

# **Telecoms Deflators: A Story of Volume and Revenue Weights**

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

# Widespread Issue



*“The great irony of the information age is that... we actually know less about the sources of value in the economy than we did fifty years ago.”*

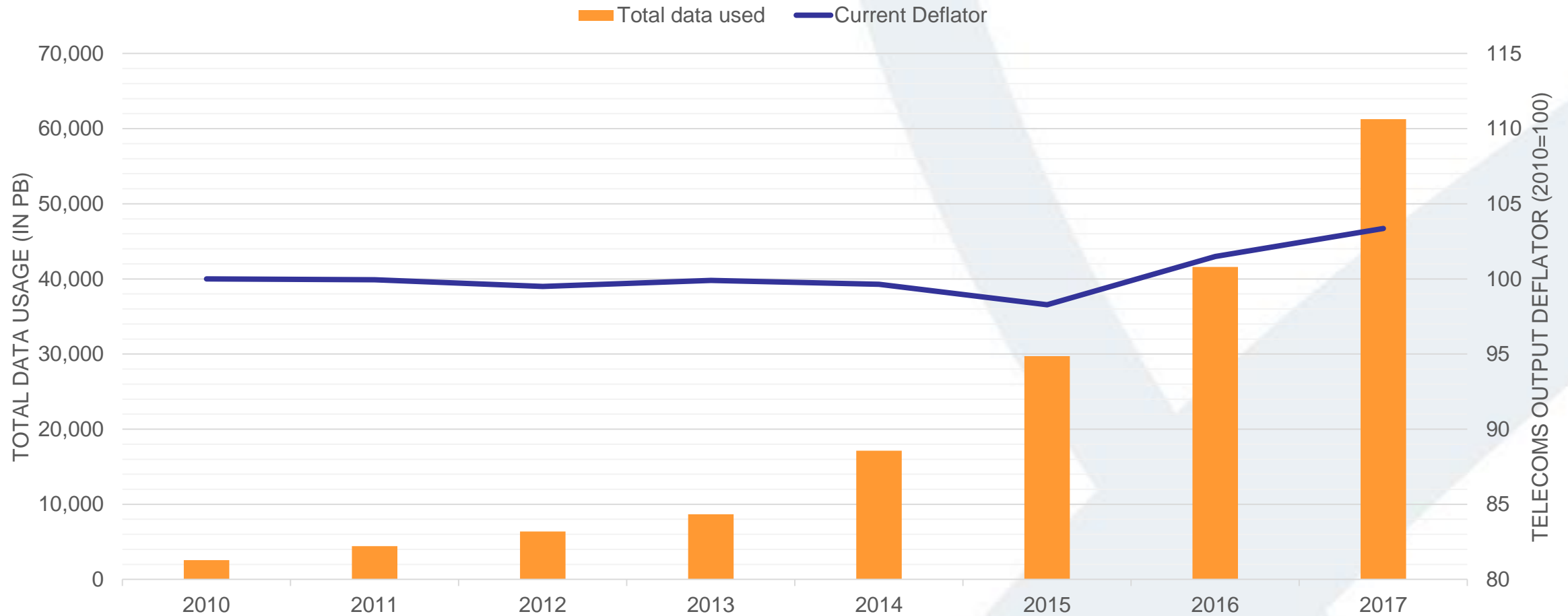
*Brynjolfson & McAfee (2014)*

*“Relatively flat prices fail to reflect the improving quality of communication services, based on vastly increasing volumes of data exchanged.”*

