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ESCoE Research Seminar

Bridging the gap between GDP and Welfare

Presented by Richard Heys (Office for National Statistics)

12 February 2019

Bridging the gap between GDP and Welfare

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February 2019

The views expressed in this presentation are those of the author, and not necessarily those of the Office for National Statistics.

Scope

- “*we live in a society in which a priesthood of technically trained economists, wielding impenetrable mathematical formulas, set the framework for public debate*” (Pilling 2018)
- Schools of user thought on GDP
- Why is GDP such a ‘statistical winner’?
- Is GDP an acceptable proxy for welfare?
- How could we use GDP as a base to create a better measure of welfare
- Putting options on a spectrum
- Pragmatic steps (and hurdles to overcome)
- Conclusions

The two philosophies of GDP

- **The Orthodox view:** GDP is a measure of the productive economy, providing insight to economic policy-makers to set fiscal and monetary policy.
- The National Accounts have ‘*a place for everything and for everything a place*’ - complete coverage of the concepts it is designed to cover.
- **Therefore:** GDP is a ‘*perfect measure*’ and does not need substantive revision.

- **The Moderniser view:** What society needs is a measure of welfare which reflects modern life, particularly as the consumption of material goods is becoming ever less important as a measure of living standards.
- Equally society needs a better measure of sustainability as finite raw materials become scarcer.
- **Therefore:** Because GDP is the dominant measure used to proxy for welfare, GDP should be transformed so it can serve this function properly

“*Measurement issues have become akin to a religious war.*” (Brynjolfsson – ESCOE Conference 2018)

Why is GDP a statistical winner?

- GDP is a statistical winner, because of its perceived quality as a policy tool:
 - Frequency
 - Accuracy
 - Timeliness / speed of production
 - Back series
 - Granularity and consistency
 - Accessibility
 - Conceptual completeness
- These strengths are enough to overcome the National Accountant's lament – "*GDP is not a measure of welfare*" – it is not a good conceptual match.
- A practical consideration: it takes time and money to produce statistics, and the statutory can crowd out the 'nice to have' in a fixed budget.

The three big issues...

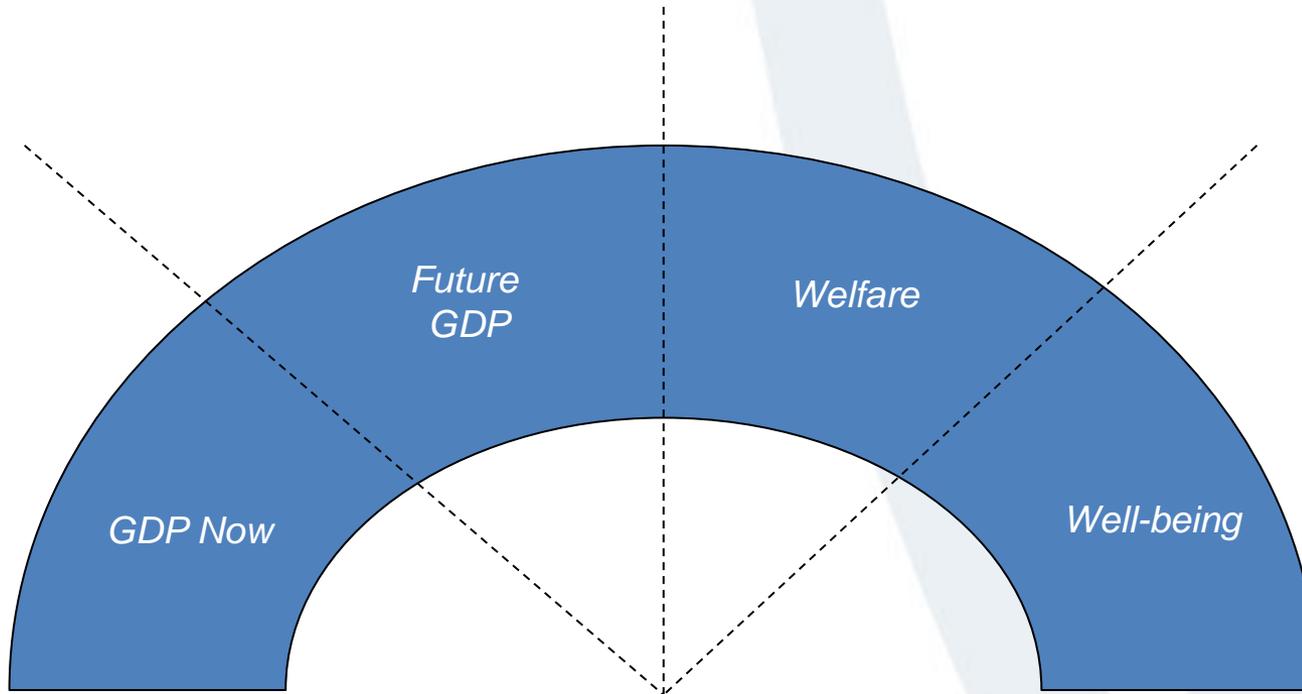
“Free digital goods are everything, except the National Accounts.”

Not Robert Solow

GDP captures production today, not sustainability tomorrow.

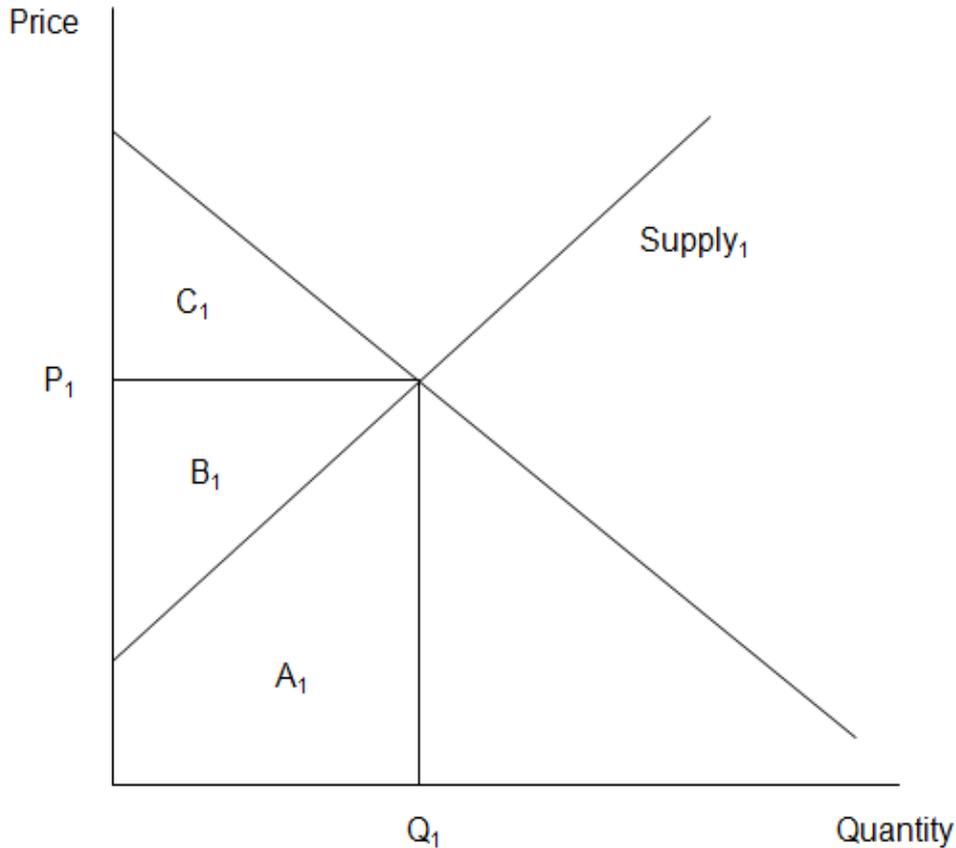
A single measure like GDP struggles to capture the distributional aspects of welfare.

