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RESEARCH

Highlights

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Does monetary policy affect firms' inflation expectations?

Firms' inflation expectations are sensitive to the conduct of monetary policy in a way that is coherent with its orientation. [Hence, by influencing firms' inflation expectations, central bank communication allows for further leverage even at times when standard policy tools have limited room of manoeuvre.]

The North-South divide and income inequality

The lack of employment opportunities in southern regions explains a larger fraction of national income inequality than differentials in earnings. The convergence in employment rates would dampen inequality even if it required a wider gap in hourly earnings.

How close is the EA to an optimal currency area?

Contrary to what should happen in a ideal currency area, inflation variability in the EA mainly reflects country-specific developments, while common components matter less. The most important domestic component is average workers compensation; labour productivity and markups play a limited role.

Did Quantitative Easing exacerbate banks' risk taking?

Ex-ante risk-taking by Italian banks is negatively related to the short end of the yield curve but positively to the long end. Banks' balance sheet conditions, as captured by the maturity mismatch between assets and liabilities, is key to relating these findings to the theoretical literature.

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Does monetary policy affect firms' inflation expectations?

To pursue the goal of price stability central banks curb excessive deviations of aggregate demand from potential output by means of appropriate monetary policy impulses. These are thought to affect the choices of households and firms, the ultimate decision makers, only indirectly, through their effects on financial markets and interest rates. However, as Bernanke (2007) suggests, if central banks' actions were able to directly influence the public's inflation expectations, the costs of output stabilization could be lower than those stemming from the standard demand channel. Despite its relevance, however, there is surprisingly little evidence about the direct influence of monetary policy impulses on the inflation expectations of households and firms.

This is admittedly a major gap, especially as concerns firms that originate the most volatile component of aggregate demand, investment expenditure, and that set prices in response to overall developments in aggregate demand and prices. In "[*Monetary policy, firms' inflation expectations and prices: causal evidence from firm-level data*](#)" (Banca d'Italia, Working Papers No. 1218) Marco Bottone and Alfonso Rosolia seek to fill this gap exploiting the Bank of Italy's Survey of Inflation and Growth Expectations, perhaps the only long-running firm survey collecting quarterly data on firms' inflation expectations and price setting behavior.

Since 2002, when the Euro was finally introduced, nearly all waves of the survey took place around a scheduled meeting of the ECB's Governing Council in which monetary policy decisions are taken and communicated to the public. Each such meeting can be associated with a market-based measure of the unanticipated monetary policy news, specifically the daily movement in selected market rates (Kuttner 2001, Gürkaynak et al. 2005). Because firms interviewed in the days just before the specific GC meeting could not be aware of the news, while those interviewed shortly after it were more likely to be informed, the difference between their expected inflation rates is plausibly due to

the monetary policy news reflected in daily rate movements on GC meeting days.

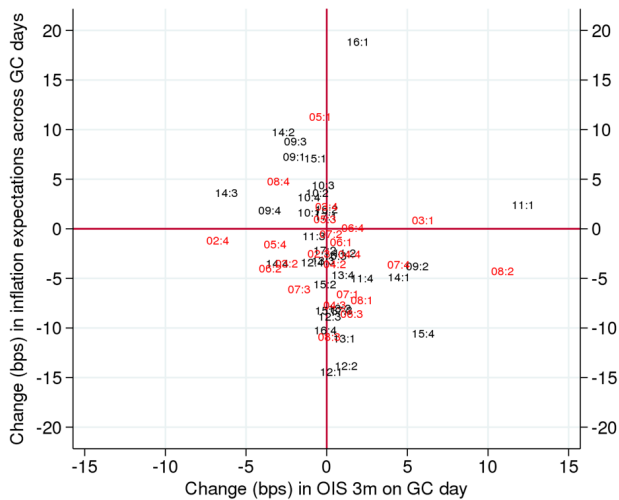
Unanticipated increases in money market rates on GC meeting lower firms' inflation expectations; similarly, unanticipated rate declines are associated with stronger expected inflation

