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The Benefits of Higher Education
Participation for Individuals and
Society: key findings and reports
"The Quadrants"

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Introduction

Coverage

This document presents information about the benefits of HE participation for the individual and society. It builds on a presentation in the BIS publication "*Things we know and don't know about the wider benefits of higher education: a review of the recent literature*" (BIS Research Paper 133, 2013)

<https://www.gov.uk/government/publications/wider-benefits-of-higher-education-literature-review>.

The core of the report is a table showing a two-way taxonomy of benefits, with individual/society as one dimension and market/non-market (or wider) benefits as the other. The table has been constructed as a simple and easily accessible presentation of what are broadly agreed and evidenced benefits of higher education participation. It does not attempt to present an exhaustive review of the evidence supporting each identified benefit. Rather it highlights a small number of clear findings for each – presenting quantitative results wherever possible – and some brief information about the studies from which they are derived. Links are provided to the original publication when it is available on the internet. However, it should be noted that some of the reports are available only on a fee-paying basis.

The report covers only benefits from HE participation, so that benefits arising from research exploitation, spin-off companies, export earnings through international student fees and spending, and other aspects of HE are not included.

Finally, for many of the benefits identified, the key supporting evidence points to a relationship between the level of education achieved and the scale of the benefit. In many cases, the impact of HE (or having a degree) is explicitly considered; in other cases the evidence may refer to "additional years of education". This report is focused on the benefits of HE, but in many cases the benefits can be demonstrated to exist as being linked to increasing levels of education and qualifications.

Causality and mechanisms

Most studies which are based on examination of administrative and other data sets are not able to demonstrate causality of HE (or other) factors. Rather they attempt to isolate the impact of HE through econometric and statistical modelling which try to account for changes in other factors. Similarly, studies on the wider benefits of HE often differentiate between effects which change behaviour directly and more indirect effects of learning which occur via other factors such as a graduate's income.

Direct effects might be achieved through a number of channels, including:

- Development of personal characteristics and skills;
- Social interactions; and
- Accreditation and signalling benefits.

Indirect effects, such as those obtained through a graduate wage premium, occur when the higher income achieved by the graduate changes the opportunities to which they have access – such as the neighbourhood in which they live, their consumption, their state welfare costs and housing quality.

A fuller exploration of direct and indirect benefits and the mechanism through which they (might) operate can be found in the *Supporting analysis for the Higher Education White Paper*, (BIS, 2011) which is available at:

<https://www.gov.uk/government/publications/supporting-evidence-for-the-higher-education-white-paper-2011>

Individual and societal level benefits

Clearly there can be close links between individual and societal level benefits: the greater propensity for an individual to trust and tolerate others can lead to higher levels of trust and social cohesion at a societal level. Similarly, it can be argued that there is not clear dividing line between market and non-market benefits. For instance the Sutton Trust have attempted to cost a market value for social mobility (see *The Mobility Manifesto*, Sutton Trust, 2010). Therefore, some benefits or validating studies could feature in more than one quadrant of the diagram.

Development of the diagram

The current report and diagram should be considered only as a ‘first draft’.
While we hope that most of the main benefits and key studies have been identified and presented, we recognise that others may have a different conceptualisation of the benefits or may feel that they have important powerful evidence which has not been included. We also recognise that the evidence base is not static and that new studies may appear at any time.

Therefore, we would welcome comments on and additions to the evidence base presented. We would like the Quadrants table to become a living document, providing clear and easy access to documentation of the range benefits of HE and key sources of evidence. We intend to produce an updated version of the Quadrants in early 2014 – probably as an interactive web-page rather than a research report.

Please send any comments on the report to:

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The Quadrants

The market and wider benefits of higher education to individuals and society

		SOCIETY		
NON-MARKET		<ul style="list-style-type: none"> • Greater social cohesion, trust and tolerance • Less crime • Political stability • Greater social mobility • Greater social capital 	<ul style="list-style-type: none"> • Increased tax revenues • Faster economic growth • Greater innovation and labour market flexibility • Increased productivity of co-workers • Reduced burden on public finances from co-ordination between policy areas such as health and crime prevention 	MARKET
		INDIVIDUAL		
		<ul style="list-style-type: none"> • Greater propensity to vote • Greater propensity to volunteer • Greater propensity to trust and tolerate others • Lower propensity to commit (non-violent) crime • Better educational parenting • Longer life expectancy • Less likely to smoke • Less likely to drink excessively • Less likely to be obese • More likely to engage in preventative care • Better mental health • Greater life satisfaction • Better general health 	<ul style="list-style-type: none"> • Higher earnings • Less exposure to unemployment • Increased employability and skills development • Increased entrepreneurial activity and productivity 	

How to use the Quadrant Diagram

In order to access the key evidence underpinning a particular benefit, hover on the name of the benefit in the table, hold the CTRL key and right click the mouse. You will be taken through to the relevant key statements and evidence. To return to the table, hover over the “Back to table” flag, hold the CTRL key and right click the mouse.

Wider (Non-Market) Benefits to Society

This section presents information about the **wider or non-market benefits** of higher education participation **for society**. It can be difficult to distinguish between benefits which arise for individuals – such as increase in an individual's level of trust in others – and the effect that collectively has for wider society. Therefore, relevant evidence may exist at the individual or societal level. Rather than present the same studies and findings twice, we have generally located a study where it seemed to be most appropriate. Therefore, in using the quadrant diagram it may be sensible to look at similar individual benefits when considering societal benefits.

Greater social cohesion, trust and tolerance

- Reducing the gap between high and low levels of educational achievement has significant benefits for social cohesion.
- In general, more highly educated individuals are found to be more trusting and are more tolerant towards migrants than the poorly educated with consequent benefits to society as a whole.
- More highly educated people are more likely to hold positive views over migrants than those with lower levels of education, especially where income is more unequally distributed and in areas of religious diversity.
- Universities and colleges help to shape a regional environment that is open to new ideas and diversity

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Sources	key findings on social cohesion, trust and tolerance
See also results on tolerance for individuals.	
Green, A., Preston, J. and Sabates, R (2003). <i>Education, Equity and Social Cohesion: A Distributional Model</i> Centre for Research on the Wider Benefits	<ul style="list-style-type: none">• <i>This report shows that the smaller the gap between high and low levels of educational achievement the larger the benefits for social cohesion.</i> <p>It identifies a significant linear negative correlation (of -0.765) between education inequality and scores on societal cohesion. An increase of 0.1 on the education inequality index will decrease the social cohesion index by -0.583 units.</p> <p>No significant relation was found between mean levels of education and societal cohesion.</p>

Sources	key findings on social cohesion, trust and tolerance
of Learning http://www.learningbenefits.net/Publications/ResRepIntro/ResRep7intro.htm	
Borgonovi, F. (2012). <i>The relationship between education and levels of trust and tolerance in Europe</i> The British Journal of Sociology, 03/2012, Volume 63, Issue 1, pp. 146 - 167 http://onlinelibrary.wiley.com/doi/10.1111/j.1468-4446.2011.01397.x/abstract	<ul style="list-style-type: none"> <i>This European study finds that overall, more highly educated individuals are generally more trusting and are more tolerant towards migrants than the poorly educated with consequent benefits to society as a whole.</i> <p>The association between education and levels of trust grows stronger when income is more unequally distributed and in the presence of greater religious diversity; but as income inequality rises, the education gap in tolerance levels decreases. The education gap in tolerance levels is smaller in countries with a higher share of foreign born individuals. But as religious diversity increases, the education gap in tolerance levels gets more important: the better educated are significantly more likely to hold positive views over migrants than those with lower levels of education.</p>
Florida, R., Gates, G., Knudsen, B. & Stolarick, K., (2006) <i>The university and the creative economy</i> http://creativeclass.com/rfcgdb/articles/Universityandthe_Creative_Economy.pdf	<ul style="list-style-type: none"> <i>Universities and colleges help to shape a regional environment that is open to new ideas and diversity.</i> <p>This US study found that universities attract students and faculty from a wide range of social and ethnic backgrounds that are open to new ideas, cultivate freedom of expression and are accepting of differences, eccentricity and diversity.</p>

Less crime

- Crime reduction has a large economic benefit and social benefit in improving well-being and quality of life in wider society. The evidence is clear on the links between improving levels of education and corresponding reductions in crime, however the evidence regarding higher education, as opposed to school level education, is limited
- It's estimated that a 16 percentage point increase in those educated to degree level could lead to more than £1bn annual savings in reduced crime costs in the UK
- Evidence from the US suggests that externalities from crime reduction are worth around 14-26% of the private return to schooling.

