to collinearity. Reference categories include: regional competition; other solicitors, other legal service providers. Source: Survey of Legal Service Providers.

Annex 1: Variable definitions

Ombudsman complaints

Ombudsman complaint (d)	A binary indicator of whether a complaint in relation to an organisation was referred to the Legal Ombudsman.
Ombudsman complaints (count)	A count indicator of the number of complaints in relation to an organisation referred to the Legal Ombudsman.

Innovation variables

Diversity of innovation	A scale variable (%) reflecting the percentage of six different types of innovation activity undertaken by the firm (service, processes, strategy, management systems, organisational change, marketing innovation). The measure will be 100 if an organisation engaged in all six types of innovation activity and 50 if the organisation undertook three different forms of innovation.
Innovative sales	Percentage of sales derived from services which have been newly introduced or improved over the last three years

Competition variables

Facing regional competition	A binary variable taking value 1 where the main competition is other regional organisations
Facing national competition	A binary variable taking value 1 where the main competition is other organisations throughout England and Wales
Facing international competition	A binary variable taking value 1 where the main competition is other organisations internationally

Firm characteristics

Employment	Full time employees in the organisation in 2012 (including all partners, managing partners, barristers and directors but excluding management consultants on short term contracts)
Age of the enterprise	Number of years since the enterprise was established
Exporting (% of sales)	A scale variable (%) reflecting the percentage of sales relating to exports

Legal activity

Property-related and planning	A binary variable taking value 1 where a solicitors' principal legal activity is property-related and planning.
Criminal	A binary variable taking value 1 where a solicitors' principal legal activity is criminal law.
Wills, Trust & Probate	A binary variable taking value 1 where a solicitors' principal legal activity is wills, trust, probate & tax planning.
Personal Injury	A binary variable taking value 1 where a solicitors' principal legal activity is personal injury.
Family	A binary variable taking value 1 where a solicitors' principal legal activity is family, matrimonial and child law.
Commercial and Intellectual Property	A binary variable taking value 1 where a solicitors' principal legal activity is commercial/corporate work for list and non-listed companies and intellectual property law.
Immigration	A binary variable taking value 1 where a solicitors' principal legal activity is immigration law
Other	A binary variable taking value 1 where a solicitors' principal legal activity is another legal activity other than those listed above.
Barristers' chambers	A binary variable taking value 1 where an organisation is a barristers' chambers.

Other Legal Service Provider
(regulated)

A binary variable taking value 1 where an organisation is an Other Legal Service Provider (regulated).

Collaboration and teamwork (partition) variables

Collaboration for innovation

A binary variable taking value 1 where an organisation collaborates with external partners for sourcing and transforming knowledge for innovation.

Teamwork

A binary variable taking value 1 where teamworking occurs for sourcing and transforming knowledge for innovation.

REFERENCES

- Ancona, D.G. and D.F. Caldwell. 1992. DEMOGRAPHY AND DESIGN - PREDICTORS OF NEW PRODUCT TEAM PERFORMANCE. *Organization Science* **3:321-341**.
- Astebro, T. and J.L. Michela. 2005. Predictors of the survival of innovations. *Journal of Product Innovation Management* **22:322-335**.
- Baumgartner, H. and J.-B.E.M. Steenkamp. 1996. Exploratory consumer buying behavior: Conceptualization and measurement. *International Journal of Research in Marketing* **13:121-137**.
- Bell, S.T.; A.J. Villado; M.A. Lukasik; L. Belau; and A.L. Briggs. 2011. Getting Specific about Demographic Diversity Variable and Team Performance Relationships: A Meta-Analysis. *Journal Of Management* **37:709-743**.
- Benner, M.J. and M.L. Tushman. 2003. Exploitation, exploration, and process management: The productivity dilemma revisited. *Academy of management review* **28:238-256**.
- Bourke, J. and S. Roper. 2016. AMT adoption and innovation: An investigation of dynamic and complementary effects. *Technovation* **55-56:42-55**.
- . 2017. Innovation, quality management and learning: Short-term and longer-term effects. *Research Policy* **46:1505-1518**.
- Buiseret, T., Cameron, H. M., & Georgiou, L. (1995). What differences does it make? Additionality in the public support of R&D in large firms. *International Journal of Technology Management*, 10(4-6), 587-600.
- Busse, M. and R. Siebert. 2018. The role of consumers in food innovation processes. *European Journal of Innovation Management* **21:20-43**.
- Cabralles, A.L.; C.C. Medina; A.C. Lavado; and R.V. Cabrera. 2008. Managing functional diversity, risk taking and incentives for teams to achieve radical innovations. *R & D Management* **38:35-50**.
- Castellion, G. and S.K. Markham. 2013. Perspective: New Product Failure Rates: Influence of Argumentum ad Populum and Self-Interest. *Journal of Product Innovation Management* **30:976-979**.
- Cheung, S.Y.; Y.P. Gong; M. Wang; L. Zhou; and J.Q. Shi. 2016. When and how does functional diversity influence team innovation? The mediating role of knowledge sharing and the moderation role of affect-based trust in a team. *Human Relations* **69:1507-1531**.
- Christiansen, J.K.; M. Gasparin; C. Varnes; and I. Augustin. 2016. HOW COMPLAINING CUSTOMERS MAKE COMPANIES LISTEN AND INFLUENCE PRODUCT DEVELOPMENT. *International Journal of Innovation Management* **20:31**.
- Edmondson, A.C. and J.-F. Harvey. 2018. Cross-boundary teaming for innovation: Integrating research on teams and knowledge in organizations. *Human Resource Management Review* **28:347-360**.
- Ellen, P.S.; W.O. Bearden; and S. Sharma. 1991. Resistance to technological innovations: An examination of the role of self-efficacy and performance satisfaction. *Journal of the Academy of Marketing Science* **19:297-307**.
- Engstrom, N.F. 2013. Attorney advertising and the contingency fee cost paradox. *Stanford Law Review* **65:633-695**.
- Frezatti, F.; D.D. Bido; A.P.C. da Cruz; and M.J.D. Machado. 2014. The role of the balanced scorecard in innovation management. *Rae-Revista De Administracao De Empresas* **54:381-392**.
- Geroski, P. A. (1990). Innovation, Technological Opportunities and Market Structure. *Oxford Economic Papers*, 42, 586-602.
- Gonzalez-Moreno, A.; C. Diaz-Garcia; and F.J. Saez-Martinez. 2018. R&D team composition and product innovation: gender diversity makes a difference.