... and how might GDP react?



What is the direction of travel of change for GDP, and would it help get us closer to a welfare measure?

What is Welfare?



Area A – Costs of production
Area B – Provider surplus
(profit)
Area C – Consumer Surplus

$$A + B = \text{GDP}$$

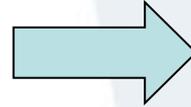
$$A + B + C = \text{Welfare}$$

So, GDP is not a measure of welfare...

- Not quite...
- Every economic indicator (prices, quantities etc) is, to some degree, a measure of welfare.
- But not necessarily good measures of welfare.
- GDP is an incomplete and therefore not necessarily accurate measure of welfare...
- But Jones and Klenow (2016) show that GDP is strongly correlated with their measure of welfare.

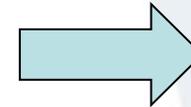
But is a strong correlation enough?

Different users need different measures because they are trying to solve different policy problems.



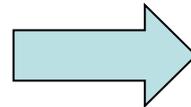
Therefore need a range of metrics to suit different purposes.

The modern economy is changing – how do we treat free goods?



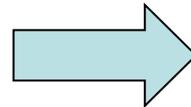
Does the correlation hold if the nature of the economy changes?

Capacity: the conditions for creating economic statistics are changing at the fastest pace in their history



We don't need to compromise with just one measure.

Whilst GDP is going nowhere, is it really a constant?

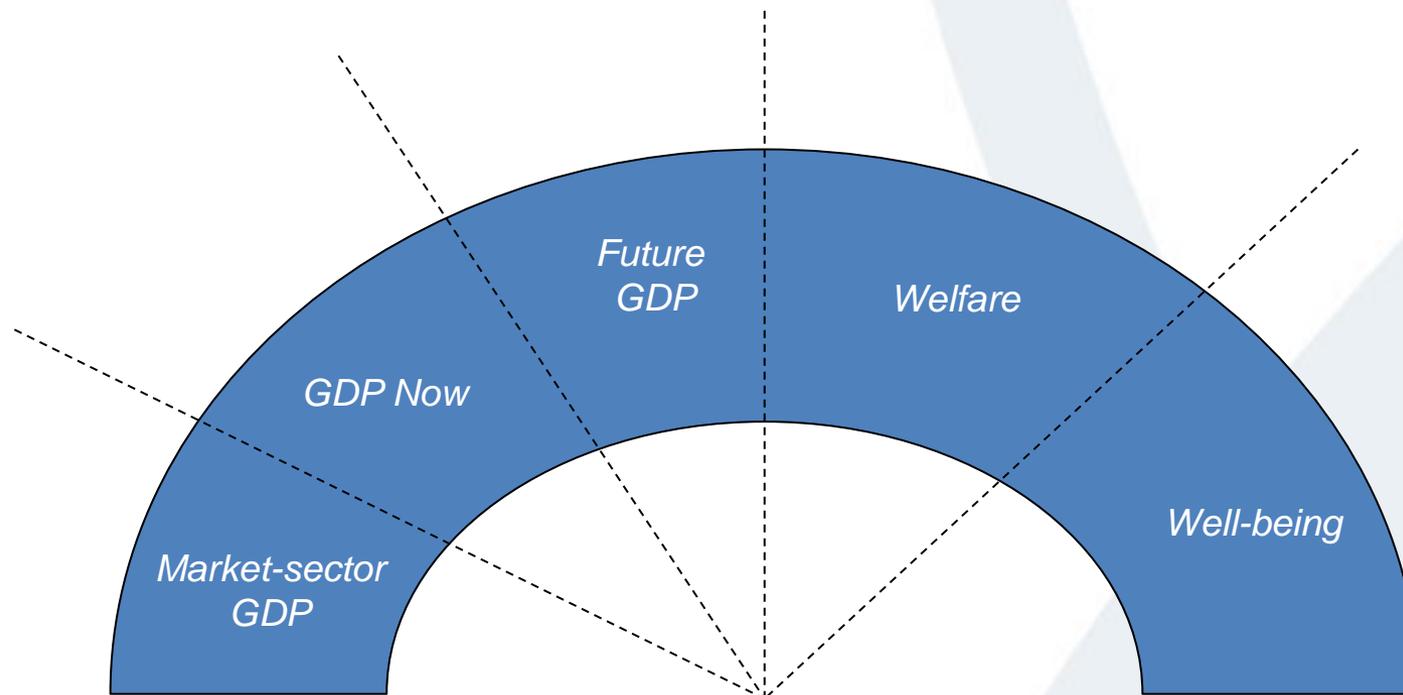


GDP has changed over time to meet user needs, in 1947, 1953, 1960, 1964, 1968, 1994 & 2008, so there is always scope to evolve.

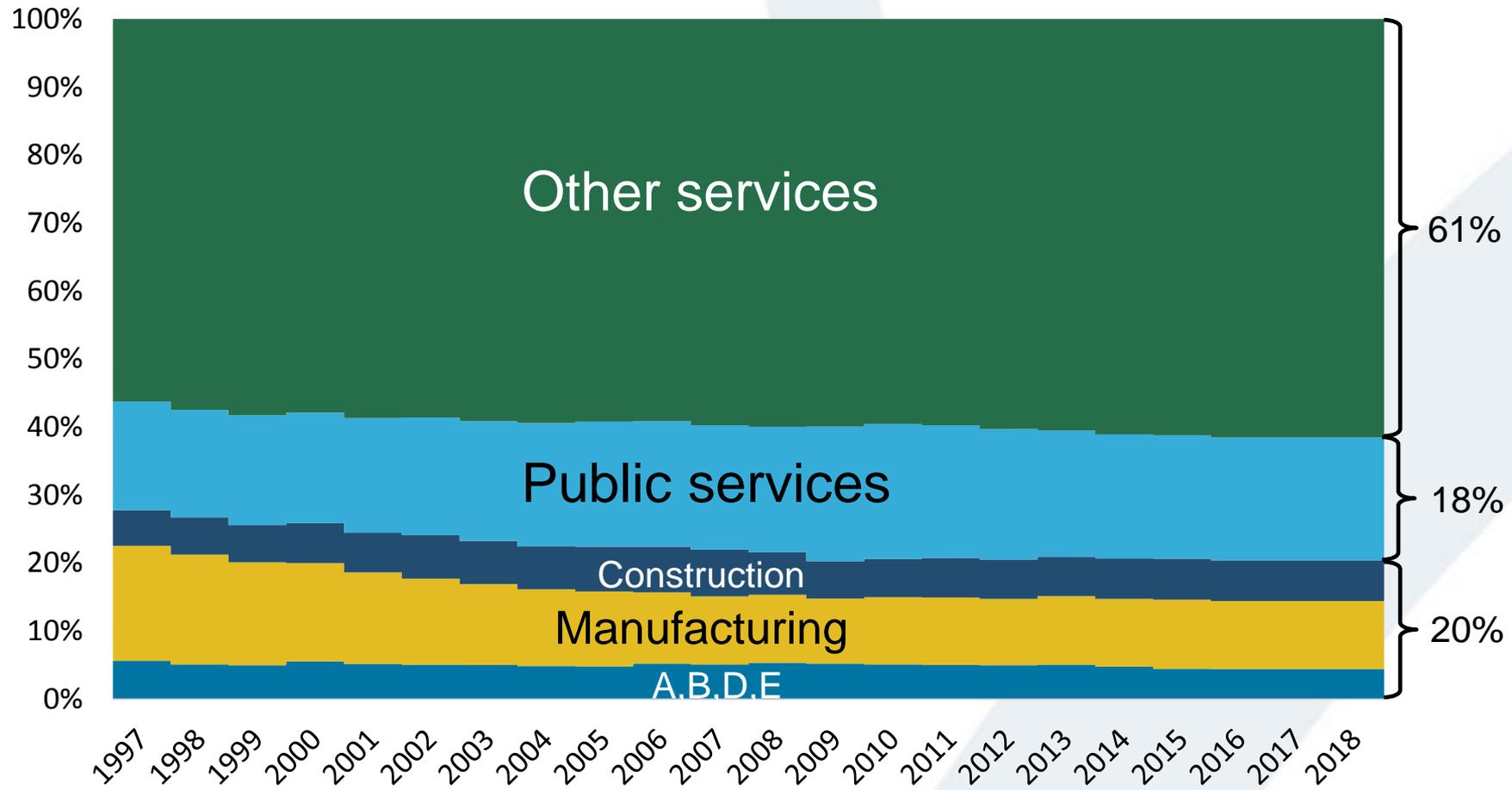
“If you don’t know where you come from, then you don’t know where you are, and, therefore, you don't know where you're going”