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Sources	Key findings on crime
See also results on crime for individuals.	
Feinstein L., Budge, D., Vorhaus, J. and Duckworth, K. (eds) 2008 <i>The social and personal benefits of learning: A summary of key research findings</i> Centre for Research on the Wider Benefits of Learning website http://www.learningbenefits.net/Publications/FlagshipPubs/Final%20WBL%20Synthesis%20Report.pdf	<ul style="list-style-type: none">• <i>It has been estimated that this a 16 percentage point increase in those educated to degree level could lead to more than £1bn annual savings in reduced crime costs in the UK</i> <p>Based on Feinstein's 2002 attempt to quantify the social benefits that improved levels of learning have on crime. Found that a 16 percentage point increase in the proportion of the population with degrees would</p> <ul style="list-style-type: none">- increase the 25th percentile of the wage distribution by 10%- reduce total property crime by 0.8 percentage points, and- produce £1.3 billion of savings in wider benefits at the lower estimate.
Lochner, L., and Moretti, E. (2004) <i>The effect of education on crime:</i>	<ul style="list-style-type: none">• <i>Evidence from the US suggests that externalities from crime reduction are worth around 14-26% of the private return to schooling.</i> <p>This report finds school education has a causal,</p>

Sources	Key findings on crime
<p>evidence from prison inmates, arrests and self-reports</p> <p><i>NBER Working Paper 8605</i> http://www.nber.org/papers/w8605.pdf</p>	<p>negative effect on crime.</p> <p>Estimates suggest that completing high school reduces the probability of incarceration by about .76 percentage points for whites and 3.4 percentage points for blacks.</p> <p>A significant part of the social return to education comes in the form of externalities from crime reduction. The authors estimate that the value of the externality effects to be around 14-26% of the private return to schooling.</p>

Political stability

- Levels of higher education participation can have positive knock on effects in terms of civic participation and for the functioning of political society.
- Graduates are more likely to vote and participate in public debates and gaining a degree appears to be a powerful antidote to political cynicism.
- Higher education is found to be the largest single determinant of a democratisation within OECD countries

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Sources	Key findings on political stability
Also see findings on voting and civic participation for individuals.	
<p>Bynner et al (2003) <i>Revisiting the benefits of higher education</i></p> <p><i>Bedford Group for Lifecourse and Statistical Studies, Institute of Education, University of London</i> http://dera.ioe.ac.uk/5167/1/rd05_03.pdf</p>	<ul style="list-style-type: none">• <i>Graduates are more likely to vote and participate in public debates and gaining a degree appears to be a powerful antidote to political cynicism.</i> <p>Gaining a degree appears to be a powerful antidote to political cynicism – analysis of British cohort studies shows that HE appears to place a powerful brake on levels of cynicism amongst those in their early thirties and forties.</p>
<p>Keller. K., (2006) <i>Investment in Primary, Secondary, and Higher Education and the Effects on Economic Growth</i></p> <p><i>Contemporary Economic Policy</i> Volume 24, Issue 1, pp 18–34, Jan 2006 http://onlinelibrary.wiley.com/doi/10.1093/cep/byj012/full</p>	<ul style="list-style-type: none">• <i>Higher education is found to be the largest single determinant of a democratisation within OECD countries</i> <p>By comparing high-income and developing countries, some studies find that primary and secondary education are most important for growth and democratisation in developing countries (for example, Keller 2006).</p> <p>Keller's study found Higher Education to be the largest single determinant of a countries democratisation, (although the direction of causality has been subject to debate).</p>

Greater social mobility

There is evidence that increasing overall levels of education do not necessarily lead to increasing levels of overall social mobility. It is argued that the mechanism through which education influences social mobility is by conferring an advantage to an individual based on their level of qualification relative to others – so that equity in access to education and closing the attainment gap are important in increasing social mobility.

- Controlling for other factors, if a mother's highest educational qualification was a university degree, the likelihood of her child obtaining a degree was 67% compared to only 12% if her highest qualification was an O level.
- The growing imbalance in access to HE has driven the decline in intergenerational mobility (between the 1958 and 1970 birth cohorts)
- There are higher percentage returns to HE for men from lower NS-SEC and low income backgrounds.

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Sources	Key findings on social mobility
<p>Ermisch, J. (1999) 'Family Matters' DP1591, CEPR, Institute for Social and Economic Research, University of Essex http://ideas.repec.org/p/cpr/ceprdp/1591.html</p>	<ul style="list-style-type: none">• <i>Controlling for other factors, if a mother's highest educational qualification was a university degree, the likelihood of her child obtaining a degree was 67% compared to only 12% if her highest qualification was an O level</i> <p>The data is derived from the first five years (1991–5) of the British Household Panel Study.</p>
<p>Blanden, J., Gregg, P. & MacMillan, L., 2010 <i>Intergenerational persistence in income and social class: the impact of within-group inequality</i> CMPO Working Paper 10/230 http://www.bristol.ac.uk/cmpo/publications/papers/2010/wp230.pdf</p>	<p>This study calculated that around 20% of persistence (the extent to which a child 'inherits' the same class/income status of their parents) is accounted for by post-16 qualifications, with degrees accounting for about half of this.</p> <ul style="list-style-type: none">• It concluded that <i>the growing imbalance [between the 1958 and 1970 cohorts] in access to HE by family background ... is driving the decline in intergenerational mobility in the UK [between those years]</i>.

Sources	Key findings on social mobility
<p>Dearden, L., McGranahan, L. & Sianesi, B. (2004) Returns to education for the marginal learner: evidence from BCS70 http://ideas.repec.org/p/cap/ceedps/0045.html</p>	<ul style="list-style-type: none"> • <i>Higher returns for people from lower NS-SEC and lower income backgrounds.</i> <p>Sizeable average wage returns to HE vs. Level 2 (15% men, 22% women) and, although in absolute terms students from lower NS-SEC earn less:</p> <p>For men, substantially higher returns for more disadvantaged groups:</p> <ul style="list-style-type: none"> - Lower NS-SEC (20% vs. 9-11%) - Low income families (23-24% vs. 9-12%) <p>For women, no difference by disadvantage ... but higher returns for all</p>

Greater social capital

- Educated individuals are more likely to interact in social networks, as highlighted through the evidence on participation in voluntary and charitable organisation and participation in local government
- A lively population of students provides role models for local young people, and makes for safer streets and a more diverse community

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Sources	Key findings on social capital
<p>Feinstein L., Budge, D., Vorhaus, J. and Duckworth, K. (eds) 2008</p> <p><i>The social and personal benefits of learning: A summary of key research findings</i></p> <p>http://www.learningbenefits.net/Publications/FlagshipPubs/Final%20WBL%20Synthesis%20Report.pdf</p>	<ul style="list-style-type: none">• <i>Educated individuals are more likely to interact in social networks, as highlighted through the evidence on participation in voluntary and charitable organisation and participation in local government</i> <p>The summary of evidence shows that not only does improved social capital through engaging in public life and participation in social networks build social capital but the ability to draw upon social resources can, in turn, contribute to resilience, leading to better psychological and physical health outcomes</p>
<p>Munro, M. et al., University of Glasgow (2010)</p> <p><i>Students as catalysts for city and regional growth.</i></p> <p>http://ewds.strath.ac.uk/Portals/8/ImpactReport_no4.pdf</p> <p>Part of the ESRC Impact of HEIs on Regional Economies Joint Research Initiative</p> <p>http://www.impcat-hei.ac.uk</p>	<ul style="list-style-type: none">• <i>A lively population of students provides role models for local young people, and makes for safer streets and a more diverse community</i> <p>The study looked at the situation in Nottingham, Sunderland, Cardiff, Glasgow and Belfast to provide in-depth understanding of the ways in which students affect the labour market and residential neighbourhoods of their host cities. In particular the study explored impacts on local labour market, wider businesses, student neighbourhoods and relationships with local service providers.</p>

Wider (Non-Market) Benefits to Individuals

This section presents information about the **wider or non-market benefits** of higher education participation **for individuals**. As noted in the previous section, many of these individual level benefits can be seen to have an impact for the wider society. Generally studies have tended to focus on individual level benefits and particularly in the area of health. Therefore, particularly on health issues, the report has tried to present the most recent or powerful studies.

More likely to vote

- Graduates are more likely to vote – 61% of adults without A-level education (or equivalent) vote in UK elections but the figure rises to 81% among those with a degree.
- Especially younger graduates – In the UK, the gap in voting rates between adults with high and low levels of education is nearly 14 percentage points rising to 32 percentage points amongst those aged 25-34.
- Findings from the US found that a college education was associated with up to a 22 percentage point increase in the likelihood of voter participation.

