**Memo on the *Finance Curse* and the Social Costs of the UK Financial Sector**

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Gerald Epstein and Juan A. Montecino

In this memo, we report new estimates for the total social costs of the financial sector in the United Kingdom applying the general methodology from our 2015 *Overcharged* paper. As in our original paper, which studies the costs imposed by an inefficiently large and risky financial sector on the U.S. economy, we attempt to calculate a similar price tag for the UK. This price tag consists of four broad components: the amount of economic rents or excess income earned by the financial sector reflected in banker wages and compensation; dynamic economic growth costs due to inefficiencies created by a bloated financial sector; the total output losses associated with the 2008-9 global financial crisis; and the amount of excess profits earned by the financial sector due to excessive risk-taking activities.

Putting a monetary price tag on the total cost of the financial sector will always inevitably require making assumptions and, at times, relying on judgement. That is why, throughout the analysis presented below, we draw on a wide range of academic research and data sources to make our case. Some estimates require making stronger assumptions than others. For these cases our guiding principle is to impose conservative assumptions and to err on the side of caution. Thus, we hope that our estimates provide as objective and unbiased a picture as possible of the costs of the UK financial sector.

The overall picture that emerges of the costs of the UK financial sector is quite staggering. For the period 1995-2015, the cumulative cost of finance amounts to around £5.2 trillion in real 2013 pounds. This figure corresponds to nearly three times national output. The largest contributors to this figure are the dynamic growth costs associated with the misallocation of talent and other factors of production in finance and the lost output following the aftermath of the 2008-9 financial crisis.

The rest of this memo will proceed as follows. The next section will discuss our estimates for the amount of excess compensation or rents earned by financial sector employees. We will then turn to the calculation of the misallocation growth costs, before providing an estimate of the cost of the financial crisis. The final section provides estimates of excess profits arising from risk-taking activities. Data appendixes with technical details on the calculations are provided at the end of this document.

**Excess Compensation and the Finance Premium**

Financial sector rents may be reflected in “excess” employee compensation; that is, financial sector employee earnings that exceed the level which can be explained or justified by underlying employee observable characteristics. Concretely, all else equal, employees across different sectors of the economy should receive the same compensation after controlling for measures of human capital, experience, and other observables. If financial sector employees systematically earn more than comparable workers in other sectors we can interpret this excess compensation as an economic rent.

Our estimates below draw on the well know empirical work of Thomas Phillipon and Ariel Reshef. (Phillipon and Reshef, 2012), who define banker rents as the wages in finance over and above what can be explained by the remuneration to education and skill levels if they were to work in non-financial sectors of the economy. Phillipon and Reshef report that these rents grew dramatically in the U.S. after the 1990’s.

To calculate the amount of excess compensation in the UK financial sector, we first estimate a series of Mincerian regressions using a large set of UK household surveys between 1970 and 2015. In particular, we use several vintages of the Family Expenditure Survey (FES), the Expenditure and Food Survey (EFS), and the Annual Population Survey (APS).[[1]](#footnote-1) The basic idea is to estimate the following regression for each available survey year:

where denotes income earned by individual *i* during survey year *s*, is a binary variable indicating that an individual works in the financial sector, and is a set of observable characteristics explaining an individual’s earning potential (e.g. level of education and years of experience). The coefficient measures the “finance premium,” that is, the share of income earned by an individual working in finance that cannot be explained by human capital and other observable characteristics.

The estimated finance premium, along with confidence intervals, are shown below in Figure 1. Two main points are evident in Figure 1. First, the financial sector income premium has remained historically fairly stable, at roughly 15 percent. Second, this historical norm appears to have broken down during the lead up to the global financial crisis. In particular, the finance premium rises to above 20 percent in the year 2000 and subsequently reaches 40 percent in 2005. This is a staggering amount, as it implies that roughly half of all financial sector income immediately before the financial crisis could be considered rents.

