How is the demand for part-time higher education affected by changing economic conditions?

Report for The Open University, Birkbeck University and London South Bank University

London Economics

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Executive Summary

There has been a **substantial fall** in the number of part-time students enrolled in higher education over the past decade, with the decline being particularly apparent amongst English higher education providers. In contrast, the number of full-time student enrolments has been on an upward trend. In parallel, the wider economy has seen both a deep recession and, more recently, a limited recovery.

There have been a number of suggestions that the decline in part-time enrolment has been because of either the **strength of the labour market** – or the fact that the increase in enrolment amongst full-time students has **reduced the available pool of part-time students**.

This report combines **theoretical** and **empirical analysis** to better understand whether the wider macro-economy impacts higher education enrolment; which students might be most or least affected by economic trends (and how?); and whether there may be other factors impacting the decline in part-time enrolment.

How many part-time students are there – and how has this changed over time?

- The number of part-time students in higher education has been declining significantly over the past decade. In the 2004/05 academic year, there were approximately **337,000** domestic part-time student enrolments in the UK. In 2015/16 this had fallen to **184,000 -** a decline of **45%**, compared to a **19%** increase in full-time students enrolments (see Figure 1)
- At the same time, part-time learners make up a smaller proportion of all students; whilst they accounted for **47%** of total domestic student enrolments in the UK in 2004/05, this share had fallen to only **31%** by 2015/16 (see Figure 1).
- The decline in part-time higher education enrolments has varied by Home Nation of the United Kingdom (see Figure 2). Compared to the **45%** decline in enrolments across the entire United Kingdom, the decline in part-time enrolment has been witnessed to the greatest extent in **England** where there has been **49%** reduction in enrolments (compared to a **30%** reduction in **Wales**, and a **12%** reduction in **Scotland**). In contrast, the number of part-time enrolments in **Northern Ireland** has increased by **10%** over the period.

Is the labour market buoyant?

- When describing the labour market as buoyant (and a reason for the reduction in part-time enrolment), reference has been made to the change in the **employment rate** observed since 2011 (see Figure 3): There has been a significant increase in the employment rate over this time period (from **70%** to almost **75%**).

Is this measure important – or should other labour market metrics be considered?

- Part-time students are substantially more likely to be older than full-time students, and **in employment**. As a result, part-time students are much more likely to have their decision on higher education enrolment affected by **income** rather than job availability. Therefore, the 'quality' of the labour market is important. It is not just about the number of jobs, but the income levels associated with those jobs that matter to part-time students.
- When **real hourly earnings** are considered instead of the employment rate as a measure of labour market buoyancy (Figure 4), the evidence demonstrates a significant decline in real earnings (from 2008/09) followed by a more modest recovery. In other words, when considering the **more relevant** measure of labour market activity for part-time students, the strength of the labour market is questionable.
- Importantly, fluctuations in the numbers of part-time students appear to **coincide** with movements in real earnings, while full-time student numbers seem to run in the opposite direction.

What does the economic theory suggest?

We undertook a fundamental review of the economic theory to try and explain why the demand for full-time and part-time higher education move in opposite directions.

The theoretical analysis provides the answer, and suggests that:

- Full-time higher education enrolment will **decrease** in a buoyant labour market (i.e. demand is **counter-cyclical**). The size of the decline will depend on the strength of individual **preferences** for higher education.
- The demand for part-time higher education will **increase** in a buoyant labour market (i.e. demand is **pro-cyclical**). The **size** of the increase in part-time demand is **dependent** on the extent to which part-time students need to **substitute** out of work to accommodate additional study.
- For part-time students, **wages** and **household incomes** – not employment rates – are the key manifestations of a buoyant labour market. **Changes to real wages and incomes directly impact part-time learners**.

Does the empirical evidence back up the theory?

The empirical evidence supports the economic theory. Specifically,

- In general, in the absence of borrowing constraints, the demand for (full-time) education is **counter-cyclical.** Individuals will substitute education for work when the current wage is low relative to future wages.
- Relaxing the notion that higher education is a full-time commitment, an assumption which clearly does not apply for part-time students, the evidence suggests that the **demand for part-time education** is **pro-cyclical.**
- However, the empirical evidence suggests that there are **other significant factors** at play in relation to the decline in part-time enrolments, including the change in **tuition fee levels, funding arrangements (and credit constraints)**, as well as **debt aversion**. A number of these additional factors are evidenced by the stark difference in part-time enrolment rates by Home Nation over the most recent economic recession (and recovery).

Has increased full-time enrolment reduced the pool of prospective part-time students?

- The analysis we have undertaken demonstrates that the increase in full-time enrolment does not compensate for the reduction in part-time study that has occurred over the last decade.
- If the growth in full-time and part-time enrolment increased in line with more general population growth amongst 'relevant' age groups, **the decline in part-time study is more than 4½ times as large as the increase in full-time study** (approximately 33,000 'surplus' full-time enrolments compared to a 'shortfall' of 154,000 part-time enrolments in 2014/15).
- **Therefore, if the increase in enrolment of full-time students has in part reduced the demand for part-time study, this has in no way exhausted the demand for part-time education.**
- **In fact, with the changing labour market and the likely need for more of the workforce to up-skill and re-skill post Brexit, this part-time 'shortfall' may deteriorate in the absence of policy intervention.**

Conclusion

Part-time study is a vital part of a diverse higher education system. It widens participation and increases social mobility, providing choice to individuals who may not have had the opportunity to attend university straight out of school and now require the flexibility to continue their education part-time whilst meeting work and family commitments.

Whether through distance learning, evening study or employer sponsorship, part-time study allows individuals to reskill or upskill, helping to address the UK's skill and productivity gaps. It is a key component in delivering both the UK Government's social mobility and Industrial Strategy aims.

The continuous reduction in the number of part-time student enrolments in England, however, poses a significant problem. In the light of longer working lives, multiple career paths, ever-changing technologies and projected post-Brexit skills gaps, part-time higher education will become an even more important element of the higher education and skills jigsaw. Demand for part-time higher education exists, but it seems that other factors – such as finance – are a big barrier for this particular type of student.

From a policy perspective, and to align with future Government policy initiatives (such as the Industrial Strategy), it makes sense to further explore a range of options to encourage part-time enrolment. Failure to do so will exacerbate the skills gaps in the economy that are expected to occur in the coming years.

1 Introduction

1.1 Background and context

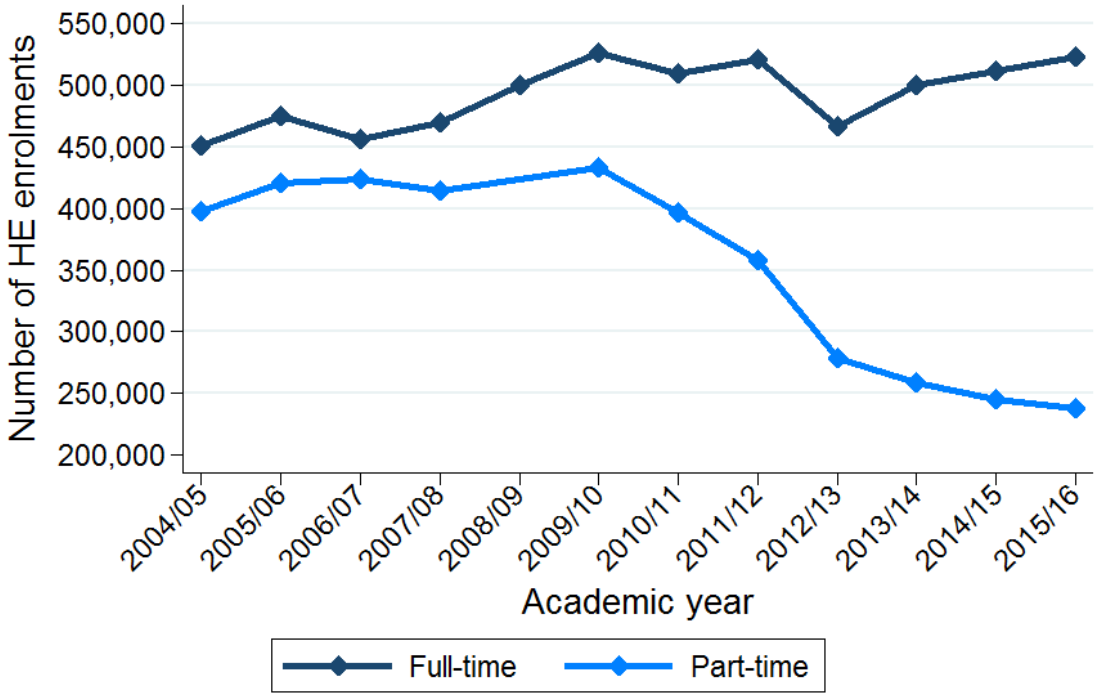
Key characteristics of part-time students and the student support available

Part-time students, defined as those who undertake less than 75% of the total course credits in a given year (also known as course intensity), are more likely to be **mature students** and be juggling their time with **work** and **family commitments** compared to those studying full-time[1]. The financing available to part-time students differs in a number of ways compared to full-time students: at the present time (in England for example), part-time students are only eligible for a tuition fee loan if their course intensity is at least 25%, and there are currently **no maintenance loans** available to help cover the costs of living (as there are for full-time students)[2].

How many part-time students are there – and how has this changed over time?

The number of part-time students in higher education has been declining significantly over the past decade. In the 2004/05 academic year, there were approximately **337,000** domestic part-time student enrolments in the UK. In 2015/16 this had fallen to **184,000 -** a decline of **45%**, compared to a **19%** increase in full-time student enrolments. At the same time, part-time learners make up a smaller proportion of all students; whilst they accounted for **47%** of total domestic student enrolments in the UK in 2004/05, this share had fallen to only **31%** by 2015/16.

Figure 1 Trends in enrolment in higher education



1) Data for PT students were suppressed for NI institutions in 2008/09 due to data quality issues
2) Domestic students at UK higher education institutions
3) Source: HESA

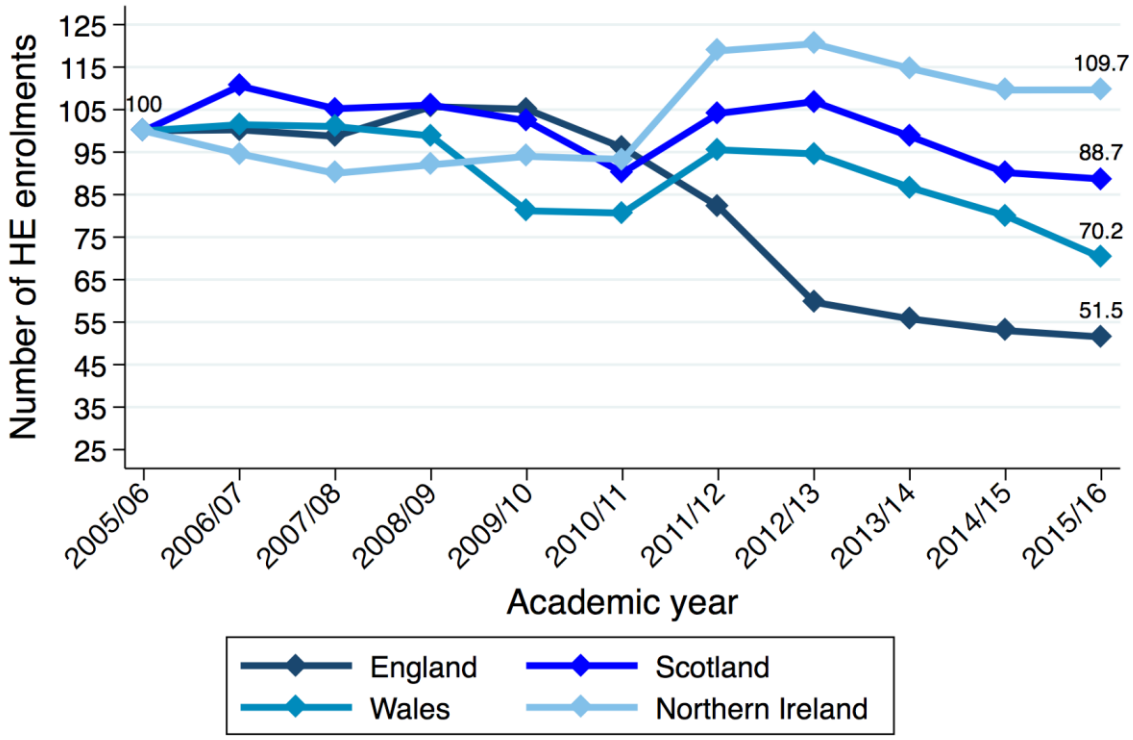
[1] In 2015/16, 67% of part-time students were aged over 30 (compared to 22% of full-time students); in 2011/12, 46% of part-time students had children (compared to 7% of full-time students); and in 2013, 82% of part-time students were employed (Hubble & Bolton, 2017).
[2] These are due to be introduced in the 2018/19 academic year for students presenting on campus and the Government has indicated that it may introduce them in 2019/20 for distance learners.

Is this a problem for the UK or UK-wide problem?

Clearly, a reduction in the number of part-time student enrolments is a problem for the UK. In the light of longer working lives, multiple career paths, ever-changing technologies and projected post-Brexit skills gaps, part-time higher education will become an even more important component of the higher education jigsaw. Turning back to the present-day, part-time education is (and has been) crucial to delivering the Governments' social mobility and industrial strategy aims.