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Sources	Key findings on voting behaviour
OECD 2011 <i>Education at a Glance 2011: OECD Indicators</i> http://www.oecd-ilibrary.org/education/education-at-a-glance-2011_eag-2011_en;jsessionid=1ucfhfiwdqnpd.x-oecd-live-01	<ul style="list-style-type: none">• <i>Graduates are more likely to vote – 61% of adults without A-level education (or equivalent) vote in UK elections but the figure rises to 81% among those with a degree.</i> <p>Across OECD, educational attainment is generally positively associated with electoral participation and volunteering. With the exception of electoral participation in Korea, all surveyed countries show statistically significant and positive associations between education and electoral participation.</p> <p>In the UK, for example, only 61.2% of adults who have not attained an upper secondary education vote in national elections, but the figure rises to 81% among adults with a tertiary education.</p>
OECD 2012	<ul style="list-style-type: none">• <i>Especially younger graduates – In the UK, the gap in voting rates between adults with high and low levels of</i>

Sources	Key findings on voting behaviour
<p><i>Education at a Glance 2012: OECD Indicators</i></p> <p>http://www.oecd-ilibrary.org/education/education-at-a-glance-2012_eag-2012-en</p>	<p><i>education is nearly 14 percentage points rising to 32 percentage points amongst those aged 25-34.</i></p> <p>On average in OECD countries, the gap in the voting rate between adults with high and low levels of education (25-64 year-olds) is 14.8 percentage points; it rises to 26.8 percentage points among younger adults (25-34 year-olds).</p> <p>The equivalent figures for the UK are even more stark; the voting gap amongst adults (25-64 years) is 13.7 percentage points compared to 32.1 percentage points for younger adults (25-34 year olds).</p>
<p>Dee, T. (2004), <i>Are there civic returns to education?</i></p> <p><i>Journal of Public Economics</i> vol. 88 (9-10), pp.1697-1720</p> <p>http://www.sciencedirect.com/science/article/pii/S0047272703002068</p>	<ul style="list-style-type: none"> • <i>Findings from the US found that a college education was associated with up to a 22 percentage point increase in the likelihood of voter participation.</i> <p>The results suggest that educational attainment has large and statistically significant effects on subsequent voter participation (by approximately 17 to 22 percentage points) and support for free speech.</p> <p>The report also finds that additional schooling appears to increase the quality of civic knowledge as measured by the frequency of newspaper readership.</p>
<p>Milligana, K., Moretti, E., and Oreopoulos, P. (2004)</p> <p><i>Does education improve citizenship? Evidence from the United States and United Kingdom'</i></p> <p><i>Journal of Public Economics</i>, vol 88 (9), pp.1667-1695</p> <p>http://www.sciencedirect.com/science/article/pii/S0047272703002056</p>	<p>Regression analysis indicates that an extra year of schooling in the UK has a small but significant effect on probability of voting. In the UK, for registered voters who finished school at age 18 or later, the voting rate is 88%, against 87%, 83%, 85% and 88% for those who finished school at 17, 16, 15 and 14 respectively.</p> <p>Results based on secondary analysis of the British General Election Studies and the Eurobarometer studies (UK).</p>

More civic engagement and volunteering

- Analysis of the British Social Attitudes survey finds that graduates had more confidence in the functioning of the welfare state, are more positive on immigration and are more likely to think their participation in politics is worthwhile than those with lower levels of education .
- Graduates are more likely to volunteer – at age 42 graduates in the UK were one and a half times more likely to be members of a charitable organisation than those whose formal education ended with A levels.
- A US study shows that in 2006, 9% of graduates compared to 4% of non-graduates volunteer for charitable organizations or social welfare groups.
- An OECD study shows that some 17% of individuals volunteer in Europe, and each additional year of schooling is associated with an increase of 0.8 percentage points in the volunteering rates.

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Sources	Key findings on Civic Engagement
<p>Ogg, J. (2006). A Brief Profile of the New British Establishment</p> <p><i>The Political Quarterly, 06/2006, Volume 77, Issue s1, pp. 81 – 89</i> http://onlinelibrary.wiley.com/doi/10.1111/j.1467-923X.2006.00783.x/abstract</p>	<ul style="list-style-type: none">• <i>Analysis of the British Social Attitudes survey finds that graduates had more confidence in the functioning of the welfare state, are more positive on immigration and are more likely to think their participation in politics is worthwhile than those with lower levels of education</i> <p>A UK study based on the British Social Attitudes (BSA) survey found higher educated people had more confidence in the functioning of the welfare state, are more positive on immigration and are more likely to think their participation in politics is worthwhile than those with lower levels of education.</p>
<p>Bynner et al (2003) Revisiting the benefits of higher education</p> <p><i>Bedford Group for Lifecourse and Statistical Studies, Institute of Education, University of London</i> http://dera.ioe.ac.uk/5167/1/rd05_03.pdf</p>	<ul style="list-style-type: none">• <i>Graduates are more likely to volunteer – at age 42 graduates in the UK were one and a half times more likely to be members of a charitable organisation than those whose formal education ended with A levels.</i> <p>Analysis of cohorts born in 1958 and 1970 shows that at graduation were over one and a half times more likely to be members of a charitable organisation than those whose formal education ended with A levels.</p> <p>This research showed a ‘sleeper effect’ whereby the difference was greater at age 42 than it was for people in their early thirties.</p>

Sources	Key findings on Civic Engagement
<p>Brand, J. (2010). <i>Civic Returns to Higher Education: A note on heterogeneous effects</i></p> <p><i>Social Forces</i>, 12/2010, Volume 89, Issue 2, pp. 417 - 433 http://paa2010.princeton.edu/papers/100224</p>	<ul style="list-style-type: none"> A US study shows that in 2006, 9% of graduates compared to 4% of non-graduates volunteer for charitable organizations or social welfare groups. <p>This US study shows that on the whole, graduates are more likely than non-graduates to engage in civic activities (in 2006, about 13 per cent of college graduates compared to 5% of non-college graduates volunteer for civic, community, or youth groups; 9% of graduates compared to 4% of non-graduates volunteer for charitable organizations or social welfare groups).</p> <p>College completion has the largest impact on volunteering among individuals in groups that were statistically least likely to complete college. The effect of reduces as the propensity for college completion increases.</p>
<p>Borgonovi, F. and Miyamoto, K. (2010). <i>Education and civic and social engagement</i></p> <p><i>OECD, Improving Health and Social Cohesion through Education</i>, Chap 3, pp. 65-110 http://www.oecd.org/edu/ceri/improvinghealthandsocialcohesionthrougheducation.htm</p>	<ul style="list-style-type: none"> An OECD study shows that some 17% of individuals volunteer in Europe, and each additional year of schooling is associated with an increase of 0.8 percentage points in the volunteering rates. <p>Education can significantly raise the level of civic and social engagement (through cognitive, socio-emotional skills, school norms, ethos and an open classroom climate).</p> <p>This study reports cross-country variations in the indicators of civic and social engagement across OECD countries, and shows that individuals' education explains a sizeable portion of cross-country variations, accounting for: 14% of cross-country variations in volunteering rates, 21% of variations in the level of political interest and 8% of variations in the level of interpersonal trust.</p> <p>Some 17% of individuals volunteer in Europe, and each additional year of schooling is associated with an increase of 0.8 percentage points in the volunteering rates.</p> <p>This report also shows that Each additional year of higher education in Europe has a marginal positive effect of 15% on political interest (against 12% for lower to upper secondary education) and of 2% on party membership (against 1.5% for lower to upper secondary education).</p>

Higher levels of trust and tolerance

- Graduates on the whole have higher racial tolerance which persists over time – analysis of British cohort studies finds a 28% increase in the measure of racial tolerance amongst graduates (compared to those educated to A level) at age 33 which rose to a difference of 34% at age 42.
- An OECD study showed that higher levels of education impacted positively on various citizenship dimensions, but especially in terms of positive attitudes towards immigration. The marginal effect of higher education on holding a positive valuation was a 41% (against 18% for secondary education).