To put a monetary price tag on the total excess compensation financial sector employees received, we can combine our estimated finance premium with aggregate national accounts data on financial sector compensation. The aggregate excess compensation in the financial sector is simply given by:

where denotes total real financial sector compensation in year *t* and is the estimated finance premium. In order to obtain a more complete time series, both real compensation and the finance premium are linearly interpolated to fill in missing years.[[2]](#footnote-2)

The aggregate excess compensation series is depicted in Figure 2, in 2013 constant pounds. As can be seen below, total excess compensation amounted to roughly £3 billion per year between 1985-1995. Total excess compensation subsequently increased markedly, peaking at around £22 billion in 2005, or 1.5 percent of GDP. Excess compensation appears to have fallen since the beginning of the global financial crisis and remains at around £8 billion per year between 2010 and 2015.

Finally, we can also calculate the cumulative amount of financial rents in present value terms for the 20-year period between 1995 and 2015. Assuming a 2 percent annual discount factor, the present value of financial sector excess compensation is £280 billion, or around 15 percent of 2015 GDP.

**Misallocation Growth Costs**

The financial sector may also impose costs on the economy by reallocating factors of production away from their most efficient uses. This would be true if, for example, the promise of earning economic rents incentivizes highly educated and talented workers to work in the financial system instead of where they would have been most productive from a societal perspective. In this case, the misallocation of workers and other factors of production towards finance could have long-run negative effects on the growth rate of GDP. We now attempt to place a price tag on these negative growth costs by building on a growing academic literature on the dynamic costs of “too much finance.”

Several recent studies have uncovered negative growth effects from excessively large financial sectors.[[3]](#footnote-3) In particular, studies by Arcaand et al. (2015) and Cecchetti and Kharroubi (2012, 2015) have uncovered an inverted U-shaped relationship between the amount of credit to the private sector and GDP growth. Credit is beneficial for economic growth in moderate amounts but appears to become a drag on growth beyond a certain threshold. Studies tend to estimate this threshold at somewhere in the range of 90 to 100 percent of GDP. As a reference, the average amount of credit to the private sector in the UK between 1995 and 2015 was 160 percent of GDP, which is well into the region that would be expected to lower growth.

These estimates of the link between growth and credit to the private sector can be used to construct a counterfactual series for the path of GDP assuming credit to the private sector was at its “optimal”, growth maximizing level. Specifically, we ask: how much higher would real output have been if the financial sector was not too large? It is worth noting that, unlike static efficiency losses, dynamic inefficiencies that affect the growth rate of GDP imply a permanently lower level of output. This means that even small detrimental effects on annual growth rates can be amplified over time and amount to large cumulative output losses.

Real gross domestic product and its counterfactual are depicted in Figure 3. We refer the reader to Appendix C for details on the calculation of the counterfactual. We arbitrarily treat 1995 as the benchmark year and compare the trajectory of actual GDP to its counterfactual level without the negative effects of excessive finance. Naturally, choosing an earlier benchmark year would magnify the estimated costs. The gap between real GDP and its counterfactual is the output cost from too much finance. As can be seen below, the dynamic growth costs are quite large and suggest that GDP would have been around 14 percent higher with a leaner financial system. Indeed, the cumulative price tag for the years 1995-2015 are in excess of £2.7 trillion or roughly 1.5 times annual output.

**The 2008 Financial Crisis: Lost GDP**

Any estimate of the social costs of the financial sector would be incomplete without taking into account the effects of the 2008-9 global financial crisis. The simplest way to assess the costs associated with the crisis is to measure its impact on national output. It is well known that countries hit hard by the global financial crisis suffered potentially permanent losses in output, with GDP lagging well below its pre-crisis trend. This is certainly the case for the UK as well.

To put a price tag on the amount of lost output due to the crisis, we compare the path of real GDP to a simple no-crisis counterfactual where the UK continued to grow at its pre-crisis trend. Specifically, we consider the pre-crisis trend as the average growth rate for the period 1980-2007, which amounted to around 2.8 percent annually. This trend growth rate can then be used to construct a simple no-crisis counterfactual where the UK economy would have continued to grow at 2.8 percent per year after 2007. We refer the reader to Appendix D for the calculation details.