The paper finds that firms' inflation expectations are surprisingly sensitive to these measures of monetary policy shocks. Figure 1 shows that unanticipated increases in the 3-month Overnight Index Swap rate on GC meeting days are associated with lower 1 year ahead expected inflation of firms interviewed in the days just after the GC meeting; similarly, unanticipated rate declines are instead associated with stronger expected inflation. These results hold also for longer inflation expectations, collected only more recently, and when considering more elaborate measures of unanticipated monetary policy news, that combine rate movements along the term structure. With regard to economic magnitude, our estimates show that, on average, an unanticipated increase of 10 basis points in the 3-month Overnight Index Swap rate on GC meeting days is associated with 5 basis points lower expected 1 year ahead inflation. Importantly, the negative relationship holds also in the more recent period (black labels in the figure), when the effective lower bound on interest rates binds, becoming even stronger.

While firms are found to revise their inflation expectations against relevant news in a way coherent with the implied orientation of monetary policy, the paper does not find evidence of a response of own prices. The price changes planned for the next year reported by firms interviewed after any GC meeting are substantially similar to those reported by firms interviewed just before, irrespective of the associated monetary policy shock. The paper advances two potential explanations for this fact. First, offsetting transmission channels of monetary policy impulses may be at work. For example, the cost-channel implies

Figure 1

Inflation expectations respond to unanticipated monetary policy news



Note: red: 2002:1-2008:4; black: 2009:1 onwards.

that a monetary policy-tightening leads to an increase in the cost of working capital which reverberates on own prices, compensating the standard demand channel. Second, the size of the monetary policy shocks the paper exploits may be too small relative to the overall dispersion in price levels across firms, making it hard to detect a sizeable response of planned price changes.

The conduct of monetary policy relies heavily on steering agents' inflation expectations towards the central bank's price stability goal, even more so when interest rates are close to the effective lower bound, at which standard tools provide limited margins of action. The findings of this paper show indeed that central bank communication does quickly and directly affect firms' expected inflation, thus potentially providing the monetary authority with further leverage even at times when the space for standard policy tools is limited.

— Marco Bottone (Bank of Italy)
 Alfonso Rosolia (Bank of Italy)

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The North-South divide and income inequality

Household income inequality in Italy is high in comparative perspective, due to the combination of marked disparities in market income and a poorly designed tax and benefit system. The limitations of the welfare system have been extensively discussed in the literature and reform proposals feature prominently in recommendations to the Italian government (e.g. by the European Commission, the IMF or the OECD). Less effort has been devoted to understanding the sources of market income inequality in Italy and assessing, in particular, the role of regional (North-South) disparities.

Yet, regional disparities account for almost one fifth of national inequality, a larger figure than that of countries characterized by long-standing geographical divides, such as Germany and Spain (Brandolini and Torrini, 2010). Households in Southern Italian regions are not just poorer than in the rest of the country, they are also much more unequal.

In “[*The Geography of Italian Income Inequality: Recent Trends and the Role of Employment*](#)” (Banca d'Italia, Occasional Working Papers No. 492) Emanuele Ciani and Roberto Torrini show that the distribution of employment opportunities is crucial in explaining both outcomes. The employment rate in Southern regions is lower (44 per cent compared to 66 according to the 2018 Labour Force Survey), and less evenly distributed than in the Centre-North: around 13 per cent of individuals live in households without labour income earners, compared to slightly more than 6 per cent in the rest of the country.

The paper employs different methods to simulate how inequality in Italy would change if the working hours or the hourly labour earnings of Southern households' members were brought to the levels observed in the Centre-North. In one exercise, Southern households were assigned the hours of work of similar – in terms of observable characteristics – households living in the Centre-North. The result is that both inequality and average income would significantly converge to those of the rest of the country, lowering national inequality by around 15 per cent (Figure 1); in terms of the Gini index, a standard measure in inequality, the drop would be approximately 2 percentage points, enough to bring Italy to the EU-28 average level.