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Sources	Key findings
<p>Bynner, J. et al (2003) <i>Revisiting the benefits of higher education'</i> Report by the Bedford Group for Lifecourse and Statistical Studies, Institute of Education http://dera.ioe.ac.uk/5167/1/rd05_03.pdf</p>	<ul style="list-style-type: none">• <i>Graduates on the whole have higher racial tolerance which persists over time –analysis of British cohort studies finds a 28% increase in the measure of racial tolerance amongst graduates (compared to those educated to A level) at age 33 which rose to a difference of 34% at age 42.</i> <p>The positive effects of higher education on racial tolerance are clear and appear to be maintained over the course of respondents' lifetime and in different age cohorts.</p> <p>Results on racial tolerance are provided by level of highest qualification, controlling for other factors, for two cohorts born in 1958 and 1970. Measures by scores compiled from Likert survey questions, show that higher qualification levels are associated with more positive attitudes towards people from other races.</p> <p>There is a relatively small difference between individuals educated below A levels and with A level or equivalent, but sub-degrees are associated with a higher tolerance score and degree graduates having the highest scores. Tolerance scores are higher at all levels for the 1970 cohort.</p>
<p>Borgonovi, F. and Miyamoto, K. (2010). <i>Education and civic and social engagement</i> OECD, <i>Improving</i></p>	<ul style="list-style-type: none">• <i>An OECD study showed that higher levels of education impacted positively on various citizenship dimensions, but especially in terms of positive attitudes towards immigration. The marginal effect of higher education on holding a positive valuation was a 41% (against 18% for secondary education).</i>

Sources	Key findings
<p><i>Health and Social Cohesion through Education, pp. 65-110</i></p> <p>http://www.oecd.org/edu/ceri/improvinghealthandsocialcohesionthrougheducation.htm</p>	<p>This study of European countries estimates that each extra year of schooling accounts for an increase in the level of interpersonal trust by 3.1%.</p> <p>It shows that HE impacts (significantly) on interpersonal trust and tolerance, and the report provides a number of estimations on the marginal effect of having a degree:</p> <ul style="list-style-type: none"> - 17% on interpersonal trust (against 13.5% for lower to upper secondary education) - 36% on type of immigration i.e. the extent to which respondents welcome the arrival of different types of immigrants in their country (against 15% for lower to upper secondary education), - 41% on positive valuation of immigration (against 18% for lower to upper secondary education) <p>This result is comparable to other studies (e.g. Huang et al 2009 and Glaeser et al. 2000).</p>

Less likely to commit crime

- A number of studies found lower levels of crime amongst those with more education though statistical evidence specific to higher education is more limited.
- There are significant differences in the conviction rates for most offences including (at decreasing rates), burglary, theft, criminal damage and drug-related offences as average levels of education rises. No difference was found for violent crime.

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Source	Key findings on propensity to commit crime
<p>Sabates, R (2007) <i>Educational Attainment and Juvenile Crime: Area-Level Evidence Using Three Cohorts of Young People</i></p> <p><i>British Journal of Criminology, 12/2007, Volume 48, Issue 3, pp. 395 - 409</i></p> <p>http://bjc.oxfordjournals.org/content/48/3/395</p>	<ul style="list-style-type: none"> • <i>There are significant differences in the conviction rates for most offences including (at decreasing rates), burglary, theft, criminal damage and drug-related offences as average levels of education rises. No difference was found for violent crime.</i> <p>Uses aggregate conviction rates over time for three cohorts born between 1981 and 1983, and their corresponding educational attainments. Results show that the increase in educational attainment between cohorts is associated with reductions in conviction rates for most offences.</p> <ul style="list-style-type: none"> - 1.06 fewer total conviction rates per 1,000 students (-0.106%). - 0.59 fewer convictions per 1,000 students for theft (-0.059%) - 0.04 fewer convictions per 1,000 students for burglary (-0.004%) - 0.04 fewer convictions per 1,000 students the case of vandalism and drug-related convictions <p>No significant statistical association with violent crime rates (which is more linked to poverty factors according to the author).</p>
<p>Feinstein, L. and R. Sabates (2005) <i>Education and youth crime: effects of introducing the Educational Maintenance</i></p>	<ul style="list-style-type: none"> • <i>A number of studies found lower levels of crime amongst those with more education though statistical evidence specific to higher education is more limited.</i> <p>This study for the Department for Education and Skills found male juvenile convictions for burglary per</p>

Source	Key findings on propensity to commit crime
<p>Allowance programme</p> <p><i>Wider Benefits of Learning Research Report 14, Institute of Education, University of London</i></p> <p>http://www.learningbenefits.net/Publications/ResReps/ResRep14.pdf</p>	<p>thousand population were between 1.1 and 1.5 lower in areas where policies were introduced to encourage teenagers to remain in school, compared to untreated areas.</p> <p>The introduction of the Reducing Burglary Initiative in conjunction with the EMA programme led to reductions in burglary rates relative to areas that did not introduce either of these policies.</p>

Better educational parenting

- Higher education has important consequences for social mobility not only by improving the life chances of the graduate but through improving outcomes for their children.
 - Graduates, adjusted for all other factors, are half as likely to see educational difficulties in their own children, compared with parents educated below A level.
 - Mothers' participation in post-compulsory education has small positive causal effects on the provision of an educationally stimulating environment for their children.

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Sources	Key findings on social mobility
<p>Bynner, J. and M. Egerton (2001) The Wider Benefits of HE <i>Report by HEFCE and the Smith Institute, HEFCE report 01/46</i> http://dera.ioe.ac.uk/5993/1/01_46_part1.pdf</p>	<ul style="list-style-type: none">• <i>Graduates, adjusted for all other factors, are half as likely to see educational difficulties in their own children, compared with parents educated below A-level.</i>
<p>Feinstein, L. and K. Duckworth (2006) Are there effects of mothers' post-16 education on the next generation? Effects on children's development and mothers' parenting', Wider Benefits of Learning Research Report 19, Institute of Education, University of London http://www.learningbenefits.net/Publications/ResReps/ResRep19.pdf</p>	<ul style="list-style-type: none">• <i>Mothers' participation in post-compulsory education has small positive causal effects on the provision of an educationally stimulating environment for their children.</i>

Longer life expectancy

- Evidence from OECD shows graduates can expect to live around 8 years longer than those with lower levels of education
- A US study found life expectancy increased by 0.6 years for every additional year of education
- Another US study found, controlling for other common characteristics, one year of college reduced the probability of death between age 32 and 46 for men by 4% (Grossman 1975).

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Source	Key findings on life expectancy
OECD 2012 <i>Education at a Glance 2012: OECD Indicators</i> http://www.oecd-ilibrary.org/education/education-at-a-glance-2012_eag-2012-en	<ul style="list-style-type: none">• Evidence from OECD shows graduates can expect to live around 8 years longer than those with lower levels of education. <p>Among 15 OECD countries (the UK is not included), on average a 30-year-old male graduate can expect to live another 51 years, whereas a 30-year old man with a low level of education (upper secondary education not completed) can expect to live an additional 43 years.</p> <p>Gender difference: male graduates can expect to live 8 years longer than a man without upper secondary education, while female graduates can expect to live 4 years longer than a woman without upper secondary education.</p>
Miyamoto, K. and Chevalier, A. <i>Education and health</i> <i>OECD, Improving Health and Social Cohesion through Education, chap.4, pp.111-180</i> http://www.oecd.org/edu/ceri/improvinghealthandsocialcohesionthrougheducation.htm	Educational expansion attainment affects positively the level of individuals' health including life expectancy and obesity. Findings specific to higher education show that 25 year-olds with tertiary education are expected to live longer than those without and correlations suggest a potentially important effect of tertiary education on obesity. For example, adults aged 25 in the US educated to degree level can expect to live a further 56.6 years compared to a further 49.6 years for 25 year olds without a degree.
Cutler, D.M. and A.	<ul style="list-style-type: none">• A US study found life expectancy increased by 0.6

Source	Key findings on life expectancy
<p>Lleras-Muney (2006) <i>Education and Health: Evaluating Theories and Evidence</i> <i>NBER Working Paper 12352</i> http://www.nber.org/papers/w12352.pdf?new_window=1</p>	<p><i>years for every additional year of education</i></p> <p>The data presented show that more educated people have a lower likelihood of having (and dying from) a range of chronic illnesses</p> <ul style="list-style-type: none"> - An additional four years of education lowers five-year mortality by 1.8 percentage points; - it also reduces the risk of heart disease by 2.16 percentage points, and the risk of diabetes by 1.3 percentage points. <p>Four more years of schooling lowers the probability of reporting oneself in fair or poor health by 6 percentage points and reduces lost days of work to sickness by 2.3 each year.</p>

Less likely to drink excessively

- Research from the Netherlands showed that those with lower level of qualification were 3 times more likely to start excessive **alcohol consumption** than those with a university degree

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Sources	Key findings on unhealthy behaviours
<p>Kuntsche, E., Rehm, J. and Gmel, G. (2004)</p> <p>Characteristics of binge drinkers in Europe</p> <p><i>Social science & medicine, 07/2004, Volume 59, Issue 1, pp. 113 – 127</i></p> <p>http://www.clinique-transculturelle.org/pdf/social_science_and_medicine_2004.pdf</p>	<ul style="list-style-type: none">• <i>Research from the Netherlands showed that those with lower level of qualification were 3 times more likely to start excessive alcohol consumption than those with a university degree</i> <p>Analysis of European countries surveyed by the European School Survey Project on Alcohol shows a strong association between low levels of education and heavy drinking.</p>