*“Free digital goods are everything, except the National Accounts.
Unlike free goods: 30% of GDP is free goods.”*

Still not Robert Solow



Public services matter in this debate



Before Atkinson

- Originally, government output was measured using deflated expenditure — “output = inputs”
- UK national accounts included direct measures of government output for the first time in 1998, as encouraged by SNA1993
- But the estimates were based on opportunistic methodologies and data sources, and led to implausible results
- Threatened the credibility of the national accounts themselves and led to Sir Tony Atkinson’s independent review

Atkinson Review - 2005

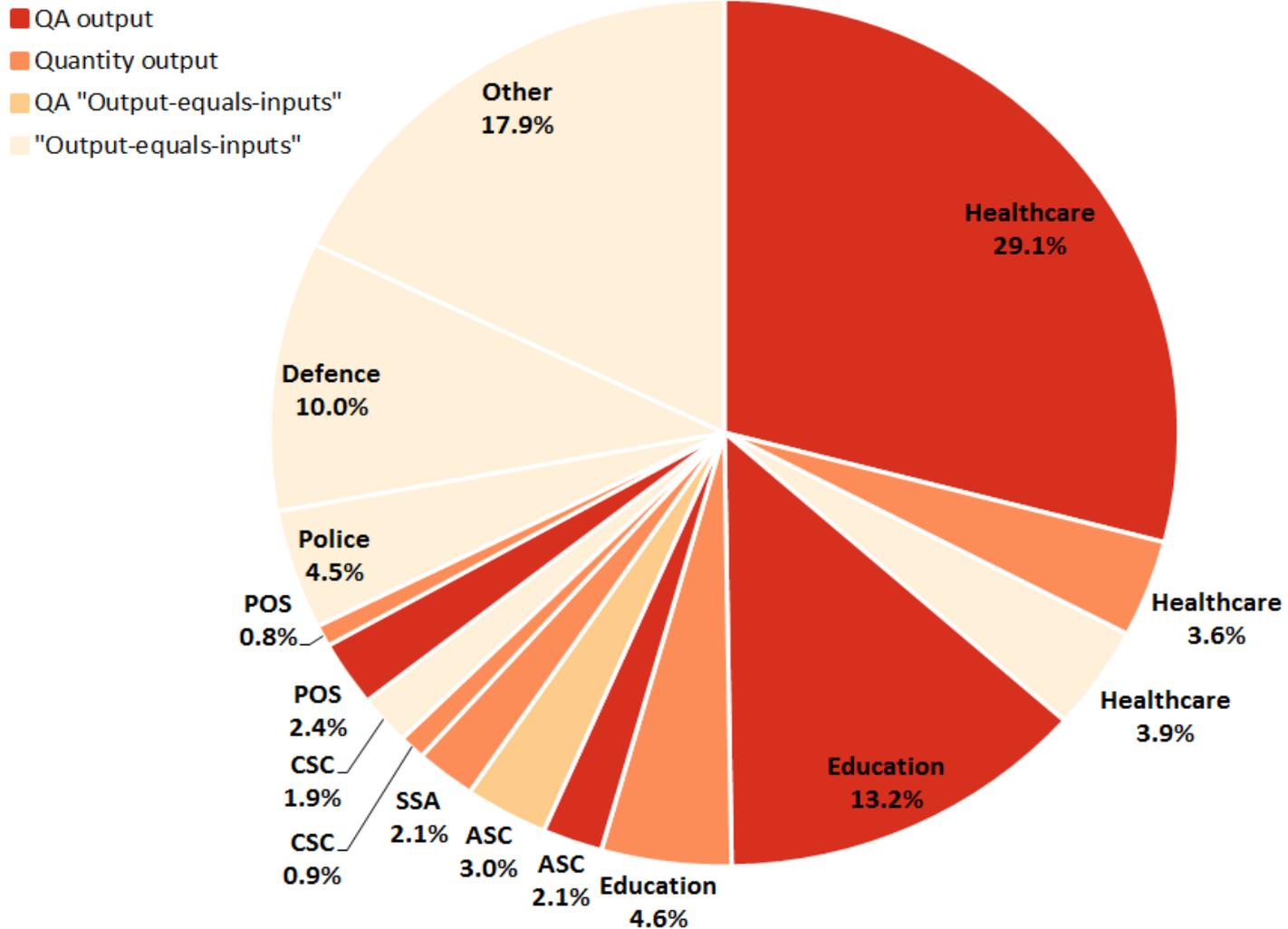
Measuring government output and productivity must be underpinned by a principled framework:

- I. Measure non-market (government) output in comparable manner to market (private sector) output i.e. by reference to value added
- II. Clearly follows government output should be quality adjusted – value depends on quality No value, no output..
- III. To the extent government activities directly lead to improved outcomes, clearly part of value
- IV. But outcomes may change for extraneous reasons (these not relevant to government output.)