In a second exercise, the authors assigned to Southern households the hourly labour earnings of similar households from the Centre-North, without altering the employment distribution. While increasing the average income of Southern households, this scenario would leave inequality between them untouched. While still beneficial for nation-wide inequality, the impact of such experiment would be significantly smaller than in the previous case (3 per cent).

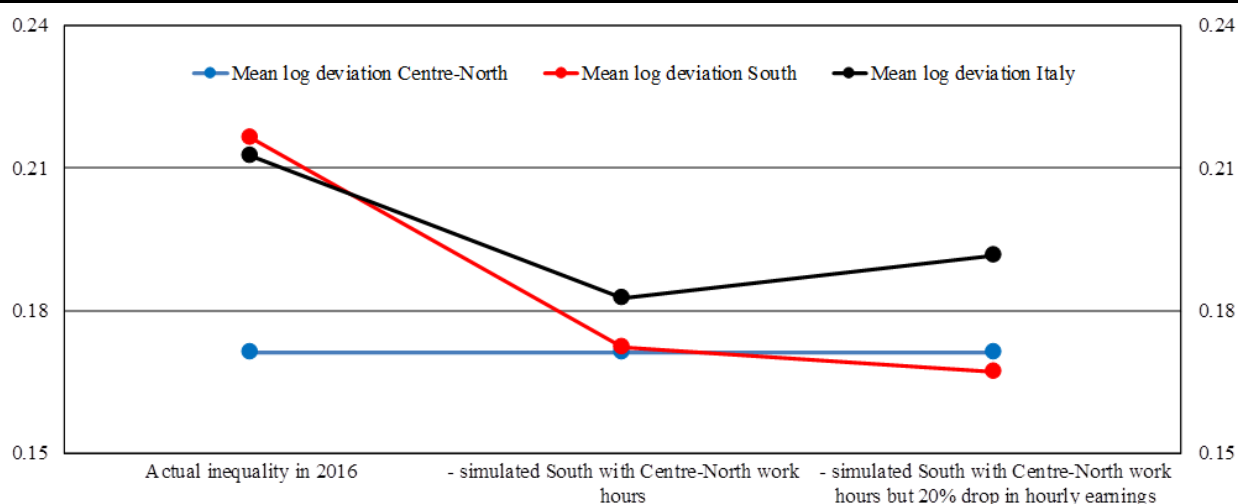
Convergence of employment rates could lower inequality by 10 per cent even if it required a 20 per cent reduction of hourly earnings in the South

How to increase employment rates in southern Italian regions is obviously an open question. Policies aimed at supporting labour supply, such as the introduction of in-work benefits and the reduction of the tax wedge on low incomes, could help increasing the structurally low southern participation rates. But they would be insufficient if not associated with a rise in labour demand, which suffers from the low average labour productivity in the area. One often-debated, shorter run measure to stimulate employment growth consists in reducing labour costs in disadvantaged areas, for example by reforming centralized bargaining (Bodo and Sestito, 1991; Boeri et al., 2019). In this case, the increase in employment would come alongside a contraction in net hourly labour earnings in the South, with ambiguous effects on overall inequality. The third exercise in the paper tries to assess the relative strength of these two opposing forces.

According to the simulations, national inequality could still fall by a sizeable amount (around 10 per cent; Figure 1) even if achieving the employment rates of the Centre North required a 20 per cent reduction of hourly labour earnings in the South. Despite the smaller contraction in the average geographical divide, in fact, there would still be a sizable drop in income dispersion within the South. In order for the effect of the increase in working hours to be completely offset, the drop in labour earnings should reach 40 per cent.

Figure 1

Inequality in Italy and within areas
(measured by the mean logarithmic deviation)



Source: estimates on the Bank of Italy's Survey on Household Income and Wealth (2000-2016).

