

Regularly Supported Firms and the 'Wage Equation'

The economic benefits of public sector R&D are captured in a 2014 report by Haskel, Hughes and Bascavusoglu-Moreau^[1], which states that the quantifiable economic impact of public R&D is **channelled through businesses with whom they are working** (A business corresponds to a Companies House reference number).

As part of NPL's work to develop a whole systems model for the UK's Measurement System, we have determined the value of **NPL's direct economic benefits channelled through the private sector**^[2]. This does not include benefits channelled through the public sector or non-monetisable societal benefits (Public Health, Environmental and Security).

We measure NPL's direct economic benefits channelled through the private sector through analysing our **Regularly Supported Firms (RSFs)**^[3]:

'Support' is defined as either **collaborating** with NPL through R&D or **payment** for NPL's services.



The '**RSFs**' are those who were **supported** for at least **five years** **within a six-year period**.

It should be noted that '**collaborators**' and '**paying customers**' have **varying relationships with NPL**. Paying customers tend to be **longer-term partners** with a level of brand loyalty, often due to being functionally dependent on NPL's services. In comparison, collaborators are focused on specific innovation projects, meaning that the continuation of such relationships are dependent on follow-up projects.

NPL's RSFs see a **net-additional increase in productivity** through **employment and wage growth**^[4].

Wages are only one of the three elements that comprise a firm's Gross Value Added (GVA), the other components are **profits for the owners of capital (Investors)**, and **taxes paid to HMRC**, which is calculated from the '**extra wages**' equation detailed below:



During 2023, NPL had **429** UK-based RSFs



The benefits going to supported firms, **endure for around six years** (discounted due to time preference - 5.12)



Each of these firms grew by **~6.3 employees each year** due to support



On average, employees who switch to one of these new jobs see their **annual wage increase by £4,080**

Using these numbers, **extra wages** is calculated as follows, with total benefits calculated in subsequent steps:

$$\begin{aligned}
 \text{'Extra Wages'} &= \frac{429}{\text{No. of RSFs}} \times \frac{6.3}{\text{Employment Growth at RSFs}} \times \frac{5.12}{\text{Lifetime of benefits (discounted)}} \times \frac{£4,080}{\text{Wage Premium for job switchers}}
 \end{aligned}$$

Step 1 →

Evaluating 'extra wages' equation on the previous page, (labour productivity) is **~£56.5 million** per annum. These benefits are only those received by the workers themselves.

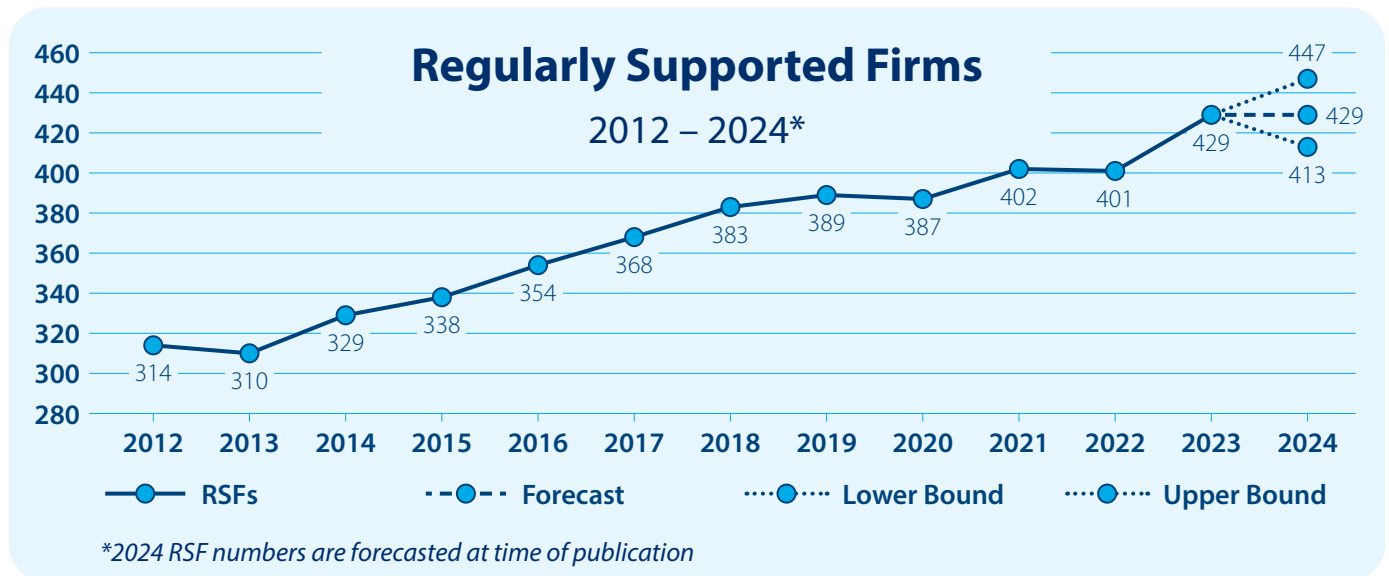
Step 2 →

Both the **taxpayer** and the **investors** see the **same amount of benefit as workers**, implying a flow of direct economic benefits amounting to **~£170 million^[5]**.

Step 3

Indirect benefits from the diffusion of technological knowledge are **typically twice that of the direct benefit** to the original innovator. A lower bound for the total benefit (direct plus indirect) is **~£510 million**.

The numbers shown are all constants, apart from the number of RSFs, which fluctuates year-on-year. NPL can generate a one-year forecast for this number which has been proven to be accurate in the past (MAPE of 2.46%), as detailed below:



NPL's impact increased by **7%** last year (2023). This is a **significantly higher year-on-year increase** of RSFs in comparison to the previous four years (2019-2022), which saw an average yearly growth rate of **1%**. Moreover, this year-on-year increase is **higher than the prior four years (2015-2018)**, which was a period of consistent **4%** growth.

The key driver of this growth is collaborative work. In the period from 2015 to 2018, the **majority of RSFs (52%) were paying customers**. In 2019-2022, this reduced to **40% of RSFs** being paying customers. This is likely driven by grant-funded R&D with the private sector, with **2023's increase associated with business support programmes**.

The forecast for **2024 is the same as 2023**, due to relatively few firms close to regular support. This is partly due to the **natural churn of supported companies**, which see some fall out of regular support and some joining, **assuming no economic or policy shock** affecting the flow. In order to keep the levels growing, there must be a **pipeline of companies receiving support**.

For further information, go to: npl.co.uk/government/evidence-of-impact

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