*Bean (2016)*

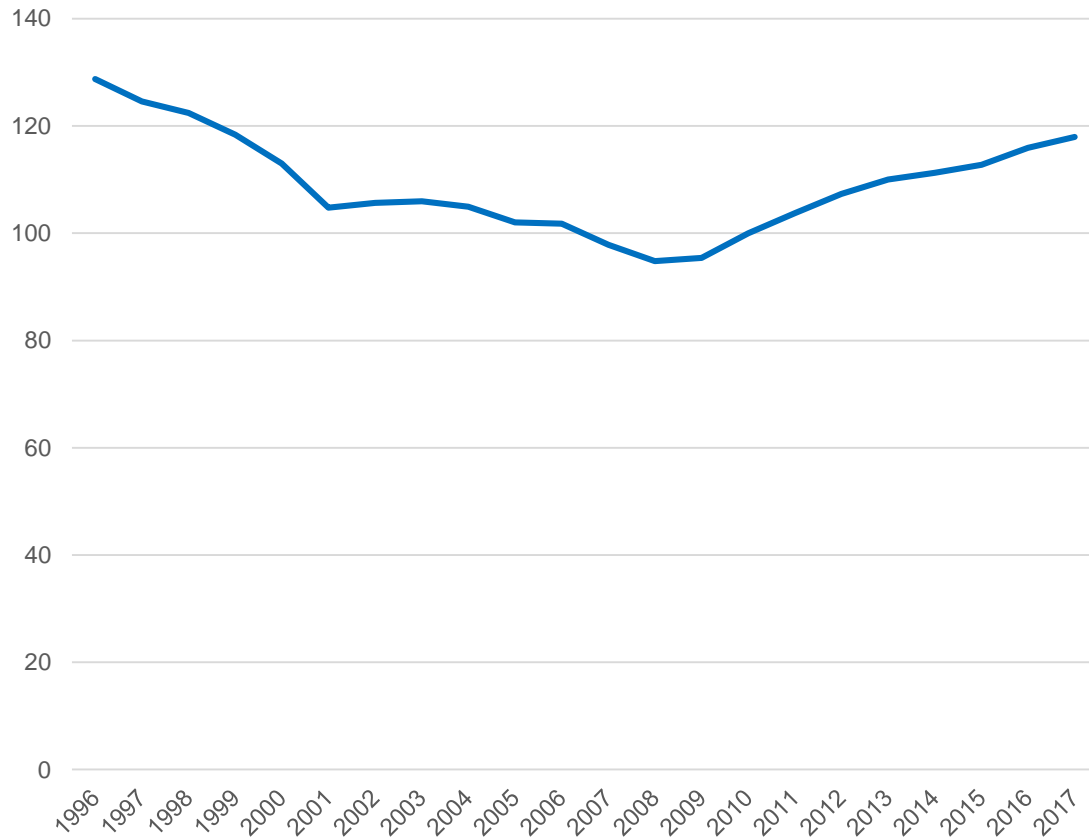
# Specific concerns

## Data Usage and Current Deflator

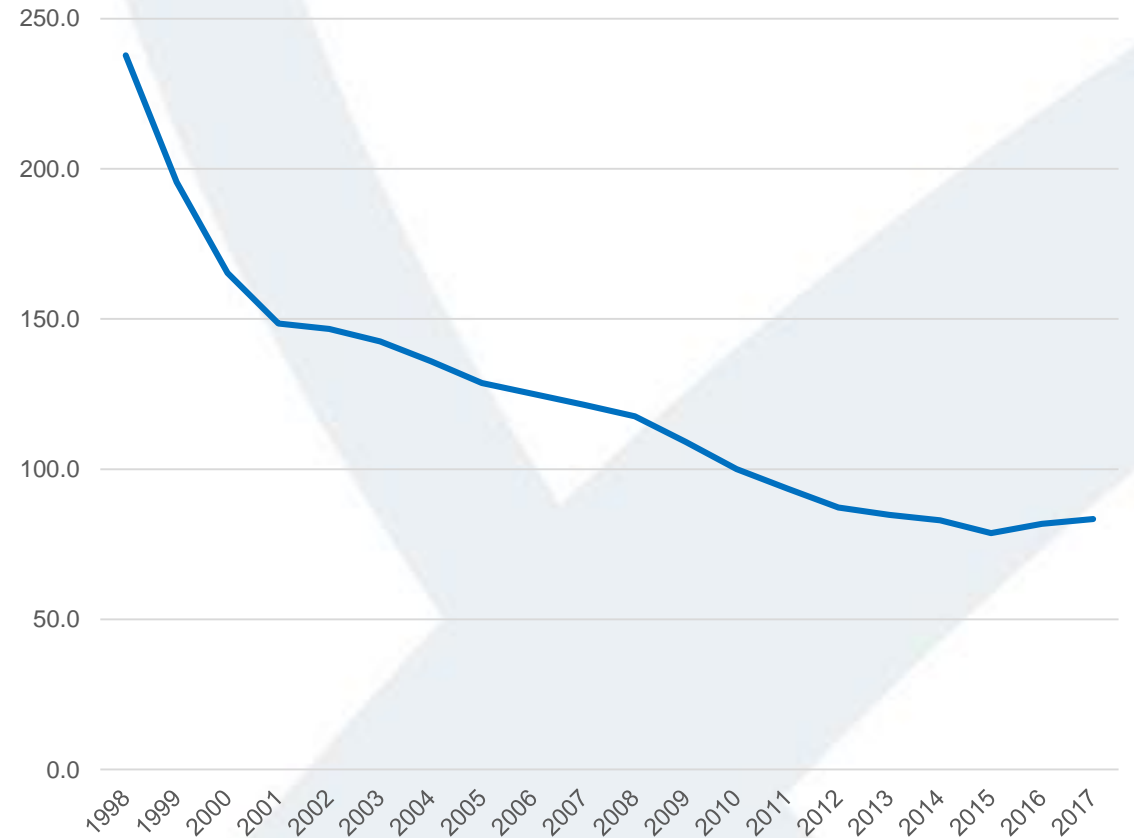


# Current Method: Combination of CPI and SPPI

**CPI Telecommunications Services and Equipment (2010 = 100)**  
Weight in Deflator = 66%



**SPPI Telecommunications Services (2010 = 100)**  
Weight in Deflator = 34%



# Previously considered two options for improvements

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- Abdirahman et al (2017) proposed two options to improve the deflator
- Option A - Improved SPPI:
  - Dropping the CPI from the output deflator
  - Expanding the SPPI from a Business-to-Business to a Business-to-All index