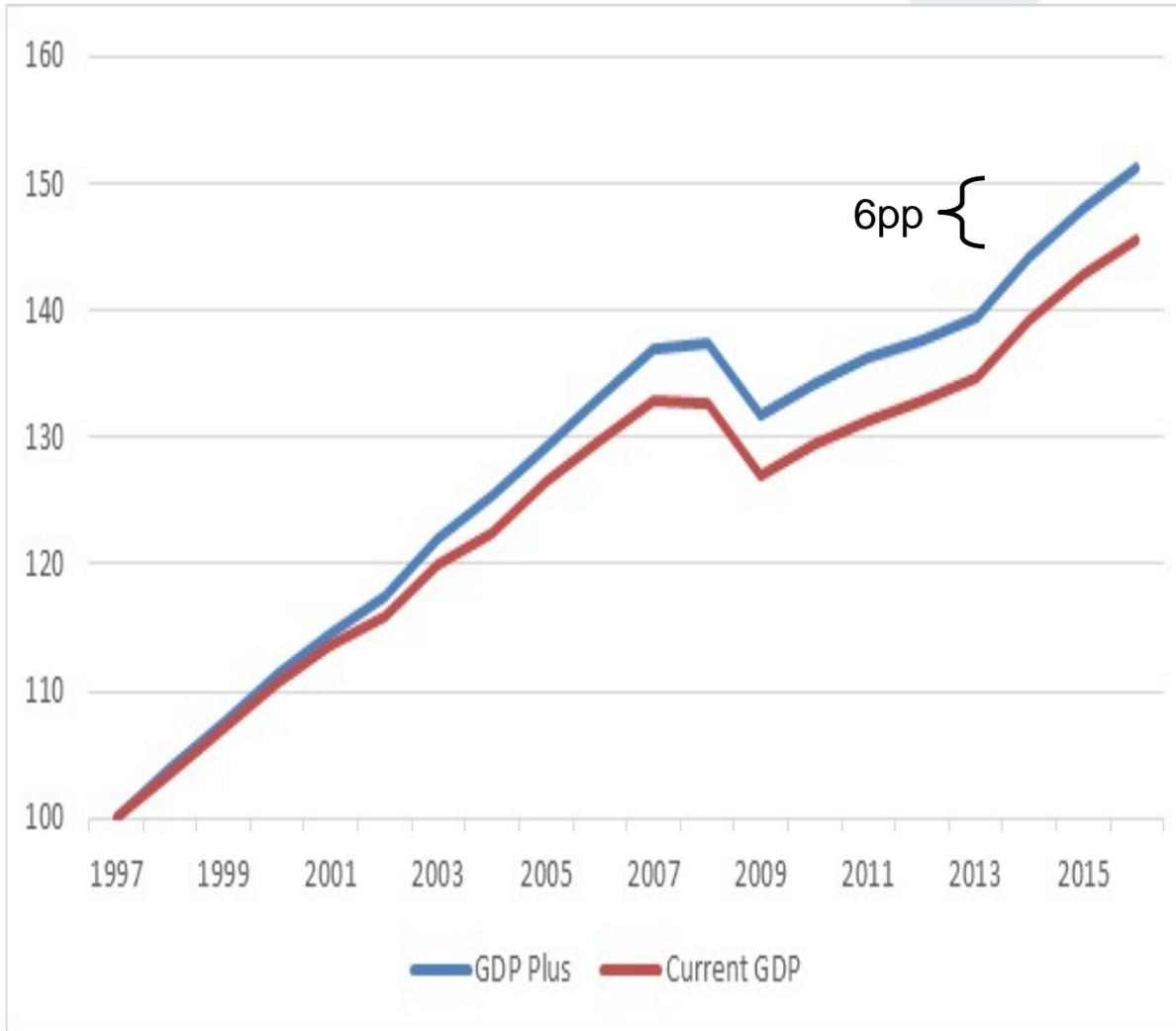
So, one should augment output data with ‘quality adjustments’ to capture value – this should give a better proxy for welfare overall.



Public Services in the UK (2016)



Impact of quality adjustments



Notes:

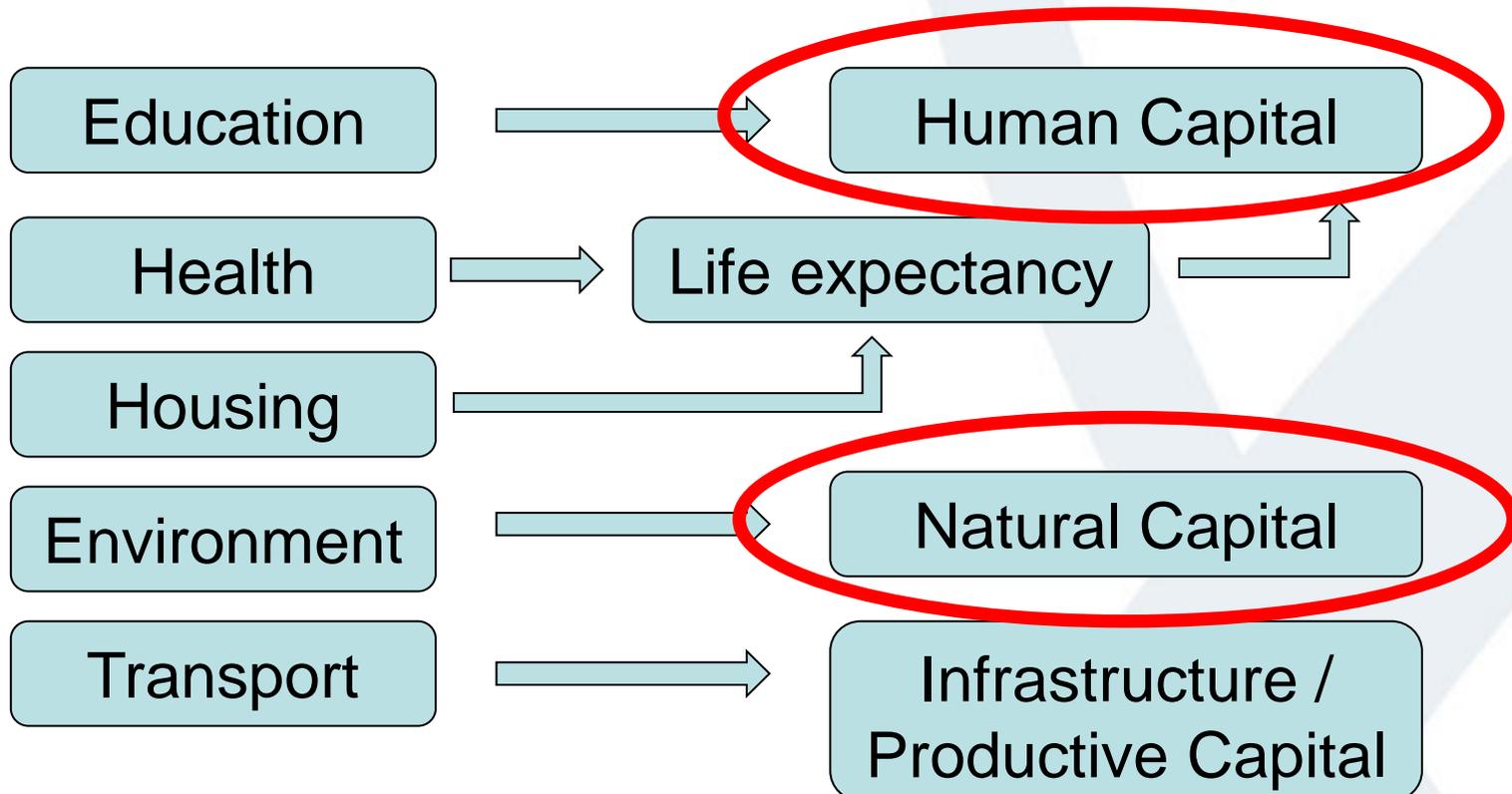
1. Growth rates of GDP and industry output taken from GDP(O) low-level aggregates.
2. Output growth not exactly comparable between GDP source data and public service productivity non-quality adjusted output measures, due in part to alignment of service area breakdowns (based on Classification of the Function of Government) and industrial classifications.
3. Public service productivity measures are not a direct match with the activities of government, including some third sector activity.
4. Calculations do not consider second-round effects on GDP weights.