Less likely to smoke

- Graduates are less likely to **smoke** – non-graduates with A levels are 50-75% more likely to be a smoker at age 30
- A US study found that a year of college education reduced the prevalence of smoking by 4 percentage points (from 52% to 48%) and increased the probability of smoking cessation by 4.1 percentage points
- In the US the probability of **smoking during pregnancy** was found to be reduced by 5.8 percentage points with two years of college education

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Sources	Key findings on unhealthy behaviours
<p>Bynner, J. et al (2003) Revisiting the benefits of higher education <i>Report by the Bedford Group for Lifecourse and Statistical Studies, Institute of Education</i> http://dera.ioe.ac.uk/5167/1/rd05_03.pdf</p>	<ul style="list-style-type: none"> • <i>Graduates are less likely to smoke – non-graduates with A levels are 50-75% more likely to be a smoker at age 30</i> <p>Graduates were less likely to smoke and more likely to give up; however, the amount smoked appeared to differ little across the qualification levels</p>
<p>de Walque, D. (2004) Education, Information, and Smoking Decisions Evidence from Smoking Histories 1940-2000 <i>World Bank Policy Research Working Paper 3362, 07/2004, World Bank</i> http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2004/07/21/000112742_20040721180236/Rendered/PDF/wps3362.pdf</p>	<ul style="list-style-type: none"> • <i>A US study found that a year of college education reduced the prevalence of smoking by 4 percentage points (from 52% to 48%) and increased the probability of smoking cessation by 4.1 percentage points</i> <p>This paper analyzes smoking prevalence across education groups in the US States from 1940 to 2000 using retrospective smoking histories from National Health Interview Surveys conducted between 1978 and 2000.</p> <p>Concludes that the smoking prevalence among more educated individuals, college graduates in particular, declined earlier and most dramatically than any other education category.</p>

Sources	Key findings on unhealthy behaviours
<p>Currie, J. and Moretti, E. (2003) Mother's Education and the Intergenerational Transmission of Human Capital: Evidence from College Openings</p> <p><i>The Quarterly Journal of Economics</i>, 11/2003, Volume 118, Issue 4, pp. 1495 – 1532</p> <p>http://www.nber.org/papers/w9360</p>	<ul style="list-style-type: none"> • In the US the probability of smoking during pregnancy was found to be reduced by 5.8 percentage points with two years of college education

Less likely to be obese

- Graduates are less likely to be obese - on average their BMI is 3% lower than that of similar less educated individuals; 4% less likely to become obese.
- A study across OECD countries found better education to be associated with a lower likelihood of obesity, especially among women

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Sources	Key findings on obesity
<p>Cutler, D. and Lleras-Muney, A. (2010) <i>Understanding Differences in Health Behaviours by Education</i> <i>Journal of health economics, 01/2010, Volume 29, Issue 1, pp. 1 – 28</i> http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2824018/</p>	<ul style="list-style-type: none"> • <i>Graduates are 4% less likely to become obese.</i> <p>Controlling for age, gender, and parental background, better educated people are less likely to be obese , less likely to smoke, less likely to be heavy drinkers, more likely to drive safely and live in a safe house, and more likely to use preventive care.</p> <p>In the UK, those with A-level qualification are</p> <ul style="list-style-type: none"> - 12 % points less likely to be smokers than less educated individuals; - 4 % less likely to become obese (figures that can be decreased (smoking) or increased (obesity) by adding economic controls). -
<p>Wilberforce M, (2005) <i>Graduate Market Trends</i> <i>Higher Education Careers Services Unit website</i> ShowPage/Home_page/Labour_market_information/Graduate_Market_Trends/Beyond_the_financial_benefits_of_a_degree_Autumn_05/_p!eXeLcmm#The%20health%20benefits%20of%20a%20degree">http://ww2.prospects.ac.uk/cms>ShowPage/Home_page/Labour_market_information/Graduate_Market_Trends/Beyond_the_financial_benefits_of_a_degree_Autumn_05/_p!eXeLcmm#The%20health%20benefits%20of%20a%20degree</p>	<ul style="list-style-type: none"> • <i>On average graduates' BMI is 3% lower than that of similar less educated individuals</i> <p>Analysis based on the British cohort studies shows that Graduates' Body Mass Index (calculated by dividing weight in kilograms by height in metres, squared as reported by Bynner 2003) is 3 per cent lower than that of similar individuals educated to Level 2 or below</p>

Sources	Key findings on obesity
<p>Devaux, M et al. (2011)</p> <p><i>Exploring the Relationship Between Education and Obesity</i></p> <p><i>OECD Journal: Economic Studies, 12/2011, Volume 2011, Issue 1, pp. 1 - 40</i></p> <p>http://www.oecd.org/eco/growth/relationship%20education%20and%20obesity.pdf</p>	<ul style="list-style-type: none"> • A study across OECD countries found better education to be associated with a lower likelihood of obesity, especially among women <p>The authors suggest that the process by which the positive effect of education on obesity occurs is likely to be related to three factors:</p> <ul style="list-style-type: none"> - greater access to health-related information and improved ability to handle such information - clearer perception of the risks associated with lifestyle choices; and - improved self-control and consistency of preferences over time.

More likely to engage in preventative care

- US research indicates that attending college is associated with a 5-15% increase in the likelihood of using several types of preventative care (including cancer screening).

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Source	Key findings on healthy behaviours
<p>Fletcher, J. and Frisvold, D (2009)</p> <p><i>Higher Education and Health Investments: Does More Schooling Affect Preventive Health Care Use?</i></p> <p><i>Journal of Human Capital, 2009, vol. 3, no. 2, pp. 144-176</i></p> <p>http://userwww.service.emory.edu/~dfrisvo/Research/Preventive_Care.pdf</p> <p>(link to a copy of earlier draft from 2008)</p>	<ul style="list-style-type: none"> • <i>US research indicates that attending college is associated with a 5-15% increase in the likelihood of using several types of preventative care (including cancer screening).</i> <p>Assesses the effect of education on health by examining whether individuals who attended college were more likely to receive physical examinations, dental examinations, flu shots, and cholesterol tests in their 50s and 60s. The study controlled for health status in childhood.</p> <p>Results suggest that college attendance has a significant and consistent effect on health decisions later in life. Increases were found in each of our four measures of between 5 and 8 percentage points or approximately 10%.</p> <p>The authors consider the effects operated largely through the occupational pathways and access to better healthcare of college graduates.</p>
<p>Baum, S., Ma, J. and Payea, K. (2010)</p> <p><i>Education Pays 2010. The Benefits of Higher Education for Individuals and Society</i></p> <p><i>The College Board Advocacy & Policy Centre website</i></p> <p>http://advocacy.collegeboard.org/sites/default/files/Education_Pays_2010.pdf</p>	<p>This US report analysed data from National Center for Health Statistics (2008) and showed that 63% of college graduates (aged 25 to 34) reported vigorous exercise at least once a week while the equivalent figure for high school graduates was 37%.</p>

Better mental health

- Depression is less common for those with a degree compared to those with A levels as their highest qualification: graduates were around a third less likely to suffer depression at age 30
- The difference is especially strong amongst male graduates – there is a 55% difference in males rate of depression for those with a university degree above A levels. This figure is 35% among women
- Individuals with a degree appear to cope better with distress, even when controlled for factors such as social background.

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Sources	Key findings on mental health
<p>Bynner, J. et al (2003) <i>Revisiting the benefits of higher education</i> Report by the Bedford Group for Lifecourse and Statistical Studies, Institute of Education http://dera.ioe.ac.uk/5167/1/rd05_03.pdf</p>	<ul style="list-style-type: none">• <i>Depression is less common for those with a degree compared to those with A levels as their highest qualification: graduates were around a third less likely to suffer depression at age 30</i> <p>As measured by the ‘Malaise Inventory’ (Rutter et al 1970).</p>
<p>Feinstein L., Budge, D., Vorhaus, J. and Duckworth, K., eds. (2008) <i>The social and personal benefits of learning: A summary of key research findings</i> <i>Centre for Research on the Wider Benefits of Learning website</i> http://www.learningbenefits.net/Publications/FlagshipPubs/Final%20WBL%20Synthesis%20Report.pdf</p>	<ul style="list-style-type: none">• <i>The difference is especially strong amongst male graduates – there is a 55% difference in males rate of depression for those with a university degree above A levels. This figure is 35% among women.</i>

Sources	Key findings on mental health
<p>Mandemakers, J. and Monden, C. (2010)</p> <p><i>Does education buffer the impact of disability on psychological distress</i></p> <p><i>Social Science & Medicine, 2010, Volume 71, Issue 2, pp. 288 - 297</i></p> <p>http://arno.uvt.nl/show.cgi?f_id=113306</p>	<ul style="list-style-type: none"> • <i>Individuals with a degree appear to cope better with distress, even when controlled for factors such as social background</i> <p>Based analysis of the 1958 British National Child Development study. Finds that a higher educational level cushions the psychology impact of disability.</p> <p>The authors suggest that this arises in part because individuals with a higher level of education have more cognitive abilities, but the better social position of those with higher levels of education appears to be of greater importance.</p>

Greater life satisfaction

- An OECD wide study shows that graduates are more satisfied with life beyond the effect a degree has on income:
 - Figures for the UK showed that, in 2008, 77% of adults with tertiary education were satisfied with their life compared to 66% of adults with upper secondary education and 63% of those educated below this level.
- Higher levels of qualifications and continued formal and informal learning have been found to be associated with greater individual subjective well-being.