However, the decline in part-time higher education enrolments has varied by Home Nation of the United Kingdom (see Figure 2). Compared to the **45%** decline in enrolments across the entire United Kingdom, the decline in part-time enrolment has been witnessed to the greatest extent in **England** where there has been **49%** reduction in enrolments (compared to **30%** reduction in **Wales**, and a **12%** reduction in **Scotland**). In contrast, the number of part-time enrolments in **Northern Ireland** has increased by **10%** over the period.

Figure 2 Trends in enrolment in higher education by Home Nation (indexed 2005/06 =100)



1) Indexed to 100 in 2005/06
2) Source: London Economic analysis of HESA data

What are the suggested reasons for this decline?

Some commentators have observed that the fall in the number of part-time students has been caused by **improved labour market conditions**. For instance, the Minister of State for Universities, Science, Research and Innovation recently claimed that the decline in the demand for part-time education was due to strength of the labour market:

> ***"We've got an exceptionally strong labour market so the appeal of part-time education diminishes relative to the attractions of going into work when there are those opportunities. […] When there's a buoyant labour market, the opportunity cost of going into part-time study is higher than when there are fewer jobs around." (Jo Johnson, BBC Newsnight, 05/07/17)***

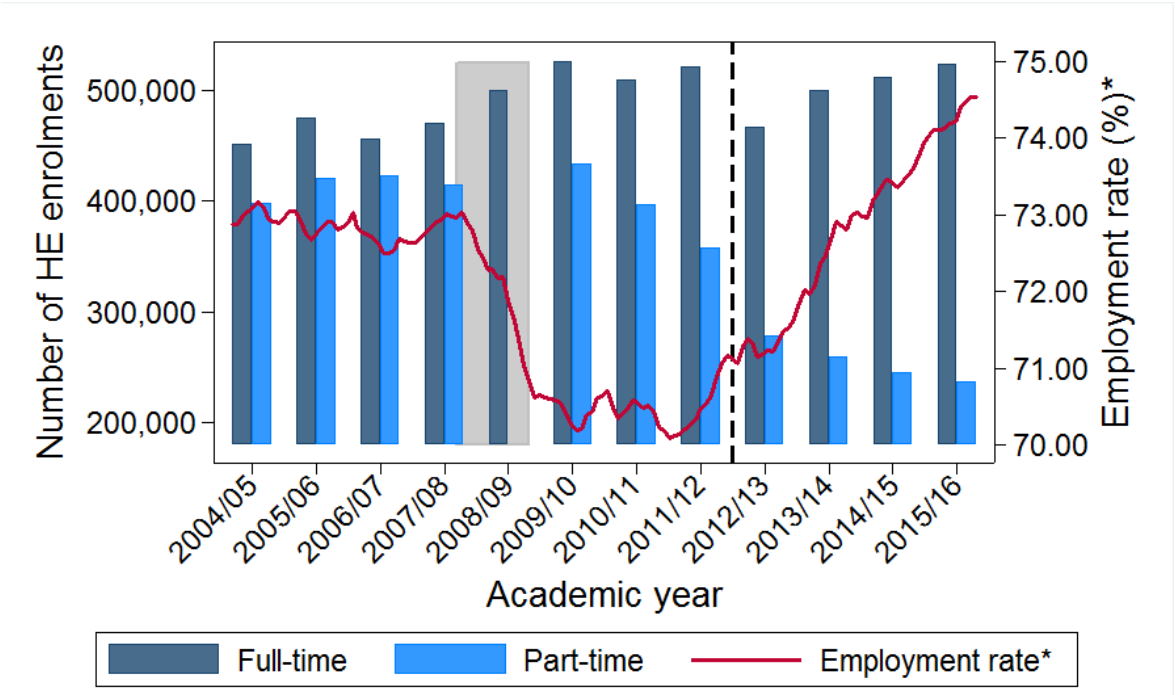
To further explain the decline in part-time study, there have also been some suggestions that the increase in full-time participation is in part the cause:

> ***"I acknowledge the fall [in part-time student enrolment], but [Mike Amesbury MP] needs to understand that there are complex reasons for it, including the rapid increase in the proportion of people entering higher education at the young age of 18. This means that there is a smaller stock of students seeking to participate in part-time and mature study later in life. " (Jo Johnson, Hansard, 19/07/17 (here))***

What *is* the economic context referred to?

When describing the labour market as buoyant, reference is made implicitly to the number of jobs available in the economy. This implies that the strength of the labour market is reflected in terms of improvements in the **employment rate** observed since 2011. This is indeed true – there has been a significant increase in the employment rate since 2011 (from **70%** to almost **75%** presented by the red-line in Figure 3) – and *if* the commentators are correct, this should result in a decline in *both* full-time *and* part-time enrolment. However, when also plotting higher education enrolments by mode, full-time enrolments have increased, while part-time enrolments have declined.

Figure 3 Trends in employment and higher education enrolments



* Seasonally adjusted
1) Data for PT students were suppressed for NI institutions in 2008/09 due to data quality issues
2) Domestic students at UK higher education institutions
3) UK employment rate
4) Sources: HESA (education statistics); ONS (employment rate)

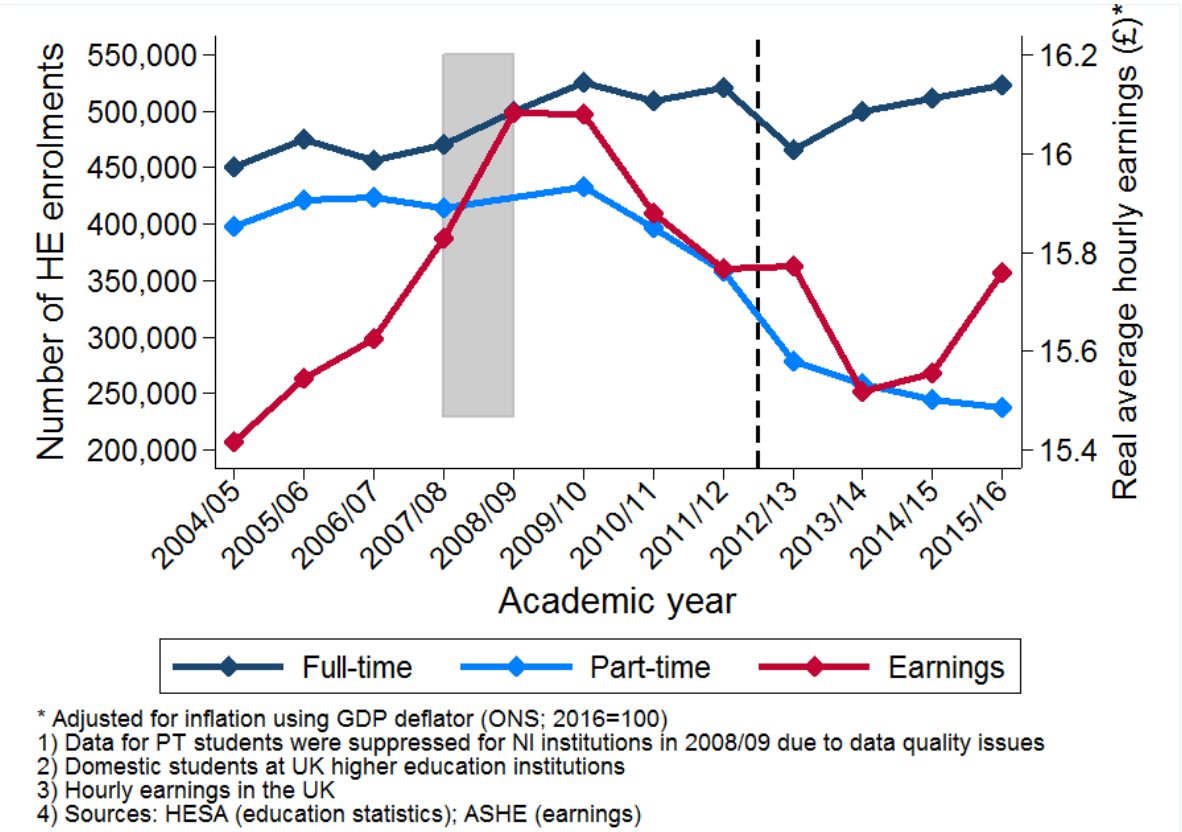
Economic context: Employment rates only go so far

Part-time students are substantially more likely to be older than full-time students, and in employment. As a result, part-time students are much more likely to have their decision on higher education enrolment affected by **income** rather than job availability. Therefore, the 'quality' of the

labour market is important. It is not just about the number of jobs, but the income levels associated with the jobs that matter to part-time students.

When real hourly earnings (red line) are plotted instead of the employment rate (Figure 4)[3], the analysis illustrates a significant decline (from 2008/09) followed by a more modest recovery. Fluctuations in the numbers of part-time students appear to **coincide** with movements in real earnings, while full-time student numbers seem to run counter to this[4].

Figure 4 Trends in earnings and higher education enrolments



* Adjusted for inflation using GDP deflator (ONS; 2016=100)
1) Data for PT students were suppressed for NI institutions in 2008/09 due to data quality issues
2) Domestic students at UK higher education institutions
3) Hourly earnings in the UK
4) Sources: HESA (education statistics); ASHE (earnings)

1.2 Structure of this report

The patterns in the data do not fully resolve the issue or offer sufficient clarity. Therefore, based on economic theory and the wider empirical literature, this report analyses whether the wider macro-economy impacts higher education enrolment; which students might be most or least affected by economic trends; and whether there may other factors impacting the decline in part-time enrolment.

The remainder of this report is structured as follows. **Section 2** explains the key theoretical concepts required for an understanding of the analysis. In **Section 3,** these concepts are then applied to the case of the demand for full-time education, and **Section 4** explains how the demand for part-time education is affected by changing economic conditions. **Section 5** considers the question of whether

[3] The Annual Survey of Hours and Earnings (ASHE) provides nominal figures. The figures in Figure 4 have been converted into 2016 prices via a GDP deflator (using data collected by the Office for National Statistics (ONS)). Figures here are for hourly pay excluding overtime, and relate to all types of workers. The annex shows the earnings for full-time and part-time workers separately.

[4] This pattern would support the idea that potential full-time students are influenced by the opportunity cost of work, and possibly treat education as an **investment good**, while part-time students are more likely to treat education as a **normal good**.

increased enrolment in full-time higher education can account for the decline in part-time enrolment. **Section 6** provides some evidence from the empirical literature, while **Section 7** summarises our main conclusions.

2 Theoretical background

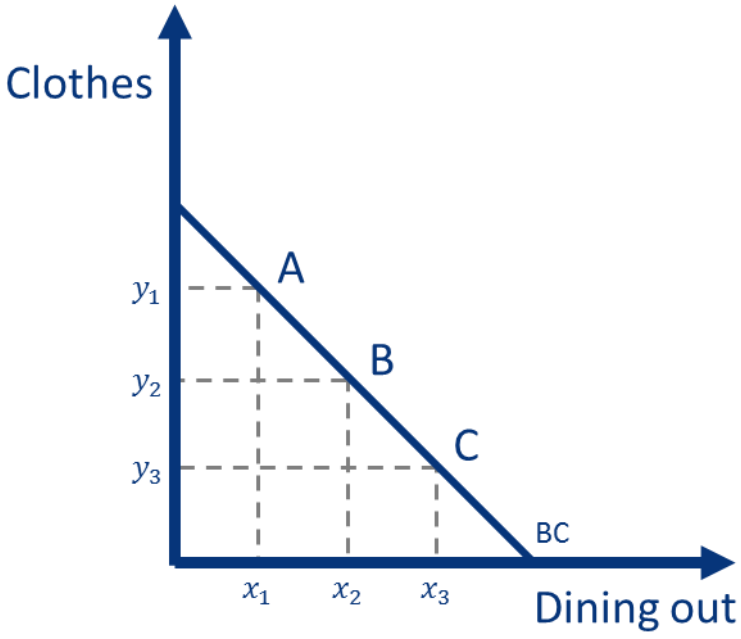
To understand the determinants of the demand for full-time and part-time education properly, some real economic theory needs to be applied. Therefore, based on the fundamental principles of consumer choice, this economic analysis will rely on an understanding of **indifference curves** and **budget constraints**. As such, this section seeks to provide a basic explanation of these key concepts. Rather than start with the demand for education, for simplicity, this section will consider two 'normal goods': new clothes, and going out for dinner. These goods are termed 'normal goods', as the demand for them increases as income rises (ignoring other ways that the money could be used).

2.1 Budget constraints

A budget constraint shows the different combinations of two goods that can be purchased with a given budget.

Each individual has a given income that they can choose to spend on goods and services. In a simplistic setting, assuming that the above-described goods are the only ones to choose from, the choice is to purchase either only new clothes, only dine out, or a combination of the two. Figure 5 demonstrates this choice.

Figure 5 Budget Constraint



The budget constraint (BC) shows all of the different combinations of the two goods that can be purchased with a given income. At point A, the budget will cover y_1 items of clothing, but only x_1 meals out. Alternatively, at point C it is possible to consume x_3 restaurant meals but only y_3 items of clothing. The values of x and y will depend on the price of the good.

