

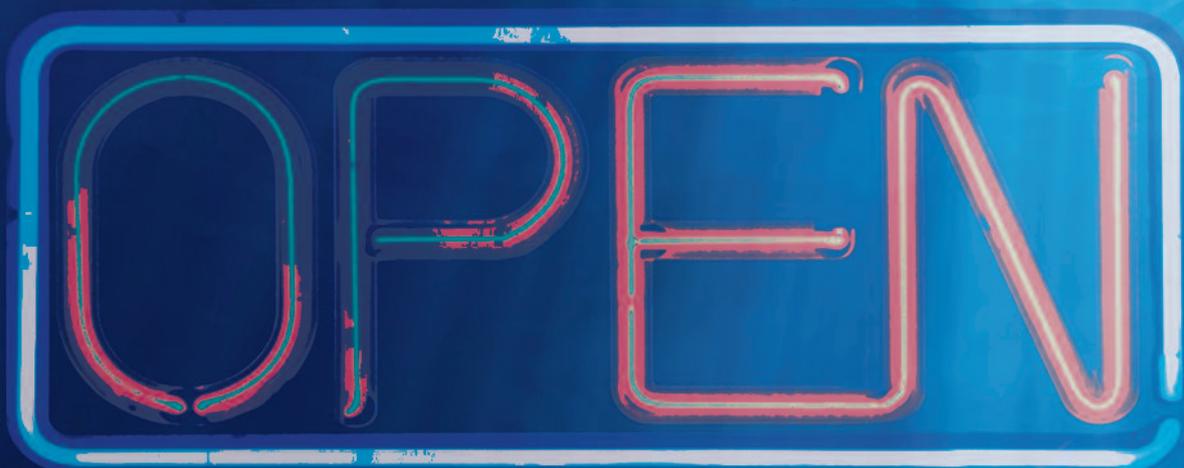
CentrePiece

The Magazine of The Centre for Economic Performance

Volume 20 Issue 3 Winter 2015/16

Crime and violence
Higher education
Online markets

Rapid response policing
Telecoms tariffs
Mental health



FLOOD ECONOMICS

CentrePiece



THE LONDON SCHOOL
OF ECONOMICS AND
POLITICAL SCIENCE ■

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Editorial

Since it was founded more than 25 years ago, the Centre for Economic Performance (CEP) has always sought to bring high-quality research evidence and the tools of economic analysis to bear on key decisions facing voters and/or their political representatives. Over the next few months, UK citizens will be considering whether the country should remain a member of the European Union (EU). To inform public debate ahead of the referendum, CEP is launching a series of reports on the economic costs and benefits of so-called 'Brexit' – options for the UK outside the EU and the potential impact of leaving on trade, investment, immigration and inequality.¹

This issue of *CentrePiece* features other areas in which CEP seeks to contribute to public debate and policy-making. One example is mental illness, which Sarah Flèche and CEP's founder director Richard Layard find is a far bigger source of human misery than poverty or

unemployment. Their call for increased public spending on mental health was answered by the expanded access to psychological therapies announced in the UK government's latest Spending Review.

Lord Layard has also been involved in a campaign to address climate change through greater investment in developing clean energy. This too has achieved policy success with the UK committing to the international initiative known as Mission Innovation.

The impact of global warming is the focus of our cover story on flood economics. Work by Guy Michaels and colleagues shows how the pain that floods have been inflicting on UK residents in recent weeks is part of a global problem: over the past 30 years, floods worldwide have killed more than 500,000 people and displaced over 650 million people.

Two further themes in this issue are crime and the internet. One article

surveys how economics can help to tackle crime and violence in Latin America and the Caribbean; while another examines the impact of 'rapid response policing' – getting officers to the scene of a crime as soon as possible. Two more pieces explore the value of online marketplaces: one global, linking firms and remote workers; and another bringing together UK networks of investors and entrepreneurs to fund new business ventures.

One more online project to mention is CEP's new blog on 'the state of working Britain', which will publish regular commentaries on the UK labour market.² This too goes right back to CEP's origins, aiming to do top-notch, policy-oriented research.

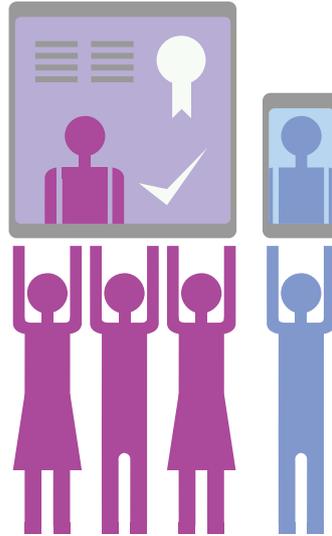
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¹ <http://cep.lse.ac.uk/brexit/>

² <http://stateofworkingbritain.blogspot.co.uk/>



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What can be done to reduce crime in Latin America and the Caribbean from its extraordinarily high levels? **Laura Jaitman** and **Stephen Machin** outline research evidence that could contribute to crime prevention in the region, as well as the opportunities to start closing gaps in knowledge about which policies are most effective.

Crime and violence in Latin America and the Caribbean: towards evidence-based policies

Crime and violence are of major concern in Latin America and the Caribbean. One in four citizens in the region claim that insecurity is the main problem in their lives, even worse than unemployment or the state of the economy. While the region is home to fewer than 9% of the world's population, it accounts for 33% of the world's homicides. The annual homicide rate of more than 20 per 100,000 people – more than three times the world average and 20 times the rate for the UK – makes the region one of the most dangerous places on Earth.

On average, six out of ten robberies in Latin America and the Caribbean are violent. While levels of violence are very low or at least decreasing in many parts of the world, this is the only region where violence remains high and, since 2005, has been intensifying. Crime leads to costly behavioural responses to mitigate the risk of victimisation and to cope with the pain and suffering.

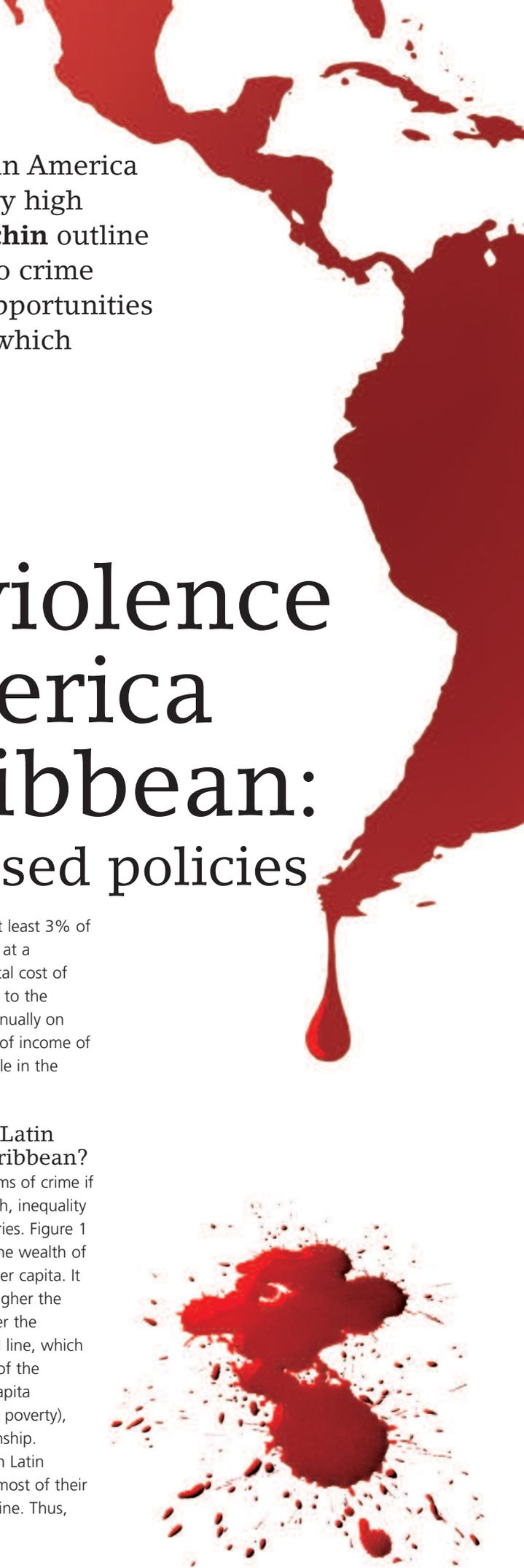
Overall, crime imposes significant costs

on the economy, absorbing at least 3% of the region's economic output at a conservative estimate. The total cost of crime is high and comparable to the amount the region spends annually on infrastructure or to the share of income of the poorest 20% of the people in the region (Jaitman, 2015).

Is crime too high in Latin America and the Caribbean?

The region is an outlier in terms of crime if we take account of the wealth, inequality and poverty level of its countries. Figure 1 relates the homicide rate to the wealth of countries measured by GDP per capita. It is usually accepted that the higher the income of a country, the lower the incidence of violence. The red line, which shows the partial correlation of the homicide rate and GDP per capita (controlling for inequality and poverty), confirms this negative relationship.

But looking at countries in Latin America and the Caribbean, most of their data points lie far above the line. Thus,



the region is an outlier for crime given its income level, as its countries' homicide rates are higher than would be expected given their income levels (and which is not explained by the fact that countries in the region might be poorer or more unequal).

Predictions from the economics of crime

The framework of crime economics is a very useful tool for analysing the drivers

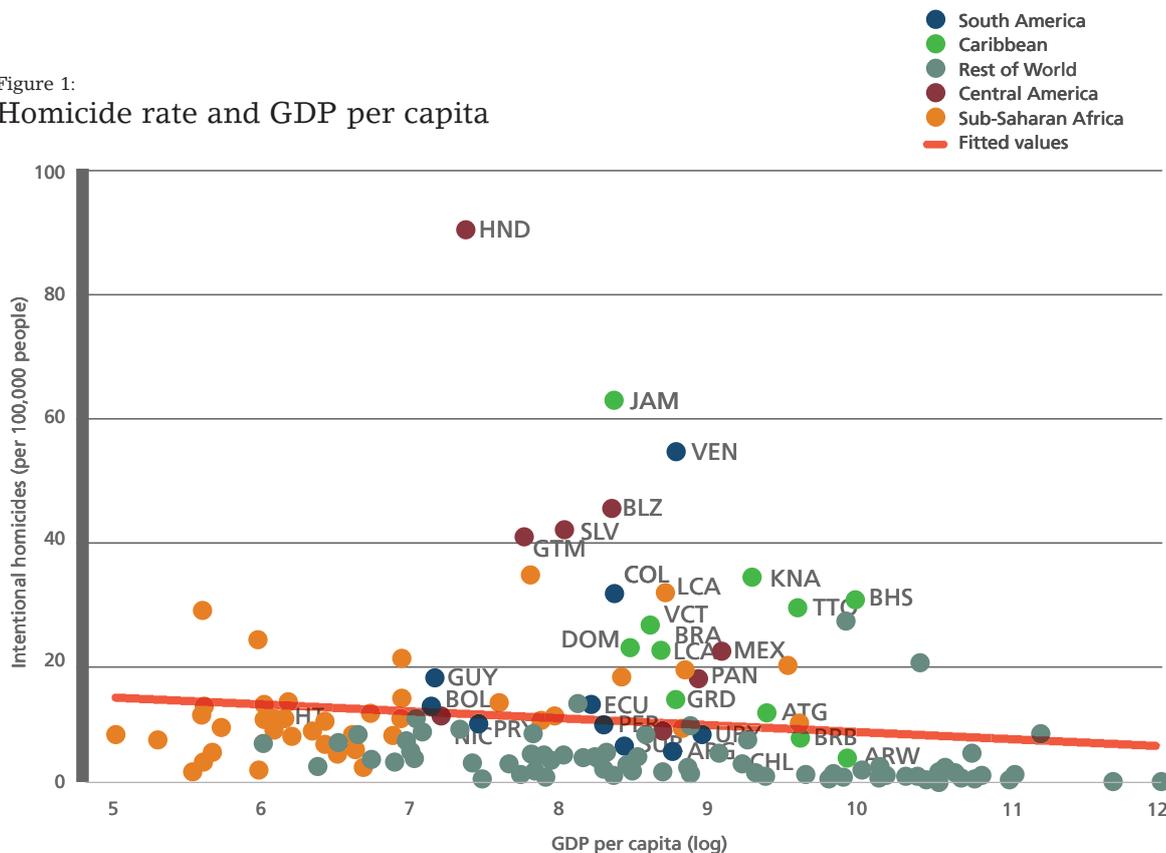
of crime in Latin America and the Caribbean. According to this body of research, which began with the work of Gary Becker (1968), potential criminals assess the benefits and costs of committing crimes, compare them with those of legal activities and choose accordingly.

Although there are 300 police officers per 100,000 people in the region (compared with a figure of roughly 200 in the United States), widespread impunity makes the expected costs of committing crimes very low. For example, fewer than 10% of homicides in the region are resolved; and the justice system is very inefficient with about 60% of the prison population in pre-trial detention on average.