These results provide useful insights for designing policies aimed at promoting a more equitable income distribution. Although they by no means imply that a reform of redistributive policies is unnecessary, they highlight the need to design such reform so to minimize the risk of discouraging employment. Moreover, they suggest that policies aimed at raising the employment

rate in southern regions are key to curb market income inequality in Italy, even if they entailed some reduction of average labour earnings in this area.

— **Emanuele Ciani (Bank of Italy)**
Roberto Torrini (Bank of Italy)

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How close is the EA to an optimal currency area?

According to Mundell's (1961) seminal contribution on optimum currency areas (OCAs), a high degree of factor mobility and price/wage flexibility is key to achieve efficient macroeconomic adjustment in response to shocks across the CA member countries. The functioning of this adjustment mechanism can be indirectly assessed focusing on inflation variability over time and across countries¹. Suppose in fact that a CA country endures an idiosyncratic shock to the costs of production (e.g. higher prices for some domestically produced intermediate inputs, or a higher minimum wage). In an "ideal" currency area, firms would resort to foreign inputs of production and/or choose to delocalize production abroad. These quantity adjustments will eventually lead to wage and price equalization across countries, eliminating arbitrage opportunities. Thus, in a smoothly functioning currency area price developments should be mostly guided by common (area-wide) shocks and only to a lesser extent reflect idiosyncratic (country-specific) labour cost and markup components.

In "[Relative price dynamics in the euro area: where do we stand?](#)" (Banca d'Italia, Working Papers No. 1226) we test the efficacy of these adjustment mechanisms in the Euro area (EA), developing a novel metric for assessing dynamics of inflation across space and time in the EA vis à vis the United States (US)². Specifically, we decompose the observed price dynamics of EA members into country-specific and area-wide labour cost and markup components. Building upon a standard pricing equation under imperfect competition, we identify different price adjustment channels, which are related to the structure of both product and labour markets.

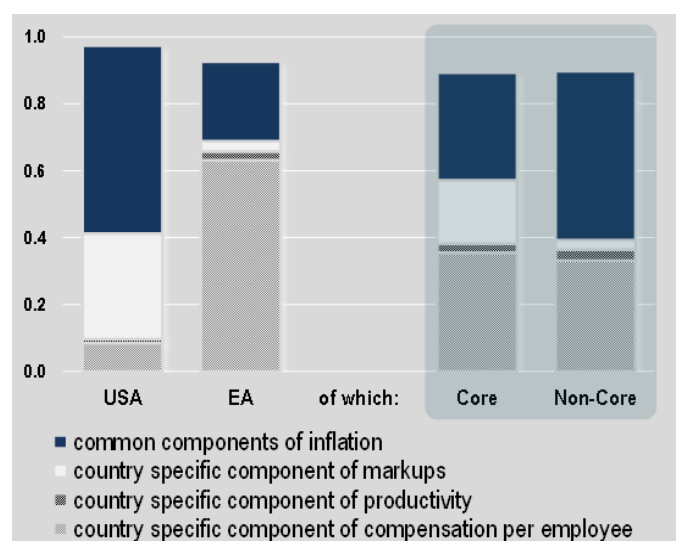
Country-specific labour and product market heterogeneities explain more than 50% of inflation variability across euro area countries

Using data over the 1978-2015 period, we find that inflation variability in the euro area reflects only to a limited extent that of the common price component, as proxied by the average growth of unit labour costs

(ULC) and of profit margins or markups (see Figure). By contrast, it mirrors quite well the country-specific components of ULC. By further splitting ULC in its two sub-components – compensation per employee and labour productivity – we find that the ULC contribution chiefly stems from the country-specific developments of compensation per employee. These findings starkly contrast with the results we obtain by applying our approach to the US: over the same period, price dynamics at the state level largely reflect common developments in both costs and profits.