To give a numerical example, assume that an individual has a disposable income of £400 in a given month (after paying taxes, rent, bills etc.). A meal out in a restaurant costs £50 and an item of clothing costs £20, and for simplicity assume no variation in prices (and no option to save) so that

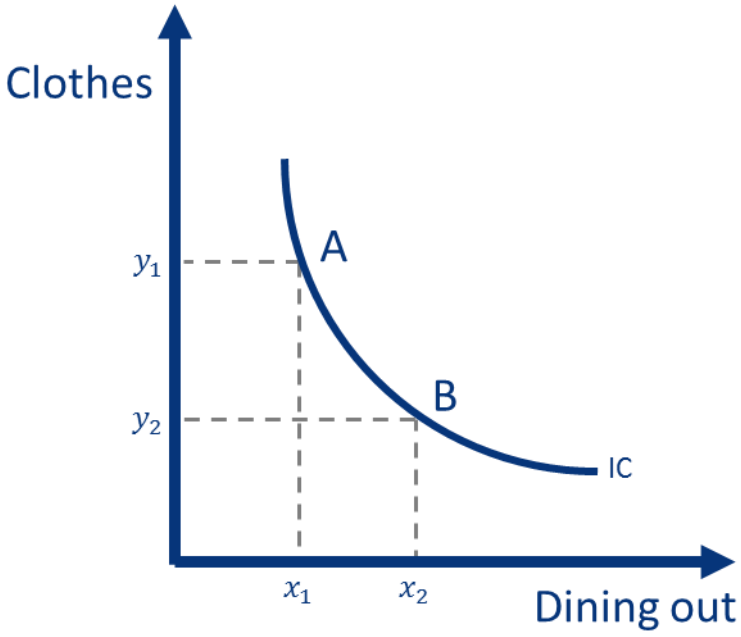
the entire budget is always spent. At point A, the budget will cover 2 meals out (£100) and 15 items of clothing (£300). Similarly at point B, there is enough income for 4 meals out (£200) and 10 items of clothing (£200), while at point C, 6 meals out (£300) and 5 items of clothing (£100) can be purchased. There are also a number of potential combinations between these, and of course the individual can choose to spend the entire budget on dining out (8 meals) or buy only clothes (20 items).

2.2 Indifference curves

An indifference curve illustrates all of the combinations of two goods that provide the same level of utility or satisfaction.

The indifference curve (IC), as demonstrated in Figure 6, portrays all of the combinations of two goods that the individual is indifferent between. As they move along the indifference curve, there is a trade-off between the two goods: in order to have more of one good they must give up some of the other. However, they are equally happy or satisfied at every point along the indifference curve.

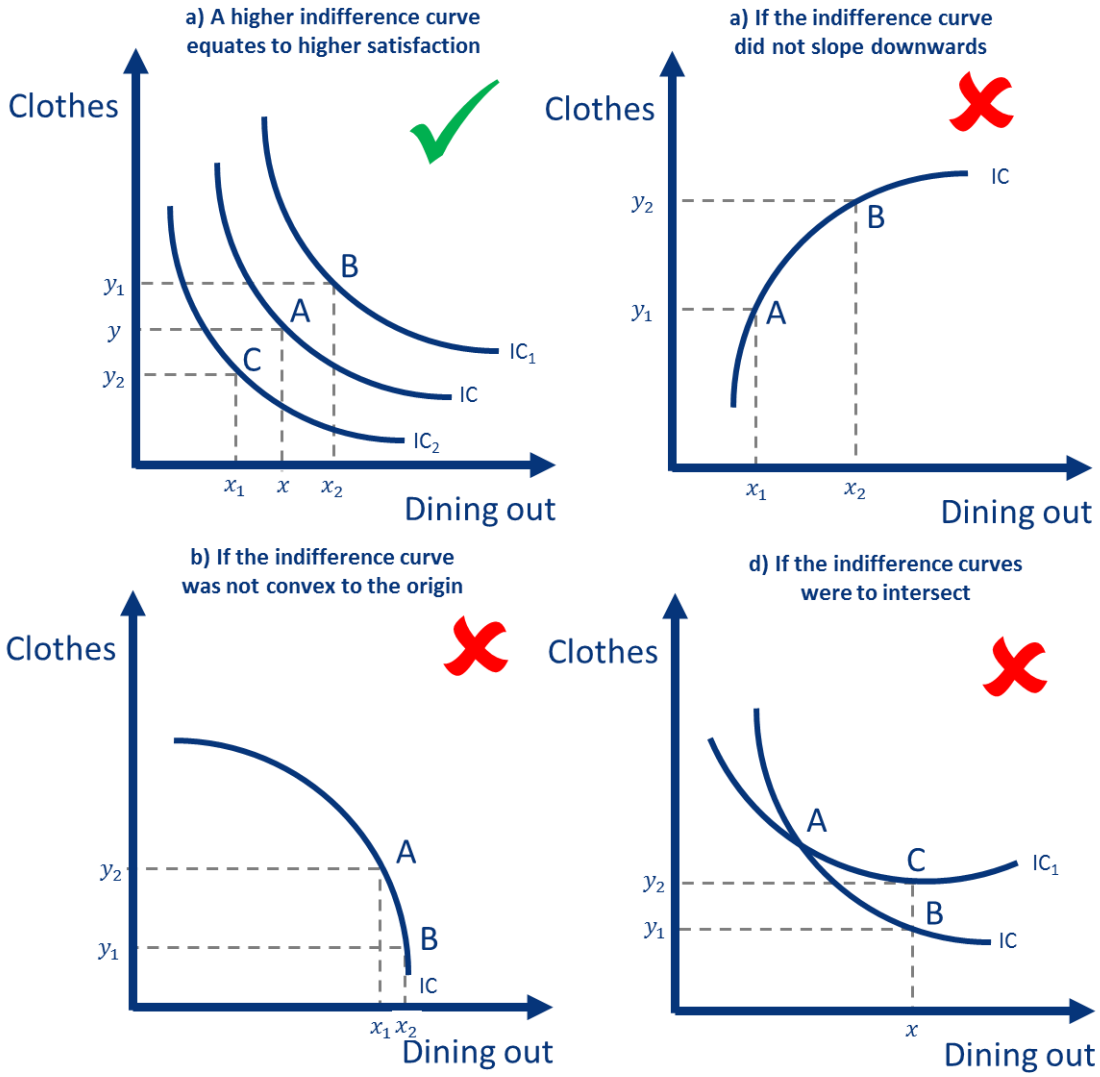
Figure 6 Indifference curve



In the above example, point A shows a large amount of clothes, and a small amount of dining out, while point B depicts a large quantity of dining out and a small number of items of clothing. Since both points lie on the same indifference curve, the individual would be equally happy at point A or point B. For this to be the case, there is always a trade-off between the two goods, since receiving more of one good without giving up any of the other would increase 'utility' (or satisfaction) and so could not lie on the same indifference curve. The values of x and y will depend entirely on the individual's preferences (which will be reflected by the slope of the curve), and are not constrained by income.

Indifference curves always adhere to four properties. Figure 7 shows the correct properties in chart a), as well as three scenarios where one of the properties is violated:

Figure 7 Properties of indifference curves



- A **higher indifference curve equates to a higher level of satisfaction**. The top left panel of Figure 7 depicts an indifference curve map, which is a collection of indifference curves corresponding to different levels of satisfaction. The highest indifference curve is IC_1, and the lowest is IC_2. Given that individuals prefer more of something to less of something[5], satisfaction levels will be greater on a higher indifference curve. Moving from IC to IC_1 (i.e. a move from point A to point B) results in greater quantities of both goods, so the level of utility must be higher on curve IC_1 than on IC. Since satisfaction is constant along the curve, this must be the case for all combinations.
- An indifference curve must always be **downward sloping**, as the level of satisfaction must be constant along the curve. If the curve sloped upwards, as in scenario B, then a higher combination of the two goods at point B would result in higher satisfaction than at point A, in which case both points cannot lie on the same curve. The downward sloping property captures the necessary trade-off between the two goods that will keep utility constant.

[5] In the case of normal goods (goods where demand increases as income rises).

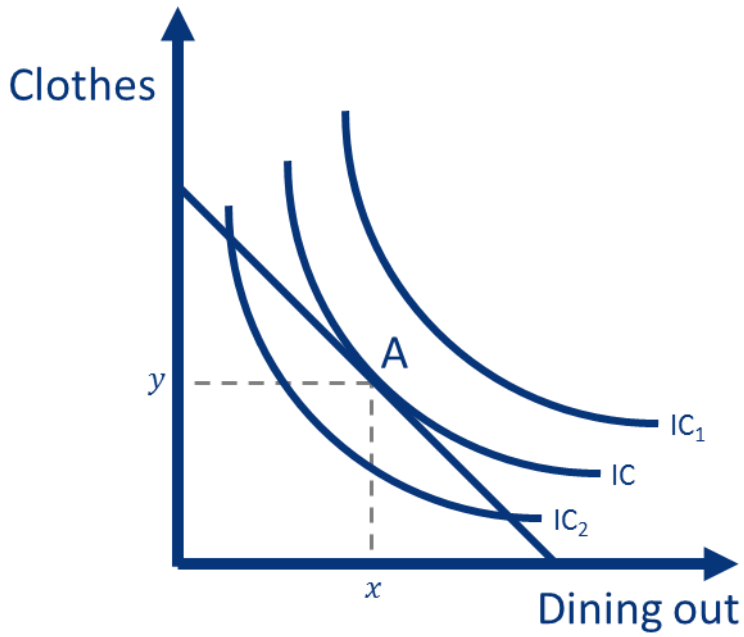
- The indifference curve must always be **convex to the origin**. The shape of the curve results from the fact that people typically derive less utility from one more unit of a good when they already have a lot of that good, compared to when they have very little of that good. For example, if an individual only had one meal out in a given month, they would give up more items of clothing to have an additional meal out than if they already had seven meals out that month. Scenario C demonstrates what would happen if the curve was concave to the origin. In this case, the individual would give up a lot more clothes for one additional meal even though they already consumed a large number of meals. This is intuitively unlikely to be the case.
- Indifference curves **cannot intersect**. In scenario D, the two curves intersect at point A. Since all points on the curve must provide a constant level of satisfaction, and point A lies on both indifference curves, it follows that both curves must deliver the same level of utility (i.e. the utility at point B equals the utility at point C). However, at point B, there is a lower quantity of clothes than there is at point C, even though the quantity of meals out is the same at both points. Since a larger quantity of clothes - without giving up dining out - will provide an individual more utility, the two indifference curves cannot provide the same level of satisfaction.

2.3 The utility-maximising position

The utility-maximising position is where the indifference curve is tangential to the budget constraint.

Figure 5 and Figure 6 can be combined on one graph, as shown in Figure 8. Utility is maximised where the indifference curve is tangential to the budget constraint. In other words, this is where the combination of the two goods makes the individual the happiest given their income.

Figure 8 The utility-maximising position



Point A represents the utility-maximising position. This lies on the highest indifference curve (IC) that can be met with this given budget. In this case they cannot lie on a higher budget line (IC_1) as

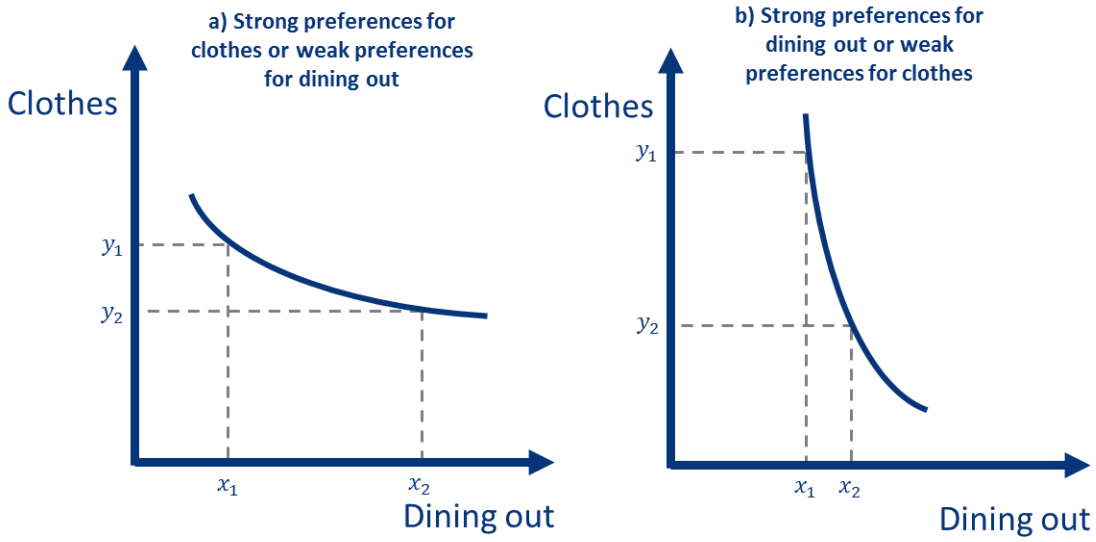
they do not have the income available to purchase enough of the two goods to reach this level of utility. It would be possible to lie on a lower indifference curve (IC_2) - either where the curve meets the budget line or at some point below the curve (which would be the situation where they do not spend the entire budget). However, since individuals will always seek to be as happy as possible, it would be irrational to lie on this indifference curve as there is a combination of the two goods that provides them with a higher level of utility (and saving is not an option).