From the perspective of the benefits of legal activities, there is a great deal of scope for improvement. School enrolment rates are very high (around 93% in primary schools and 70% in secondary schools) but the region is lagging behind

Latin America and the Caribbean account for a third of the world's homicides but under 10% of the world's population

Figure 1: Homicide rate and GDP per capita



Source: Jaitman (2015). Fitted values also control for inequality and poverty levels.

Country codes: ARG (Argentina), BHS (Bahamas), BLZ (Belize), BOL (Bolivia), BRA (Brazil), BRB (Barbados), CHL (Chile), COL (Colombia), CRI (Costa Rica), CUB (Cuba), DOM (Dominican Republic), ECU (Ecuador), GTM (Guatemala), GUY (Guyana), HND (Honduras), HTI (Haiti), JAM (Jamaica), MEX (Mexico), NIC (Nicaragua), PAN (Panama), PER (Peru), PRY (Paraguay), SLV (El Salvador), SUR (Suriname), TTO (Trinidad and Tobago), URY (Uruguay), VEN (Venezuela).

in the indicators of quality of education. The eight Latin American countries that participated in the latest Programme for International Student Assessment are ranked among the worst, and many young people are not well prepared for the labour market.

All of this suggests that to improve the situation, a portfolio of interventions is needed to increase the payoff to legal activities, together with crime control strategies that deter crime and violence.

Promoting evidence-based crime prevention strategies

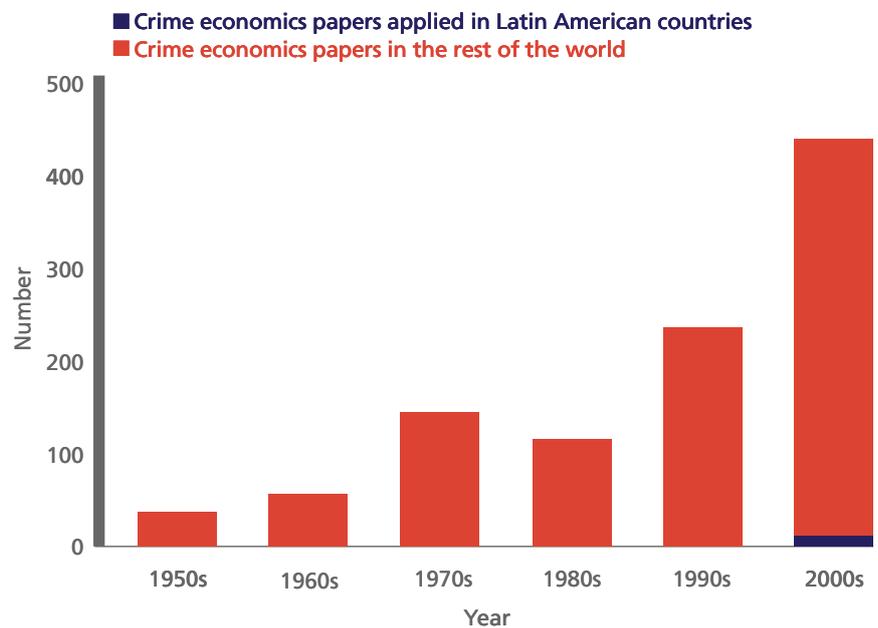
A sound research agenda on citizen security is critical to guide policies in this area. Although research on crime economics has been growing in the developed world, in Latin America and the Caribbean, crime remains an understudied area (see Figure 2).

But conducting rigorous research on citizen security programmes is difficult in the region. One challenge is political: security in the developing world is a sensitive topic closely related to public opinion and political concerns. Citizen security interventions are often driven by politics, dogma and emotions. The dissemination of research projects is frequently obstructed when they run counter to established political gains, expose corruption or simply are considered by political operators to undermine society's perception of security. The high rotation of public servants in this area also precludes longer-term research projects.

But perhaps the most evident problem is deficient information systems, which result in scarce and unreliable data. Crime statistics in the region are fragmented, inconsistent and aggregated only to the most macro levels. The lack of information and weak national statistics systems on crime thwart accurate diagnosis, monitoring and evaluation of crime and the interventions to counter crime.

Research conducted in Latin American contexts has shown interesting but scant results so far (see Jaitman and Guerrero Compean, 2015a for a comprehensive review; and 2015b). For example, by increasing household income and by mitigating the impact of income shocks, conditional cash transfer programmes contribute to the prevention of crime

Figure 2: Papers on the economics of crime published in leading economics journals



Note: Journals include *American Economic Review*, *Bell/RAND Journal of Economics*, *Econometrica*, *Economic Journal*, *Economica*, *Journal of Law and Economics*, *Journal of Political Economy*, *Quarterly Journal of Economics*, *Review of Economic Studies* and *Review of Economics and Statistics*.

Source: Adapted from Draca and Machin (2015).

and violence in Brazil, Colombia and Mexico. And in Peru, the introduction of violence prevention and care centres for women has reduced the likelihood of domestic violence.

Research has also found that implementing urban renewal and neighbourhood improvement programmes and transit-oriented urban redevelopment connecting isolated low-income neighbourhoods show promise, but further research is required. There are several studies suggesting that police presence can deter crime and disorder: both hotspot policing and community policing show significant success in reducing homicides and fear of crime in Chile and Colombia.

Issues relating to police organisation are very important for the region, and research in Brazil has found that the integration of police forces' operations leads to increased efficacy and reductions in crime. Finally, programmes based mainly on fear or military discipline reveal

Homicide rates in the region are higher than they should be given countries' levels of income, poverty and inequality

no appreciable impact on recidivism, but results show promise in electronic monitoring, reducing relapses in criminal behaviour in Argentina.

Gaps in knowledge about crime prevention

There remain many gaps in knowledge about crime prevention efforts as many police strategies have yet to be rigorously tested. There is currently not a clear understanding of the evolution of the disaggregated crime patterns and the roots of these high levels of violence. Furthermore, organised crime and drug issues might be exacerbating violence in some cities and specific contexts that need to be examined from a regional perspective.

The research agenda should also include assessing the effect of optimum curricula and multi-level behavioural interventions to prevent violence in youth at risk. For example, little is known about the effect of combining education or employability training with life skills to strengthen resilience to crime. Another area of vital importance is the study of violence against women.

On policing, the emphasis should be on the role of police in terms of deterrence rather than incapacitation, because the latter necessarily requires higher imprisonment rates and overcrowding in prisons is recurrent. It is still unclear which are the main components of successful police reforms in the region. For example, community policing and problem-oriented policing are being pursued in many countries and are worth studying. Police investigation is also a key area with room for improvement.

Finally, in terms of criminal justice, a solid body of evidence is needed on the effect of imprisonment and most forms of extreme disciplinary mechanisms, particularly the effects on minors and low-risk individuals. Research on the use of alternative approaches to prosecution – such as electronic monitoring, community work programmes, drug courts, restorative justice meetings, cognitive behavioural therapies and re-entry initiatives – are promising areas for future research.

Laura Jaitman leads the citizen security and justice research programme at the Inter-American Development Bank (IDB) in Washington DC. **Stephen Machin** is CEP's research director and professor of economics at University College London.

CEP and the IDB co-organised the 7th Transatlantic Workshop on the Economics of Crime in London in October 2015. The workshop included a special session on crime in Latin America and the Caribbean, an area in which the IDB is actively promoting crime prevention and control strategies.

Further reading

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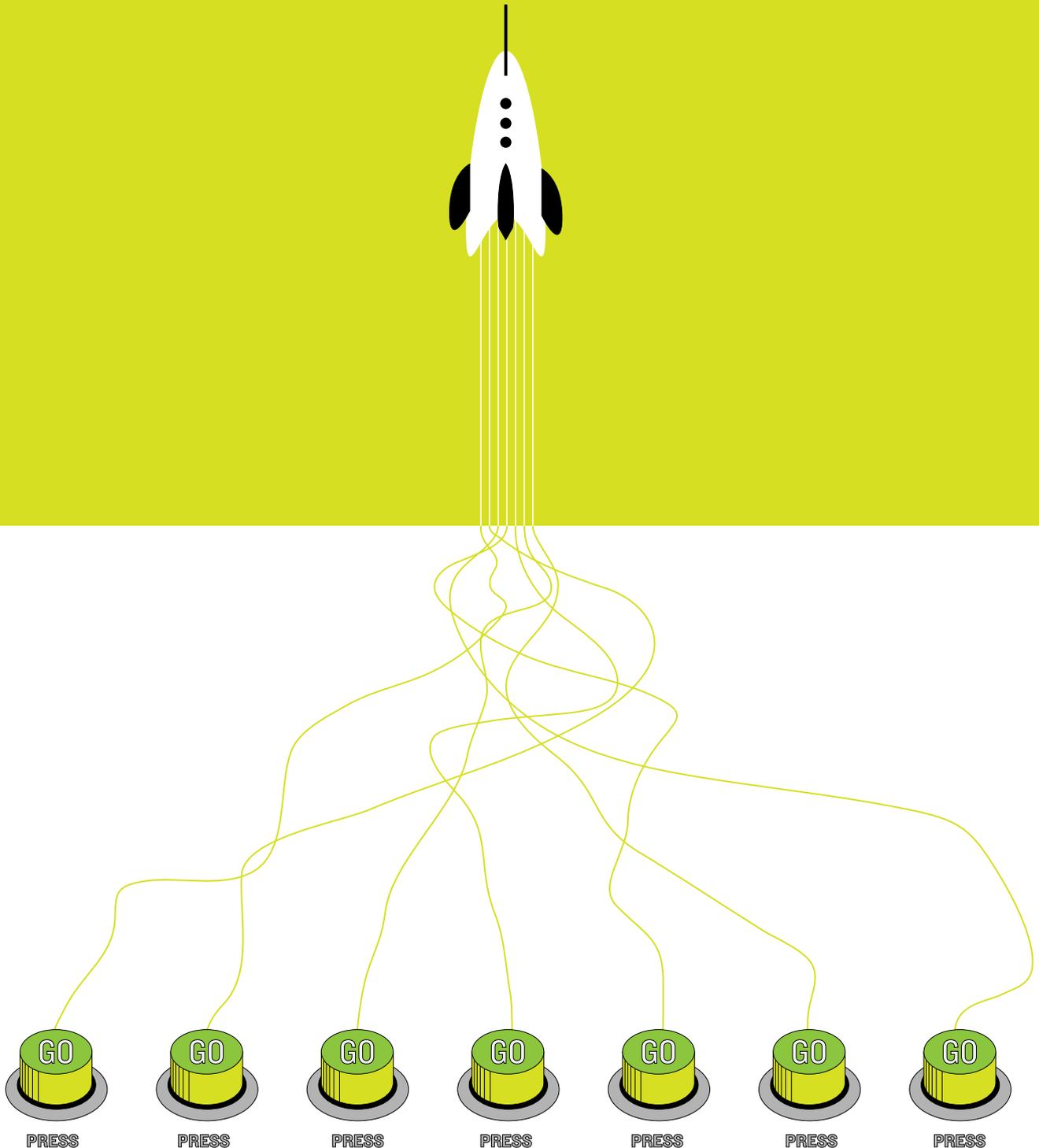
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A sound research agenda on citizen security is critical to guide crime prevention and control policies

In recent years, the UK has become a leader in fostering an entirely novel mechanism for raising capital for small business enterprises. **Saul Estrin** and **Susanna Khavul** explain how 'equity crowdfunding' works – and the benefits that online financial marketplaces provide for large networks of investors and entrepreneurs.



Equity crowdfunding can solve the persistent market failures in funding entrepreneurial ventures

Equity crowdfunding: a new model for financing entrepreneurship?

Entrepreneurship has long been recognised as an essential driver of economic growth and employment creation. In the UK, for example, small and medium-sized firms, of which there are roughly 5.4 million, employ a combined workforce of more than 10 million people and account for almost two thirds of the jobs created since 2008. Yet many small firms face a big problem: their inability to access the finance they need to survive and expand.

Successive UK governments have implemented tax schemes and other initiatives in support of entrepreneurial investment to enhance the supply of formal and informal venture capital. Yet because of the risks and despite government incentives, lack of funding remains a major constraint on new venture growth. Moreover, venture capital and angel investor markets, which are a source of private investment, have come under criticism for a lack of regional, gender and ethnic inclusiveness.

These problems apply to local small businesses as much as to high-tech entrepreneurs. The Greater London Authority, for example, identifies a serious equity gap for both start-ups and early stage companies. In sectors that are not capital-intensive, such as social media software, the sums are relatively small (between £250,000 and £1 million); but for capital-intensive high-tech start-ups, the gap can be as much as £10 million.

The promise of crowdfunding

In the past few years, the UK has been a leader in fostering an entirely novel mechanism for raising capital for entrepreneurs. Using entrepreneur and investor networks and supported by increasingly pervasive social media, 'crowdfunding' is a financial innovation that describes a suite of alternative financing tools that can transform the way new ventures are financed.