SNA v ESA – different approaches

- SNA08 includes provision to include the quality adjustment of public services into National Accounts.
- ESA10 explicitly prevents inclusion of quality adjustments of public services in National Accounts.
 - Key rationale: methodological consistency for GNI calculations – Could different countries with very different systems deliver consistent adjustments?
- So National Accounts in the UK are not quality adjusted, but Public Service Productivity statistics are quality adjusted.
- Clashes between standards are confusing and need resolution.
- Assuming this happens, *Future GDP* would likely include these adjustments.

But this is only part of a bigger story

Do we 'consume' government services, or in some cases are they a form of investment?



The general issue of missing Capitals

- Potential to add missing capitals to National Accounts and derive better estimates, particularly from a productivity perspective. If GDP is to form a base for any proxy of welfare, capturing the full implications of the balance sheets, investment, depreciation can only help in addressing sustainability
- Issues:
 - Completeness
 - Overlapping estimates
 - Allocation of services

Completeness

Type	National Accounts?	Investment (CP)	Investment (CVM)	Stock (CP)	Stock (CVM)	Consumption of fixed capital	Other outflows
Fixed Assets	Yes	✓	✓	✓	✓	✓	✓
Inventories	Yes	✓	✓	✓	✓	N/A	✗
Valuables	Yes	✓	✓	✗	✗	N/A	✗
Non-produced assets	Yes	✓	✓	✓	✓	N/A	✗
Natural Capital	No	✗	✗	✓	✓	N/A	✓
Broader intangible assets	No	✓	✗	✗	✗	✗	✗
Human capital	No	✗	✗	✓	✓	✗	✗

Key: ✓ = Data available; ✗ = Data not currently available; N/A = Not applicable.

Notes:

- Consumption of fixed capital is only recorded on fixed assets, such as buildings, machinery, software, etc. Human capital could be thought of as a type of fixed asset, as it could reduce in value over time due to anticipated obsolescence, i.e. the normal aging of the population and resultant decrease in its human capital.
- Investment flows between sectors are possible for non-produced natural resources and natural capital, but must sum to zero across the whole economy. Other non-produced assets in the national accounts include contracts, leases and licences, and goodwill and marketing assets, for which non-zero investment flow across the economy are possible.
- The quality of the available data in each category is variable.

Over-laps

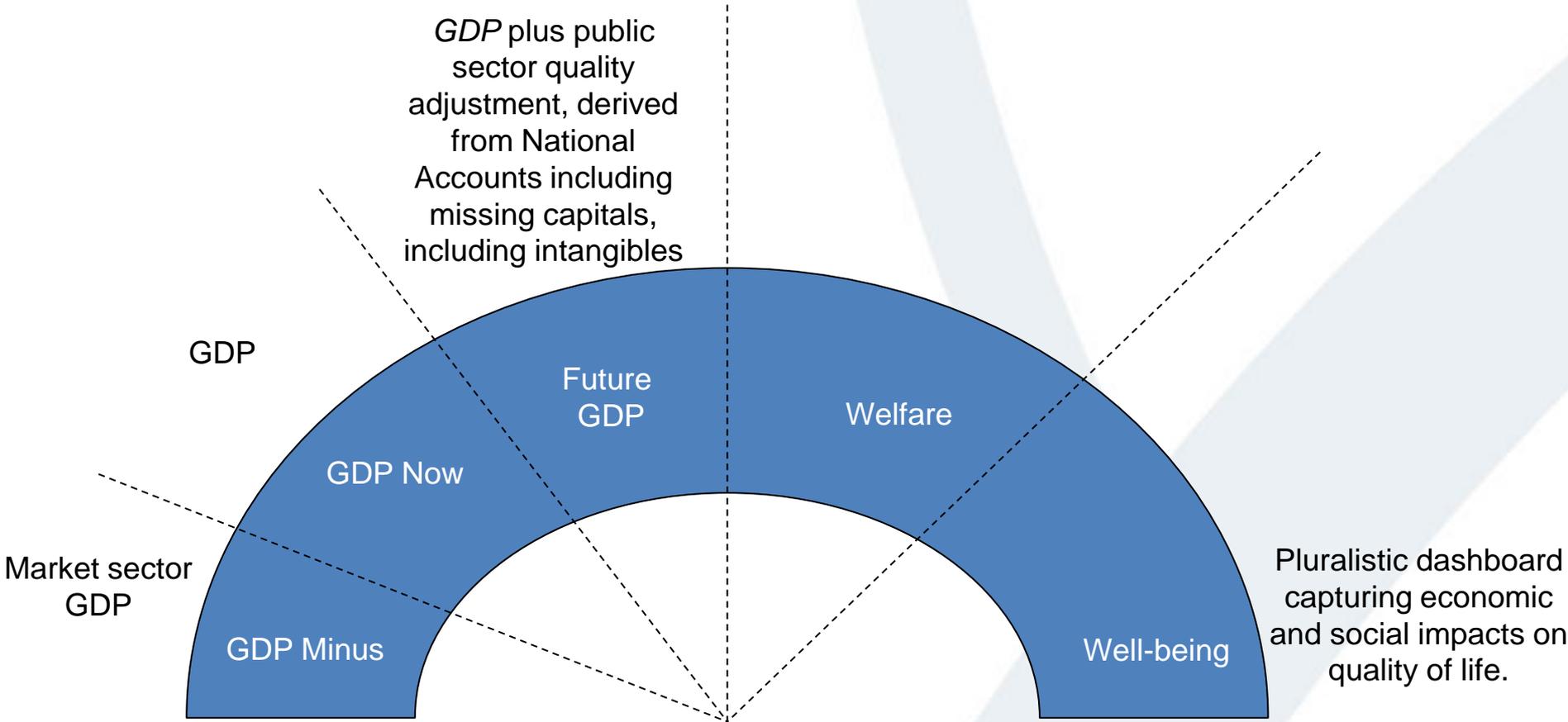
Different measures of capital, produced for different accounts, can contain overlapping estimates. We have identified (non-exhaustive list):

- **Grass and Feed:** National accounts 'cultivated biological resources' are likely to include some duplication with 'agricultural biomass (crops)' as included in the Natural Capital accounts. Farmed animals are not included as they are a produced asset rather than natural. The grass and feed the animals consume is included.
- **Timber and Minerals:** Timber and minerals may be contained in 'materials and supplies' within National Accounts 'inventories'. These are likely to also be found in 'timbers' and 'minerals' in the Natural Capital accounts.
- **Precious metals and stones:** Contained within 'valuables' in the National Accounts, these are possibly also included within 'minerals' in the Natural Capital accounts.

