Inflation's impact on green and brown firms and its effect on the green transition

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The one-way impact of green transition on inflation is currently discussed by central banks. However, there are channels through which inflation can impact green and brown firms differently, and in return, affect the green transition. This creates a two-way link between inflation and green transition that necessitates further research.

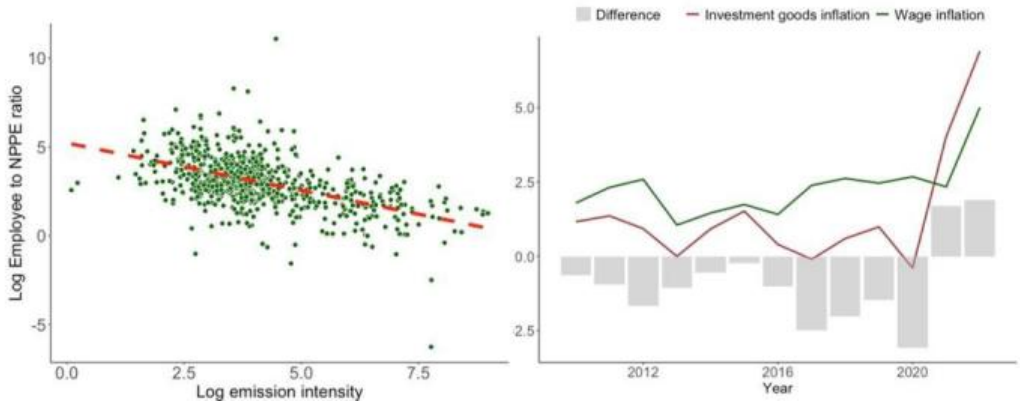

Chart 1: Labour-to-capital ratio and emission intensity [left], and inflation rates in Euro Area [right]

Source: Fred Economic Data, Trucost, Capital IQ

Note: Figure [left] reports 2016–2021 averaged metrics for 790 Euro Area publicly traded firms. Figure [right] shows the inflation rates in PPI of investment goods and hourly labor compensations in private sector, and their differences for Euro Area.

The green transition will come at a cost with likely consequences on inflation (Dees et al. 2023, Ferrari et al. 2022). At the same time, inflation can impact firms unevenly, particularly in terms of their input prices (Chava et al. 2022). Analyzing the impact of monetary policy on green and brown firms, Havrylchyk and Pourabbasvafa (2023) show significant differences between firms that have good environmental performances and firms that don't. This post suggests that the same differences can influence the channels through which inflation impacts firms, and in turn, create an uneven impact of inflation on green and brown firms. However, determining the aggregate direction of this impact is challenging.

Labor-intensity of green and brown firms exposes them unevenly to inflationary pressures

Green firms tend to be more labor-intensive while brown firms are (tangible) capital-intensive. Chart 1 [left] shows the negative correlation between firms' emission intensities and their labor-to-capital ratio (the ratio of firms' full-time employee to its PPI-adjusted (real) net property, plant, and equipment). The firms at the bottom 25% of emission intensity (green firms) have on median 35 employees per 1$ million of tangible capital in form of property, plant, and equipment (henceforth NPPE), while the firms in the top 25% (brown firms) have only 7. The higher labor-intensity of green firms corresponds with their higher intangible capital investment (discussed in section 2) and the sectors at which they operate, which are usually service and/or technology.

This gap in labor-intensity of green and brown firms coupled with differences in stickiness of inflation rates for wages and investment goods Chart 1 [right] could result in an uneven impact of inflation on green firms and brown firms. In inflationary episodes, the input prices of green firms, which mostly comprises of wages, is under weaker upward pressure compared to input prices of brown firms, which mostly comprises of tangible products. However, in times of low inflation, green firms face higher input inflations compared to brown firms due to stickiness of wage growth and they cannot pass this cost onto their output.

Inflation's wealth and credit effects are more favorable to brown firms

Brown firms tend to own significantly more tangible capital in form of NPPE, and less intangible capital (patents and goodwill and, in addition, organizational capital and employees' training), while green firms own more intangible capital and less tangible capital. This distinction is also evident in their investment where brown firms have higher capital expenditure and green firms have larger R&D expenses and organizational capital investment (Chart 2).

This difference can alter the impact of inflation on green and brown firms in two ways. First, inflation corresponds to an increase in the prices of assets such as tangible capital, without impacting the prices of intangible capital. This is because intangible capital is much harder to price (Falato et al. 2022). For example, intangible capital in form of employees' training or organizational capital is very firm-specific and cannot be traded. This translates into a wealth effect of inflation for brown firms with tangible capital while no such effect impacts green firms.

Second, tangible capital can be used as collateral to secure bank loans, while intangible capital offers no collateral because it is firm-specific, hard to redeploy, and difficult to price (Falato et al. 2022). Consequently, brown firms' borrowing ability strengthens when inflation increases tangible capital prices, while green firms are not affected in the same way. Both these channels operate to disproportionately benefit brown firms in times of high inflation.