Until now, research attention has focused on donation and reward-type crowdfunding. On platforms like Kickstarter, artists and inventors raise money from social networks in exchange for rewards such as free tickets to their events or samples of their products.

At the end of 2011, there were 453 platforms globally, raising total funds of \$1.5 billion. By May 2013, there were around 1,000 platforms with estimated funds raised of \$5.1 billion (Massolution, 2013). The World Bank estimates that the world crowdfunding market will expand to \$93 billion by 2025 (Kshetri, 2015).

Of much greater significance for capital-starved entrepreneurs is 'equity crowdfunding'. This offers founders of new ventures an online social media marketplace where they can access a large number of investors who, in exchange for an ownership stake, provide finance for business opportunities they find attractive. Since around 2010, the UK has permitted equity crowdfunding along with 'light

touch' regulation to protect investors. Other Western economies – Australia, France, Ireland, the Netherlands and Switzerland – were also early movers with laws and regulations to support equity crowdfunding.

The United States followed in 2012 with the JOBS (Jumpstart Our Business Start-ups) Act, although the specific rules for investing became bogged down: the creation of nationwide market investments in crowdfunding was delayed until this year. Yet countries that started down the equity crowdfunding path early have seen remarkable growth.

Between 2011 and 2014, the UK's crowdfunding market, which is a world leader, grew from a few million to an estimated £1.73 billion. Likewise, equity crowdfunding investments saw a meteoric rise. For example, Crowdcube* – which is the largest UK equity crowdfunding platform with an estimated 80% market share – started in 2011: that year it raised £2.1 million and funded nine companies. In 2013, those numbers had increased to £10 million raised and 45 firms. Nearly five years after the company began, it has now passed the £100 million investment mark with more than 300 entrepreneurial ventures financed.

Unlike in reward-based crowdfunding, investments are not necessarily small and there are not necessarily large numbers of investors. Individual lead investments in pitches are routinely between £100,000

* <https://www.crowdcube.com/>

and £200,000; and depending on the model the equity crowdfunding platform follows, average investments are between £1,000 and £3,000, while minimum investments of £10 remain popular. The rapid pace of growth of UK equity crowdfunding platforms has provided them with plenty of experience in building two-sided networks of investors and entrepreneurs.

How equity crowdfunding platforms work

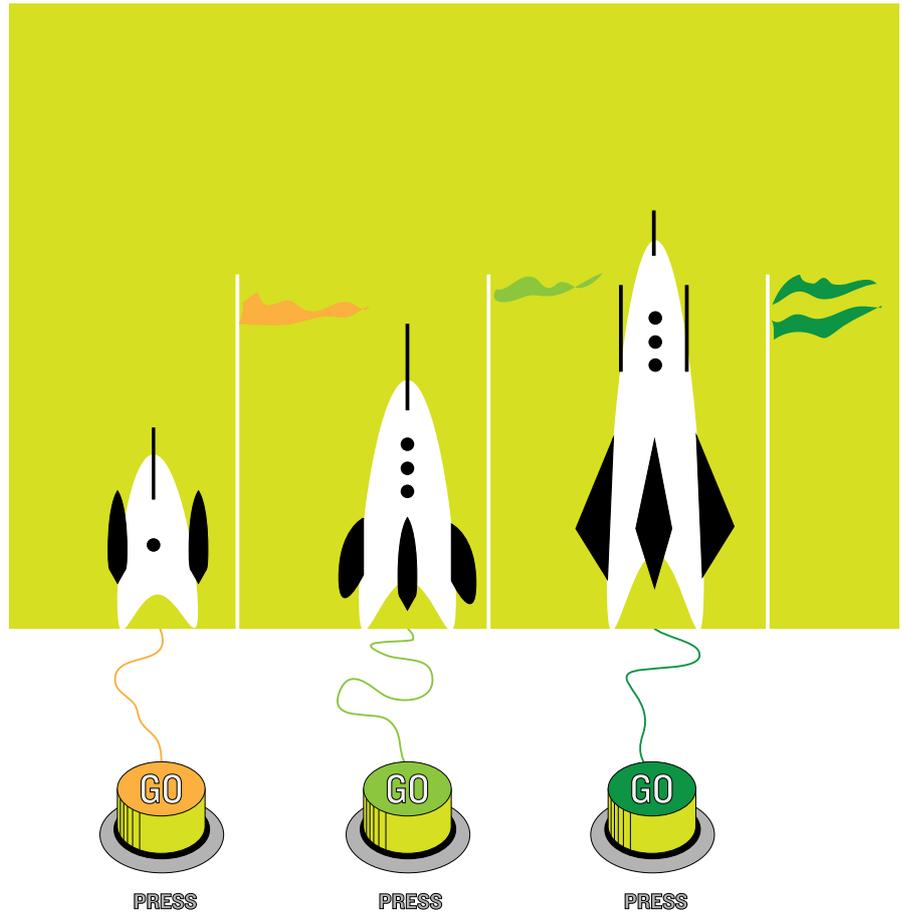
Despite rapid expansion in the UK under the gaze of a sympathetic financial regulator, observers continue to raise concerns about equity crowdfunding as a financial innovation. Does it represent a danger for investors because of poorly explained risks? Aren't investors likely to invest irrationally through herding within the crowd?

To begin to answer these questions, we have been working exclusively with Crowdcube over the last few years. We have developed a large dataset that is yielding powerful empirical evidence on how equity crowdfunding actually works, enabling us to draw out implications for entrepreneurs, investors and financial regulators.

Our analysis – which is based on 150,000 platform members, more than 7,000 entrepreneurs and 735 firms that have tried to raise funds on the platform – shows that this new virtual market serves as a robust source of alternative entrepreneurial finance. To be precise, we find that investment choices are significantly influenced by information about entrepreneurial quality and a venture's price for its equity. Furthermore, we find that it is the platform's architecture and the design of its processes that explain how equity crowdfunding is filling the equity gap (Estrin and Khavul, 2016).

So how exactly does it work? An equity crowdfunding platform has two networks: one of investors and one of entrepreneurs. Regulations require that both have to register. Investors on the platform include professional early stage investors, sector specialists, angels and venture capitalists, as well as potential small investors.

An offer to supply funds is only taken up if the pitch is successful. Thus, whether or not a project is funded is determined



through the platform's 'all or nothing' investment mechanism but is not under the control of the individual investors themselves.

Entrepreneurs seek funding by making pitches to the network of investors. To do so, entrepreneurs have to state a sum that they seek to raise, the amount requested and the number (proportion) of shares that they will offer in return for the investment. Thus, they are implicitly providing a valuation of their business.

On Crowdcube, but not necessarily all platforms, entrepreneurs can set a level of investment whereby successful investors will receive A shares (with voting rights) rather than B shares. They also have to provide financial information about the company, following a standard format, including information about themselves and their business experience and an explanation of their business idea. In addition, they must post a video of themselves outlining their pitch to potential investors.

In practice on Crowdcube, only about 10% of the entrepreneurs seeking to make pitches are allowed to do so by the platform. Once accepted, a pitch is usually live on the Crowdcube platform for a fixed period, which started out as 60 days but is now a more rapid 30 days. During the pitch there is an exchange of information and data around the network – between investors as well as between entrepreneurs and investors. This is the process whereby the knowledge within the network (the 'crowd') is disseminated.

There are three possible outcomes to a pitch:

- First, it fails to accumulate the amount requested, in which case potential investors in this pitch as a group are not able to make an investment. This occurs in the majority of cases. Over five years on the Crowdcube platform, around 31% of pitches have been funded, but the share funded in 2015 rose above 50%.
- Second, the cumulated amount

invested exactly equals the amount requested, in which case the pitch is funded.

■ Third, the cumulative sum available for investment exceeds the amount requested. In this case, the entrepreneur receives the additional amount and the proportion of shares supplied is increased (from the entrepreneur's own holding) but not in proportion to the overfunding, thereby diluting the holding of all bidders.

Evidence on investor behaviour

So do investors follow the herd by stampeding into popular pitches and investing irrationally in equity crowdfunding? Analysis of the data from our unique proprietary dataset allows us to look at two aspects of investor behaviour: the supply of funds within a pitch and whether or not a pitch is funded through the crowdfunding process.

We find that information accumulates through the pitch process, with each incremental investment providing additional information, visible to all other potential investors, about how the pitch is currently evaluated. But the impact of other investors' actions does not generate unstable or explosive investment paths.

One pound invested on one day of the pitch generates an additional 51 pence in the subsequent day, and an additional 76 pence over five days. The lagged effects taper quickly, suggesting fairly rapid absorption of the incremental information driving the initial new investment – and since the sum of the lagged effects is less than unity, the impact of fresh investment is not unstable. As an alternative source of finance, equity crowdfunding appears to have operated in a stable and predictable manner through its period of early emergence. The crowd invests in a rational manner, and we see no evidence of a stampede effect from investors.

In terms of the likelihood that a pitch is successful in receiving funding, we find that easily available information in the public domain about the entrepreneur and the firm – such as the sector or location of the business or the gender of the entrepreneur – does not have a significant influence.

On the other hand, information that the entrepreneur is forced to reveal to be able to enter the pitch process – notably the price and number of shares on offer, setting the company valuation and the

current size and prospective future growth of the firm – does have a predictable and significant impact on pitch outcomes. For example, as the implicit valuation rises, the likelihood that a pitch will be funded declines.

A solution to market failure

In sum, we find that when entrepreneurs and investors exchange positive signals about themselves and their ventures on an equity crowdfunding platform, the effect is to increase the supply of funds and to increase the chances that a pitch will be funded. Moreover, this virtual market improves flows of information between investors and entrepreneurs, and it appears to reduce the biases and location limits on funding that are typical of traditional forms of early stage entrepreneurial finance.

We therefore suggest that the architecture of equity crowdfunding platforms such as Crowdcube is able to exploit the low transactions costs characteristic of its online environment and to bring increasing network effects to bear on investor decisions in early stage entrepreneurial finance.

Thus, by moving from the physical space to the digital space, equity crowdfunding engages larger networks of entrepreneurs and investors, creating an opportunity to solve the persistent market failures in funding entrepreneurial ventures. In the process, as equity crowdfunding offers an entry point for investors across demographics and geographies, it may also socialise entrepreneurial finance.

Saul Estrin is professor of managerial economics and strategy at LSE and a research associate in CEP's growth programme.

Susanna Khavul is a Leverhulme visiting professor at LSE, a CEP research associate and faculty at the University of Texas at Arlington.

Further reading

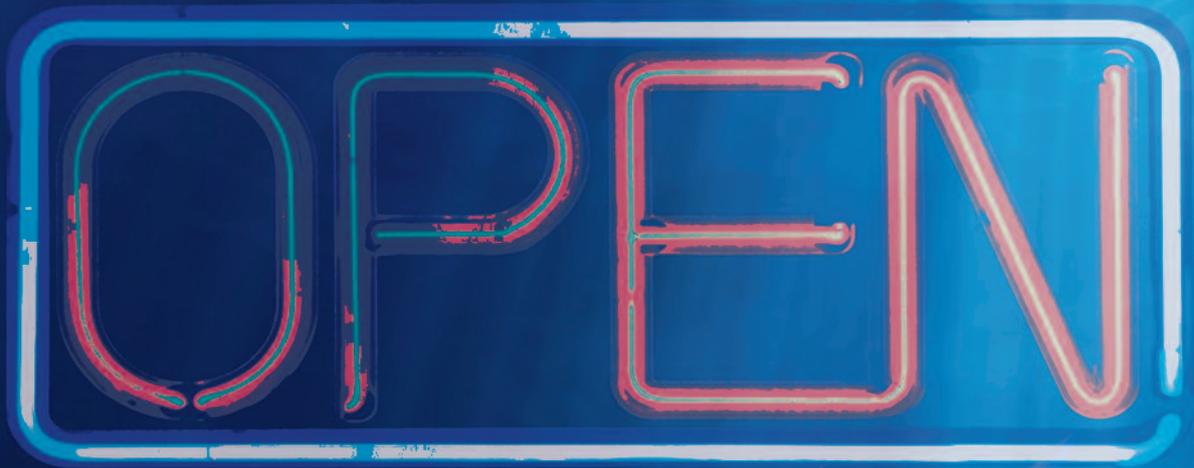
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Equity crowdfunding
reduces the biases
in traditional forms
of early stage
entrepreneurial
finance



Despite their exposure to flooding, low elevation urban areas concentrate a high density of economic activity

The misery that floods have been inflicting on UK residents in recent weeks is part of a major global problem: over the past 30 years, floods worldwide have killed more than 500,000 people and displaced over 650 million people. Research by **Adriana Kocornik-Mina, Guy Michaels, Thomas McDermott and Ferdinand Rauch** investigates why so many cities are hit by floods year after year.

Flooded cities

Extrême rainfall during December 2015 resulted in widespread flooding across northern England, Scotland and Ireland. With the costs of this one event potentially exceeding \$2 billion, an important policy question is why so many people are hit by flooding, particularly in locations that are repeatedly inundated.