2.4 Preferences

The individual's preferences for each good affect the slope of the indifference curve.

The slope of the indifference curve is affected by the individual's preferences for each good. If an individual has particularly strong preferences for one of the goods, then the curve will be steeper or flatter than it was in Figure 8, where preferences for the two goods were relatively equally balanced.

Figure 9 Preferences



The left-hand side panel of Figure 9 displays the slope of the indifference curve for an individual with either **strong preferences for clothes** or **weak preferences for dining out**. In this situation, the indifference curve is flatter than it would be for an individual with balanced preferences (i.e. no strong preferences for either good, as shown in Figure 8). The shape of the curve results from the idea that, in order to keep utility constant, the individual would have to be given a large amount of meals out to compensate for giving up a relatively small amount of clothes. The flip side of this is that they would be willing to give up a relatively large amount of dining out for a small quantity of clothes.

In the same way, the slope of the indifference curve would be steeper for an individual with strong preferences for dining out or weak preferences for clothes, as shown in the right-hand side panel of Figure 9. Here, the individual would have to be given a large amount of clothes to compensate for giving up a relatively small amount of dining out, or would be willing to give up a relatively large amount of clothes in exchange for a small amount of additional dining out.

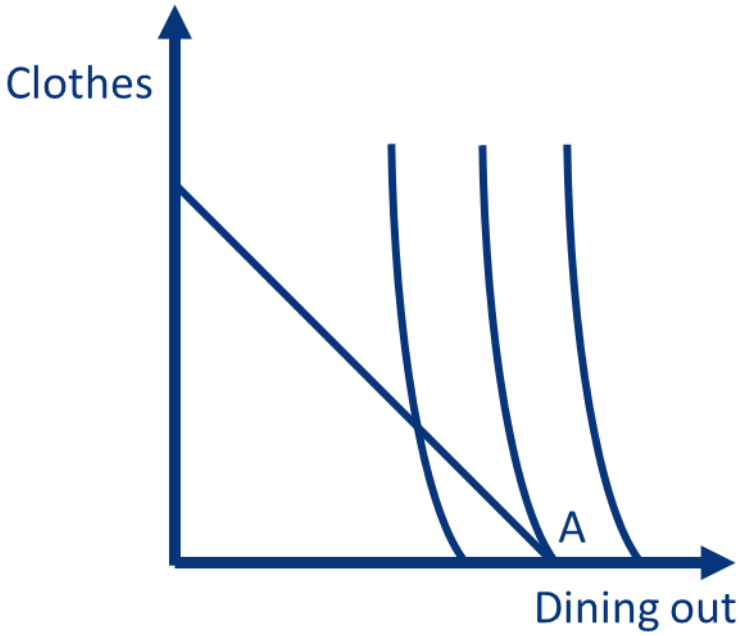
If preferences were so strong that the individual would not give up any amount of dining out for any quantity of clothes, then the indifference curve would be vertical, whilst strong preferences for clothes would result in a horizontal line. In the case of **extreme preferences** for clothes, the individual only cares about clothes, so no amount of dining out will make them happier if they cannot increase the quantity of clothes that they possess. Hence all points on the straight horizontal indifference curve would still provide a constant level of utility - even though no trade-off between the two goods is involved.

2.5 Corner solutions

A corner solution occurs where utility is maximised when the quantity demanded of one of the goods is zero.

In some circumstances it is optimal for an individual to spend their entire budget on only one of the goods. Figure 10 shows one such circumstance, in which the individual displays very strong preferences for dining out. The extremely steep indifference curve comes from the idea that the individual would have to be given a large quantity of clothes in order to be compensated for giving up a tiny amount of dining out.

Figure 10 A corner solution



Utility is maximised at point A but, contrary to the normal utility-maximising position, in a corner solution the indifference curve does not need to be tangential to the budget line. This is because, in this circumstance, a higher indifference curve can be reached than the one attained by the tangency point (which is not normally the case). If the preferences were actually very strong for clothes, then the slope of the curve would be very flat, and the optimal solution would be a corner solution where the budget line meets the y-axis instead.

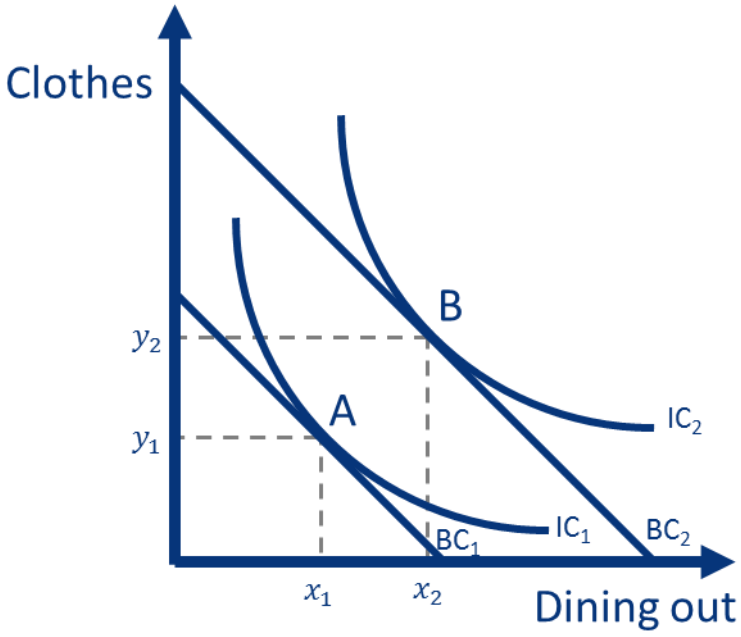
Corner solutions do not only arise in the case where there are very strong preferences. Another example of where this might happen is if there is a non-standard budget constraint. For example, there could be a kink or a discontinuity in the budget line for a number of reasons. This will be explained further in Section 3, as there is a kink in the demand curve for education.

2.6 The effect of a change in income

A change in income will cause the budget constraint to shift.

A change in income shifts the budget line since it affects the purchasing power of both goods at the same time. If the income level rises then the budget constraint will shift out, since it is possible to purchase more of both goods. If income falls then the opposite is true; the budget constraint would shift in and the quantity demanded of both goods would fall.

Figure 11 Impact of a change in income



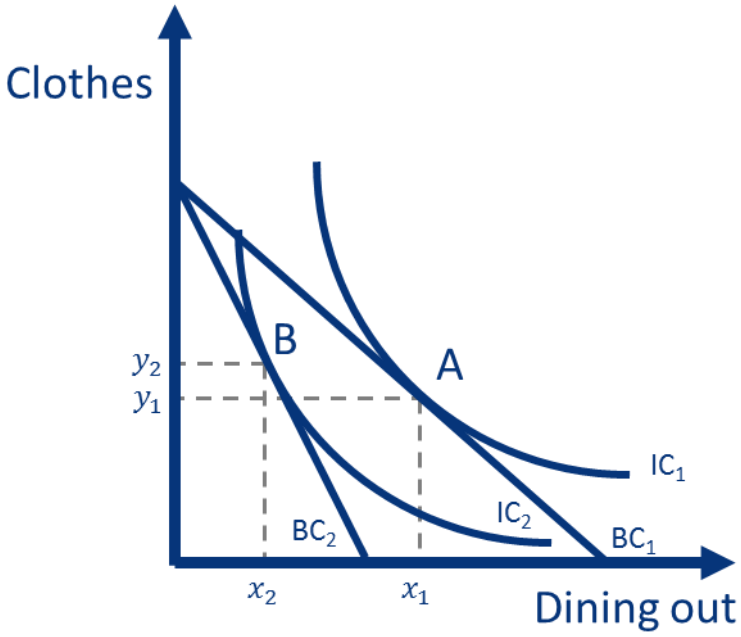
Taking an increase in income, the consumer can now purchase more of both goods so the budget line would shift out from BC_1 to BC_2. This budget line is tangential to a higher indifference curve (IC_2), so the consumer can increase utility by moving from point A to point B. At point B, it is possible to buy a higher quantity of clothes (y_2 instead of y_1) and also purchase more meals out (x_2 instead of x_1). Hence an increase in income raises the quantity demanded of both goods, which is what would be expected since both are normal goods.

2.7 The effect of a change in price

A change in the price of one of the goods will cause the budget constraint to pivot.

A change in the price of one of the goods affects the quantity of that good that can be purchased within a given budget. It is equivalent to a change in the budget itself, but only for one of the goods. Consequently, the budget constraint will meet the axis in the same place for the good that hasn't changed in price, and will *pivot* around this point to correspond to the change in purchasing power for the other good. If the price of one of the goods falls, then the budget line will pivot outwards. In contrast, if the price were to rise then the budget constraint would pivot inwards (as in Figure 12).

Figure 12 Impact of a change in price



If the cost of dining out were to rise, the budget line would pivot inwards (from BC_1 to BC_2). This is because, although the level of income is technically the same, for a given quantity of clothes, it is now not possible to purchase as many meals out. This is true at all points along the line. If the price had fallen, the budget constraint would have pivoted to the right (to a higher quantity of meals out), but it still would have met the y-axis (clothes) in the same place. This point on the y-axis will always remain the same unless the price of clothes changes.

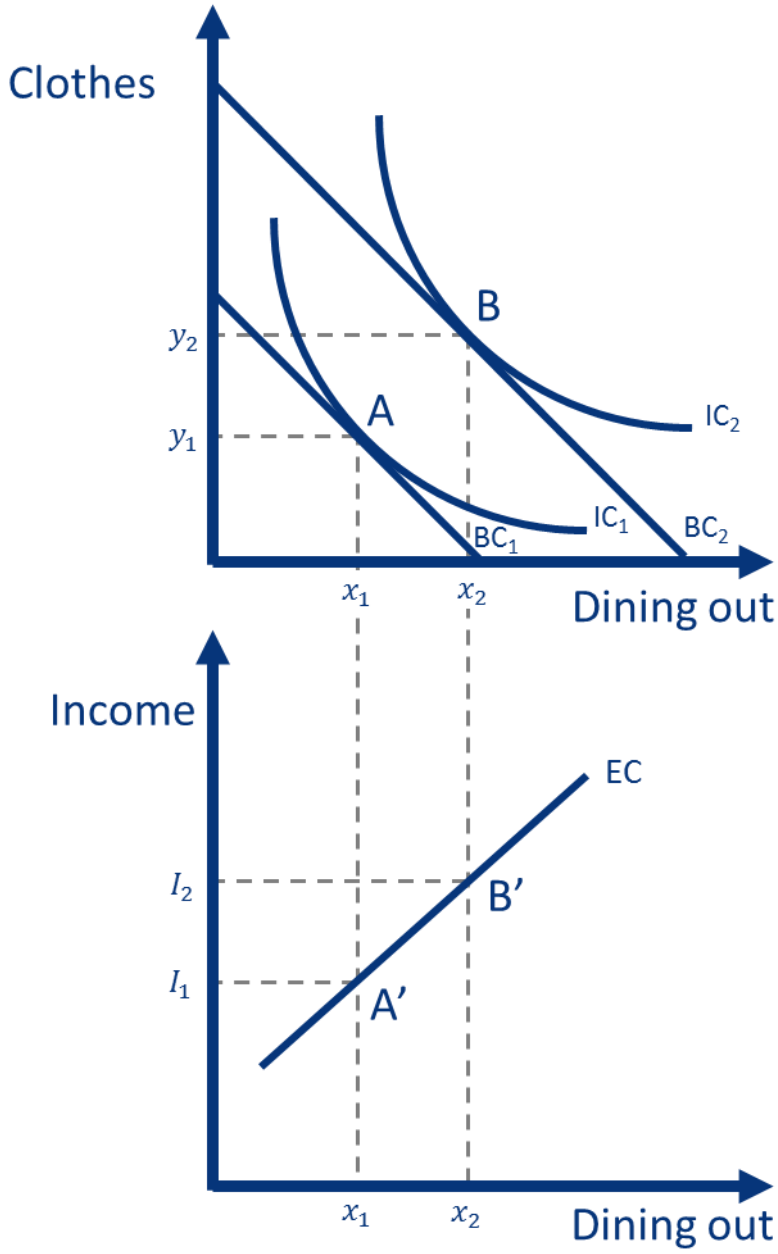
The result of this rise in price is that the new budget line is tangential to a lower indifference curve (moving from point A to point B). In contrast to the case of the increase in income shown in Figure 11, where the quantity demanded of both goods was affected in the same direction, in this situation the quantity of meals out demanded has fallen (in response to the price rise) but the quantity of clothes demanded has risen. This is because the angle of the budget constraint has changed and is now meeting the indifference curve at a different point on the curve (further up the slope).

2.8 Engel curves

An Engel curve shows the relationship between income and the demand for a good.

Using the shift in the budget line that results from a change in income, it is possible to derive an **Engel curve** which shows the relationship between income and the demand for one of the goods, as shown in Figure 13.