  - Annual Chain Linking the SPPI
  - Adding Mobile and Broadband Data to SPPI

# Previously considered two options for improvements

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- Option B - Data Usage Approach:
  - Regards all telecoms services as being essentially a bit-transport service
  - Converts all voice and text services to data bits. The conversion rates are 480 kBytes per minute of calls and 140 bytes per text
  - Constructs an aggregate unit value index for the cost of transporting bits of data

# There are substantial differences between the initial improvement options

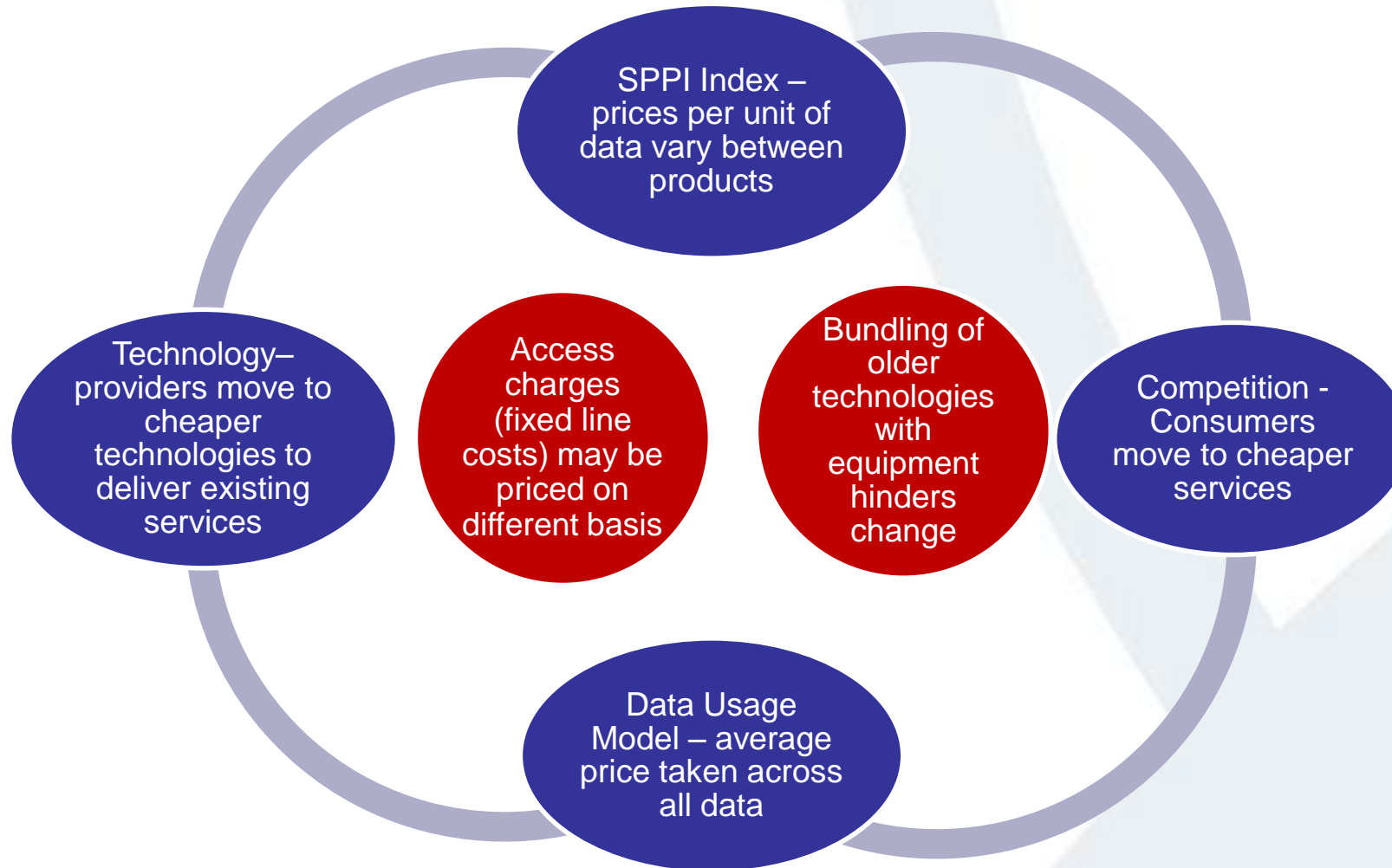
Comparison of Telecoms Services Deflators (2010 = 100)