The recent events in the British Isles are just one example of a major global problem. According to media reports collated by the Dartmouth Flood Observatory, between 1985 and 2014, floods worldwide killed more than half a million people, displaced over 650 million people and caused damage in excess of \$500 billion (Brakenridge, 2016).

Other datasets tell of even farther reaching impacts: according to the International Disaster Database, in 2010 alone, 178 million people were affected by floods and total losses exceeded \$40 billion (Guha-Sapir et al, 2016). To these direct costs we should add longer-term costs of disruptions to schooling, increased health risks and reduced incentives to invest.

So it seems important to understand why so much is lost to floods. One might argue that the private risks of floods are balanced by the private gains from living in flood-prone areas. But in fact, flood plains tend to be overpopulated because the cost of building and maintaining flood defences is often borne by governments

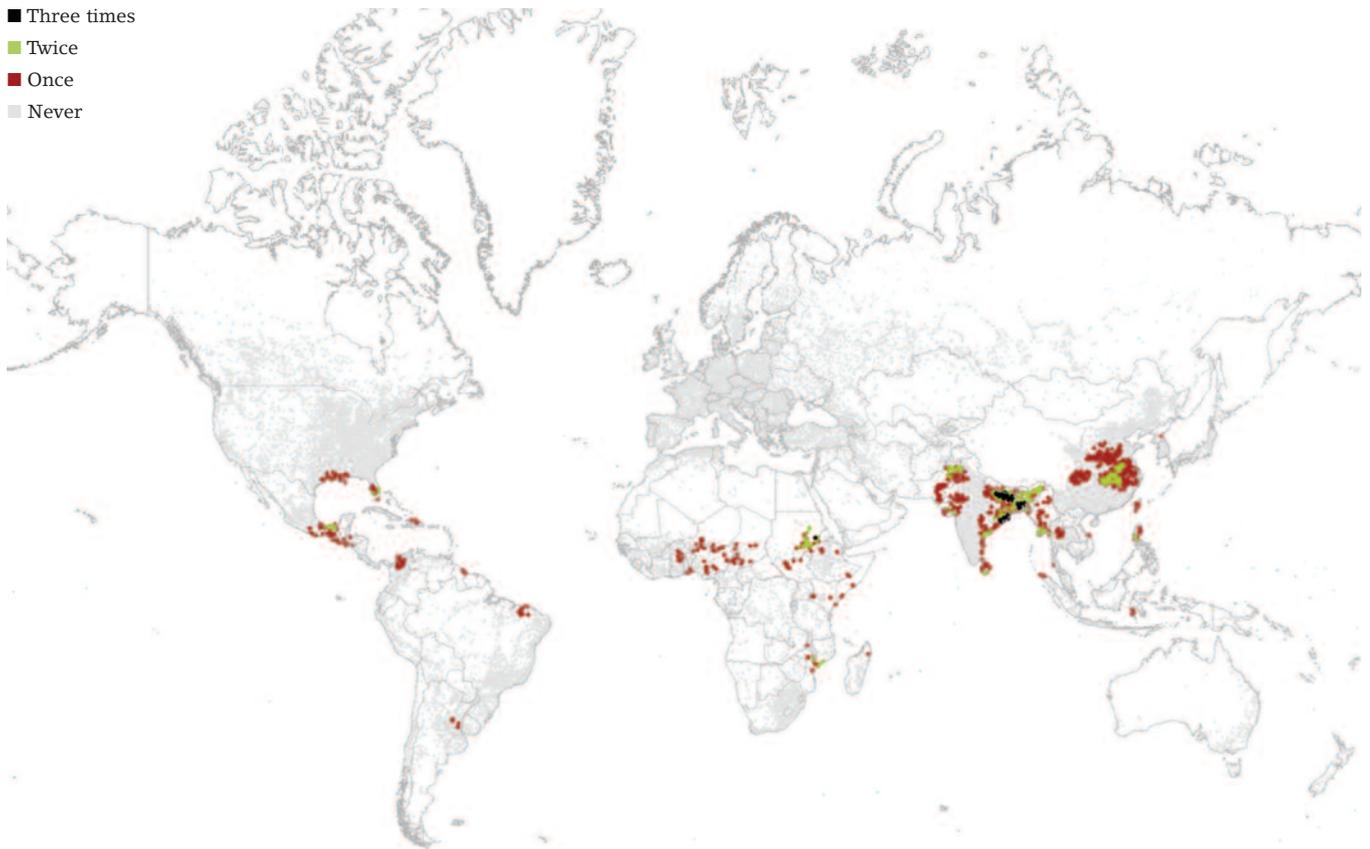
and not by private developers. This problem of an inadvertent subsidy to build on flood plains is made worse because the costs of flood recovery are also borne by governments and non-governmental organisations. This situation creates potential for misallocation of resources, and forces society to answer difficult distributional questions.

Our research examines how prevalent it is for economic activity to concentrate in flood-prone areas, and whether or not cities adapt to major floods by relocating economic activity to safer areas.

Large-scale urban floods

In our empirical analysis, we study the impact of large-scale urban floods. We use

Figure 1:
Locations of cities affected by large flood events, 2003-08



Notes: City sizes are inflated to make them visible on a map of the entire world. Smaller dots correspond to cities not affected by any of the floods in our sample. The number of floods in the legend refers to the number of years in 2003-08 during which each city was affected by a flood that displaced a total of 100,000 people or more.

new data from spatially disaggregated inundation maps of 53 large floods, which took place between 2003 and 2008. Each of these floods displaced at least 100,000 people and taken together, the floods affected 1,868 cities in 40 countries, mostly in the developing world. Figure 1 shows the locations of the large flood events included in our analysis. We study the local economic impact of the floods using satellite images of night lights at an annual frequency.

Our data show that the global exposure of urban areas to large-scale flooding is substantial, with low-lying urban areas flooded much more frequently. Globally, the average annual

risk of a large flood hitting a city is about 1.3% for urban areas that are more than 10 metres above sea level, and 4.9% for urban areas at lower elevation. In other words, urban areas that are less than 10 metres above sea level face an average annual risk of about one in 20 of being hit by a large flood. Of course, this average masks considerable variation across locations.

Local flooding risk results from a complex combination of local climate, permeation and topography, among other factors. Some urban areas – even some located at low elevation – will flood rarely, if ever. At the other extreme, some urban areas flood repeatedly. In our sample,

Cities built in flood-prone areas are locking in exposure to flood risk for the long term

about 16% of the cities that are hit by large floods are flooded in multiple years.

We also find that even though low-lying areas are more likely to be flooded, they concentrate a higher density of economic activity, as represented by night light intensity. There is a disproportionate concentration of economic activity in low elevation areas even in areas that are prone to extreme precipitation, where the risk of large-scale flooding is highest.

Local impact and responses

When we analyse the local economic impact of large floods, we find that on average they reduce a city's economic activity (as measured by night light intensity) by between 2% and 8% in the year of the flood. But recovery is relatively quick: night lights typically recover fully within a year of a major flood, even in the hardest-hit low-lying areas.

Figure 2 illustrates this pattern of recovery in the aftermath of Hurricane Katrina, which hit the city of New Orleans in 2005. But it is worth noting that New Orleans is unusual in our sample as it is much richer (and much better lit) than most of the flooded cities.

Our finding that economic activity recovers after floods even in low-lying areas suggests that there is no significant adaptation, at least in the sense of a relocation of economic activity away from the most vulnerable locations. With economic activity fully restored in vulnerable locations, the scene is sadly set for the next round of flooding.

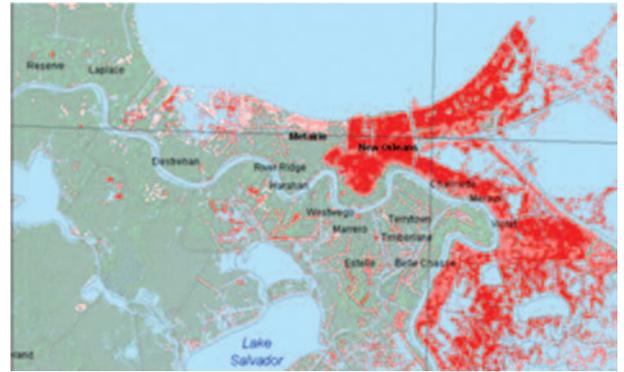
A possible motivation for restoring vulnerable locations is to take advantage of the trading opportunities – and amenity value – offered by water-side locations. But we find that economic activity is fully restored even in low elevation locations that do not enjoy the offsetting advantages of being near a river or coast.

Our results are also robust to restricting our sample to cities with at least some areas more than 10 metres above sea level. This means that there is no movement to higher ground in the aftermath of large floods even within cities where such movement is possible.

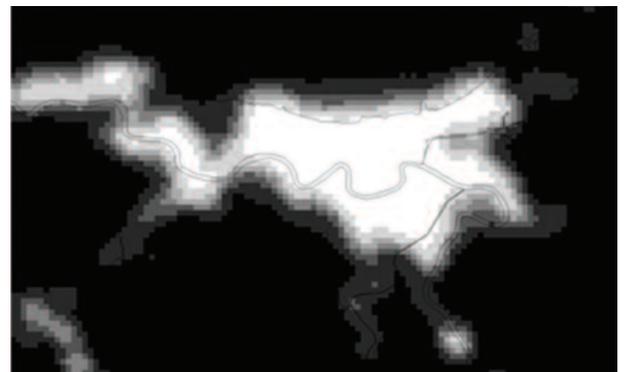
One exception to our general finding that cities do not adapt in response to large floods is evident in the subset of recently populated parts of cities (those that had no night lights in 1992). We find that in these recently populated urban

Figure 2:
Inundation and night light intensity maps for Hurricane Katrina, New Orleans.

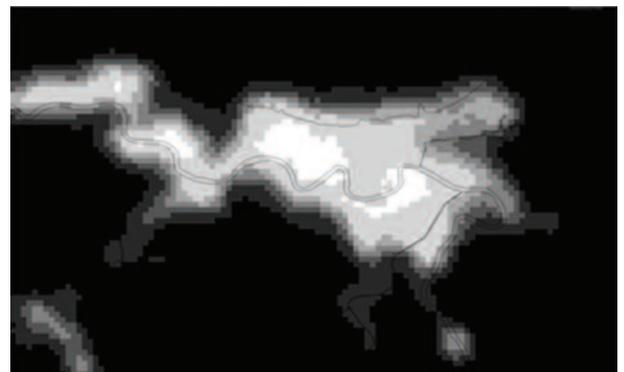
Panel A



Panel B



Panel C



Panel D



Notes: Panel A shows a detail from one of the inundation maps associated with Hurricane Katrina, concentrated on the area around New Orleans. The map displays in red and pink the areas that were inundated during the flooding. Panels B, C and D show the average annual night light intensity in 2004, 2005, 2006 respectively, for New Orleans. There is a notable dimming of night lights across the city in 2005. In Panel D, a recovery of night light intensity is apparent.

areas, flooded areas show a larger and more persistent decline in night light intensity, indicating some relocation of economic activity in response to flooding. This may be either because flood risk was under-appreciated in these newer urban locations or because these areas had fewer past investments, so moving away was less costly.

Future floods

Our findings are important for a number of reasons. First, global warming and especially rising sea levels are expected to exacerbate the problem of flooding in many of the world's cities.

Second, there is a continuing trend towards increased urbanisation around the world, especially in poor regions. As urbanisation progresses, it is important to know whether cities adapt and how their populations can avoid dangerous areas. Our results suggest that flooding poses a challenge for urban planning because adaptation away from flood-prone locations cannot be taken for granted even in the aftermath of large and devastating floods.

Third, floods disproportionately affect poor countries. Given the scale of human devastation and its potential damage to human capital formation (for example, disruptions to education or harm to people's health), this is an important

development issue. To illustrate, planning and zoning laws and their enforcement are typically weak in developing countries. Consequently, slums and other informal urban settlements tend to develop on cheap land with poor infrastructure, including flood-prone areas.

More than 860 million people live in flood-prone urban locations worldwide, and this population increased by about six million a year between 2000 and 2010. Our finding that low elevation locations concentrate much of the economic activity even in poor urban areas with erratic weather patterns highlights the tragedy of the recurring crisis imposed by flooding.