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Source	Key findings on life satisfaction
OECD 2011 <i>Education at a Glance 2011: OECD Indicators</i> http://www.oecd-ilibrary.org/education/education-at-a-glance-2011_eag-2011-en;jsessionid=1ucfhfiwdqnpd.x-oecd-live-01	<ul style="list-style-type: none">• <i>An OECD wide study shows that graduates are more satisfied with life beyond the effect a degree has on income:</i> There is a significant association for those with higher level of education (tertiary education attainment), even after accounting for age, gender and income. This suggests that higher education can contribute to life satisfaction beyond the impact it has on their earnings. This is true for many OECD countries. No statistically significant relationship between education and satisfaction with life for those with lower levels of education (upper secondary or below) once differences in income are taken into account. Figures for the UK showed that in 2008 77% of adults with tertiary education were satisfied with their life compared to 66% of adults with upper secondary education and 63% of those educated below this level.
ONS (2011) <i>Measuring National Well-being, Education and Skills</i> http://www.ons.gov.uk/ons/dcp171766_268091.pdf	<ul style="list-style-type: none">• <i>Higher levels of qualifications and continued formal and informal learning have been found to be associated with greater individual subjective well-being.</i> Data attached to the report shows that more highly educated people report being highly satisfied with their lives overall (81% for adults with NVQ3 level qualifications or above vs. 74% for NVQ2 level) and to report life to be more worthwhile (85% vs 79% respectively).

Better general health

- Graduates are between 70-80% more likely to report ‘excellent’ health, compared with a similar individual educated to level 2 or below

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Source	Key findings on leisure time
<p>Bynner, J. et al (2003) Revisiting the benefits of higher education' <i>Report by the Bedford Group for Lifecourse and Statistical Studies, Institute of Education</i> http://dera.ioe.ac.uk/5167/1/rd05_03.pdf</p>	<ul style="list-style-type: none">• <i>Graduates are between 70-80% more likely to report ‘excellent’ health, compared with a similar individual educated to level 2 or below</i> <p>Also shows consistent increases in self-reported general health as qualification levels increase.</p> <p>No differences between groups were found in the reporting of specific conditions such as asthma, bronchitis, cancer which might suggest the reported health amongst graduates reflects general feelings rather than an objective measure of health status</p>

Economic (Market) Benefits to Society

This section presents information about the **market benefits** of higher education participation for **society**. As for non-market benefits, it can be difficult to distinguish between benefits which arise for individuals – such as increased individual productivity – and the effect that collectively has for wider society. Therefore, relevant evidence may exist at the individual or societal level. Rather than present the same studies and findings twice, we have generally located a study where it seemed to be most appropriate. Therefore, in using the quadrant diagram it may be sensible to look at similar individual benefits when considering societal benefits.

Increased tax revenues

- The net working life benefits to the Exchequer as a result of individuals gaining a first degree compared to 2+ A levels are estimated to be of the order of:
 - Men - £260,000 for men
 - Women - £315,000 for women(These account for tax payments, student loan repayments, grants, etc., and are in today's value).
- The Exchequer rate of return was calculated as being 12.1% prior to the introduction of fees and loans in 2006. This fell to 11% following their introduction.

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Source	Key findings on tax revenues
Walker, I. & Zhu, Y., BIS (2013) <i>The impact of university degrees on the lifecycle of earnings: some further analyses</i> https://www.gov.uk/government/publications/university-degrees-impact-on-lifecycle-of-earnings	<ul style="list-style-type: none">• <i>The net working life benefits to the Exchequer as a result of individuals gaining a first degree compared to 2+ A levels are estimated to be of the order of:</i><ul style="list-style-type: none">• Men - £260,000 for men• Women - £315,000 for women <p>Predominantly using LFS data from 1993 to 2010, this study found larger net discounted graduate premia than earlier studies due to a number of methodological differences.</p>
PWC, UUK (2007) <i>The economic</i>	<ul style="list-style-type: none">• <i>The Exchequer rate of return was calculated as being 12.1% prior to the introduction of fees and loans in</i>

Source	Key findings on tax revenues
benefits of a degree http://www.universitiesuk.ac.uk/highereducation/Documents/2007/EconomicBenefitsDegree.pdf	<p>2006. This fell to 11% following their introduction.</p> <p>The study examined returns to HE qualifications by subject and level of HE qualification (from HNC/HND to postgraduate). It calculated rates of return for individuals (12.1% prior to the introduction of fees and loans and 13.2% after). It also calculated rates of return to the Exchequer – noting the fall in this rate since the 2006 changes involved a resource transfer from the Exchequer to the individual.</p>
London Economics, BIS (2011) <i>The returns to higher education qualifications</i> https://www.gov.uk/government/publications/higher-education-qualifications-returns-and-benefits	<ul style="list-style-type: none"> The mean gross Exchequer benefit associated with undergraduate degree level provision stands at approximately £100, 000 in present value terms. <p>The net Exchequer benefit associated with undergraduate degree level provision stands at £89,000 overall, with a net Exchequer benefit of £102,000 for men and £59,000 for women. The associated rate of return achieved by the Exchequer from funding these qualifications stands at 10.8% overall (11.4% for men and 9.6% for women).</p>

Faster economic growth

- Around 20% of UK economic growth between 1982 and 2005 came as a direct result of increased graduate skills accumulation.
- Once externalities are taken into account through econometric analysis, the report finds that a 1% increase in the share of the workforce with a university degree raises long-run productivity by between 0.2 and 0.5%.
- This implies that at least one third of the increase in UK labour productivity between 1994 and 2005 can be attributed to the rising number of people with a university degree over the time period.
- The impact of graduates on regional economies is greater than the expenditure impact of universities when considered on a comparable basis.

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Source	Key findings on economic growth
<p>Holland, D., Liadze, I., Rienzo, C. & Wilkinson, D., (NIESR), BIS (2013)</p> <p><i>The relationship between graduates and growth across countries</i></p> <p>https://www.gov.uk/government/publications/graduates-and-economic-growth-across-countries</p>	<ul style="list-style-type: none">• <i>Around 20% of UK economic growth between 1982 and 2005 came as a direct result of increased graduate skills accumulation. However, the growth accounting approach used to come to this result ignores the indirect benefits (externalities) of higher education.</i>• <i>Once externalities are taken into account through econometric analysis, the report finds that a 1% increase in the share of the workforce with a university degree raises long-run productivity by between 0.2 and 0.5%.</i>• <i>This implies that at least one third of the increase in UK labour productivity between 1994 and 2005 can be attributed to the rising number of people with a university degree over the time period.</i> <p>Previous evidence used by the Department to highlight the wider macroeconomic benefits of higher education (e.g. Gemmell (1996) in Supporting Analysis for the HE White Paper 2011) was out-of-date, covering the time period 1960-1985. This report updated the evidence base to cover the period 1982-2005.</p> <p>This report contains a comprehensive literature review which concludes that almost all studies find a positive and significant effect of human capital on growth. Previous evidence supports the assertion that graduate skills accumulation strengthens economic growth</p>