	2010	2011	2012	2013	2014	2015	2016	2017
Current Deflator	100	100	100	100	100	98	102	103
Option A	100	95	77	76	68	67	65	63
Option B	100	56	38	27	14	8	6	4

# Facing forward or back?

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# Problems with Option A – Improved SPPI:

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## Fixed Line Access Charges

- Are Fixed Line Access Charges (line rental, etc) a separate service or a cost component (e.g Network Rail charge in a train ticket?)
- Many operators only break down the revenue to meet regulatory requirements
- We have explored re-allocating the fixed line access charge revenues back to voice and data services

## Bundled Mobile Charges

- Without a breakdown of bundled mobile charges into its different components (calls, texts, data), we use out-of-bundle revenue weights to estimate in-bundle revenues
- Assumes in-bundle and out-of-bundle usage follow the same pattern
- An alternative approach would be to use volume weights to break down the bundled revenues for mobile services

Option A.1: Fixed line access charges are broken using revenue weights for fixed line voice and data services

Option A.2: Similar to A.1 but access charges broken down using volume weights for fixed line voice and data services

Option A.3: Same as A.2 for fixed-line. For mobiles, bundled revenues broken down using volume weights for mobile calls, texts and data

# Options A1 & A2

Option A1: Revenue weights for breaking down fixed line access charges

Year	Calls	Data
2010	57%	43%
2011	50%	50%
2012	45%	55%
2013	42%	58%
2014	36%	64%
2015	31%	69%
2016	27%	73%
2017	23%	77%

Same as Option A (Improved SPPI) except Fixed Line Access charges broken down using revenue weights

This does not represent usage. R reported revenues by activity a result of accounting exercises to meet regulatory requirements

Option A2: Revenue weights for breaking down fixed line access charges

Year	Calls	Data
2010	2.59%	97.41%
2011	1.26%	98.74%
2012	0.82%	99.18%
2013	0.53%	99.47%
2014	0.24%	99.76%
2015	0.12%	99.88%
2016	0.08%	99.92%
2017	0.04%	99.96%

Based on Option A but Fixed Line Access charges are broken down using volume weights, using Option B conversions into data to create weights. Enables the break down of Fixed Line Access Charges based on the usage of the different services

# Option A3

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- This option is the same as A2, with the exception that bundled mobile charges are broken down using volume weights, as opposed to out-of-bundle revenue weights
- Out-of-bundle revenue weights are not appropriate to break down bundled revenue since usage patterns could differ within and outside the bundle
- In addition, as more data keeps getting added to mobile tariff bundles, this approach leads to an even greater bias in the resulting index
- A volume weighted approach would allow the bundled revenue to be broken down based on usage.

# Option A3 Impact on In-Bundle Revenue Estimates

Table 3: Out of Bundle Mobile Revenues and Weights by Service Type

Out of Bundle	Revenues (£millions)			Weights		
	Calls	Texts	Data	Calls	Texts	Data
2010	4,181	2,578	1,731	49%	30%	20%
2011	4,863	2,573	2,247	50%	27%	23%
2012	3,670	2,420	2,506	43%	28%	29%
2013	3,213	1,807	2,651	42%	24%	35%
2014	2,878	1,298	2,734	42%	19%	40%
2015	2,352	773	1,758	48%	16%	36%
2016	1,996	713	1,772	45%	16%	40%
2017	1,644	642	1,731	41%	16%	43%