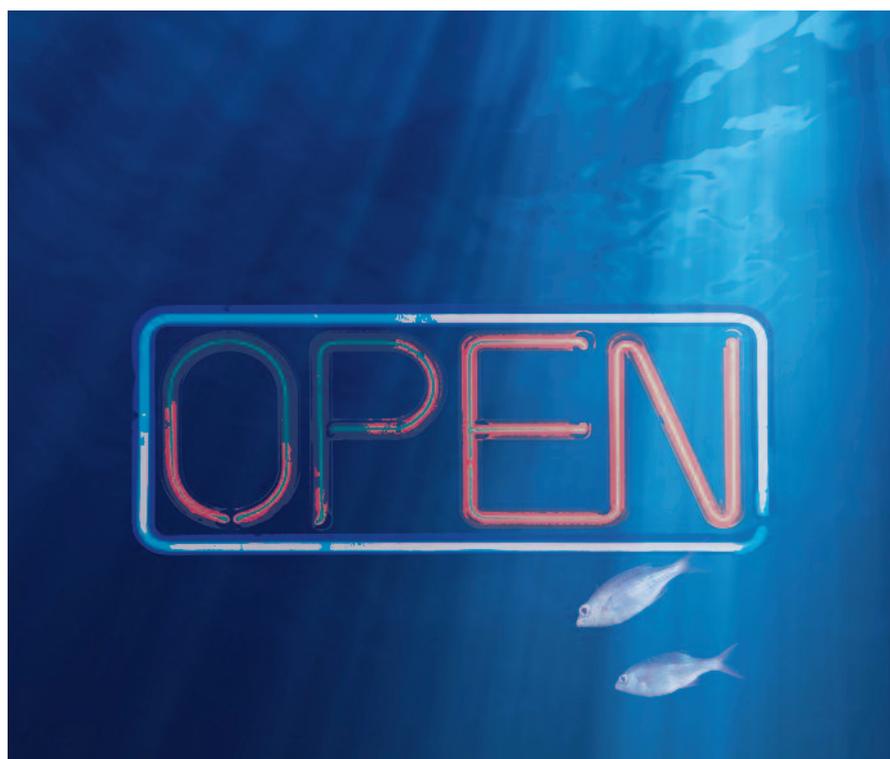
Fourth, recovery assistance after flooding is an important part of international aid. Our findings suggest that in some circumstances, part of the aid and reconstruction efforts should be targeted at moving economic activity away from the most flood-prone areas to mitigate the risk of recurrent humanitarian disasters.

Finally, our results are relevant for discussions of the costly effects of 'path dependence' (Bleakly and Lin, 2012; Michaels and Rauch, 2013). Our findings suggest that parts of cities that are built in flood-prone areas may be locking in exposure to flood risk for a long time, even when circumstances and the global climate change.

This article summarises 'Flooded Cities' by Adriana Kocornik-Mina, Guy Michaels, Thomas McDermott and Ferdinand Rauch, CEP Discussion Paper No.1398 (<http://cep.lse.ac.uk/pubs/download/dp1398.pdf>).

Adriana Kocornik-Mina is at Alterra-Wageningen UR in the Netherlands. **Guy Michaels** is associate professor of economics at LSE and a research associate in CEP's labour markets programme. **Thomas McDermott** is at University College Cork. **Ferdinand Rauch** of the University of Oxford is a research associate in CEP's trade programme.

In the aftermath of large floods, economic activity tends to return to flood-prone areas rather than relocating to higher ground



Further reading

Hoyt Bleakley and Jeffrey Lin (2012) 'Portage and Path Dependence', *Quarterly Journal of Economics* 127(2): 587-644.

G Robert Brakenridge (2016) 'Global Active Archive of Large Flood Events', Dartmouth Flood Observatory, University of Colorado (<http://floodobservatory.colorado.edu>).

Debarati Guha-Sapir, Regina Below and Philippe Hoyois (2016) 'EM-DAT: The International Disaster Database', Université Catholique de Louvain, Brussels (<http://www.emdat.be>).

Guy Michaels and Ferdinand Rauch (2013) 'Resetting the Urban Network: 117-2012', CEP Discussion Paper No. 1248 (<http://cep.lse.ac.uk/pubs/download/dp1248.pdf>).

in brief...

The rewards for getting a good degree

Does an individual's educational achievement at university affect their pay later in life? Looking at evidence on degree classes and UK graduate earnings during the expansion of higher education, **Shqiponja Telhaj** and colleagues find that it pays to study hard: there is a significant hourly wage premium for getting a first or upper second.

Since the early 1960s, with developments in the field of human capital research, analysis of the returns to education has established robust evidence of a strong positive association between earnings and years of schooling or level of qualification attained. But there has been little analysis of how returns vary according to the level of academic performance – for example, what US universities measure as students' 'grade point average' – conditional on the level of qualification.

This is particularly surprising given that employers often recruit at specific educational levels and, when ranking candidates, they are likely to consider grades or marks achieved. For example, according to a 2010 report from the Association of Graduate Recruiters, 78% of employers filter out applicants who have not achieved at least an upper second.

Our research investigates whether there is a premium associated with the level of educational achievement at university for graduates in the UK, as measured by the class of degree awarded: first, upper second, lower second or third.

Graduate earnings might vary with academic performance at university because employers treat performance as a signal of potential productivity. In that case, we might view a high premium as reflecting employers' lack of information about workers' productivity at the point of recruitment, and expect the premium to diminish with workers' tenure, as employers acquire information about their productivity.

Graduate earnings might also vary with academic performance at university because degree class is a measure of human capital acquired. Under that approach, we would interpret a high premium as reflecting greater acquisition of human capital by the graduate. Under either approach, evidence of a high premium associated with the level of academic performance is likely to be interpreted as indicating substantial variation in post-university outcomes by degree class.

Our study estimates the returns to degrees by degree class awarded by analysing data from the British Cohort Study (BCS70) for a single cohort of graduates born in a particular week in April 1970 and graduating in 1991. We obtain an estimate of a wage premium of 7-8% for a good degree (a first or upper second) relative to a lower degree (a lower second or third) at the ages of 30 and 38. We view the estimated premium to be large when we consider that our estimate of the premium for a lower degree relative to A-levels is 11% at age 30.

For graduates more than five years out of university, the wage premium for a good degree is 7-9%



The implication of this result is that there is a large dispersion around the average return to a degree according to class of degree awarded. Such evidence of substantial variation in graduate returns by academic performance creates a public policy concern if the perception that investment in higher education is risky acts as a deterrent to participation. In particular, young people from backgrounds where participation in higher education has traditionally been low might be less confident of their capacity to perform well.

We supplement evidence from the BCS70 with analysis of other datasets, such as the Labour Force Survey (LFS), the Higher Education Statistics Agency's survey of destinations of leavers from higher education, and graduate cohort studies. Using these datasets for graduates born in or around 1970, we obtain estimates for the good degree premium that are very similar to the BCS70 estimates.

We conclude that there is robust evidence of a significant wage premium for a good class over a lower class of degree for individuals born in or around 1970 and graduating in 1991. At least for graduates more than five years out of university, our estimates of the wage premium all lie in the range of 6.8-8.8%. Evidence from all data we employ suggests that between the ages of 30 and 40, the wage premium for a good degree is essentially constant.

We also examine variations over time in degree class premia. Using information from the LFS for the period 2005-13, we produce estimates for birth cohorts ranging from 1973/74 to 1981/82. This enables us to make comparisons of the premium for a good degree across birth cohorts at specific ages, covering the period of UK higher education expansion in an attempt to identify any trends in degree class premia across cohorts. We group individuals by birth cohorts, producing estimates of returns to degree class for individuals at ages 28-31, 30-33 and 32-35.

Our estimates of the premium for a good degree tend to cluster in the region 9-11%, but they do not reveal robust evidence of any clear upward or downward trend. We note, however, that this analysis is based on comparisons

across cohorts through a limited observation window and with relatively small sample sizes.

We address this issue by exploiting administrative data on full populations of university graduates, matched to survey data on their first destinations after university. We find that the early career earnings premium associated with a good degree was very modest (less than 3%) until the index of participation in higher education began to rise markedly across the cohorts graduating between 1991 and 1998, by which time the premium had increased to more than 6%.

We also find evidence that much of the increase in the premium for a good degree after 1990 was realised by 1993 as the index of higher education participation rose from 15% towards 20% of the age cohort. These results are consistent with the idea that as more young people obtain degrees, the premium for graduating with a good class of degree increases.

We explain the absence of clear evidence of further increases in the good degree premium by the observation that the proportion of students awarded good degrees grew markedly between 1993 and 1998, when the expansion of higher education tailed off. We also find that the premium associated with the award of a first class degree (relative to an upper second) grew significantly over the period of expansion.

Due to a lack of data, we cannot identify whether the estimated premium for a good degree arises from signalling or because degree class is a proxy for underlying ability and other dimensions of human capital. If degree class acts as a crude sorting mechanism for graduate employers, then this might be a further justification for the current trend in the UK away from the traditional system based on degree classifications and towards the issuing of detailed transcripts and grade point averages.

But if the continuing marketisation of higher education in the UK leads to further grade inflation through the awarding of a higher proportion of good degrees, then this is likely to reduce the premium.

As more young people get degrees, the premium for graduating with a good degree increases

This article summarises 'Graduate Returns, Degree Class Premia and Higher Education Expansion in the UK' by Robin Naylor, Jeremy Smith and Shqiponja Telhaj, CEP Discussion Paper No. 1392 (<http://cep.lse.ac.uk/pubs/download/dp1392.pdf>).

Robin Naylor and **Jeremy Smith** are at the University of Warwick. **Shqiponja Telhaj** of the University of Sussex is a research associate in CEP's education and skills programme.

Navigating through thousands of tariff plans for mobile phones to find the best one is not easy in today's telecoms market – and having an 'expert friend' calculate the contract with the biggest savings definitely helps. But as research by **Christos Genakos** and colleagues shows, people's desire to avoid psychological losses helps even more.



What makes consumers switch mobile phone tariffs?

Over 70 million customers have selected one of the seven million mobile tariff plans available in the UK today. It is highly likely that some are not in the best contract for them and would be better off switching to a more appropriate tariff. But with such a large number of contracts available, people face confusion and might avoid switching altogether, harming both themselves and the competitive process among firms.

Understanding what kind of information would help people switch is important for bodies like Ofcom, the UK's communications industry regulator and competition authority. The predominant thinking among such policy-makers worldwide is that the problem is mainly one of information and computation. That view has given rise to many accredited schemes for third-party price comparison sites covering telecoms as well as several other industries, including banking, electricity and credit cards.

The aim of these schemes is to raise

consumer confidence about how to find the best price for the service they wish to purchase, and to increase market transparency by providing or facilitating expert guidance. The idea is for people to have an 'expert friend' who can tell them how much they would save by switching to the best tariff.

Our research analyses individual-level data on roughly 60,000 mobile users in the UK over the period 2010-12. To

Savings are not necessarily the first thing even well informed consumers are looking for

explore how they select their contracts, we have unprecedented access to Billmonitor.com (BM), the UK's leading mobile price comparison site, which was the first company to receive such an accreditation award for mobile services.

Consumers in our sample subscribe to monthly plans with a fixed payment component (the monthly rental), which includes several allowances (for call minutes, text messages, data usage, etc.). On registration with BM, consumers receive personalised information on the exact amount they could save by switching to the best contract for them. This information is calculated by BM's optimising algorithm, which is allowed to look into consumers' past bills. In other words, consumers know precisely how much they can save by switching since BM does this computation on their behalf.

Many consumers could save substantial amounts of money by switching to the alternative plans that BM finds. They fall into two categories:

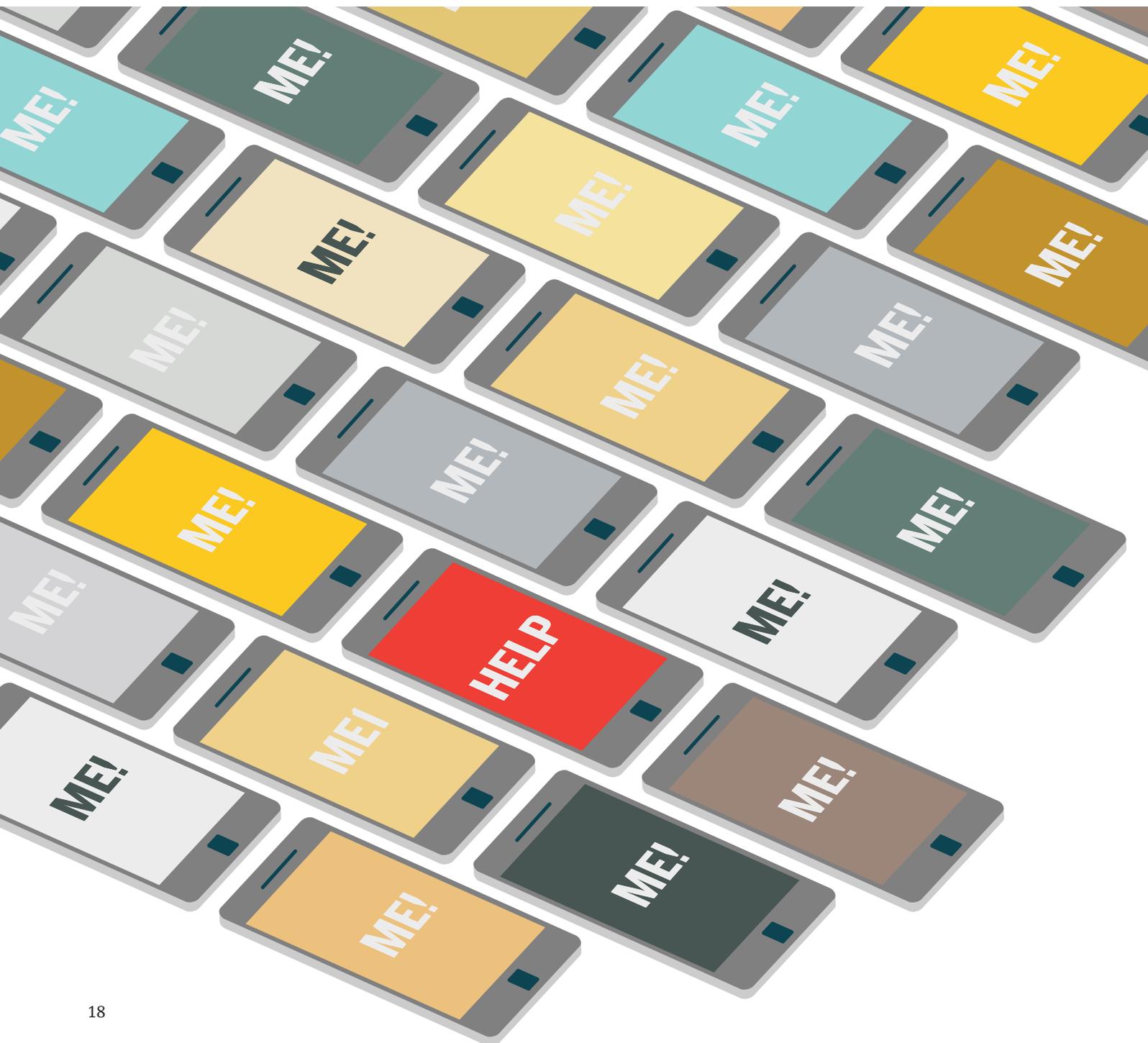
those who happen to exceed their allowance and pay extra fees (known as 'overage'), and could therefore save money by switching to a higher, more inclusive plan; and those who could save money by switching to a lower, less inclusive tariff if their consumption is systematically lower than their allowance.