Source	Key findings on economic growth
	<p>prospects. To explore this relationship further, the study conducted rigorous econometric analysis on a recently-compiled dataset (EUKLEMS) covering fifteen advanced economies, including the UK, between 1982 and 2005.</p> <p>The UK is amongst the countries with the highest increase in GDP per employment hour and the highest annual average percentage change in the share of the workforce with a university degree between 1982 and 2005.</p>
<p>Hermannsson, K., et al., University of Strathclyde, (2010)</p> <p>Graduates significantly enhance productivity and economic activity in Scotland</p> <p>http://ewds.strath.ac.uk/Portals/8/Research%20Brief%202017.pdf</p> <p>Part of the ESRC Impact of HEIs on Regional Economies Joint Research Initiative</p> <p>http://www.impcat-hei.ac.uk</p>	<ul style="list-style-type: none"> <i>The impact of graduates on regional economies is greater than the expenditure impact of universities when considered on a comparable basis.</i> <p>Study measured the impact of HEIs on the Scottish economy through the enhanced productivity of Scottish graduates relative to non-graduates. It calculated the following:</p> <p>The maximum possible impact of combined HEI and student expenditure was 2.6% of GDP. The impact of graduate son the economy is projected to be 4.2% of GDP, assuming they earn 45% more than non-graduates, signalling effect explains 10% of the wage differential and education policy does not change.</p> <p>A key transmission mechanism is from improved regional competitiveness, which stimulates trade.</p>

Greater innovation and labour market flexibility

- Firms which are innovative have a higher proportion of their workforce with graduate level qualifications – amongst those firms who are innovative active, around 5% of the workforce are science graduates and a further 8% are graduates in other subjects, compared to only 1% and 3% respectively of firms which are not innovation active

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Source	Key findings on innovation and labour market flexibility
<p>UK Innovation Survey (2009) in Supporting analysis for the HE White Paper, BIS, 2011</p> <p>https://www.gov.uk/government/publications/supporting-evidence-for-the-higher-education-white-paper-2011</p>	<ul style="list-style-type: none"> Firms which are innovative have a higher proportion of their workforce with graduate level qualifications – amongst those firms who are innovative active, around 5% of the workforce are science graduates and a further 8% are graduates in other subjects, compared to only 1% and 3% respectively of firms which are not innovation active <p>By sector, firms in research and experimental development were found to have the greatest share of science graduates, while financial services and creative industries had the highest share of other graduates among the workforce.</p>
<p>Florida et al., 2006</p> <p><i>The university and the creative economy</i></p> <p>http://creativeclass.com/fcqdb/articles/University_andthe_Creative_Economy.pdf</p>	<p>There is a positive correlation between the number of students per capita in an area and measures of talent including the percentage of the population aged 25+ who hold degrees and the percentage of employees in creative occupations (eg management, business, legal and healthcare occupations) and in super-creative occupations (eg computing, engineering, arts design and media occupations)</p>

Increased productivity of co-workers

- A one percentage point increase in the proportion of the workforce with a degree, instead of A-levels or equivalent, is estimated to lead to a 0.5% increase in productivity
- Productivity in enterprises is estimated to be 30% higher if the entire workforce has a degree than if none do

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Source	Key findings on productivity of co-workers
Machin, S., Vignoles, A. & Galindo-Rueda, F., DfES (2003) Sectoral and Area Analysis of the Economic Effects of Qualifications and Basic Skills http://webarchive.nationalarchives.gov.uk/20130411151715/https://www.education.gov.uk/publications/RSG_arc_BasicSkills/Page2/RR465	<ul style="list-style-type: none"> • <i>A one percentage point increase in the proportion of the workforce with a degree, instead of A-levels or equivalent, is estimated to lead to a 0.5% increase in productivity</i> <p>This report aimed to determine whether the productivity effects of human capital, specifically academic and vocational qualifications, exceed the wage effects of such qualifications. The analysis needed to estimate industry level production functions which incorporate measures of educational achievement, in a panel/longitudinal framework. This was analysed at two levels, looking at an industry level panel and at a region by industry panel.</p>
Haskel, J. & Galindo-Rueda, F. (2005) Skills, Workforce Characteristics and Firm-level Productivity in England http://ftp.iza.org/dp1542.pdf	<ul style="list-style-type: none"> • <i>Productivity in enterprises is estimated to be 30% higher if the entire workforce has a degree than if none do</i> <p>Study using firm-level data set with matched productivity and qualification data by linking the Annual Business Inquiry and Employer Skills Survey for England. Examines the effect of workplace skills and other characteristics such as part-time status and gender on both productivity and wages in English firms. Also investigates how productivity-implied returns to worker characteristics compare with wage-implied returns. Finds that firms with a higher share of college-educated, full-time and male workers also tend to be more productive, with considerable variations across sectors. Also studies the effect of local skills on productivity controlling for skills at the firm, finding a positive and</p>

Source	Key findings on productivity of co-workers
	robust association.
Moretti, E. (2004) <i>Estimating the social return to higher education: evidence from longitudinal and repeated cross sectional data</i> http://emlab.berkeley.edu/~moretti/socret.pdf	<p>This study estimated the social return to HE based on data from the United States and found that a percentage point increase in the supply of college graduates increases the wages of high school drop-outs by 1.9%, high school graduates' wages by 1.6%, and college graduates wages by 0.4%.</p>

Reduced burden on public finances from better co-ordination with other social policy areas such as health and crime prevention

- A number of studies have indicated that the non-labour market effects and social externalities (including reduced state non-HE expenditure) is equivalent to average graduate premium

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Sources	Key findings on reduced burden on public finances
	<p>A number of studies have attempted to provide a quantitative estimate of the scale of the impact of HE on society – and in a few cases attempts have been made to ‘monetise’ these impact. While most authors acknowledge the difficulty in calculating these estimates, the results below exhibit remarkable consistency indicating that the non-labour market effects that economists have attempted to quantify may be equivalent in scale to the size of calculations on wage returns.</p>
Haveman, R. and Wolfe, B. (1984) <i>Schooling and economic well-being: the role of non-market effects</i> http://www.terry.uga.edu/~mustard/courses/e4250/R-Haveman-Wolfe.pdf	<p>Haveman and Wolfe’s (1984) analysis concludes that a conservative estimate of the value of non-labour market effects of education to be "of the same order of magnitude as estimates of the annual marketed, earnings-based effects of one more year of schooling" (pp. 400-401). The authors maintain the same conclusion in subsequent papers.</p>
Grossman, M. (2006) <i>Education and non-market outcomes</i> in Hanushek, E. and Welch, F. eds., <i>Handbook of the Economics of Education</i> . Amsterdam: North Holland, pp 576-633	<p>Similarly, Grossman (2006) estimates that all of the health-related impacts of higher education, including own health, effects on child health, spousal health and longevity are collectively worth around 100% of the average increment to earnings in the United States.</p>
McMahon, W.W. (2009) <i>Higher Learning, Greater Good: the</i>	<p>Concluded that the non-market private benefits (including own health, longevity, child cognitive development) and social externalities (including democracy, attitudes and reduced state expenditure on</p>

Sources	Key findings on reduced burden on public finances
<p><i>private and social benefits of higher education</i> Oxford University Press, Oxford</p>	<p>heath) amounted to more than the average graduate wage premium.</p> <p>Note that McMahon wrote an article in THES (No. 1975, 2010) which proposed estimates of the annual returns of a graduate to society which included costing many of the items in this quadrant diagram including: democracy, human rights, political stability, life expectancy, poverty reduction, reduced inequality, public welfare costs, sustainability, social capital and new ideas and adoption of R&D.</p>
<p>Lochner, L. and Moretti, E. (2004) <i>The effect of education on crime: Evidence from prison inmates, arrests and self-reports</i> American Economic Review vol. 94(1), pp. 155-189 http://www.nber.org/papers/w8605.pdf</p>	<p>Estimate that the externality of education is about 14-26% of the private return to schooling, suggesting that a significant part of the social return to education comes in the form of externalities from crime reduction.</p>

Economic (Market) Benefits to Individuals

This section presents information about the **market benefits** of higher education participation **for individuals**. As noted in the previous section, many of these individual level benefits can be seen to have an impact for the wider society. Many studies have focused on the earnings benefits for individuals – though these are clearly linked to issues such as likelihood of employment and productivity.

Higher earnings

- Over their working life, the average graduate will earn comfortably over £100,000 more in today's valuation, net of tax, than a similar individual with 2 or more A-levels who does not continue into higher education.
- The most recent study (Walker & Zhu, 2013) estimates the following:
 - Men - £168,000
 - Women - £252,000
- Initial graduate salaries tend to benefit from substantial pay rises.
- Higher returns for people from lower NS-SEC and lower income backgrounds.