We then looked separately at Core and Non-Core euro area countries (the latter include Italy, Greece, Spain, and Portugal). In both cases, the common (within group) component explains a higher share of the variance of inflation than when looking at the whole euro area (see Figure). This indicates that within each group countries tend to be homogeneous, and that aggregate price dynamics in the EA largely reflect the heterogeneity between Core and Non-Core countries³.

Figure 1
The decomposition of the variance of inflation for the Euro area and the US
(estimates performed over the sample 1978-2015)



Finally, we looked at whether the relative importance of these determinants changed over time. In the most recent sub-period (1999-2015) we find that the common component continues to account for a high share of

variance of inflation within Non-Core countries. For Core countries, on the contrary, the share of inflation variability explained by the common component shrinks compared to the country-specific one⁴. Interestingly, this mimics the dynamics observed in the US, where the idiosyncratic markup movements have also become the dominant component of the variance of inflation only in the more recent sub-period. The increased relevance in country-specific price markups for inflation variability may be suggestive of a rise in corporate market power across euro area Core countries and US states⁵.

Overall, our results highlight that inflation variability in the euro area is to some extent driven by movements in common ULC and markup components, consistent with a well-functioning currency area in the Mundellian sense. However, country-specific labour and product market heterogeneities play a relatively more important role among the determinants of inflation

variability across EA countries. A similar pattern is also observed for the US, where the dominant share of inflation variability explained by common cost and price components observed until the end of the previous century, has been progressively outsized in the more recent years by the idiosyncratic components related to the dynamics of markups across US federal states. Future work should explore whether these changes in the underlying determinants of inflation variability in these two currency areas may have some policy relevant macroeconomic implications⁶.

— **Pietro Cova (Bank of Italy)**
Lisa Rodano (Bank of Italy)

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1 A more standard approach to the analysis of efficiency within currency areas (see the pioneering work by Asdrubali et al., 1996) focuses instead on the notion of consumption risk sharing and on the measurement of the channels of risk sharing.

2 The pool of European countries considered comprises the 12 euro members that first entered the EMU: Germany, France, Italy, Spain, Netherlands, Austria, Ireland, Finland, Belgium, Luxembourg, Portugal and Greece. The estimates for the US are obtained from the pool of the all 50 US federal states.

3 Results confirm similar findings reported in Busetti et al. (2007).

4 The relevance of profit margins or markups for a correct assessment of competitiveness developments across euro area countries is highlighted in Amici, Bobbio, and Torrini (2017).

5 An increase in market power since 2000 across advanced economies (and industries) has been documented, among others, in International Monetary Fund. 2019. *World Economic Outlook: Growth Slowdown, Precarious Recovery*. Washington, DC, April. See in particular “Chapter 2: The Rise of Corporate Market Power and Its Macroeconomic Effects”.

6 See also IMF, op. cit., on this point.

Did Quantitative Easing exacerbate banks' risk taking?

In response to the global financial crisis many central banks reduced official rates to their effective lower bound and, at the same time, implemented nonstandard measures of monetary policy which progressively induced a reduction in long-term rates. A concern is usually heard that such flattening of the yield curve squeezes banks' interest margins and might induce banks to extend credit to riskier borrowers, thus threatening financial stability.

Are these concerns grounded? Theoretically, the link between profitability and risk taking is unclear. "Reach-for-yield" models suggest that intermediaries seeing their interest margins, equity value and risk-bearing capacity lowering would refrain from risk-taking activities (see Adrian and Shin, 2011). On the other hand, when the interest margin is lower banks might invest less in screening new borrowers and thus increase risk-taking (see Allen et al., 2011). "Search for yield", whereas managers target certain return levels and have their compensation tied to banks' performance, would also imply a negative link between profitability and credit risk-taking (Rajan, 2005).