If the only problem was information acquisition, then consumers of both types should switch with the same probability on receiving their personalised information. But our conjecture is that because of 'loss aversion', consumers react differently to the two different

situations: individuals evaluate economic outcomes not only according to an absolute valuation of the outcomes in question but also relative to subjective reference points. This is based on the pioneering work of Kahneman and Tversky (1979), which established 'prospect theory' as a tool for analysing choice under uncertainty.

Paying more than the monthly rental (which serves as a natural reference point) is experienced as a loss. It should be a more 'painful' experience and should prompt consumers to switch with higher probability than they would if they

The potential psychological pain of nasty surprises on phone bills is a great motivator to switch tariffs



could save the exact same amount by switching to a lower tariff.

Using the data on BM's customers, we evaluate what affects people switching contracts over time. We look at switching within operators so that the process is seamless and unconstrained by contractual clauses. We show that potential savings are a significant determinant of switching. Indeed, having an expert friend to help calculate potential savings increases the probability that users will switch contracts.

More importantly though, and in line with our conjecture about loss aversion, we find that, controlling for savings, switching is six times more likely if the customer is charged overage fees. In other words, the psychological pain of paying over and above what an individual expects to pay as a fixed monthly fee is an even greater motivator to switch, in addition to the conventional reasoning that only savings information matters.

What is even more fascinating is that consumers do not just face a large number of contracts. These environments are, almost by definition, uncertain, as there is a random element in people's behaviour that determines what is ultimately consumed and charged. This uncertainty brings with it an element of risk. Placing risk aversion vis-à-vis loss aversion is important since in many real-life environments, the potential of both gain and loss is most likely to co-exist with risk.

In situations of choice under uncertainty, prospect theory stresses the importance of loss versus gain whereas traditional 'expected utility theory' typically assumes a uniform attitude towards risk. Although a large body of research focuses on assessing the relevant merits of the two theories (for example, Rabin, 2000; and Fehr and Goette, 2007), to the best of our knowledge, no one has attempted to account for both with field data.

We believe that this is important, as we do not see loss aversion and risk aversion as antagonistic, just as we do not necessarily see loss aversion and expected utility theory as mutually exclusive. In principle, they can both help us understand the determinants of choice.

Given the appropriate data, it becomes an empirical question whether

the predictions of either theory are consistent with the data, as well as the extent to which they can help predict observed behaviour. In this study, we allow both risk aversion and loss aversion to affect consumers' choices.

Testing for the influence of both, we find that risk aversion cannot explain consumer switching as expected utility theory would suggest, whereas loss aversion remains strong and significant. More precisely, we find that individuals seem to be risk-averse in the domain of gains and risk-seekers in the domain of losses: this differential risk attitude is consistent with prospect theory.

Our results not only shed light on an important research debate but also put the practical use of price comparison sites in a new perspective. We suggest that regulators hoping to rely on price comparison sites like BM to discipline market prices using shared data should first investigate what giving 'good advice' means in a context that includes loss aversion.

Consumers also switch for behavioural reasons that have little to do with savings, but that still could be consistent with optimal individual behaviour. Just informing consumers about potential savings may not prompt the healthy competitive switching that regulators would like to nudge. According to our results, savings are not necessarily the first thing even well-informed consumers are looking for: rather, they like a fixed reference point that leaves little room for nasty surprises on their phone bills.



This article summarises 'Loss Aversion on the Phone' by Christos Genakos, Costas Roumanias and Tommaso Valletti, CEP Discussion Paper No. 1373 (<http://cep.lse.ac.uk/pubs/download/dp1373.pdf>).

Christos Genakos is a research associate in CEP's growth programme. He and **Costas Roumanias** are at Athens University of Economics and Business. **Tommaso Valletti** is at Imperial College Business School.

Further reading

Ernst Fehr and Lorenz Goette (2007) 'Do Workers Work More if Wages Are High? Evidence from a Randomized Field Experiment', *American Economic Review* 97(1): 298-317.

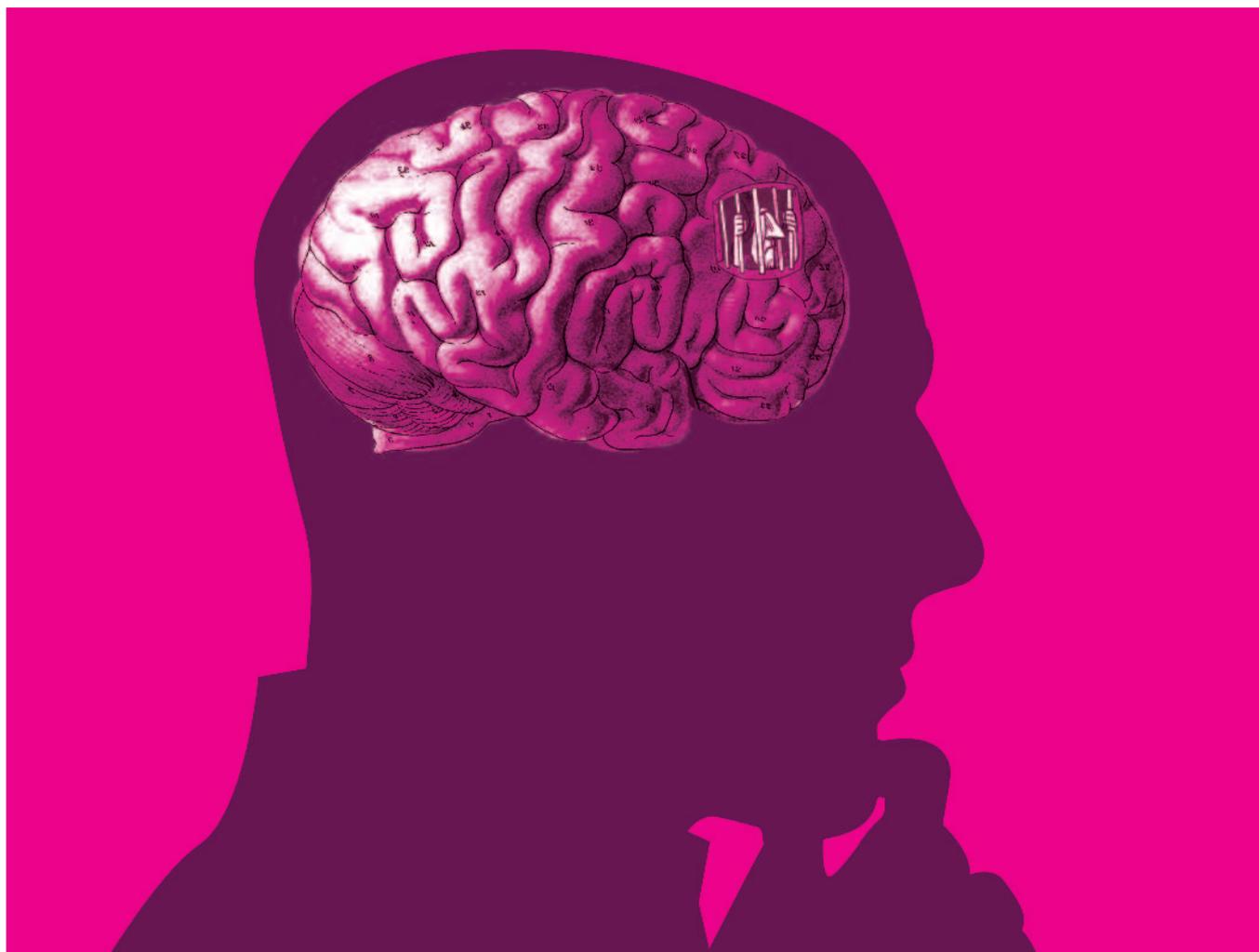
Daniel Kahneman and Amos Tversky (1979) 'Prospect Theory: An Analysis of Decision Under Risk', *Econometrica* 47(2): 263-92.

Matthew Rabin (2000) 'Risk Aversion and Expected-utility Theory: A Calibration Theorem', *Econometrica* 68(5): 1281-92.

Regulators cannot rely on price comparison sites to discipline the market

Mental illness is a far bigger source of human misery than poverty or unemployment, according to research by **Sarah Flèche** and **Richard Layard**. They argue that we need to move beyond a purely materialistic conception of misery, and call for increased public spending on mental health.

Misery and mental health



Most analysis of human misery focuses on external factors – poverty, unemployment, physical illness or disability – and from this work spring the priorities of public policy-makers. But what about the ‘inner’ person: is mental illness a major source of misery; and could not policy do more about it?

The answer to both these questions is yes. To show the importance of mental illness, we use household surveys. They collect information on representative adults of all ages in Australia, Germany, the UK and the United States. These data show which people are most miserable – that is, the least satisfied with their lives – and

which are not. And they tell us the characteristics of each group of people.

Figures 1 and 2 show the characteristics of those who are in misery in the United States and Australia. In the former, 27% of the most miserable people are poor, 13% are unemployed and 14% are physically ill. But 61% of the most miserable people have been diagnosed with depression or anxiety disorders. Many more of the least happy people suffer from mental illness than suffer from poverty or unemployment.

The position is similar in Australia. Even if poverty and unemployment are causing some people to be mentally ill as well, these findings show that a lot of people are suffering from mental illness unconnected

with poverty or unemployment.

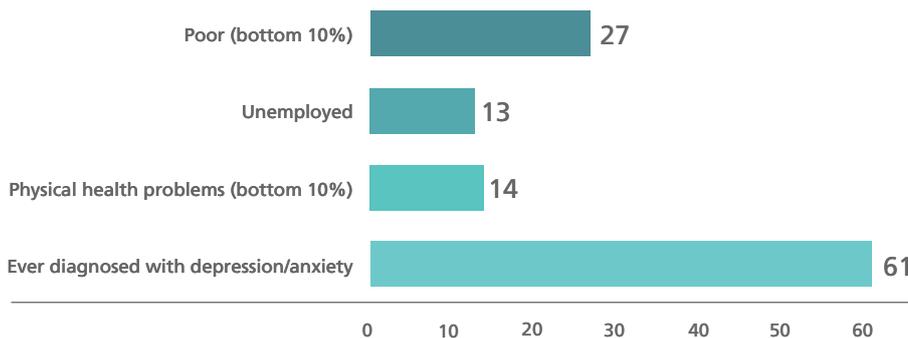
To come closer to causality, we have to use multivariate analysis. This confirms that more of the misery in each country is explained by mental illness than by low income or unemployment. Going further, if we look at changes over time in the life satisfaction of the same individual, more of the fluctuations in life satisfaction are due to fluctuations in depression or anxiety than to fluctuations in income or employment.

Why is such a striking feature of our society so little recognised? It is indeed surprising when at least a third of all families include someone with mental health problems that cause enormous distress (Layard and Clark, 2014).

One possible excuse is that until recently, surveys of mental health relied on people answering batteries of questions about their feelings rather than, as in Figures 1 and 2, about diagnosis by a third party. Without such external evaluation, the data could lead to a biased correlation between mental illness (as measured) and dissatisfaction with life.