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Source	Key findings on higher earnings
Walker & Zhu, BIS (2013) <i>The impact of university degrees on the lifecycle of earnings: some further analyses</i> https://www.gov.uk/government/publications/university-degrees-impact-on-lifecycle-of-earnings	<ul style="list-style-type: none">• <i>Estimated the following lifetime premium for men and women, as follows:</i><ul style="list-style-type: none">• Men - £168,000• Women - £252,000 <p>Predominantly using LFS data from 1993 to 2010, this study found larger net discounted graduate premia than earlier studies due to a number of methodological differences, e.g. assumptions around wage growth and different earnings profile simulation methodology. Looking at different cohorts of graduates, the study finds no significant differences in earnings differentials associated with the expansion of HE, implying that the graduate premium has persisted.</p>
London Economics, BIS (2011)	Estimated the graduate premium (in net discounted terms) to be £125,000 ignoring tuition fees, and

Source	Key findings on higher earnings
<p>The returns to higher education qualifications</p> <p>https://www.gov.uk/government/publications/higher-education-qualifications-returns-and-benefits</p>	<p>£108,000 when taking the £3,000 fees into account. Updating to reflect the change to a £6,000-£9,000 system, internal analysis found that this did not greatly diminish the premium (the main qualification attainment costs are foregone earnings).</p>
<p>PWC, UUK (2007)</p> <p>The economic benefits of a degree</p> <p>http://www.universitiesuk.ac.uk/highereducation/Documents/2007/EconomicBenefitsDegree.pdf</p>	<p>Shortly after the introduction of £3,000 top-up fees, this study found that there was no erosion of the financial benefit of a degree despite a large increase in the supply of graduates in the previous 15 years. Looking at LFS 2000-2005, the authors estimated a gross earnings premium which they specified is broadly equivalent to a £120,000 net premium.</p> <p>The study also explored differences in premium by subject, reporting a range from £35K for arts and £52K for humanities through to £340K for medicine and dentistry.</p>
<p>PWC, Royal Society of Chemistry/Institute of Physics (2005)</p> <p>The economic benefits of higher education qualifications</p> <p>http://www.rsc.org/ScienceAndTechnology/Policy/EducationPolicy/EconomicBenefitsofHE.asp</p>	<p>Estimate of average premium - £129,000. Similar methodology to O'Leary and Sloane, covering LFS 2000-2004. This study (conducted for the Royal Society of Chemistry and Institute of Physics) also differentiated by subject studied, finding that the value of chemistry/physics degrees was between £185,000 and £190,000.</p>
<p>O'Leary & Sloane (2005)</p> <p>The returns to a university education in Great Britain</p> <p>National Institute Economic Review, July 2005, 93.1, 75-89</p>	<p>Estimate of average premium:</p> <p>Men - £142,000</p> <p>Women - £158,000</p> <p>Using the LFS (1994-2002), compared the net discounted lifetime earnings of graduates to those of 2+ A-level holders, controlling for other factors.</p>

Source	Key findings on higher earnings
<p>HESA Destination of Leavers from Higher Education: Longitudinal Survey 2006/07</p>	<ul style="list-style-type: none"> <i>Graduate salaries tend to benefit from substantial pay rises.</i> <p>The median salary of first degree graduates (full time) in the 2006/07 cohort increased by 26% from £19,000 six months after graduating to £24,400 3.5 years after graduating This compares with an increase in average earnings across the whole economy of around 6.3% over the same period.</p>
<p>Dearden, L., McGranahan, L. & Sianesi, B. (2004)</p> <p>Returns to education for the marginal learner: evidence from BCS70</p> <p>http://ideas.repec.org/p/cap/ceedps/0045.html</p>	<ul style="list-style-type: none"> <i>Higher returns for people from lower NS-SEC and lower income backgrounds.</i> <p>Sizeable average wage returns to HE vs. Level 2 (15% men, 22% women) and, although in absolute terms students from lower NS-SEC earn less:</p> <p>For men, substantially higher returns for more disadvantaged groups:</p> <ul style="list-style-type: none"> - Lower NS-SEC (20% vs. 9-11%) - Low income families (23-24% vs. 9-12%) <p>For women, no difference by disadvantage ... but higher returns for all</p>

Less exposure to unemployment

- An undergraduate degree increases the probability of being employed by 3.3ppt; women receive a 4.2 ppt boost, for men the increase is 2.1ppt
- Male and female graduates have steeper age-employment profiles than their non-graduate counterparts
- LFS analyses consistently show much higher employment rates for 18-30 year old first degree graduates than for 18-30 years olds with highest qualification at L3 or below

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Source	Key findings on higher earnings
London Economics, BIS (2011) <i>The returns to higher education qualifications</i> https://www.gov.uk/government/publications/higher-education-qualifications-returns-and-benefits	<ul style="list-style-type: none"> • <i>An undergraduate degree increases the probability of being employed by 3.3ppt; women receive a 4.2 ppt boost, for men the increase is 2.1ppt</i> <p>This research establishes the impact of higher education qualifications on earnings and employment outcomes (for men and women separately). It considers the returns associated with undergraduate degrees by grade of degree, subject of study and single subject versus combined degrees. It also covers the returns associated with postgraduate degree level qualifications and other sub-degree level qualifications.</p>
Walker & Zhu, BIS (2013) <i>The impact of university degrees on the lifecycle of earnings: some further analyses</i> https://www.gov.uk/government/publications/university-degrees-impact-on-lifecycle-of-earnings	<ul style="list-style-type: none"> • <i>Male and female graduates have steeper age-employment profiles than their non-graduate counterparts</i> <p>Predominantly using LFS data from 1993 to 2010, this study found larger net discounted graduate premia than earlier studies due to a number of methodological differences, e.g. assumptions around wage growth and different earnings profile simulation methodology.</p>
BIS Internal Analysis (2013) <i>LFS, Q1 2013</i>	<ul style="list-style-type: none"> • <i>LFS Q1 2013 showed that over 86% of all young first degree (18-30 year old) graduates were employed, compared to around 60% of 18-30 year olds with highest qualification at L3 or below</i>

Increased employability and skills development

- Employers value graduates because they:
 - Challenge how things are done and come at things from a different perspective
 - Use their initiative and act without waiting for instruction
 - Problem solving and flexibility
 - Assimilate knowledge quickly and bring new ideas and energy

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Source	Key findings on employability
<p>Hogarth, T. et al., DfES (2007) <i>Employer and University Engagement in the Use and Development of Graduate Level Skills</i> http://aces.shu.ac.uk/employability/resources/rr83_5a.pdf</p>	<ul style="list-style-type: none">• <i>Employers value graduates because they:</i><ul style="list-style-type: none">- <i>Challenge how things are done and come at things from a different perspective</i>- <i>Use their initiative and act without waiting for instruction</i>- <i>Problem solving and flexibility</i>- <i>Assimilate knowledge quickly and bring new ideas and energy</i> <p>Study explored employer engagement with universities – noting differences between large and small employers. Case study work identified common features that employers valued in graduates.</p>
<p>Bynner, J. and Egerton, M. (2001) The Wider Benefits of HE Report by HEFCE and the Smith Institute, HEFCE report 01/46 http://dera.ioe.ac.uk/5993/1/01_46_part1.pdf</p>	<p>Graduates of both sexes reported more skill improvement over the past ten years than people with lower qualifications. The effects were particularly marked for mature graduates in verbal, computing and caring skills</p>

Increased entrepreneurial activity and productivity

- Individuals with higher levels of education have higher levels of entrepreneurial activity
- The productivity gain of education and training is around twice of the increase in wages.

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Source	Key findings on innovation and productivity
<p>Bloom, D., Hartley, M. and Rosovsky, R. (2006)</p> <p><i>Beyond private gain: the public benefits of higher education</i></p> <p><i>International Handbook of Higher Education: Global Themes and Contemporary Challenges Pt. 1</i>, New York: Springer</p> <p>http://link.springer.com/chapter/10.1007/978-1-4020-4012-2_15</p>	<ul style="list-style-type: none"> • <i>Individuals with higher levels of education have higher levels of entrepreneurial activity</i> <p>This study establishes a correlation between educational attainment and entrepreneurship indicators. Using the Total Entrepreneurship Activity (TEA) Index (which measures the share of adults involved in new firms or start-up, activities) it reveals for the 17 countries studied that individuals with higher levels of education have higher levels of entrepreneurial activity.</p>
<p>Dearden, L. et al., 2005</p> <p><i>The impact of training on productivity and wages : evidence from British panel data</i></p> <p>http://ideas.repec.org/p/ifsiifsewp/05-16.html</p>	<ul style="list-style-type: none"> • <i>The productivity gain of education and training is around twice of the increase in wages.</i> <p>This paper examines the effects of work-related training on direct measures of productivity. Using a new panel of British industries 1983-1996 and a variety of estimation techniques it finds that work-related training is associated with significantly higher productivity. A one percentage point increase in training is associated with an increase in value added per hour of about 0.6% and an increase in hourly wages of about 0.3%. It also shows evidence using individual level datasets that is suggestive of training externalities.</p>

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