Figure 13 Derivation of an Engel Curve

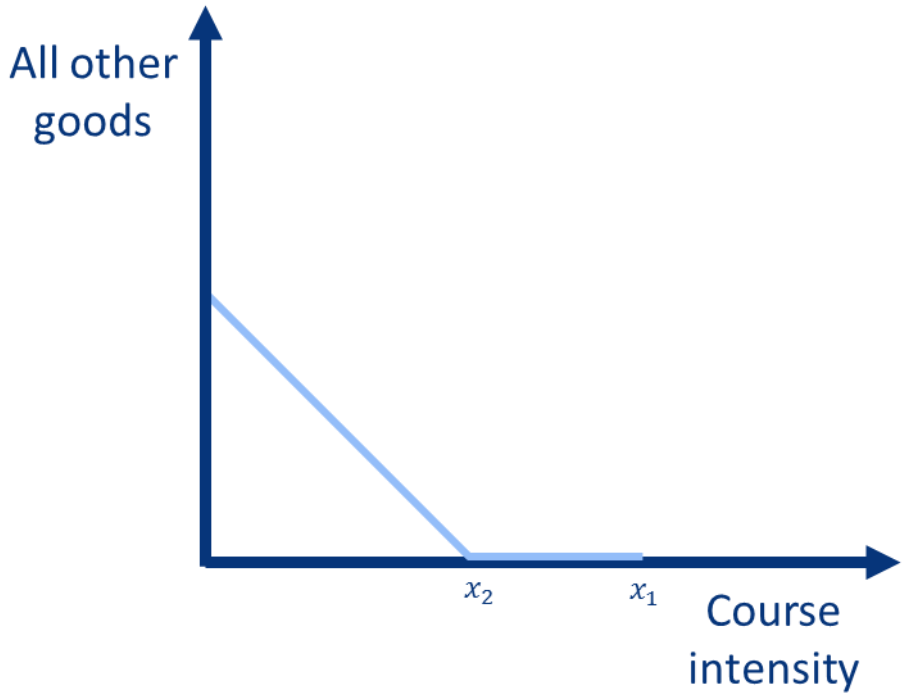


When income rises, the budget constraint in the top graph shifts out, as before, from BC_1 to BC_2 and the consumer moves from point A to point B. If we are interested in the relationship between this and the demand for dining out only, ignoring clothes, we can transpose these points onto the bottom graph. So, at point A, the consumer is at income level I_1 and quantity demanded x_1. This corresponds to point A' in the lower graph. When income rises (to I_2), the consumer moves to point B and quantity demanded rises to x_2, corresponding to point B' in the lower graph. The Engel curve slopes upwards, showing a positive relationship between income and the demand for dining out, as would be expected for any normal good (and in fact, a normal good is defined as having a positively sloping Engel Curve).

3 The demand for full-time education

Since the focus of this analysis is how the demand for higher education varies with income, and not how it interacts with the demand for a specific alternative good, the y-axis here consists of the combination of all other goods that could be purchased with that budget if it were not spent on education. Course intensity on the x-axis encapsulates both part-time and full-time status.

Figure 14 The budget line for full-time students



Students are considered full-time when they undertake more than 75% of the total number of credits in a given year[6]. This is represented by point x_2. At and above point x_2, students are considered to be full-time, while below the point x_2, the student is considered part-time.

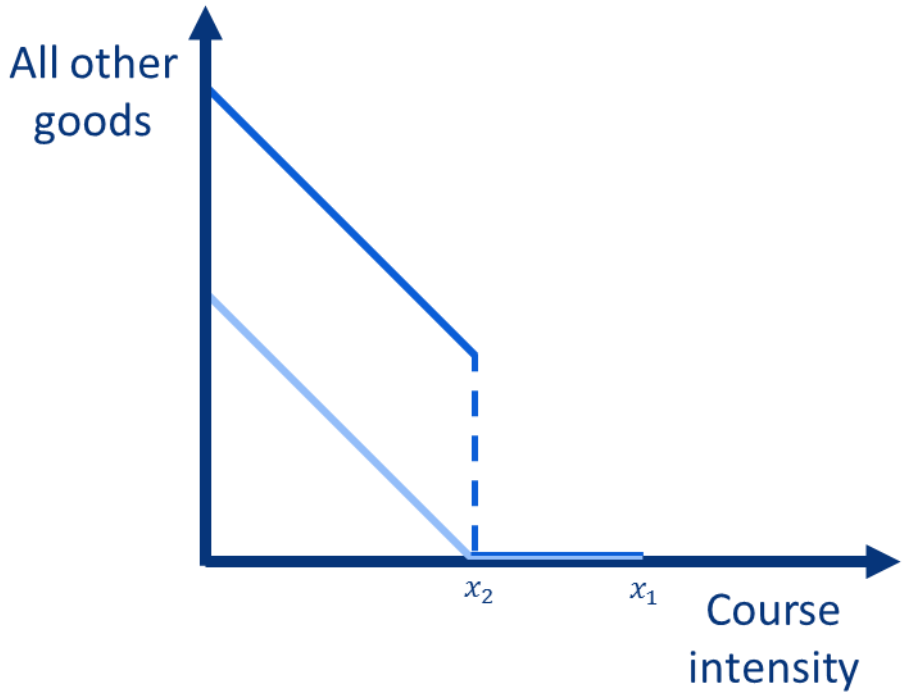
Given that part-time students typically work to some extent while learning, we assume that they have an income represented by the downward-sloping portion of the budget constraint. Along this line, they face a trade-off between hours of study and all other goods. However, if they are studying full-time, then the assumption is that they are not working and consequently that they are not earning any income from employment[7]. As a result, the budget line after this point is flat and therefore there is a **kink** in the budget constraint. They can increase their hours of study up to 100% of the full credit load (moving towards x_1), but their income will not be affected as they are not working. Therefore, the quantity of all other goods that they can purchase remains the same (here it is nothing[8]).

[6] https://stats.oecd.org/glossary/detail.asp?ID=5396
[7] At least not a substantial quantity of hours necessary to significantly affect income.
[8] Assuming that rent, food and other basic necessities required to live are already covered and not included in "all other goods". This could be funded by alternative sources such as parents or a student loan, which are not affected by improvements in the labour market.

How do we treat an improvement in the economy (and the labour market)?

An improvement in the economy is represented a shift outwards in the budget constraint – and represented by the darker blue line in Figure 15. If the economy were to expand, there would still be a shift out in the budget constraint for part-time students (who are generally in some form of employment and would see an improvement in their household income). However, full-time students would not see any difference as only those in the labour market would benefit from improved wages. The result is that the budget constraint shifts out prior to x_2 but stays static after x_2 (the two overlapping blue sections together indicate that this portion belongs to both budget constraints). The two separate sections of the budget constraint are joined by a vertically dashed line at x_2. It is not possible to lie along this line since it would imply being able to increase the consumption of all other goods without having to trade off any hours of study. This is known as a discontinuity in the budget constraint.

Figure 15 A shift in the budget constraint for full-time students



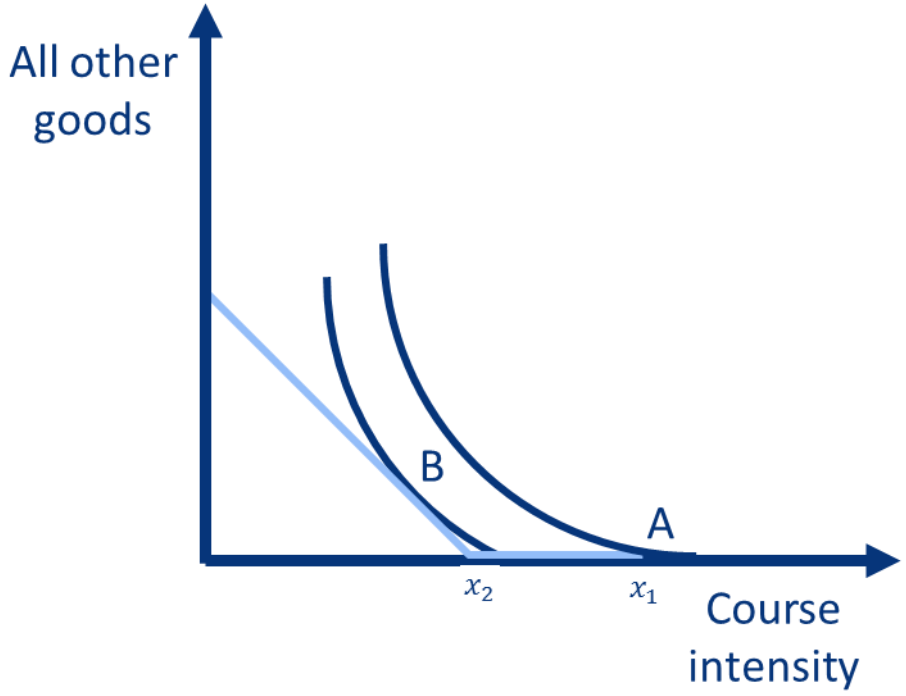
Where is the equilibrium point? It depends on preferences

In the first instance, we consider the optimal choice for full-time students before any change in the budget constraint. As shown in Figure 16, the optimal point on the initial budget constraint is a **corner solution** at point A. This is the highest indifference curve that can be reached given the budget constraint (the tangential point (B) lies a lower indifference curve). Here the individual maximises their utility by enrolling in full-time education and consuming no other goods.

As before, however, the slope of the budget line is affected by preferences. The example shown displays relatively **strong preferences** for education (i.e. individuals are willing to give up a lot of other goods for more higher education), and hence the optimal solution is to enrol in full-time study. If the preferences for education were to weaken slightly (in an economic sense) so that the indifference curve became flatter, it could be possible that the highest indifference curve occurs where the curve is tangential to the sloped portion of the budget constraint. In this case, the individual would choose to enrol in part-time education, since the quantity of education demanded would fall below x_2 (75%). If the preference for education were to weaken substantially, so that the indifference curve became very flat, then the

optimal solution would be a corner solution where the budget constraint meets the y-axis and the individual would not choose to pursue any education at all.

Figure 16 The utility maximising position for full-time students



3.1 Strong preferences for full-time education

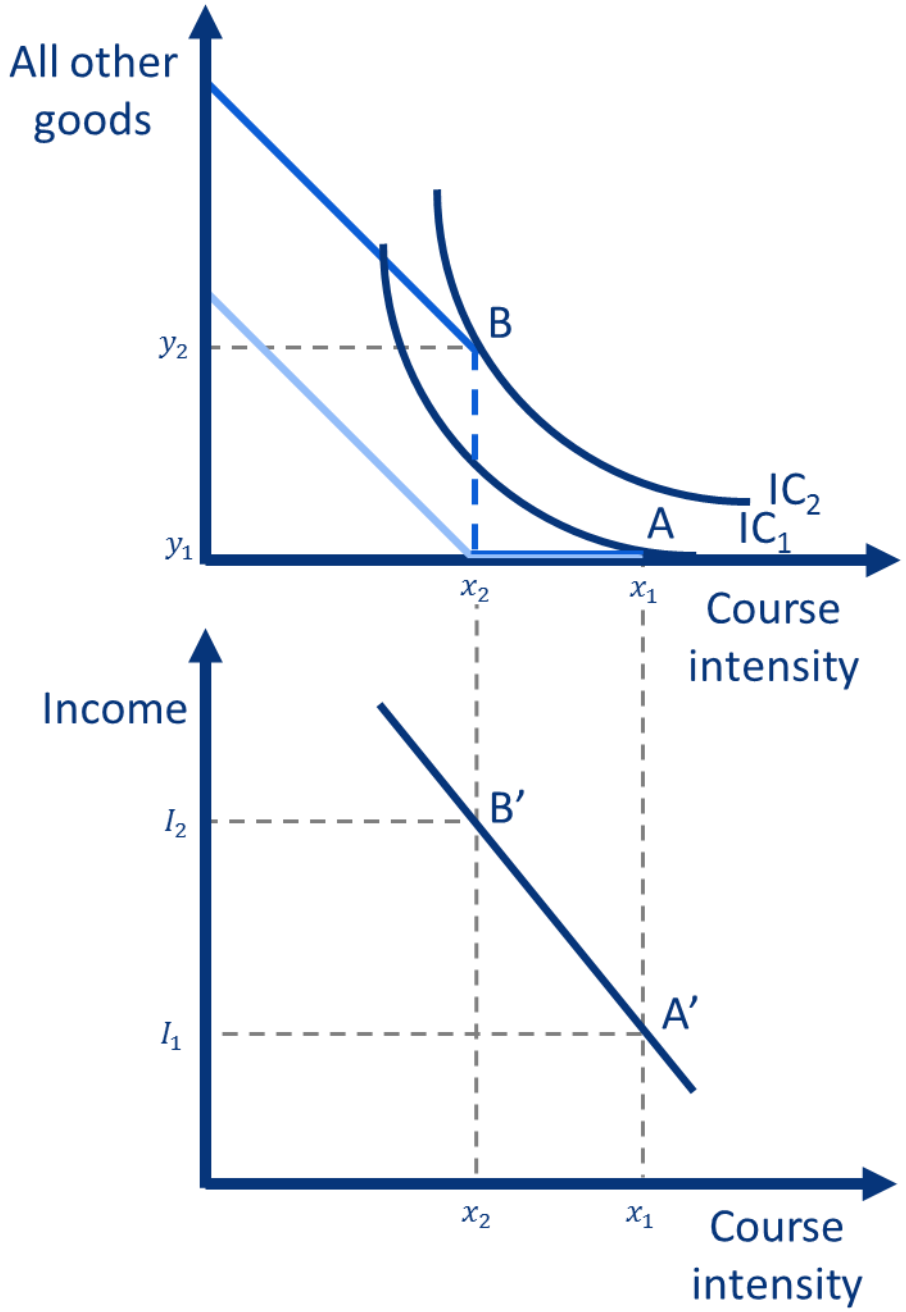
When the wider economy improves, all individuals face an increased opportunity cost as foregone earnings are higher. *Workers* who were considering leaving employment to enrol in full-time education will see their existing incomes rise; this is the income that they would have to forego if they were to leave employment for full-time study. *Potential* full-time students who were not already working, for example A-level students about to finish school and choosing between entering the labour market and enrolling in a higher education qualification, would face an improved likelihood of employment should they seek work. This will raise expected income above zero and, should they find a job, pay higher wages than they would have previously earned. For those *already* studying full-time, the potential income that they could earn should they leave education is higher.