The only data we have for the UK and Germany are of that form. But as Figures 3 and 4 show, the findings are very similar to those for the United States and Australia, for which we have the more ‘objective’ measures of mental illness. And the multivariate analysis again shows that dissatisfaction with life can have many causes but mental illness is the most important. Indeed, it is at least as important as physical illness, which is not surprising when depression is, for example, 50% more disabling than the most common long-term physical conditions, such as angina, asthma, arthritis or diabetes (Moussavi et al, 2007).

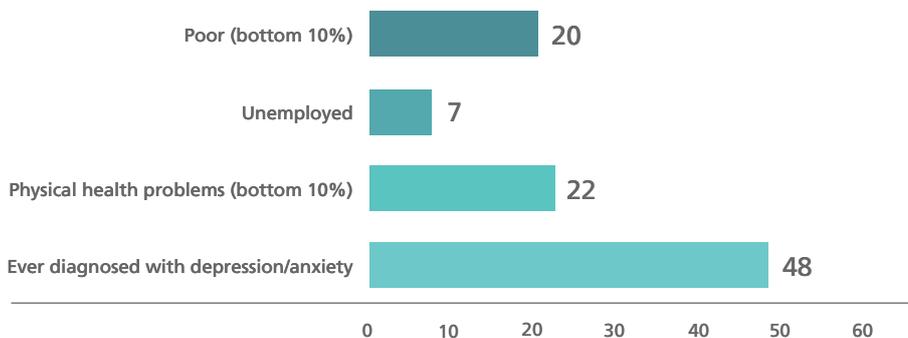
Figure 1:
Percentage of those in misery having the characteristics shown (United States)



Note: Those in misery comprise the bottom 5.6% in terms of life satisfaction.

Source: Behavioral Risk Factor Surveillance System (BRFSS), with a sample size of over 200,000.

Figure 2:
Percentage of those in misery having the characteristics shown (Australia)



Note: Those in misery comprise the bottom 7.5% in terms of life satisfaction.

Source: Household, Income and Labour Dynamics in Australia (HILDA), with a sample size of 17,000.

Dissatisfaction with life can have many causes – but mental illness is the most important

Implications for healthcare

What does this imply for the allocation of resources in healthcare? Governments in both the UK and the United States are committed by law to parity of esteem for mental health and physical health. So what does this suggest should be the share of total health expenditure going on mental health?

First, we have to realise that physical healthcare is concerned with more than enhancing the quality of life: it is also concerned with preventing premature death. Thus, World Health Organisation (WHO, 2008) analysis estimates that 38% of health-related reductions in the quality of life are due to mental illness; but if we

allow for premature death, mental health accounts for 23% of the total burden of disease. By contrast, we spend only 13% of our total health budget on mental health.

This could only be justified if we lacked cost-effective treatments for mental illness, and especially the most common problems of depression and anxiety disorders. So how cost-effective are the main available treatments?

Let us consider cognitive behavioural therapy (CBT) – the only treatment that the National Institute for Health and Care Excellence (NICE) recommends for all forms of depression and anxiety. With the information from our analysis, we can

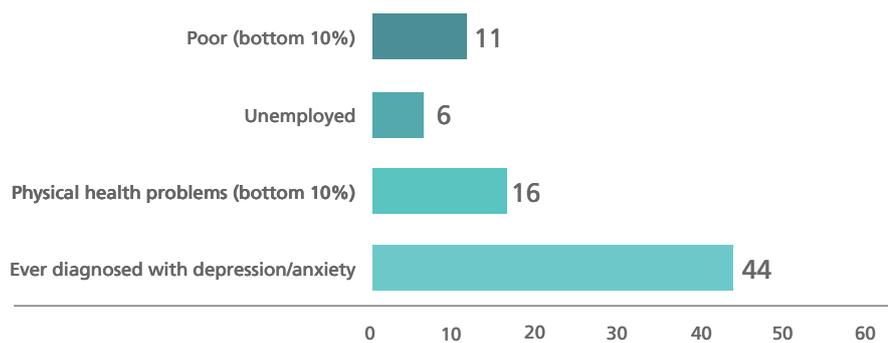
provide a simple evidence-based evaluation of its benefits and costs measured in terms of life satisfaction.

It turns out that when someone is treated for depression or anxiety and recovers, the increase in life satisfaction outweighs the cost of treatment by at least ten times. And this ignores altogether the cost savings that result from increased employment and reduced physical healthcare (Layard and Clark, 2014).

However one looks at it, mental health is a shockingly neglected issue. One reason is technological lag: many people do not realise that cost-effective treatments exist. But another reason is our materialistic conception of misery: when people picture those who are deprived in our society, they typically focus on external factors. But if people cannot enjoy life, they are just as deprived whether the cause is outside themselves or within. In this light, a new concept of deprivation is essential.

Figure 3:

Percentage of those in misery having the characteristics shown (UK)

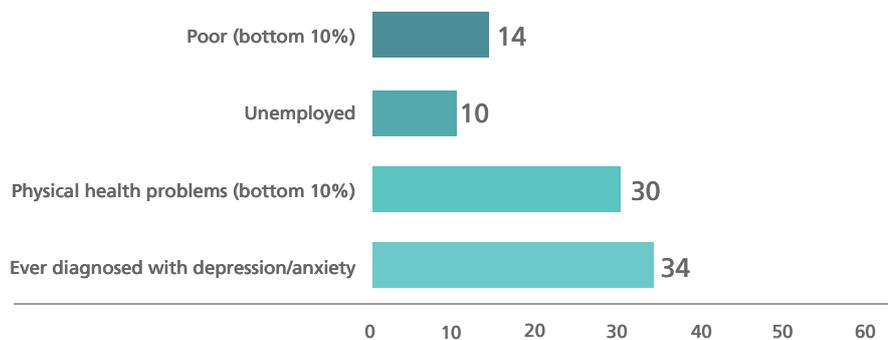


Note: Those in misery comprise the bottom 9.9% in terms of life satisfaction.

Source: British Household Panel Survey (BHPS), with a sample size of 115,000.

Figure 4:

Percentage of those in misery having the characteristics shown (Germany)



Note: Those in misery comprise the bottom 8.7% in terms of life satisfaction.

Source: Germany Socio-Economic Panel (GSOEP), with a sample size of 53,000.

This article summarises ‘Do More of Those in Misery Suffer from Poverty, Unemployment or Mental Illness?’ by Sarah Flèche and Richard Layard, CEP Discussion Paper No.1356 (<http://cep.lse.ac.uk/pubs/download/dp1356.pdf>).

Sarah Flèche is a research officer in CEP’s wellbeing programme. **Richard Layard** is the programme’s director.

Further reading

Richard Layard and David M Clark (2014) *Thrive: The Power of Evidence-based Psychological Therapies*, Penguin.

Saba Moussavi, Somnath Chatterji, Emese Verdes, Ajay Tandon, Vikram Patel and Bedirhan Ustun (2007) ‘Depression, Chronic Diseases, and Decrements in Health: Results from the World Health Surveys’, *The Lancet* 370(9590): 851-58.

World Health Organisation (WHO) (2008) *The Global Burden of Disease*.

in brief...

Rapid response policing: the impact on crime detection

Is it worth police officers aiming to get to the scene of a crime as soon as possible after being alerted by a member of the public? Analysis of data from the Greater Manchester Police by **Jordi Blanes i Vidal** and **Tom Kirchmaier** indicates that such practices not only boost crime detection but also reduce the time it takes to find the offenders.

Police agencies across the world devote considerable resources to minimising their response times. They track and publicise response time statistics, and often include target response times as part of the core performance measures by which they are evaluated.

Indeed, according to the British Crime Survey, responding to emergency calls is the aspect of police work that is most valued by the public. And in a recent BBC interview about whether resources devoted to neighbourhood policing may have to be significantly reduced, Sara Thornton, chair of the National Police Chiefs' Council, said that officers would 'always respond to the pub fight, domestic abuse, to people in difficulty'.

Criminologists have long argued that the emphasis on rapid response policing is misplaced, since rapid responses have not been found to have any effect on crime rates or even on the likelihood of detecting a crime. But this widely held view is largely the result of a single piece of social science research: the Kansas City Response Time Analysis Study.

The US study examined a small number of crimes in two neighbourhoods over a period of four months and found no correlation between police travel time (the time between an officer being asked to attend a scene and arrival at the scene) and the likelihood of an arrest. The Kansas City Study was pioneering for its time. But it suffers from a number of significant shortcomings, including a limited and highly non-random sample, and the lack of any attempt to identify whether there is a real causal connection.

Our research examines the effect of police response time on the likelihood of crime detection using a uniquely large dataset and a credible strategy for identifying causation. We analyse data from the 2008-14 internal record of the Greater Manchester Police, which is the second largest force in England and oversees a local population of 2.6 million people.

A first look at our dataset indicates that response time and crime detection are negatively correlated. But it

would be naïve to interpret this correlation as evidence of a causal link. The police optimally assign different levels of priority to the calls for service that they receive. Crimes assigned a higher priority could be those with either a higher or lower difficulty of detection, making the identification of causation challenging.

To deal with this challenge, we make use of the fact that crime scenes closer to the police stations where the response officers are based can be reached more quickly following a call for service. Of course, unobserved determinants of detection difficulty at the crime scene might correlate with distance to the response station. To account for this, we exploit the partition of the Greater Manchester territory into 11 operationally distinct divisions.

This partition implies that crime scenes within a small local area but on different sides of a division boundary are served by separate response stations, which may be at very different respective distances. Once we have controlled for the 'local area' by introducing a large number of geographical cell indicators, variation in distance to the division response station is due to crime scenes in the same local area falling on separate sides of division boundaries. We use this exogenous variation in distance as our instrument for response time.

What do we find? A 10% increase in response time leads to a fall of 4.6 percentage points in the likelihood of detection. The effects are larger for thefts and robbery than for violent crimes, although they are large for every type of crime.

Longer response times
reduce the likelihood
of crimes being
detected, especially
thefts and robbery



Faster response times make it more likely that victims or witnesses will name a suspect

Our findings also hold on the intensive margin. When we look only at those crimes that are eventually detected, we find that the number of days it takes to detect those crimes is significantly lower when the initial response time is faster. A 1% increase in response time is associated with a 0.9% increase in the number of days that it takes to detect the crime, conditional on eventual detection.

So why would response time have such a large effect? There are many potential mechanisms: the police could arrest the offender either at the scene of the crime or in its vicinity; they could collect physical evidence before it is contaminated or destroyed; they could interview witnesses before they have left the scene; and they could encourage victim or witness cooperation by signalling efficiency and dedication.

While we cannot explore every possible mechanism, our dataset allows us to measure the importance of the last two mechanisms. In particular we have information on whether a suspect was named to the police by a victim or witness.

Unsurprisingly, the naming of a suspect is strongly correlated with the likelihood of detecting the crime: among the 24% of crimes where there is a named suspect, 65% of them are detected; whereas in the remaining 76%, the detection rate is only 29%. We find that faster response times lead to a higher likelihood of this type of cooperation by a victim or witness, suggesting that this is indeed a mechanism through which faster response times have a positive effect on crime detection.

So what should we make of all of this? The effect of response time on the likelihood of detection is statistically significant and economically large. We cannot compare the cost effectiveness of response time policing relative to every other use to which the police could devote their limited financial resources. Indeed, to the best of our knowledge, such an ambitious analysis has never been credibly undertaken.

But what our findings do suggest is that if the police are interested in detecting as many crimes as possible, rapid response policing is a major mechanism that can accomplish that. Our findings also illustrate that when social scientists and the public hold completely opposite views about the effectiveness of a policy, it may be the public that turns out to be right.

This article summarises 'The Effect of Police Response Time on Crime Detection' by Jordi Blanes i Vidal and Tom Kirchmaier, CEP Discussion Paper No. 1376 (<http://cep.lse.ac.uk/pubs/download/dp1376.pdf>).

Jordi Blanes i Vidal of LSE's department of management is a research associate in CEP's growth programme. **Tom Kirchmaier** is in LSE's Financial Markets Group.

Global online labour markets are connecting firms with remote workers, but it remains difficult for people to get their first job. Research by **Christopher Stanton** and **Catherine Thomas** reveals how new types of intermediaries enable inexperienced workers to signal their quality to potential employers.

Online hiring of offshore workers: the value of intermediaries

A variety of online markets have developed in recent years to facilitate trade in labour services. Upwork – previously known as oDesk-eLance* – is the largest global online market for outsourced work, with revenues of around \$1 billion a year, making it the ‘behemoth of the human cloud’ (O’Connor, 2015). One key feature of the company is that over 80% of the transactions it processes are across national borders and hence constitute offshoring or international trade in labour services (Horton, 2010).