- European Journal of International Management* **12:423-446**.
- Heidenreich, S. and M. Handrich. 2015. What about Passive Innovation Resistance? Investigating Adoption-Related Behavior from a Resistance Perspective. *Journal of Product Innovation Management* **32:878-903**.
- Heidenreich, S. and T. Kraemer. 2015. Passive innovation resistance: The curse of innovation? Investigating consequences for innovative consumer behavior. *Journal of Economic Psychology* **51:134-151**.
- Heidenreich, S.; T. Kraemer; and M. Handrich. 2016. Satisfied and unwilling: Exploring cognitive and situational resistance to innovations. *Journal of business research* **69:2440-2447**.
- Hipp, C. and H. Grupp. 2005. Innovation in the service sector: The demand for service-specific innovation measurement concepts and typologies. *Research Policy* **34:517-535**.
- Hortinha, P.; C. Lages; and L.F. Lages. 2011. The Trade-Off Between Customer and Technology Orientations: Impact on Innovation Capabilities and Export Performance. *Journal of International Marketing* **19:36-58**.
- Huppertz, J.W. and E. Mower. 2014. An effort model of first-stage complaining behavior. *Journal of Consumer Satisfaction, Dissatisfaction & Complaining Behavior* **27:6-18**.
- Jacoby, J. and J.J. Jaccard. 1981. THE SOURCES, MEANING, AND VALIDITY OF CONSUMER COMPLAINT BEHAVIOR - A PSYCHOLOGICAL ANALYSIS. *Journal of Retailing* **57:4-24**.
- Janeiro, P.; I. Proenca; and V.d.C. Goncalves. 2013. Open innovation: Factors explaining universities as service firm innovation sources. *Journal of Business Research* **66:2017-2023**.
- Johnson, M.; K. Yazdi; and B.D. Gelb. 1993. ATTORNEY ADVERTISING AND CHANGES IN THE DEMAND FOR WILLS. *Journal of Advertising* **22:35-45**.
- Karshenas, M. and P.L. Stoneman. 1993. The rank, stock order and epidemic effects in the diffusion of new process technologies - an empirical model *Rand Journal of Economics* **24:503-528**.
- Karshenas, M. and P.L. Stoneman. 1993. Rank, Stock, Order, and Epidemic Effects in the Diffusion of New Process Technologies: An Empirical Model. *The RAND Journal of Economics* **24:503-528**.
- Kucsko-Stadlmayer, G. 2008. *European Ombudsman-Institutions - A comparative legal analysis regarding the multifaceted realisation of an idea*. Vienna, New York: Springer
- Lau, A.K.W.; E. Tang; and R.C.M. Yam. 2010. Effects of Supplier and Customer Integration on Product Innovation and Performance: Empirical Evidence in Hong Kong Manufacturers. *Journal of Product Innovation Management* **27:761-777**.
- Leavengood, S.; T.R. Anderson; and T.U. Daim. 2014. Exploring linkage of quality management to innovation. *Total Quality Management & Business Excellence* **25:1126-1140**.
- Legal Ombudsman. 2015. Legal Ombudsman Scheme Rules. London: Legal Ombudsman for England and Wales.
- . 2016. The Office for Legal Complaints Annual report and Accounts (for the year ending 31 March 2016). UK: Legal Ombudsman for England and Wales.
- . 2017. The Office for Legal Complaints Annual Report and Accounts (for the year ending 31 March 2017). UK: Legal Ombudsman for England and Wales.
- . 2018. The Office for Legal Complaints Annual Report and Accounts (for the year ending 31 March 2018). UK: Legal Ombudsman for England and Wales.
- Legal Services Board. 2011. The legal services market. In *Research note*.
- Li, D.H.; J. Lin; W.T. Cui; and Y.J. Qian. 2018. The trade-off between knowledge exploration and exploitation in technological innovation. *Journal of Knowledge Management* **22:781-801**.