In all cases, as individuals see their potential or existing employment and/or earnings improve, the budget constraint shifts out for the portion below x_2 (as before). A prospective full-time student with strong preferences for education will move from a corner solution at point A to a new corner solution at point B in Figure 17. This equates to a fall in the demand for education from x_1 to x_2. In other words, the increased opportunity cost will cause an individual with these preferences to reduce the intensity of their future course and **move from full-time study to part-time study**. In this case they have remained at the relatively high intensity end of part-time study (undertaking the maximum number of credits for a part-time student (75%) which allows them to undertake some hours of work concurrently). At the same time however, since they will see their budget increase, they can also increase their consumption of all other goods from y_1 to y_2.

As shown below, the Engel curve is downward sloping, displaying a negative relationship between income and the demand for full-time education. In other words, as income rises, the demand for full-

time education will fall. Reflecting the wider empirical evidence, the relationship between the demand for full-time education and wider economic activity it is **counter-cyclical**.

Figure 17 The effect of a rise in income on the demand for full-time education for individuals with strong preferences for education

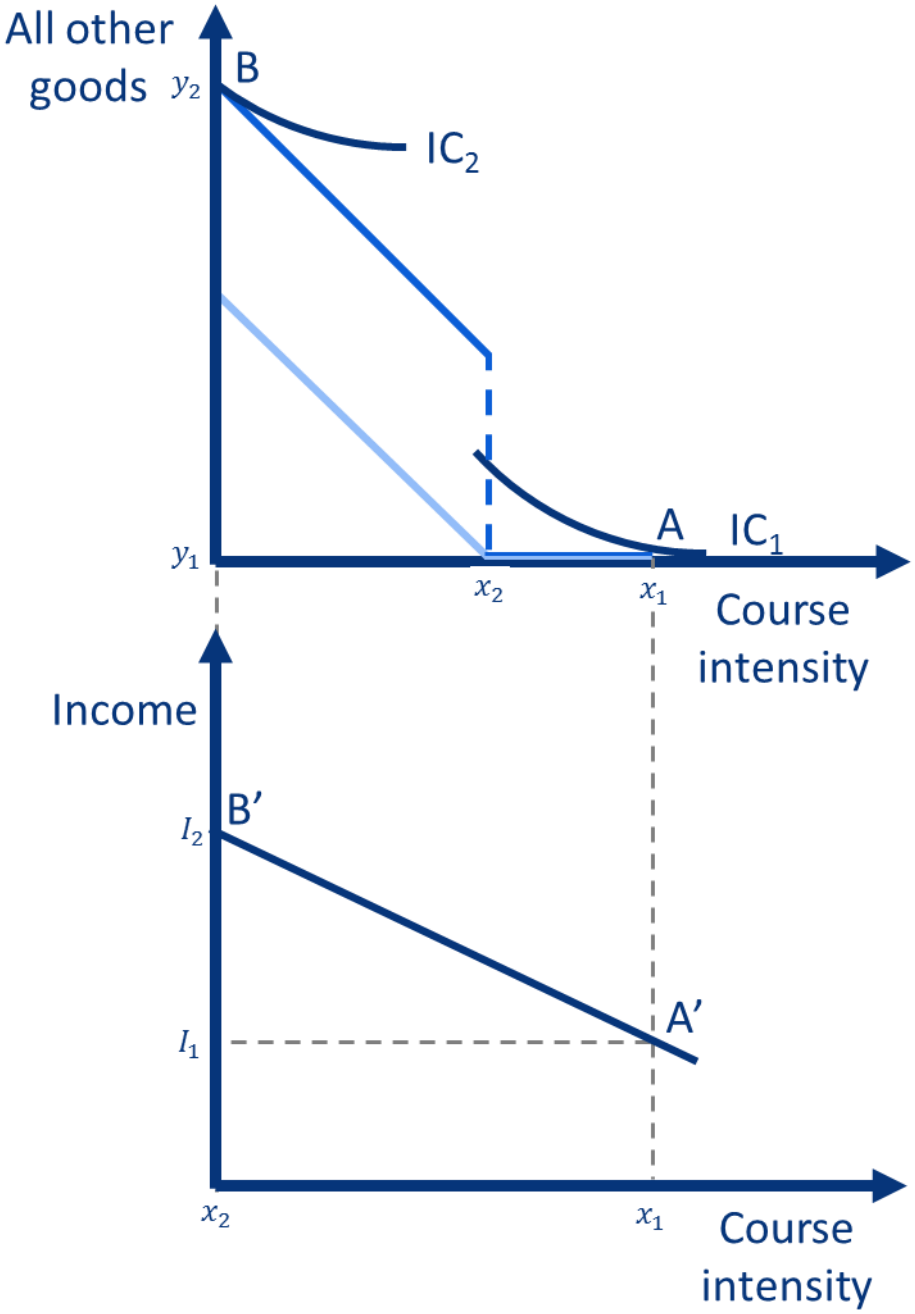


3.2 Weak preferences for full-time education

With weaker preferences for education, the indifference curve will be flatter, as shown in Figure 18. Note that these preferences are not so weak that the optimal solution prior to the shift in the budget constraint would be a corner solution where no education is demanded at all (i.e. where the budget constraint meets the y-axis for all other goods). In this event, the individual would have not considered

education at any level of income and so would always reside at a corner solution for no education enrolment irrespective of the labour market conditions.

Figure 18 The effect of a rise in income on the demand for full-time education for individuals with weak preferences for education



When the budget constraint shifts out, an individual with relatively weak preferences for education would move from a corner solution at A to a corner solution at B. This means that they would transfer from enrolling in full-time higher education to no higher education enrolment at all. In this situation, the Engel curve is still downward sloping, but it is flatter than it was in the situation of strong preferences for education. Once again, the demand for full-time education is **counter-cyclical**. This is unaffected by preference types, the only difference being where demand shifts to.

The theoretical model reflects the empirical evidence that suggests that there is a negative relationship between the demand for full-time higher education and the strength of the labour market, and partially supports the recent claims the Minister of Higher Education.

4 The demand for part-time education

The choice for potential part-time students is very different from full-time students, as these individuals are likely to be already working to some extent. Furthermore, they have an element of autonomy over how many hours they study and how many hours they work, so it is possible to have any given number of combinations between the two options. Since part-time students are defined as undertaking less than 75% of the course in a given year, the following figures only display the downward sloping portion of the budget constraint (i.e. the portion below x_2) and the x-axis is now only illustrates the intensity of part-time study from 0% to 75%. The flat portion of the curve, applicable only for full-time students, still exists, but is obscured for simplicity.

The choice for part-time study is slightly more complex than full-time study, as individuals are **constrained** not only by **income**, but also by **time**. For example, given that these students are more likely to be working and to have existing commitments (such as caring for dependents), they may not have the same flexibility as potential full-time students to rearrange the way that they spend the time in their days.

4.1 Time unconstrained: individuals who take time from leisure activities

Time unconstrained – one effect

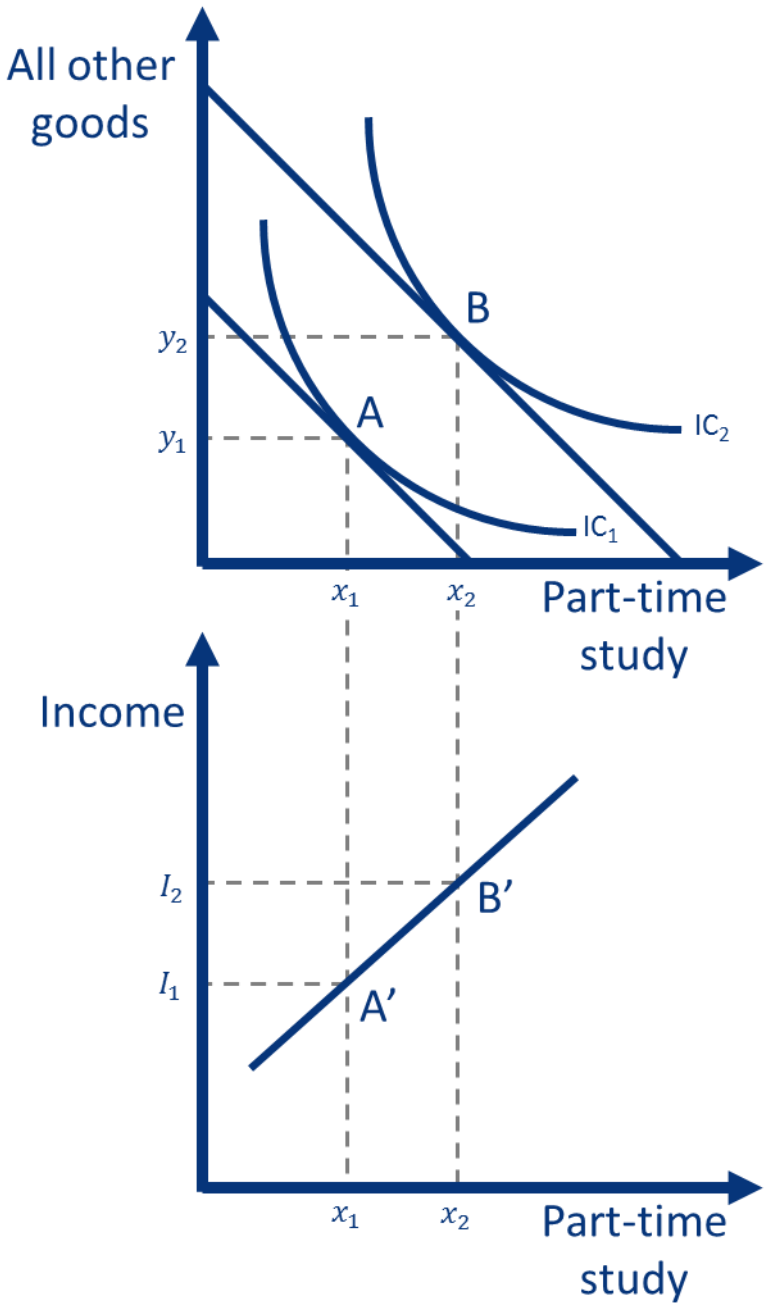
Following an improvement of the labour market and a subsequent increase in household income, if an *existing* part-time student was considering increasing the number of hours that they study for in a given year (so that they can increase their course intensity closer towards 75% and complete their qualification in a faster timeframe), they will have to choose which other activities to take these hours from. The same applies for *prospective* part-time students, who may have to shift from full-time to part-time employment. However, if they are **unconstrained by time** and are able to take this time from 'leisure' activities, for example, then the budget constraint will move in the same way as presented previously (it will shift out).

As a result, individuals can maximise their utility by meeting a higher indifference curve, moving from point A to point B (see Figure 19). Hence, they can consume more of all goods, including part-time education.

Plotting these same points with income on the y-axis (the Engel curve), where A' relates to point A on the diagram above (and B' relates to point B), there is a **positive relationship** between income and part-time study. This is the **opposite pattern** to that observed in the case of full-time students.

Economic theory predicts that when the economy is doing better, the demand for part-time education will rise: under these circumstances, the demand for part-time higher education is **pro-cyclical**.