The results of this exercise are shown below in Figure 4. The solid black line depicts actual real GDP while the dashed blue line shows the pre-crisis trend. As can be seen in the figure, had GDP continued to expand at its pre-crisis trend it would have reached around £2.1 trillion by the year 2015. This is about a 16 percent difference from the actual post-crisis path of GDP, which stood at £1.8 trillion in 2015. As above, we can also calculate the cumulative net present value of the output loss. This amounts to roughly £1.8 trillion, or approximately 100 percent of 2015 output.

**Excess Profits**

The final missing component of the social costs of the financial sector is the amount extracted by unwarranted or “excessive” financial profits. As with our original *Overcharged* paper, we want to estimate the excess profits accumulated in the finance sector. We drew on work that made the distinction between “risk management” and “risk taking”, especially Haldane, et. al., (2010) and Wang (2011). The idea is that risk taking is not a contribution to economic output while risk management is. One way to control for this is to utilize risk-adjusted rates of return when measuring profits, whereas it is usually the case that profits without risk adjustments are reported.

A related approach is to recalculate value added in finance, utilizing a measure of value added that controls for risk. For the UK we will follow Haldane and Madouros (2011), who utilize a study by Colangelo and Inklaar (2010).

According to Haldane, in 2009, value added in finance was about 10% of UK GDP. But when the distinction between risk taking and risk management is taken into account, this is likely to be an over-estimate. As quoted in Haldane and Madourous, Colangelo and Inklaar (2010) suggest that, for the Eurozone as a whole, adjusting for risk-taking would reduce the estimated output of the financial sector by about 25-40% relative to the current methodology. If the same factor were applied in the UK, the measured contribution of the financial sector would suddenly drop to about 6-7.5% of GDP. That’s a measurement error of about £35-£55 billion based on 2009 data. Using the lower bound of this estimate by Colangelo and Inklaar, this would suggest that excessive profits are roughly 25% of total financial profits, on average, on an annual basis over this period.

Aggregate financial sector profits in real 2013 pounds are depicted below in Figure 5. As can be seen in the figure, financial sector profits peaked at roughly £110 billion immediately before the global financial crisis in 2007 and subsequently remained between £60 and £70 billion. To put a total price tag on the amount of excess profits, as before, we can apply the lower bound 25% excess profits share in suggested by Colangelo and Inklaar and compute the cumulative net present value. Carrying out this calculation for the 1995-2015 period, the total cost of the financial sector embodied in excess profits amounts to roughly £400 billion in real terms, or around 22 percent of 2015 GDP.

**The Total Price Tag**

Now that we have estimated the various components of the social cost of the financial sector, we can combine these separate estimates to obtain a total price tag. Summing the estimated £280 billion in excess compensation, £400 billion in excess profits, £1.8 trillion lost output due to the crisis, and £2.7 trillion long-run growth costs due to misallocation, we arrive at total price tag of roughly £5.2 trillion. Expressed as a percent of 2015 GDP, the *total cost amounts to nearly three times national output.*

***Table 1: Cumulative Financial Sector Costs (1995-2015)***

|  |  |  |
| --- | --- | --- |
|  | *Billions of Pounds* | *Percent of 2015 GDP* |
| Excess Compensation | 280 | 15.3 |
| Misallocation Costs | 2,700 | 147.4 |
| Crisis Costs | 1,800 | 98.3 |
| Excess Profits | 400 | 21.8 |
| **Grand Total** | **5,180** | **282.8** |

**Note:** Authors’ calculations. Amounts are in terms of the cumulative net present value over the period 1995-2015 assuming a 2 percent rate of return. Monetary values are expressed as constant 2013 Pounds.