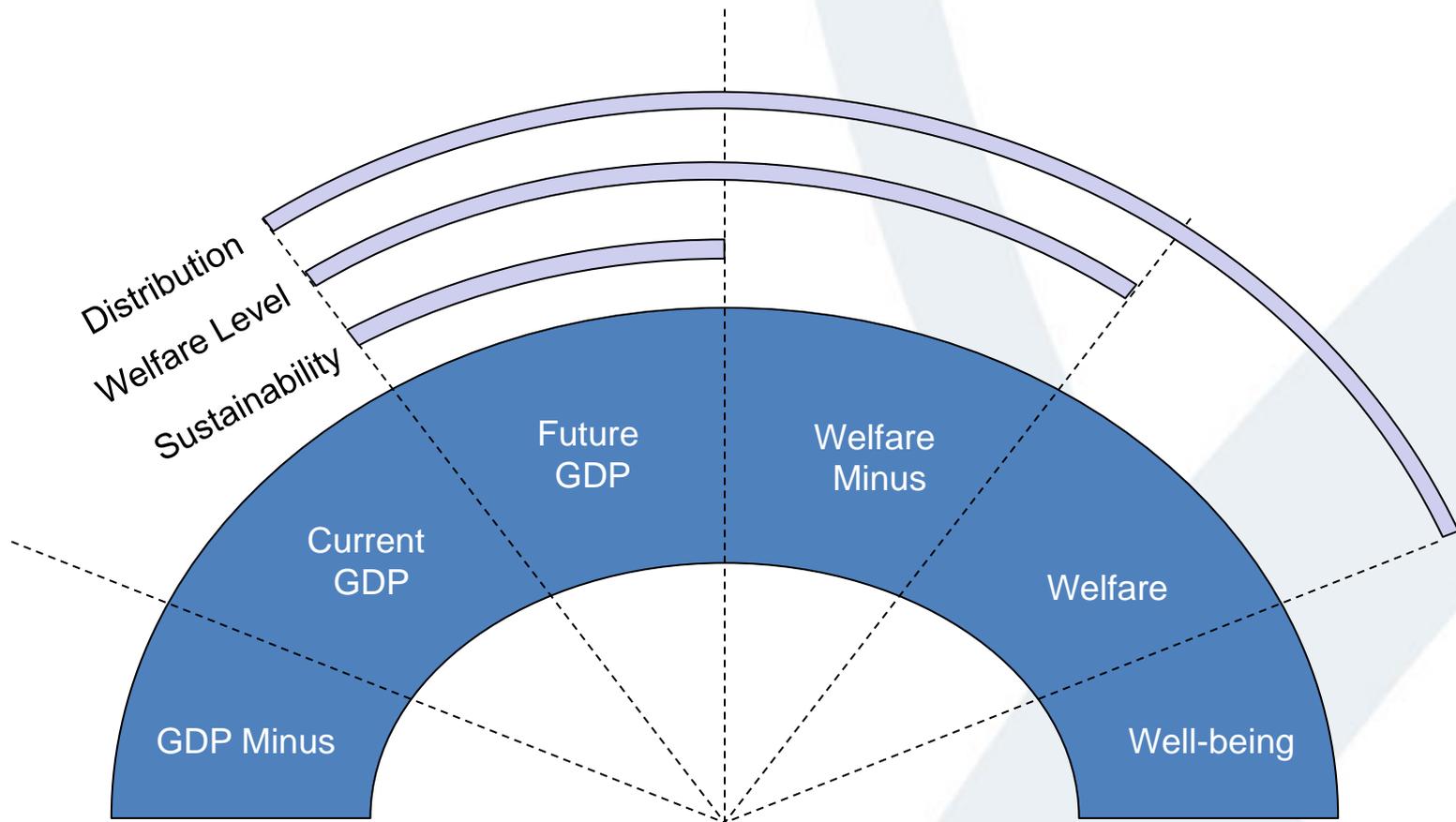
Allocation of capital services (Heys & Martin, forthcoming)

Type	Example	Capitalised?	Ownership?	Capital services flow to	Allocation in growth accounting
Private capital (tangible & intangible)	IT Hardware	Yes	Private	Owners of assets	Correct
Private infrastructure	Energy network	Yes	Private	Owners of assets and rest of economy	Only to owners of assets
Public infrastructure	Roads	Yes	Public Sector	Whole economy	None, in residual
Uncapitalised intangibles	Branding	No	Private	Owners of assets	None, in residual
Free/open information	Official statistics	No	Public	Whole economy?	None, in residual
Natural resources	Land	Yes (non-produced)	Public/private	Whole economy? Especially users	None, in residual
Inventories		Yes	Private	Owners of assets	None, in residual
Social infrastructure	Healthcare	No	Public	Whole economy?	None, in Hours/LC/Residual
Human capital	Education	No	Household sector	Owners of assets, and employers	None, in Hours/LC/Residual
Consumer Durables	Car / washing machine	No	Household Sector	Owners of assets / shared economy users	None, in residual
Capital replacement services	Cloud Computing	No	Private	Whole economy	Intermediate consumption / final output of computing services industry
Labour replacement services	Outsourced labour	No	Private	Whole economy	Intermediate consumption / final output of employment agencies industries

So that would give us Future GDP... what next?



Is there more we can do to identify the level of welfare or address the distributional aspects?

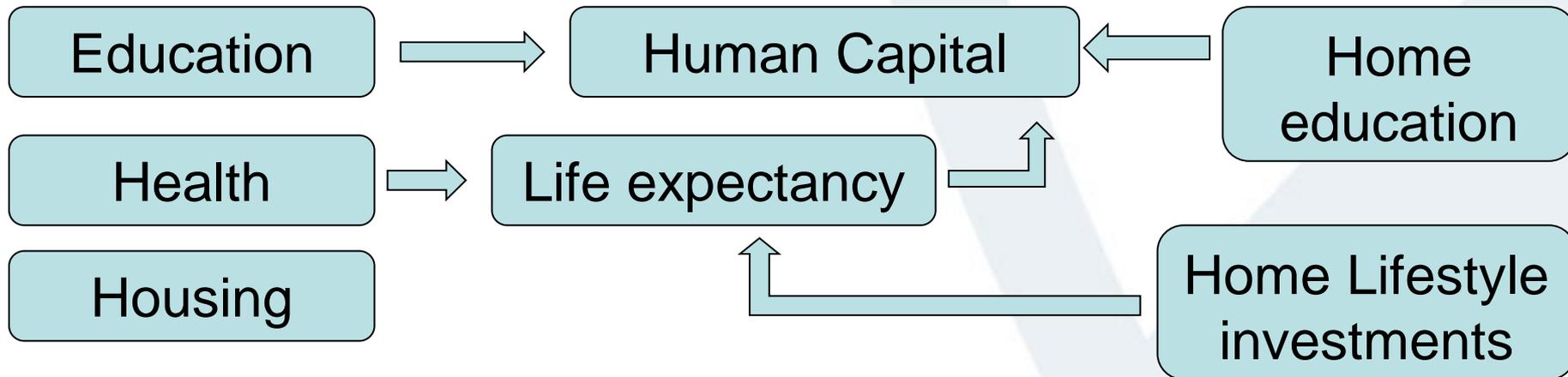


Recap

- GDP is an incomplete measure of welfare.
- Improving GDP through the inclusion of public sector quality adjustments and including the missing capitals into the National Accounts can only help improve GDP as a measure of welfare, but it is still conceptually incomplete and therefore would remain not an optimal measure of welfare.
- Therefore a welfare measure would need other components. Age-old debate about home production (Kuznets etc) – the value of (unpaid) work in the home. The improvements proposed to GDP exacerbate this