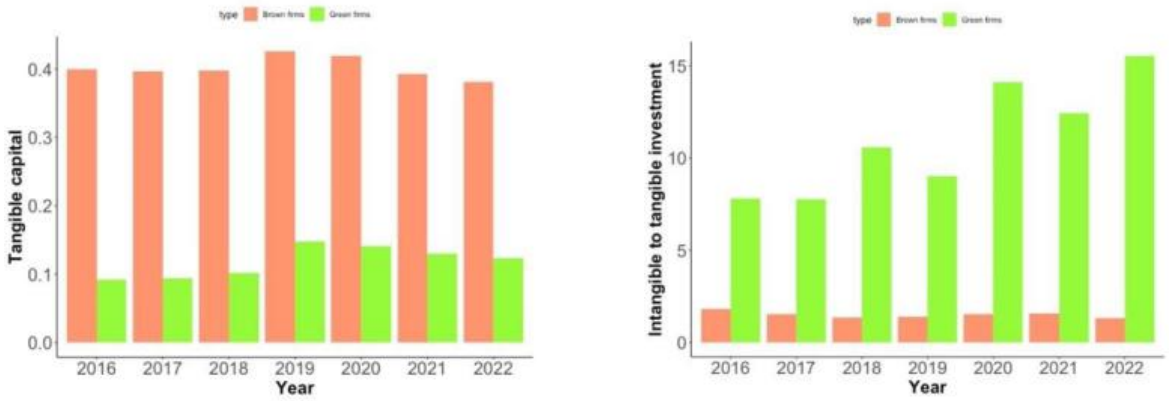

Chart 2: Capital tangibility [left] and intangible-to-tangible investment [right] by green and brown firms

Source: Trucost, Capital IQ

Note: Tangible capital is NPPE to total assets. Intangible investment is sum of R&D and 30% of SG&A expenses, while tangible investment is capital expenditure. Green firms are firms in bottom 25 percentile and brown firms are in top 25 percentile of emission intensity. Bars are group means.

The redistribution effect and the inflation tax are more favorable to brown firms

Because green firms have less collateral, they are more financially constrained. They have lower leverage but larger cash holding compared to brown firms. They hold more cash to finance their intangible investment needs as they cannot easily obtain bank loans (Falato et al. 2022).

In case of inflation, green firms get more adversely impacted via two channels. First, inflation redistributes wealth from lender to borrower. Brown firms' have consistently higher leverage compared to green firms (Chart 3 right). Hence, this channel puts brown firms at an advantage. Second, the inflation-tax negatively impacts green firms with higher cash holding by reducing the real value of their cash, putting them at a disadvantage.

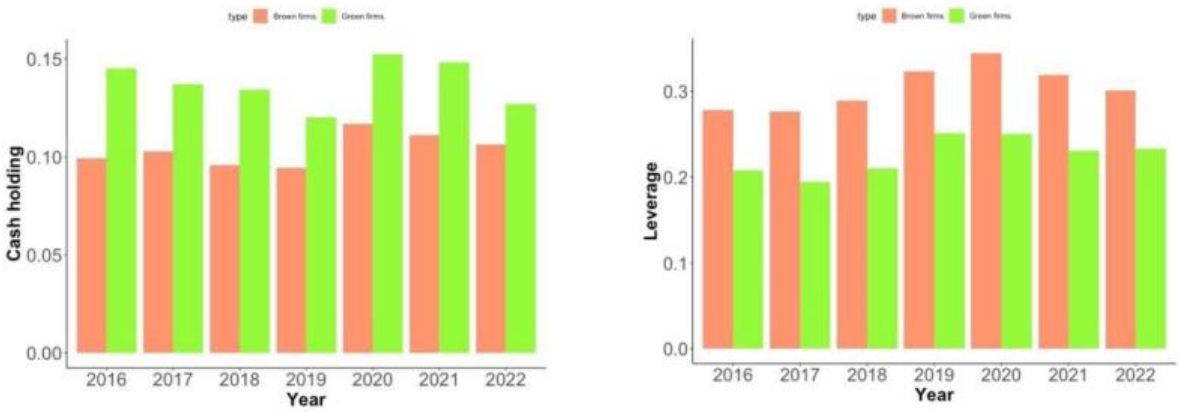

Chart 3. Cash holding [left] and leverage [right] for green and brown firms

Source: Trucost, Capital IQ

Note: Cash holding is ratio of cash and its equivalent to total asset. Leverage is total debt to total assets. Green firms, brown firms and bars : see Chart 2

Inflation and the green transition: a challenge for the monetary policy

Inflation has significant negative impacts on the economy and green firms have a significant disadvantage in four of the five inflation channels discussed above. This suggests that green transition-driven inflation could undermine the efforts of the green transition itself. Hence, green transition can achieve its objectives more effectively if inflation is kept at target during its implementation.

Finally, the only channel through which inflation positively impacts green firms is through increasing the gap between price and wage growth rates (discussed in point 1). This article suggests that wage rigidities and low inflation has significant negative impact on labor-intensive green firms. This is particularly relevant in the Euro Area where wage setting remains rigid and higher inflation target, as an 'inflation buffer', is discussed for ECB (Consolo et al 2021). A further benefit of a higher inflation target for the ECB could be alleviating the wage rigidities for labor-intensive low emission firms.

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