**Figure 1: Finance Premium (1970 – 2015)**



***Figure 2: Excess Compensation (1985-2015)***

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**Figure 3: Real GDP and Counterfactual GDP**



**Figure 4: Real GDP vs. Pre-Crisis Trend**



**Figure 5: Real Financial Sector Operating Surplus**

**Appendix A: Data and Estimation of the Finance Premium**

This appendix describes the data and econometric approach used to estimate the finance premium. In order to obtain time-varying estimates of the finance premium, we used several vintages of the following UK-wide household surveys: The Family Expenditure Survey (FES), the Expenditure and Food Survey (EFS), and the Annual Population Survey (APS).

In all cases, the dependent variable is the natural logarithm of individual gross income. For years prior to 2005, we use the income of the head of the household. For years after 2005, we use the income of the “household reference person.” When possible, the regressions were estimated using population sampling weights. Standard errors are clustered by geographic region.

This information is summarized below, indicating the survey title and year, as well as the codes for each variable used in the estimation. Unavailable variables for a given survey year are denoted by “N/A.”

*Family Expenditure Survey (1970)*

* *Gross Income:* P345, P353
* *Finance Indicator*: A211 = 25
* *Age*: A005
* *Gender:* A004
* *Race:* N/A
* *Education:* N/A
* *Marital Status:* A006
* *Geographic:* A096
* *Occupational Category:* A210
* *Sample Weights:* N/A

*Family Expenditure Survey (1975)*

* *Gross Income:* P345, P353
* *Finance Indicator*: A211 = 25
* *Occupational Category:* A210
* *Gender:* A004
* *Age*: A005
* *Education:* N/A
* *Race:* N/A
* *Marital Status:* A006
* *Geographic:* A096
* *Sample Weights:* N/A

*Family Expenditure Survey (1980)*

* *Gross Income:* P345, P353
* *Finance Indicator*: A211 = 25
* *Occupational Category:* A210
* *Gender:* A004
* *Age*: A005
* *Education:* A010
* *Race:* N/A
* *Marital Status:* A006
* *Geographic:* A096
* *Sample Weights:* N/A

*Family Expenditure Survey (1985)*

* *Gross Income:* XP345, XP353
* *Finance Indicator*: A211 = 25
* *Occupational Category:* A210
* *Gender:* A004
* *Age*: A005
* *Education:* A010
* *Race:* N/A
* *Marital Status:* A006
* *Geographic:* A098
* *Sample Weights:* N/A

*Family Expenditure Survey (1995)*

* *Gross Income:* XP345, XP353
* *Finance Indicator (3-digit SIC)*: IND1 = {60-67}
* *Occupational Category:* A210
* *Gender:* A004
* *Age*: A005
* *Education:* A010
* *Race:* N/A
* *Marital Status:* A006
* *Geographic:* A098
* *Sample Weights:* N/A

*Family Expenditure Survey (2000)*

* *Gross Income:* XP345, XP353
* *Finance Indicator (3-digit SIC)*: SIC90 = {60-67}
* *Occupational Category:* A210
* *Gender:* A004
* *Age*: A005
* *Education:* A010
* *Race:* N/A
* *Marital Status:* A006
* *Geographic:* A098
* *Sample Weights:* N/A

*Expenditure and Food Survey (2005)*

* *Gross Income:* P051, P053
* *Finance Indicator (3-digit SIC)*: SIC90 = {60-67}
* *Occupational Category:* NSSEC
* *Gender:* A004
* *Age*: A005P
* *Education:* A010
* *Race:* A012P
* *Marital Status:* A006
* *Geographic:* GORA
* *Sample Weights:* WEIGHTA

*Annual Population Survey (2010)*

* *Gross Income:* GROSS99, GROSSPAY
* *Finance Indicator:* IND07M = 7
* *Occupational Category:* NSECMMJ
* *Gender:* SEX
* *Age*: AGE
* *Education:* EDAGEBAND
* *Race:* ETH01
* *Marital Status:* MARTSTA
* *Geographic:* GOVTOF
* *Sample Weights:* PWTA14