Household Own-Account Investment in Missing Capital

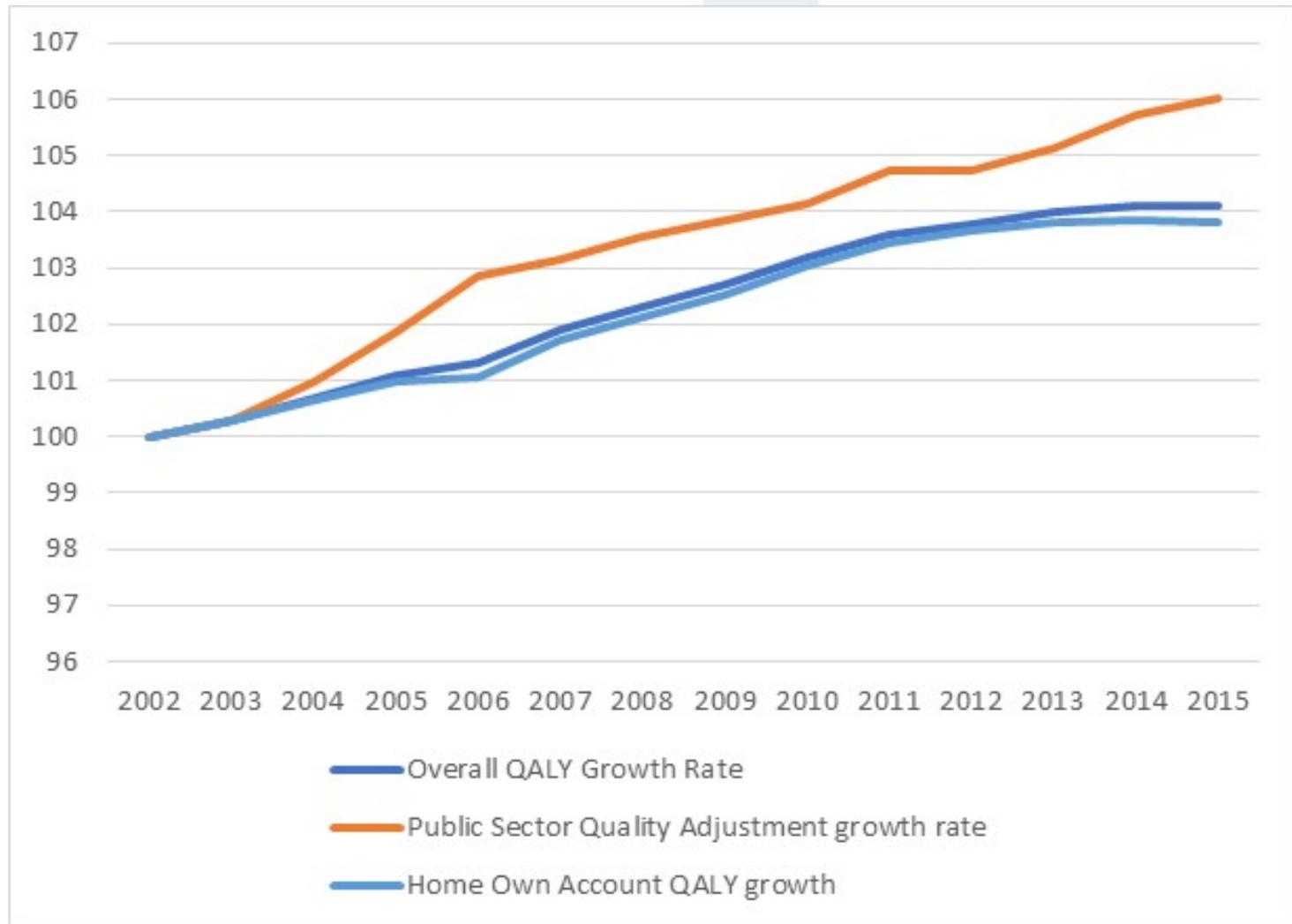
- Is it logical to include government / productive sector investment in missing capital, but not the investments carried out by households?



Inclusion of the Household Account into a welfare measure...

- Allows us to capture more 'free goods' – childcare, catering, cleaning, gardening, care, DIY, taxi services.
- Conceptually clear distinction for welfare from GDP.
- Consistent treatment of all investment into missing capitals

A Simple Life Expectancy Example



Author's own calculations. Assumes constant 12.5% share for public service (MacGinnis et al 2002)

Free digital goods

- The production costs of free digital goods are already in the National Accounts - except the archetypal *'geek coding in their bedroom'* – but let's assume he's going to incorporate when he reaches scale.
- This is paid for from advertising revenues (mainly).
- So, that's it, isn't it?

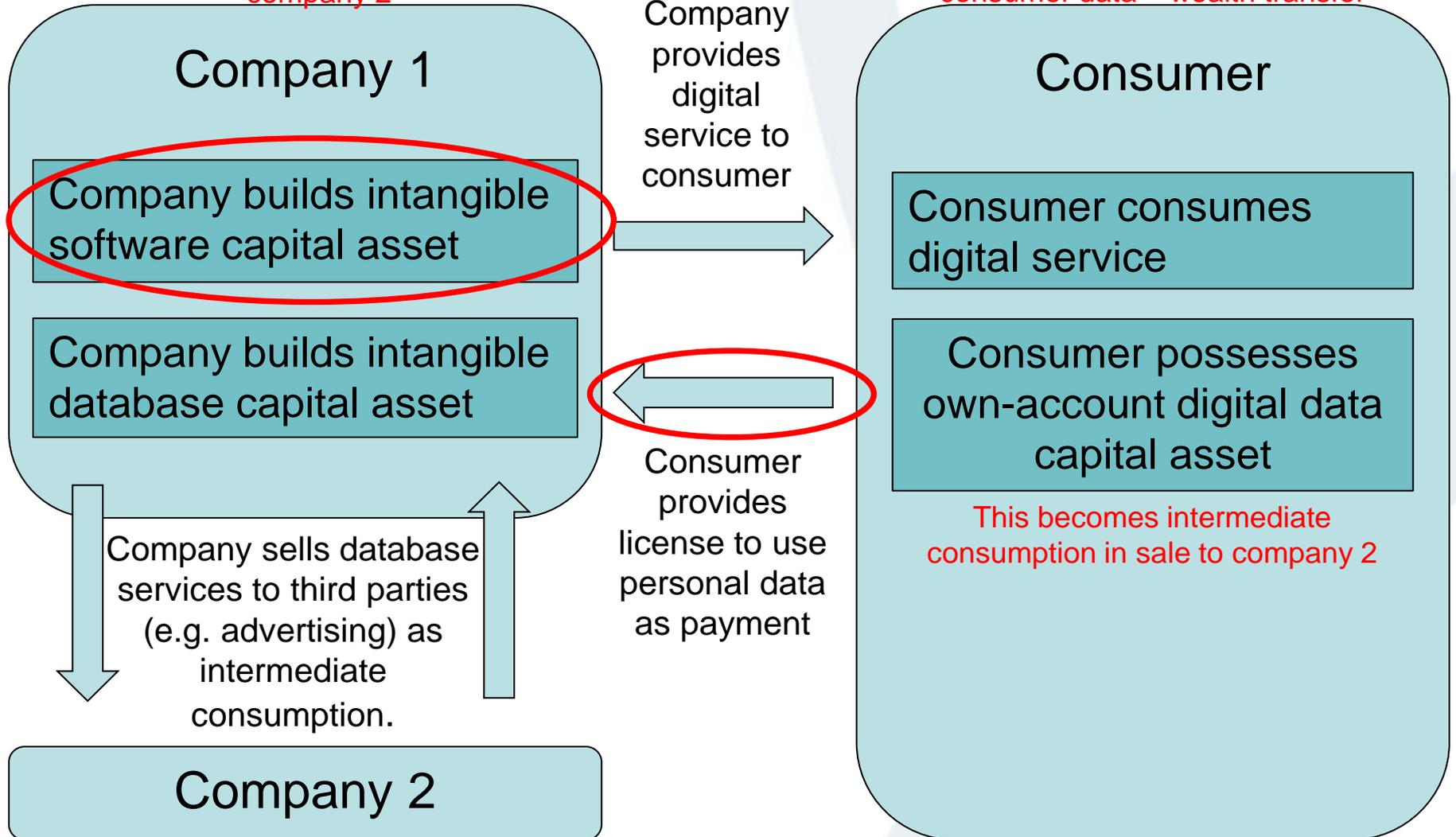
Atkinson (part 2)