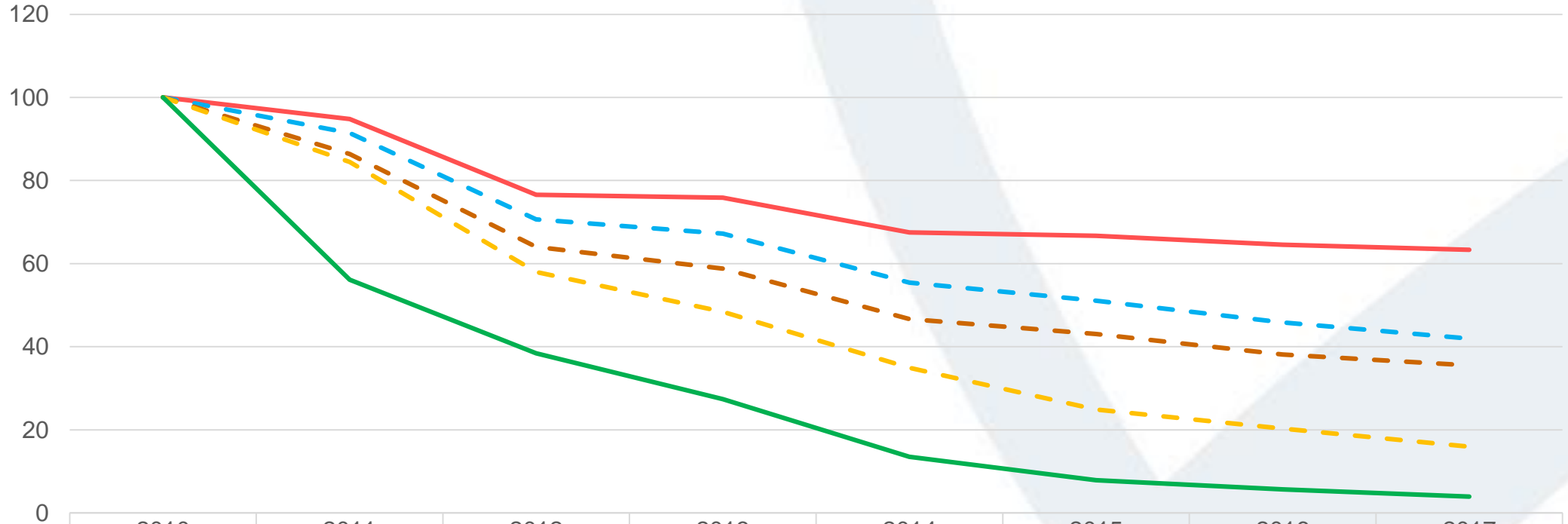
Table 4: Estimated Bundled Mobile Revenues and Weights by Service Type for Option A3

Estimated Bundle	Revenues (£millions)			Weights		
	Calls	Texts	Data	Calls	Texts	Data
2010	2,768	0.83	3,646	43%	0.01%	57%
2011	2,289	0.78	3,637	39%	0.01%	61%
2012	1,533	0.58	5,778	21%	0.01%	79%
2013	1,221	0.34	6,605	16%	0.00%	84%
2014	904	0.21	7,428	11%	0.00%	89%
2015	748	0.15	9,589	7%	0.00%	93%
2016	588	0.10	10,295	5%	0.00%	95%
2017	423	0.06	11,127	4%	0.00%	96%

- Using out-of bundle weights, OFCOM reports out of bundle revenue for the industry from texts of £640m in 2017
- However, applying the volume weights to break down the bundle, the estimated revenue for text messages is only £60k for the entire industry
- How far does this reflect real changes in behaviour?

# The more we make use of volume weights, the narrower the gap between the improved SPPI and the Data Usage Approach

Comparison of all Deflator Options



	2010	2011	2012	2013	2014	2015	2016	2017
Option A	100	95	77	76	68	67	65	63
Option A.1	100	91	71	67	55	51	46	42
Option A.2	100	86	64	59	47	43	38	36
Option A.3	100	84	58	48	35	25	20	16
Option B	100	56	38	27	14	8	6	4

# Conclusions

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- All options appear improvements over current methods
- We are testing options to decide which to recommend for inclusion in Blue Book 2020.
- Preliminary analysis suggests we now understand the difference between the Improved SPPI and the Data Usage Approach can mainly be explained through the use of volume and revenue weights
- Using volume weights in the Improved SPPI allows better representation of usage, but suggest that the implied revenues from traditional telecoms services are negligible
- This is something that we have to test with the industry further before making any recommendation for use in official statistics