Figure 19 The effect of a rise in income on the demand for part-time education for individuals who do not reduce hours of work



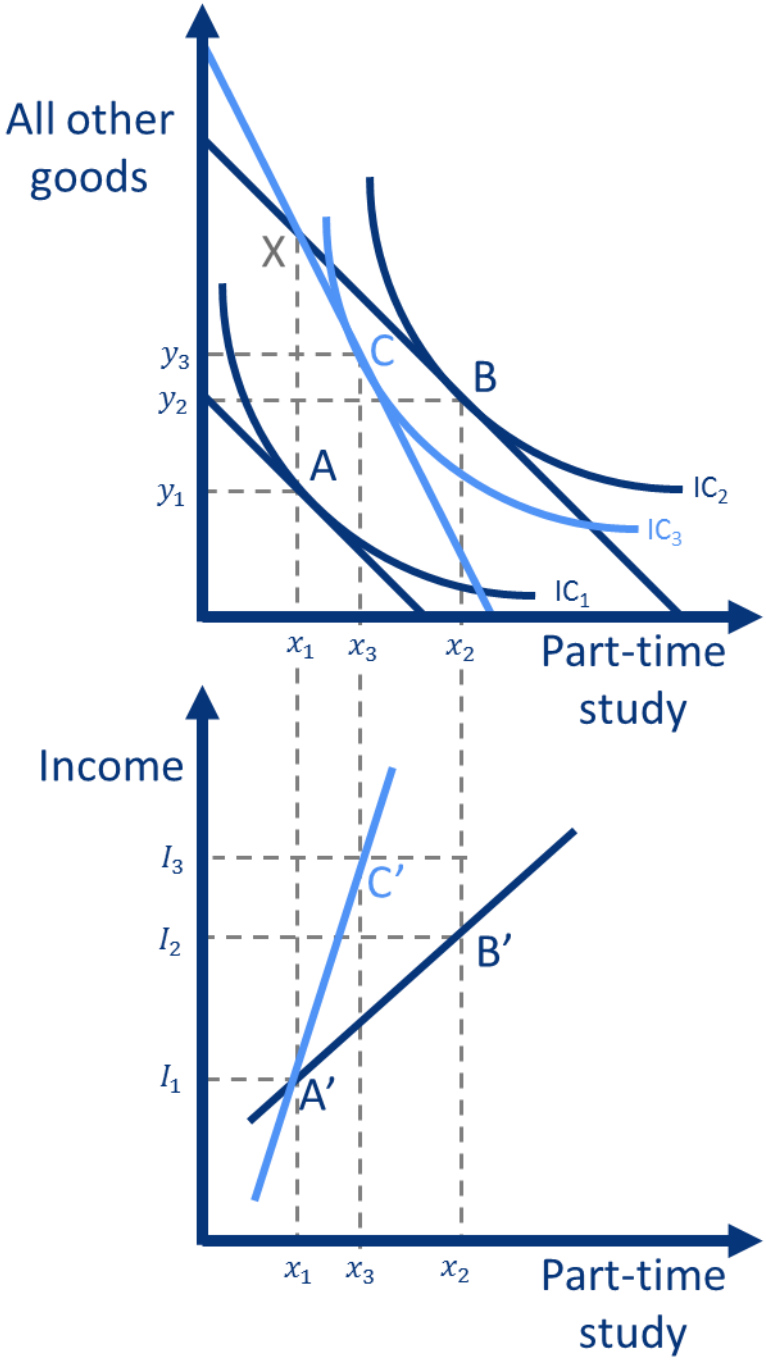
4.2 Time constrained: individuals who reduce working time to engage in study

Time constrained – two effects

However, in many cases, the individual may divide their time between work, study and leisure. It may be unlikely that they will be able to reduce the time allocated to wider activities (such as sleep or childcare) to free up the time for additional study, leaving only hours of work remaining. In this situation, in order to increase the number of hours that they study, they will have to reduce the

number of hours that they work. However, hours of work also affects income (i.e. the budget constraint). The improvement in the economy will see the budget constraint shift out (as before), inducing individuals to increase their course intensity as they have a greater amount of disposable income to spend on education services. However, giving up hours of work to free up the time necessary for the additional hours of study will change the 'price' of part-time education (resulting in a pivot of the new budget constraint). In this set of circumstances, there are two **competing effects** on the budget constraint.

Figure 20 The effect of a rise in income on the demand for part-time education for individuals who reduce hours of work



In Figure 20, point B represents the shift in the budget constraint and tangency point that would be achieved if the individual did not take the time out of hours of work (this is the same as in Figure 19). This will be referred to as the *notional* budget constraint, along which hours of work is always constant. If, however, they do reduce working time, then there would be a **pivot** in the budget line **in addition** to the shift, demonstrated by the light blue line and tangency point at point C.

Consider the case of a student who is already studying part-time. Initially, the individual maximises utility at point A, consuming x_1 units of part-time study. Following the shift out of the budget constraint, if the time-constrained individual were to keep their hours of work constant, they would also keep their hours of study constant at x_1. This means that the quantity of all other goods consumed, given x_1 hours of study, must be the same for both (new) budget constraints. In other words, point X must lie on both (new) budget constraints. The budget line will then pivot around this point, which is common to both scenarios, to reflect the steeper trade-off between part-time education and all other goods[9].

Individuals who have to give up hours of work in order to increase their hours of study will meet a lower indifference curve (IC_3) than those who do not face this additional constraint (IC_2). The new optimal choice is at point C. They are still better off than they were prior to the expansion of the economy, and they have still increased their consumption of both part-time education and all other goods, but they will consume **less** part-time education and (potentially) **more** of all other goods compared to those who do not trade off hours of work.

The Engel curve remains positively sloping, so the demand for part-time education is still **pro-cyclical**, but the slope of the curve is now steeper. This is relatively intuitive: an increase in income has a greater impact on the demand for part-time education for those who do not have to trade-off hours of work than it does for those who do[10].

What does all this mean?

We have presented a lot of material. Fundamentally, the theoretical analysis suggests that:

- Full-time higher education enrolment will **decline** in a buoyant labour market (**counter-cyclical**). The size of the decline will depend on the strength of individual **preferences**.
- The demand for part-time higher education will **increase** in a buoyant labour market (**pro-cyclical**). The **size** of the increase in part-time demand is **dependent** on the extent to which part-time students need to **substitute** out of work to accommodate additional study.
- For part-time students, **wages and household incomes** – not employment rates – are the key manifestations of a buoyant labour market. **Changes to real wages and incomes directly impact part-time learners**.

[9] The portion of the budget constraint to the right of point X must lie below the notional budget constraint. This is because, as students increase their hours of study, they must give up some hours of work, and so they have less income to spend on all other goods; the quantity demanded of all other goods is lower on every point to the right of X. Conversely, the portion of the budget constraint to the left of point X must lie above the notional budget constraint: as the quantity of hours of study falls, this time can be spent working and so income will be higher for each point along this section of the budget constraint. The gap between the budget constraint and the notional budget constraint gets wider as the quantity of education demanded moves away from point X to represent the fact that the additional income gained or lost is proportional to the number of hours of study increased or decreased. Increasing hours of study by 10 hours results in 10 hours of lost work, which will have double the impact on income (and purchasing power of all other goods) than increasing hours of study by 5 hours.

[10] Both of these scenarios depict the decisions of students who are already studying part-time to some extent. However, this does not necessarily need to be the case, as individuals do not inevitably choose to sit at the utility-maximising position. This is because they typically face additional constraints. Only those with some preferences for education would consider enrolling in part-time study when their income levels rise, so they would be expected to enrol in a certain amount of education at all non-zero income levels; however, clearly this does not occur. One potential reason for this may be that part-time students only receive financial support for their tuition fees when they undertake more than 25% of the course credits in a given year. As a result, many potential students who would like to enrol at, say, a 10% intensity may be blocked from doing so due to financial constraints. When their income levels rise, their utility-maximising position may cross this threshold, inducing them to enrol.

5 Has the increase in full-time higher education participation reduced the available part-time pool?

To further explain the decimation in part-time study, there has also been the suggestion that the increase in full-time participation is the reason:

> ***"I acknowledge the fall [in part-time student enrolment], but [Mike Amesbury MP] needs to understand that there are complex reasons for it, including the rapid increase in the proportion of people entering higher education at the young age of 18. This means that there is a smaller stock of students seeking to participate in part-time and mature study later in life. " (Jo Johnson, Hansard, 19/07/17 (here))***

It is clearly exceptionally difficult to illustrate; however, it is possible to consider the demand for full-time and part-time higher education over time – and compare this to the size of the corresponding population – making some simplifying assumptions relating to the age at which full-time and part-time students undertake their studies.

The 'excess' of full-time students

In Figure 21, we have presented the number of full-time students entering higher education between 2005/06 and 2014/15 (dark blue bars)[11]. The analysis indicates that the number of full-time students has increased by **12%** over this period (equivalent to **45,750** students).

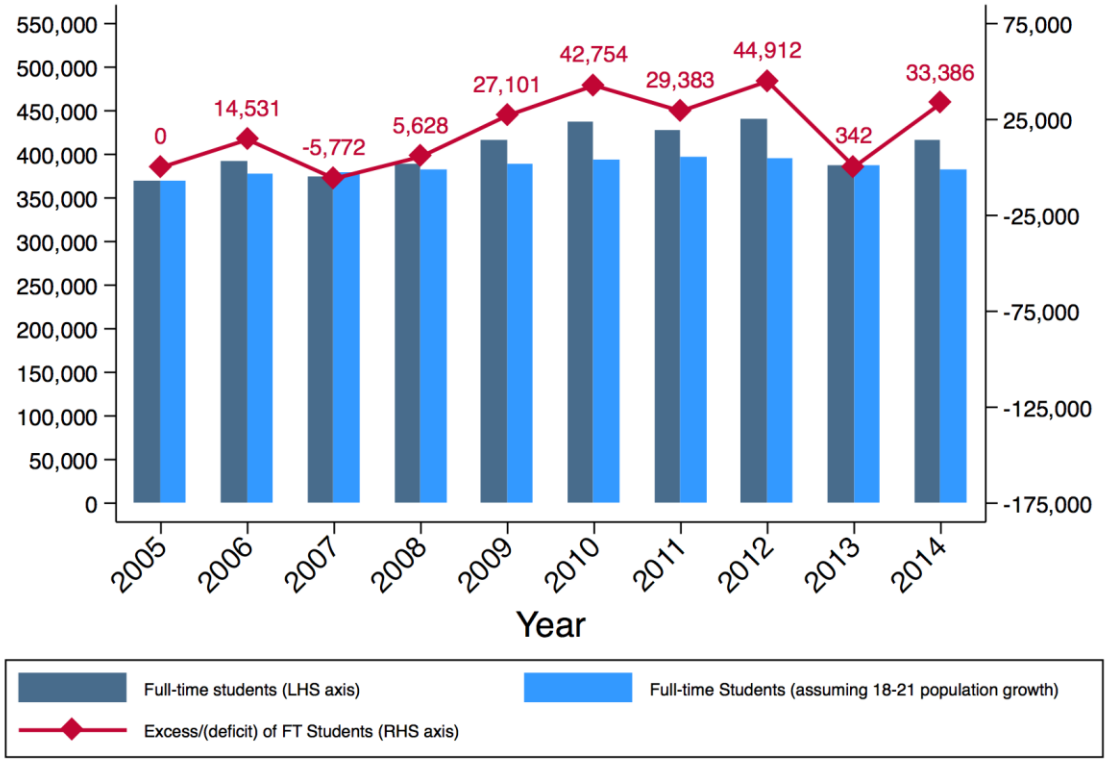
In addition, we have estimated the number of full-time students on an annual basis (in grey bars) *assuming* that the number of full-time students increases at the same rate as the population of 18-21 year olds (which has increased by approximately 3% over the period). If enrolments had increased in line with population growth estimates, the total number of full-time enrolments would be approximately **12,364** higher than in 2005/06.

In other words, full-time enrolment rates have significantly outstripped the rate of population growth amongst 18-21 years olds – and this corresponds to an 'excess' of full-time students of **33,386** in 2014/15.

However, the picture that emerges when considering part-time students is significantly different. Replicating the analysis for full-time students, the number of part-time students enrolling in higher education has declined by **41%** over the period between 2005/06 and 2014/15 (by approximately **138,000** students). In contrast, the population of individuals aged between 22 and 59 has increased by **5%** over the same period. Therefore, if we apply population growth amongst this age group to the number of part-time enrolments to maintain a constant proportion of part-time entrants, the analysis suggests that there should be approximately **352,467** part-time enrolments in 2014/15, which is approximately **15,673** more that in 2005/06. Given the fact that enrolments declined by more than 138,000, this suggests that there is a deficit of part-time students of more than **153,000** in 2014/15.

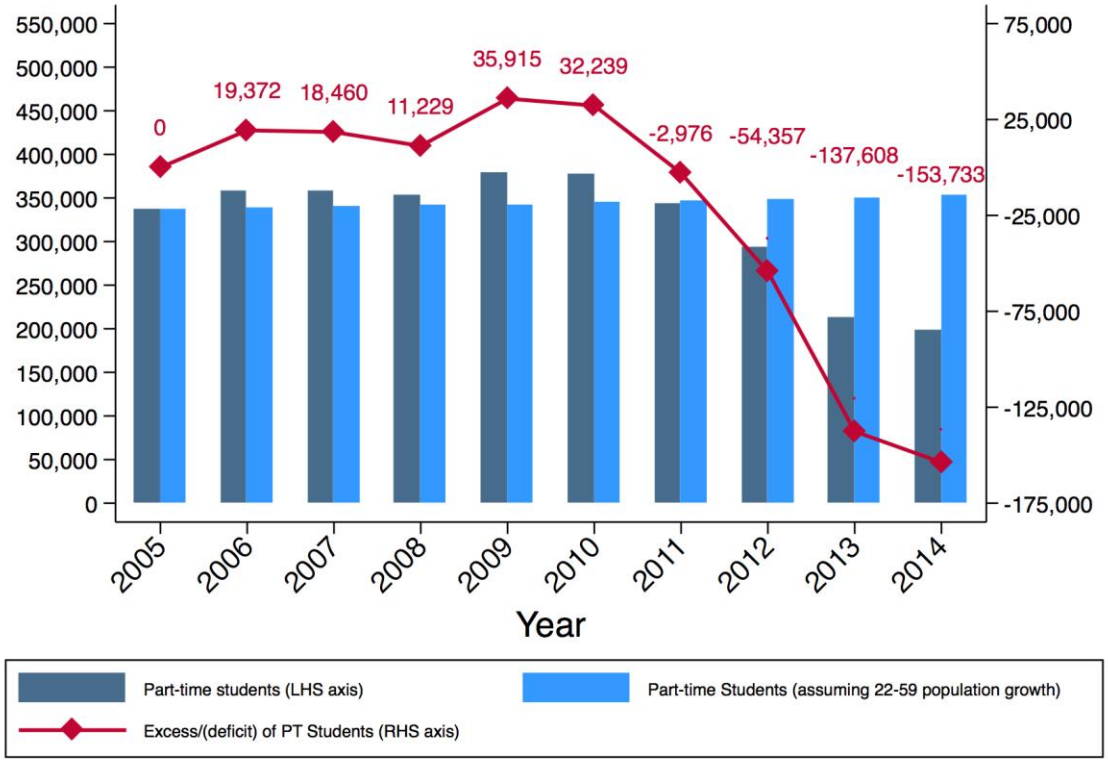
[11] In selecting 2014/15, we have used the most recently available information from the ONS on population levels over time by age

Figure 21 Full-time student enrolment 2005/06 to 2014/15



Source: London Economic analysis of HESA and ONS data

Figure 22 Part-time student enrolment 2005/06 to 2014/15



Source: London Economic analysis of HESA and ONS data

Based on population growth rates and current levels of enrolment, the 'excess' of full-time students (of **33,386**) does not bridge the 'deficit' of part-time students (of **153,733**).