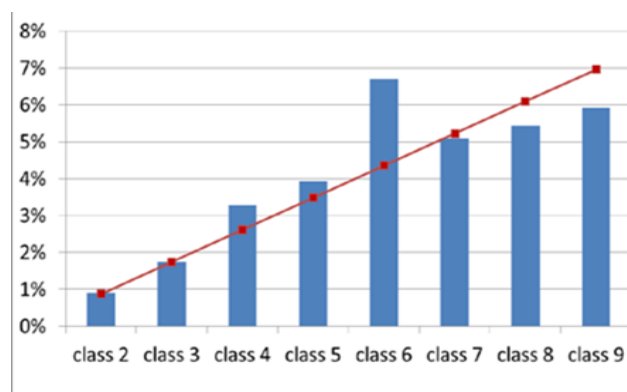
To date, empirical studies using data from a number of countries find that banks tend to take more risk when short-term interest rates are lower: they increase the amount of lending to firms with bad credit histories (Jimenez et al., 2014) or soften lending standards (Maddaloni and Peydrò, 2015). On the contrary, the nexus between the slope of the yield curve and credit risk taking seems to be weak or insignificant.

A recent paper, "[Credit risk-taking and maturity mismatch: the role of the yield curve](#)" (Banca d'Italia, Working Papers No. 1220), by Giuseppe Ferrero, Andrea Nobili and Gabriele Sene, re-assesses this nexus empirically by focusing on the Italian banking system. The analysis covers the period 2005-2016 – characterized by various configurations of the term structure of interest rates – and combines granular information on new loans issued to non-financial firms from the Credit register with an indicator of ex-ante borrowers' creditworthiness (the Z-score provided by

Cerved Group). The authors also consider banks' balance sheet conditions taken from supervisory reports and exploit the heterogeneity across banks to identify the effects of a change in interest rates via credit supply, in the spirit of Kwajha and Mian (2008) and Jimenez et al. (2014).

Figure 1

Increase in lending induced by a yield-curve steepening by rating classes



Note: growth rates of loans in different rating classes, in deviation from those in rating class 1 (most creditworthy), determined by a steepening of the yield curve. Solid red line: linear specification. Blue histograms: a dummy variable for each rating class.

A first result from their econometric analysis shows that when the yield curve is steeper banks, on average, increase the amount of lending to riskier borrowers by about 7% and the opposite holds when the yield curve becomes flatter (Figure 1).

A flattening of the yield curve decreases banks' credit risk-taking ...

In order to relate this result to the debate on profitability and risk-taking, the authors set out to characterize the relationship between the slope of the yield curve – and more generally interest rates developments – and banks profitability. This nexus calls into question the business model followed by different banks. They therefore extend the analysis by focusing on the duration gap between assets and liabilities in the banking book, which is a novelty in the empirical literature. Banks with a

majority of long-term fixed-rate assets and short-term floating-rate liabilities exhibit a larger duration gap and benefit more from a steepening of the yield curve; conversely, banks with more short-term floating-rate assets and long-term fixed-rate liabilities have a smaller duration gap and thus benefit to a less extent from a steepening of the yield curve. By focusing on the duration gap as the main source of bank heterogeneity, this approach provides a better characterization of each bank business model and a direct link between developments in market interest rates and banks' profitability.

The estimates show that the effect of a change in the slope of the yield curve on credit risk-taking is stronger for banks with a larger duration gap. Overall, this evidence provides empirical support for "reach-for-yield" models in which credit risk-taking rises when bank's profitability increases.

...and the effect is stronger the larger is the bank duration gap

These results have important policy implications. They imply reassuring answers to concerns for financial stability stemming from a low interest rate environment characterized by low short-term interest rates and a relatively flat yield curve. With regards to conventional monetary policy, observing a low level of official rates does not automatically warrant financial stability concerns via the traditional risk-taking channel. On the other hand, measures aimed at stimulating the economy by reducing long-term interest rates do not induce banks to increase lending to relatively less creditworthy firms. Monetary policy actions, such as the Eurosystem's public and private securities purchase programmes, can stimulate economic activity and sustain inflation without necessarily increase the amount of risk in the economy.

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