Upwork and similar marketplaces bring together employers, who mainly offer short-term jobs or tasks, and workers, who are paid by the hour. But while these markets provide a huge amount of information about potential trading partners, our research shows that ‘information frictions’ still hamper the growth of global outsourcing. We also find, however, that new types of organisations – ‘agencies’ – have sprung

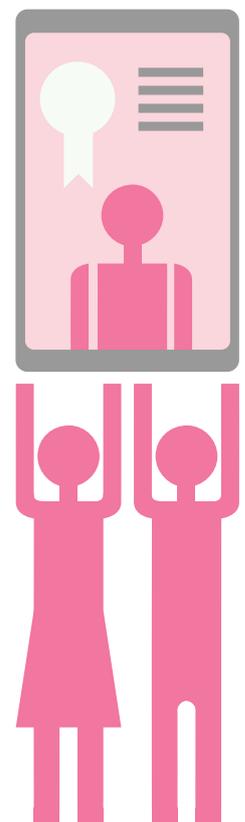
up to reduce information-related barriers to trade, notably the uncertainty about workers without verifiable prior experience in the marketplace.

Online labour markets

Employers and workers can find each other easily on Upwork: workers’ profiles include short biographies, details of their education, skills and experience, scores received in online tests and feedback from past performance. And as in online product markets such as Amazon or eBay, buyers – or, in this case, employers – leave feedback after completed jobs.

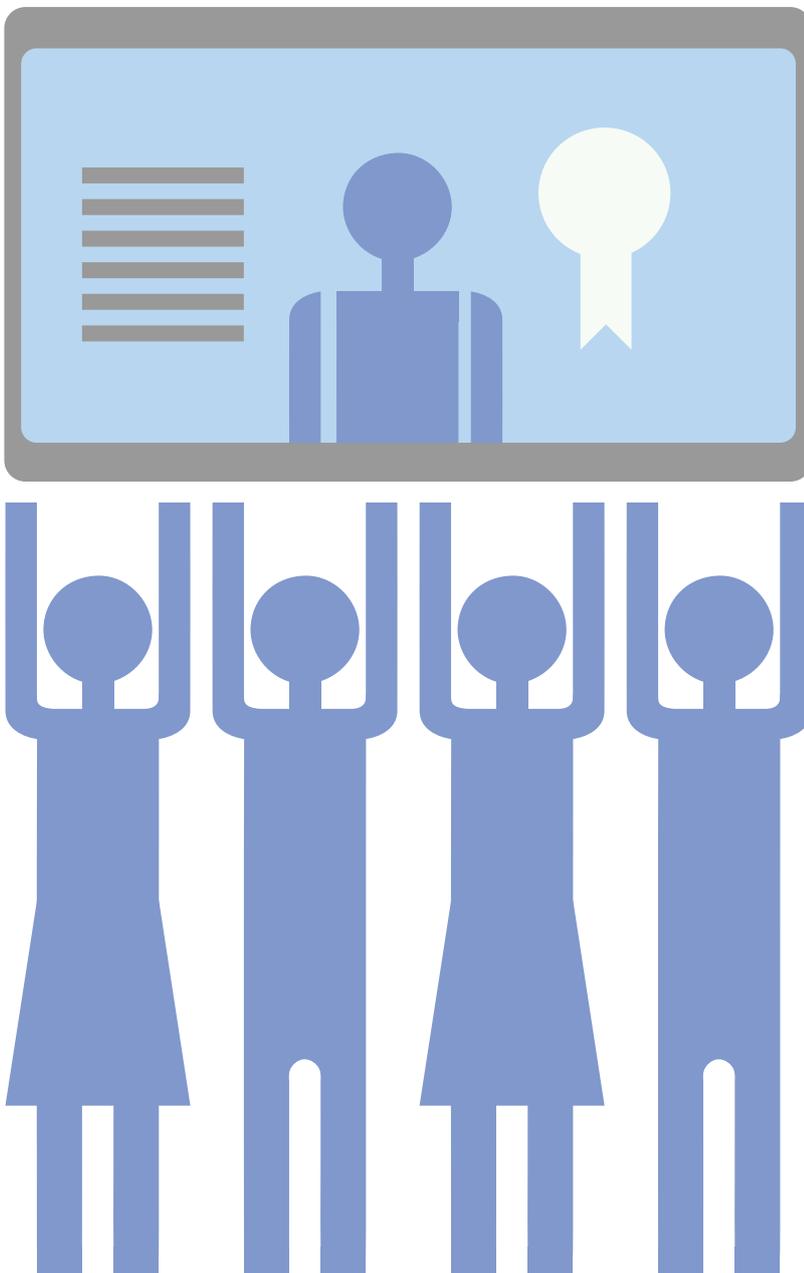
The feedback scores and comments that are visible on workers’ profiles are highly positively correlated with their likelihood of future employment and wages earned. They are a form of high bandwidth data (Autor, 2001a) that are imperfectly correlated with other observable worker characteristics.

But by definition, new workers on the website – those without previous experience – have no observable



* oDesk was founded in 2005 and merged with eLance in 2014

Being a member of an agency is a signal of quality for inexperienced workers



feedback on their profiles. Detailed administrative data on job postings, applications, hiring decisions and job outcomes show that finding the first job is particularly hard. Indeed, of those new workers who applied for their first job on the website between August 2008 and December 2009, only 10% were eventually hired; in contrast, after being hired once, 70% find a second job.

This large difference between hiring rates for workers with and without feedback on their profiles suggests that a feedback score and some experience gives workers a foot in the door. Indeed, in an experiment with oDesk, Pallais (2014) finds that randomised workers treated with feedback scores go on to have better outcomes than control workers.

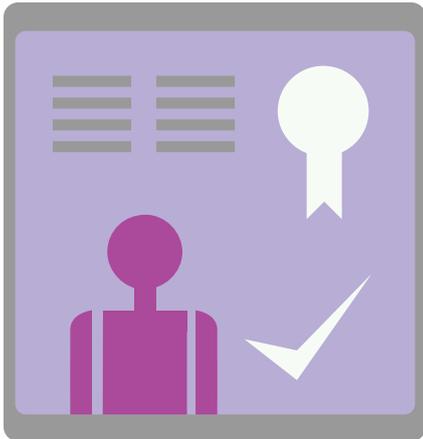
But while the first job is extremely valuable for workers, their first employers do not receive the future benefits of revealing information about workers that come from their increased likelihood of finding future jobs since these are likely to be with different employers. Analysis by Tervio (2009) provides insight into such markets in which talent is revealed on the job: in these cases, because the first employer does not capture the full returns from talent discovery, they hire an inefficiently low number of inexperienced workers.

The inability to capture the long-term value of investment in information is similar to the reason why firms may be reluctant to invest in providing general skills training (Becker, 1962) unless they have monopsony power or private information that allows them to capture the returns (Acemoglu and Pischke, 1998; 1999).

The benefits of agency affiliation

A new type of market intermediary helps to solve the problem. Of all workers hired at least once on Upwork, 27% are affiliated with one of the 1,000 or so small autonomous 'agencies' that exist within this marketplace.

Agencies are typically groups of around three to ten workers with similar skills and backgrounds. They are independent of Upwork, but the website accommodates their presence by allowing



common agency members to reveal their affiliation on their profile page and to display the pooled feedback scores of all current and past agency members. Employers can observe these agency-level feedback scores, even for new agency members who have yet to be employed on the website and have not earned any individual feedback scores.

Agency affiliation has a limited effect on the average probability of being hired across all workers. But among inexperienced workers, it is tremendously important in determining hiring outcomes. Controlling for all other observable differences in workers' characteristics, a new agency affiliate is 75% more likely to be hired than a new non-affiliated worker – despite the fact that affiliates request and earn higher hourly wages on their first job.

This early advantage matters for overall career outcomes: between August 2008 and August 2010, the average affiliate earned over four times as much as the average non-affiliate. Most of the

Agency affiliation is especially important in technical work where worker quality is unknown until the job is done

difference in career outcomes between affiliates and non-affiliates can be attributed to the fact that a larger share of non-affiliates is never hired. Once individuals are hired for their first job, their on-the-job feedback scores are much more important to future success than their affiliation status.

This explains why agency affiliation appears irrelevant to hiring decisions among all workers. The probability of being re-hired is greater for affiliates because they receive better individual feedback scores on early jobs; but when non-affiliates are re-hired, their wages catch up with affiliates' wages. Among workers who have had five or more jobs on the website, wages and hiring probabilities are very similar for affiliates and non-affiliates with the same individual feedback scores – and so future career outcomes become indistinguishable.

Overall, these findings suggest that agencies are able to screen workers' quality and offer affiliation only to high quality inexperienced workers. For those new workers that are not affiliated with an agency, quality revelation on the job allows employers to screen out those that are low quality only after they have been hired, and only those high quality non-affiliates who are fortunate to be hired go on to future success.

In contrast, agency affiliation pre-empts on-the-job quality revelation for affiliates. Being a member of an agency is

a signal of worker quality for inexperienced workers – a signal that substitutes for an earned individual feedback score and becomes redundant once affiliates have earned their own feedback. Since affiliates' feedback is almost always positive, affiliation is a credible signal of worker quality.

The implication that agency affiliation signals inexperienced worker quality is supported by the fact that agencies are much more prevalent when quality is particularly hard to discern from other observable worker characteristics. For example, affiliates are concentrated in technical job categories, such as programming, where worker quality remains unknown until after the job is done. Furthermore, agencies are concentrated outside the relatively familiar labour markets of the United States, where the majority of employers are located.

How agencies work

Since our research finds limited evidence of any other way that agencies create value in this market, we investigate how agencies work. How can agencies screen worker quality when potential employers cannot? The data suggest that it is often because workers in an agency know each other offline. Agency members tend to be from the same city or even from the same university. So we hypothesise that the ability to screen affiliate quality is due to existing knowledge in offline communities.

A conservative estimate suggests that the presence of agencies in the market increases the efficiency with which workers are allocated to jobs in the overall market by around 11%. But what's in it for the agency head? Upwork comments that these individuals typically retain some share of affiliates' revenues on the website.

Affiliates tend to prefer to remain in an agency, even if that means sharing their revenues throughout their careers. This is because the website further accommodates agencies by tying the

Offline and local social ties help to increase the value of online global labour markets

affiliate's online profile to an agency for the duration of that worker's career. Workers who leave their agencies are unlikely to be able to retain their individual feedback scores, rendering them observationally equivalent to inexperienced workers in the marketplace.

Under this business model, agency heads are able to sustain long-term contracts with workers, overcoming the problem that no employer has an incentive to invest in quality revelation in a world of short-term contracts between employers and employees. At the same time, the fact that agency-level feedback is public dissuades an agency head from offering affiliation to a low quality worker. This is what gives credibility to the signal that affiliates are high quality.

These findings imply that the type of social ties that are known to be important in traditional labour markets – such as referrals through 'old boy networks' (Saloner, 1985) – continue to matter in the new global labour markets. Agencies play a role that is similar to that performed by experts in a study by Biglaiser (1993), by certification intermediaries in work by Lizzeri (1999) and by the temporary-help supply firms discussed in Autor (2001b). But in contrast to these organisations, agencies do not require any costly additional screening or self-selection (Spence, 1973).

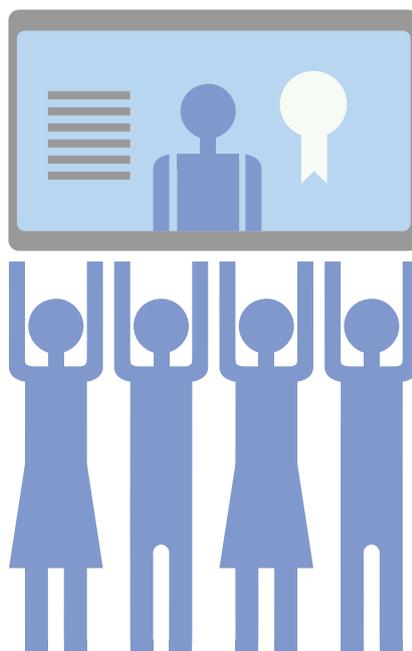
Will agencies fully solve the problem of missing information about inexperienced worker quality? This is an unlikely outcome because an agency's boundaries are determined by the size of the agency head's offline network, which is necessarily localised and limited in size. At the same time, a new agency relies on previously non-affiliated workers with good feedback being able to recruit and brand new affiliates from their offline networks. The supply of potential new agency heads is therefore limited due to the very problem that agencies exist to address.

While new global and fragmented production processes have the potential to revolutionise how work is done, some aspects of traditional labour markets remain important. Our research shows that rather than being rendered obsolete by recent developments in communications technology, offline and local social ties can serve to increase the value of online global labour markets.

This article summarises 'Landing the First Job: The Value of Intermediaries in Online Hiring' by Christopher Stanton and Catherine Thomas, CEP Discussion Paper No. 1316 (<http://cep.lse.ac.uk/pubs/download/dp1316.pdf>) and forthcoming in the *Review of Economic Studies*.

Christopher Stanton is at Harvard Business School. **Catherine Thomas** is in LSE's department of management. They are research associates in CEP's growth and globalisation programmes, respectively.

'Old boy networks' have not been rendered obsolete by modern communications technology



Further reading

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