- Liao, S.L.; C.Y. Chou; and T.H. Lin. 2015. Adverse behavioral and relational consequences of service innovation failure. *Journal of business research* **68:834-839**.
- Love, J.H. and M.A. Mansury. 2007. External Linkages, R&D and Innovation Performance in US Business Services. *Industry and Innovation* **14:477-496**.
- Love, J.H. and S. Roper. 2004. The Organisation of Innovation: Collaboration, Co-operation and Multifunctional Groups in UK and German Manufacturing. *Cambridge Journal Of Economics* **28:379-395**.
- Love, J.H.; S. Roper; and J.R. Bryson. 2011. Openness, knowledge, innovation and growth in UK business services. *Research Policy* **40:1438-1452**.
- Love, J. H., & Roper, S. (2015). SME innovation, exporting and growth: A review of existing evidence. *International small business journal*, 33(1), 28-48. doi:10.1177/0266242614550190
- Malagueno, R.; E. Lopez-Valeiras; and J. Gomez-Conde. 2018. Balanced scorecard in SMEs: effects on innovation and financial performance. *Small Business Economics* **51:221-244**.
- Mattsson, J. and H. Helmersson. 2007. Food product development - A consumer-led text analytic approach to generate preference structures. *British Food Journal* **109:246-259**.
- McWilliams, B. and D. Zilbermanfr. 1996. Time of Technology Adoption and Learning By Using. *Economics of Innovation and New Technology* **4:139-154**.
- Miozzo, M. and L. Soete. 2001. Internationalization of services: a technological perspective. *Technological Forecasting and Social Science* **67:159-185**.
- Nakata, C. and S. Im. 2010. Spurring cross-functional integration for higher new product performance: a group effectiveness perspective. *Journal of Product Innovation Management* **27:554-571**.
- Nishitani, K. and M. Itoh. 2016. Product innovation in response to environmental standards and competitive advantage: a hedonic analysis of refrigerators in the Japanese retail market. *Journal of Cleaner Production* **113:873-883**.
- Nov, O. and C. Ye. 2009. Resistance to Change and the Adoption of Digital Libraries: An Integrative Model. *Journal of the American Society for Information Science and Technology* **60:1702-1708**.
- Parker, C.; T. Gordon; and S. Mark. 2010. Regulating law firm ethics management: an empirical assessment of an innovation in regulation of the legal profession in New South Wales. *Journal of law and society* **37:466-500**.
- Pedersen, A.R. 2016. The role of patient narratives in healthcare innovation: supporting translation and meaning making. *Journal of Health Organization and Management* **30:244-257**.
- Rickman, N. and J.M. Anderson. 2011. Innovations in the provision of legal services in the United States. In *RAND Occasional Paper*.
- Roper, S.; J.H. Love; P. Rieger; and J. Bourke. 2015. Innovation in legal services. London.
- Schreier, M. and R. Prugl. 2008. Extending lead-user theory: Antecedents and consequences of consumers' lead useriness. *Journal of Product Innovation Management* **25:331-346**.
- Schuhmacher, M.C. and S. Kuester. 2012. Identification of Lead User Characteristics Driving the Quality of Service Innovation Ideas. *Creativity and Innovation Management* **21:427-442**.
- Shipton, H.; D. Fay; M.A. West; M. Patterson; and K. Birdi. 2005. Managing people to promote innovation. *Creativity and Innovation Management* **14:745-768**.
- . 2005. Managing people to promote innovation. *Creativity and innovation management* **14:745-768**.
- Storey, C. and C. Larbig. 2018. Absorbing Customer Knowledge: How Customer Involvement Enables Service Design Success. *Journal of Service Research* **21:101-118**.

- Suh, Y. and M.S. Kim. 2012. Effects of SME collaboration on R&D in the service sector in open innovation. *Innovation-Management Policy & Practice* **14:349-362**.
- Talke, K. and S. Heidenreich. 2014. How to Overcome Pro-Change Bias: Incorporating Passive and Active Innovation Resistance in Innovation Decision Models. *Journal of Product Innovation Management* **31:894-907**.
- Tidd, J. and K. Bodley. 2002. The effect of product novelty on the new product development process. *R&d Management* **32:1127-1138**.
- van Dijk, H.; M.L. van Engen; and D. van Knippenberg. 2012. Defying conventional wisdom: A meta-analytical examination of the differences between demographic and job-related diversity relationships with performance. *Organizational Behavior and Human Decision Processes* **119:38-53**.
- Witell, L.; H. Gebauer; E. Jaakkola; W. Hammedi; L. Patricio; and H. Perks. 2017. A bricolage perspective on service innovation. *Journal of business research* **79:290-298**.

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