*Annual Population Survey (2015)*

* *Gross Income:* GROSS99, GROSSPAY
* *Finance Indicator:* IND07M = 7
* *Occupational Category:* NSECMMJ
* *Gender:* SEX
* *Age*: AGE
* *Education:* EDAGEBAND
* *Race:* ETH01
* *Marital Status:* MARTSTA
* *Geographic:* GOVTOF
* *Sample Weights:* PWTA17

**Appendix B: Calculation of Excess Compensation**

Data for aggregate compensation in the financial sector was obtained from the Office of National Statistics. As explained in the text, the amount of excess compensation is simply the product of the finance premium and the aggregate amount of compensation:

Two difficulties need to be overcome to obtain a continuous time-series of aggregate excess compensation. First, the aggregate compensation series is only available from 1987 onward. Second, due to available survey limitations, we only have estimates of the finance premium for 5-year intervals (with a gap in 1990). Thus, we extended the aggregate compensation series backwards to 1985 using a simple linear extrapolation. Similarly, we used a simple linear interpolation to fill in the gap years in the finance premium. These two extended series are then used to calculate the excess compensation series for the period 1985 to 2015.

**Appendix C: Real GDP Counterfactual and Too Much Finance**

In order to calculate the cumulative impacts of foregone GDP resulting from an inefficiently large financial system, we build on Arcand et al (2012) and Cecchetti and Kharroubi (2012), who investigate the relationship between the size of the financial sector and economic growth. Both studies estimate regressions of the following form:

where *g* is the real growth rate of GDP per capita and *C* is the ratio of private credit to GDP and thus stands for the size of the financial sector. The key result in both of these papers is that the coefficient is positive, indicating that an increase in finance is associated with faster growth, but that the coefficient is negative, indicating that finance becomes detrimental to growth after a certain point. In other words, there is such a thing as “too much finance.”

To approximate the negative growth effect from having too much finance, we start by calculating the maximum growth rate that could be obtained, holding all else constant, were the financial sector at its optimal size. This maximum growth rate can be obtained by plugging in the growth maximizing credit to GDP ratio, , in the regression equation. We can then calculate the cost to growth from having an inefficiently large financial system as the difference between the growth maximum and the average growth rate that results from the observed size of the financial sector between 1995-2015.

**Table A1: Too much finance coefficients and maximum credit threshold**

|  |  |  |
| --- | --- | --- |
|  | Arcand et al. (2012) | Cecchetti and Kharroubi (2012) |
|  | 5.3 | 3.6 |
|  | -2.6 | -1.8 |
|  | 101.9 | 100 |

The next step is to define a counterfactual per capita growth rate:

The counterfactual growth rate is the growth rate that would have prevailed if the financial sector were not inefficiently large. Finally, to arrive at a counterfactual measure of GDP it is necessary to extrapolate a per capita income series beginning in 1990 using the counterfactual growth rate and then multiply by the population each year. Series for GDP, GDP per capita, and total population for the United Kingdom were obtained from the UK Data Service.

**Appendix D: No-Crisis GDP Counterfactual**

In order to calculate the pre-crisis trend growth rate, we estimate the following regression model for the period 1980-2007:

where the estimated coefficient measures the trend growth rate throughout the time-horizon. Our estimates indicate that the trend real growth rate between 1980-2007 was around 2.8 percent annually.

Next, with the trend growth rate in hand, we can calculate the no-crisis counterfactual as:

where denotes the level of real GDP in 2007. This expression simply states that the counterfactual real GDP is equal to the level of GDP on the eve of the crisis times the cumulative counterfactual growth between 2007 and 2015.

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1. Please refer to the Appendix A for details on the survey years used, variable definitions, and estimation approach. [↑](#footnote-ref-1)
2. Details are discussed in Appendix B. [↑](#footnote-ref-2)
3. See Loayza et al. (2018) for a survey of this literature. [↑](#footnote-ref-3)