In other words, even if the increase in enrolment of full-time students has in part reduced the demand for part-time study, this has in no way exhausted the latent demand for part-time education.

6 Previous research

Does the empirical evidence sit well with the theoretical models?

A number of studies have looked into the relationship between the demand for education and macroeconomic conditions, both theoretically and empirically (Dellas & Sakellarisy, 2003; Campos, Dent, Fry, & Reid, 2011; Oxford Economics, 2014; Stratton, O'Toole, & Wetzel, 2004). Dellas & Sakellarisy (2003), for instance, claim that in the absence of borrowing constraints, the demand for education is **countercyclical**. They argue that individuals will substitute education for work when the current wage is low relative to future wages and the interest rate is low (as this is viewed as the least costly time to invest in improving their future wages via education). Using data on the United States, they find that the empirical evidence provides support for their hypothesis.

However, Stratton O'Toole, & Wetzel (2004) argue that the standard human capital model assumes that higher education is a full-time commitment; a notion which clearly does not apply for part-time students. They develop a theoretical model to account for this relaxed assumption, which suggests that the demand for part-time education is actually **pro-cyclical**. This view is supported by Oxford Economics (2014), who assert that this is due to the existing commitments of part-time students and the reliance on employment or employer support to fund their course. Specifically, they report a **strong positive relationship** between part-time education demand and both **economic growth**, and **real disposable income**, and a **negative relationship** with the **unemployment rate**. They add that the anticipated rise in enrolment rates as the economy emerged from recession was likely cancelled out by the substantial policy changes (namely the rise in tuition fees). Similarly, when they apply their model to US data, Stratton O'Toole, & Wetzel (2004) find that, as the employment rate rises, the likelihood of part-time enrolment increases[12].

Of further consideration is the impact of funding provision. When tuition fees tripled in 2012, there was a **35% fall** in the number of part-time students with **employer funding** (Oxford Economics, 2014). Remarkably, this provision was relatively stable throughout the preceding recession, indicating that increased tuition fees are more of an impediment for employers than macroeconomic conditions. Furthermore, self-funded students are either incapable of paying the fee increases, or disinclined to do so (Universities UK, 2013).

Vieru (2015) and Butcher (2015) argue that policy has underestimated the **debt aversion** of potential part-time students. According to Halterbeck & Conlon (2015), even though student financing is now available for part-time students, their propensity to take out a student loan is **lower** than for full-time students. Additionally, Universities UK (2013) indicate that part-time students are more fearful of accumulating debt, particularly amongst mature students and those supporting dependents.

While all factors will have undoubtedly have had an influence on enrolment rates, Oxford Economics (2014) claim that higher education policy changes were the **driver** of the fall in part-time student enrolments, while macroeconomic conditions **exacerbated** the decline.

[12] A fall in the unemployment rate by one percentage point increases the likelihood of part-time enrolment by more than one percentage point.

7 Conclusions

The number of students in part-time higher education has fallen significantly over the past decade, coinciding with significant fluctuations in **macroeconomic conditions**, as well as a number of **key policy changes implemented by successive Governments**. In particular, higher education fees essentially tripled in 2012/13 and funding was withdrawn in 2008/09 for students studying at an equivalent level to a qualification that they already possess. There have also been notable changes to student finance provision, with part-time undergraduate student fee and maintenance grants being replaced with fee loans only for students starting their learning in 2012/13 (and no maintenance loan option to help with the additional costs of studying). Alongside all of these reforms, the economy has experienced a recession followed by a recovering labour market in terms of the employment rate, while real income levels have only very recently started to rise.

There have been a number of suggestions that the falling numbers of part-time enrolments directly result from a **more buoyant labour market**, since the opportunity cost of work is higher. Whilst this is **probably true for full-time students**, part-time students are not affected by this opportunity cost argument to the same extent as they are likely to already be working to some extent. In reality, part-time students would see their incomes rise as the labour market improves, resulting in greater disposable income available to purchase education services.

Furthermore, the labour market has only really grown stronger in terms of the employment rate, while income levels have remained depressed until last year (2016). Realistically, since part-time students are generally already working, it is **income levels** that are more likely to matter. When observing the trends in the data, the number of enrolments in part-time education appears to have fallen alongside falling income levels, while full-time enrolments follow the opposite trend. This lends further support to the idea that the opportunity cost argument is more relevant for full-time students only, while part-time students demand more (of all goods) of as their incomes rise.

Economic theory predicts that the demand for full-time education would fall as the labour market improves (**counter-cyclical**). Depending on individuals' preferences for education, these individuals would either switch to part-time study (in part conflating the impact on part-time demand) or choose not to purchase any education services at all.

In contrast, the demand for part-time education would rise to differing extents depending on whether individuals have to trade off hours of work in order to increase their hours of study. In other words, economic theory predicts that the demand for full-time education is **counter-cyclical**, while the demand for part-time education is **pro-cyclical**.

The analysis we have undertaken also demonstrates that the increase in full-time enrolment does not compensate for the reduction in part-time study that has occurred over the last decade. If the growth in full-time and part-time enrolment increased in line with more general population growth amongst relevant age groups, **the decline in part-time study is more than 4½ times as large as the increase in full-time study**.

Therefore, if the increase in enrolment of full-time students has in part reduced the demand for part-time study, this has in no way exhausted the demand for part-time education.

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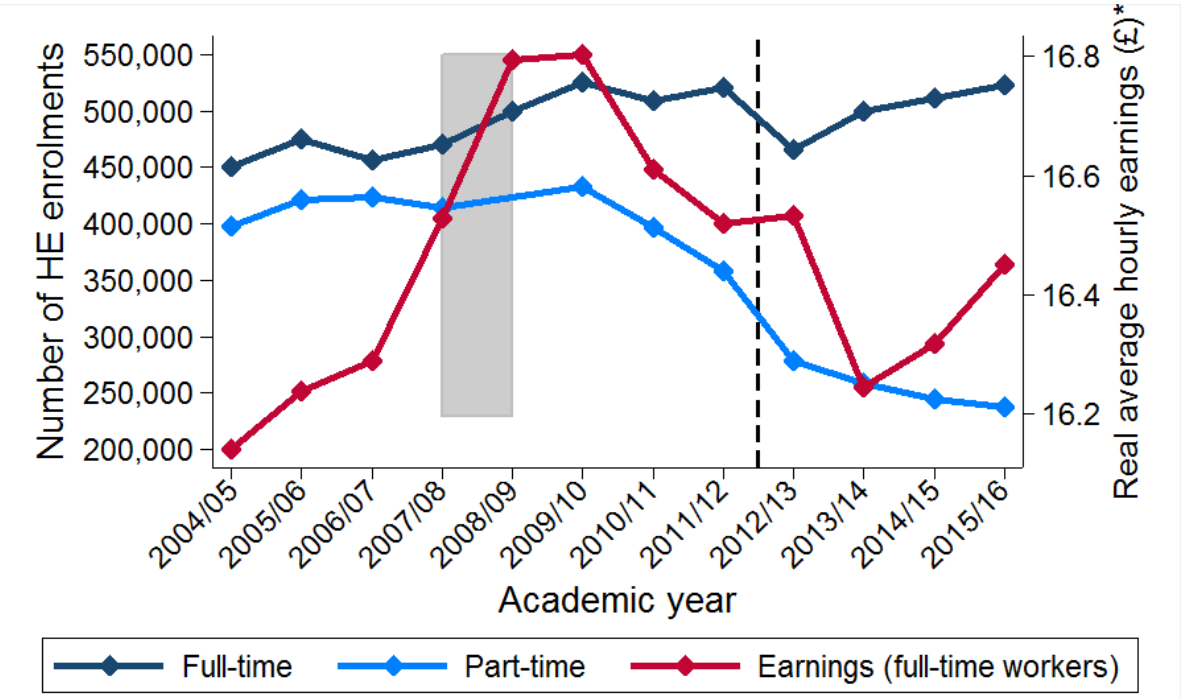
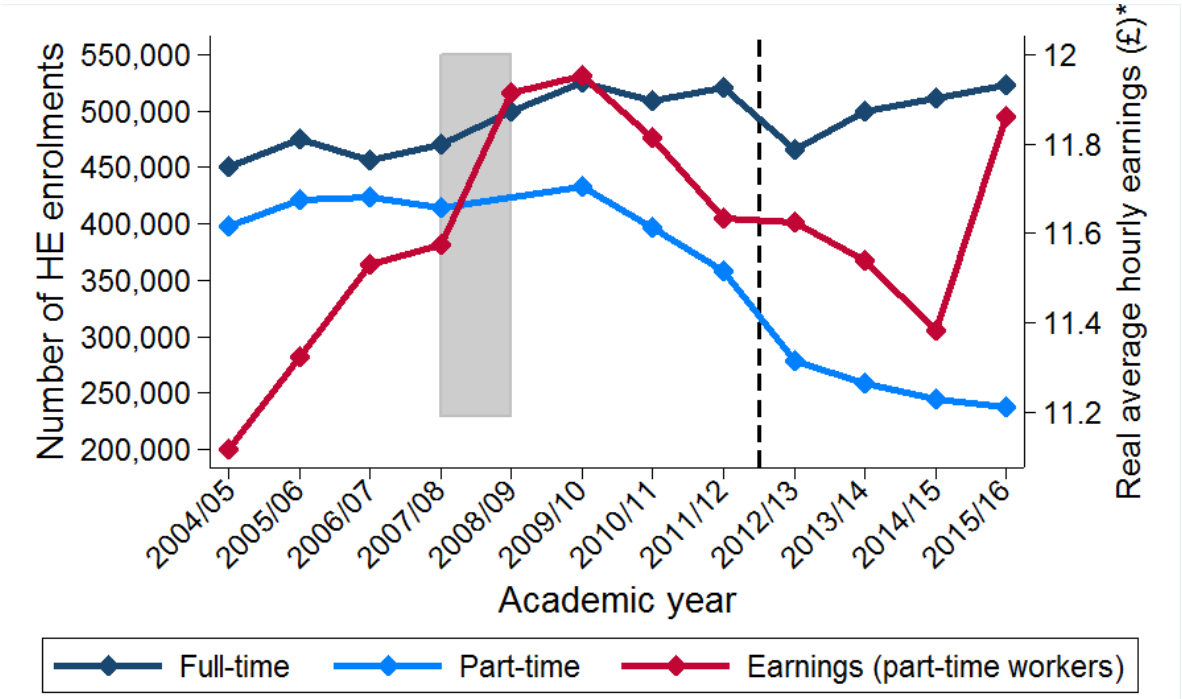
ANNEXES

Annex 1 Trends in earnings for full-time workers and higher education enrolments



* Adjusted for inflation using GDP deflator (ONS; 2016=100)
1) Data for PT students were suppressed for NI institutions in 2008/09 due to data quality issues
2) Domestic students at UK higher education institutions
3) Hourly earnings in the UK
4) Sources: HESA (education statistics); ASHE (earnings)

Annex 2 Trends in earnings for part-time workers and higher education enrolments



* Adjusted for inflation using GDP deflator (ONS; 2016=100)
1) Data for PT students were suppressed for NI institutions in 2008/09 due to data quality issues
2) Domestic students at UK higher education institutions
3) Hourly earnings in the UK
4) Sources: HESA (education statistics); ASHE (earnings)

Annex 3 Opportunity costs during study

Reflecting the expectation that part-time students are typically able to combine work with their academic studies, an analysis of the Labour Force Survey indicates that part-time students incur significantly lower opportunity costs than full-time students.

Students undertaking undergraduate degrees tend to forego relatively high proportions of earnings (ranging between **84%** and **86%** among full-time students), compared to much lower opportunity costs amongst part-time students (ranging between **21%** and **48%** of earnings).

Table 1 Proportion of earnings foregone during study, by qualification level, gender and study mode

Qualification level	Full-time students		Part-time students	
	Male	Female	Male	Female
Other HE	79%	75%	32%	19%
HNC/HND	69%	74%	1%	46%
HE Diploma	80%	83%	9%	35%
Foundation Degree	82%	76%	8%	35%
UG Degree	86%	84%	21%	48%

Note: Based on proportion of average full-time working hours per week (37.5) foregone over the period of study.

Source: London Economics' analysis of Labour Force Survey data (2004-2016)

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