- When dealing with free goods, the principle Atkinson establishes is 'look at value, not cost of production.' Otherwise value-added is always zero and productivity growth is always zero.
- Why would we treat free goods outside the account any differently from those within the production boundary?
- Especially when they share non-excludable / non-rivalrous qualities of public goods.
- But are these goods really free?

A simple example.

Today – final output – part of the sale to company 2

Becomes payment (means of exchange) for consumer data – wealth transfer



Valuing the barter transaction

Three options:

- 1) Estimating the value of the personal data 'payment' – 'the price is the price is the price' – some studies say this is as low as the price of a cup of coffee.
- 2) Estimate the value of the free digital services provided in exchange for the data license
- 3) Treat as a free good
 - Time Use Survey (under development at ONS) to investigate usage of free digital goods, particularly change through time if possible.
 - Willingness to Pay Survey (ESCOE pilot investigating) to collect 'value' / consumer surplus data for these free goods.
 - Multiplied together these provide a value of the free digital goods and services for these 'privately provided public goods'.

Net National Disposable Income – a definition

- Eurostat:
- *“...derived from National Income by adding all current transfers in cash receivable by resident institutional units from non-resident units and subtracting all current transfers in cash payable by resident institutional units to non-resident units”*
- *“GNI corresponds to the better known GDP minus primary income payable by resident units to non-resident units, plus primary income receivable by resident units from the rest of the world. Net national Income equals Gross National income after deduction of the consumption of fixed capital.”*
- Augmenting this with income from the Household Account, including returns from missing capitals, and privately provided public goods leaves us with a welfare adjusted NNDI ($NNDI_w$)

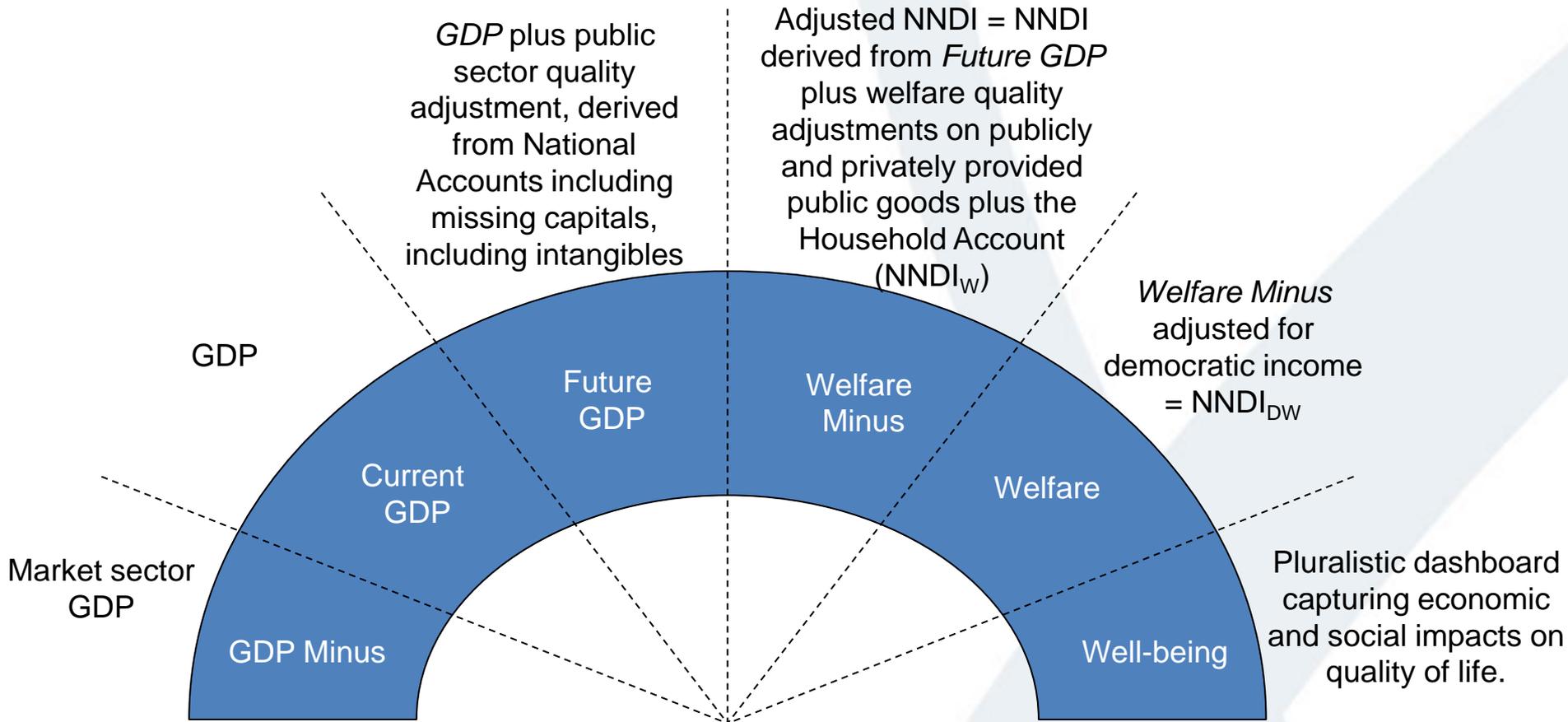
Recap

- Adding the Household and National Accounts, including taking account of household capitals, would provide a complete view of the value of goods and services being consumed – effectively a welfare adjusted measure of National Income.
- Assumes we're addressing capital depreciation, and producing 'net' not 'gross' estimates
- Including privately provided digital 'public goods' will give us a view of the 'level' of welfare.
- But this is still only 'welfare minus' because we haven't dealt with distribution.

Capturing distributional factors

- Weale & Aitken (2018) – democratic measures of income – the rate of growth for the average household, not the average rate of growth across all households.
- Allows the creation of a single measure which better reflects distributional variation.

A spectrum of theoretical options



Conclusions

- GDP in its current form is here to stay, but the world can move around it.
- Producing a new measure is not enough – it has to meet the varied aspects of quality at least as well as GDP to make users shift across.
- Lots of core building blocks to create new measures exist, and the Digital Economy Act and new technology make further exploration feasible.
- Need to complete existing agendas (capitals, Atkinson) at least as important as exploring new ones (free digital goods).

A spectrum of theoretical options

