Department of
Economics and Finance

Working Paper No. 2002

Economics and Finance Working Paper Series

Guglielmo Maria Caporale, Faek Menla Ali, Fabio Spagnolo and Nicola Spagnolo

# Cross-border Portfolio Flows and News Media Coverage

February 2020

# Cross-border Portfolio Flows and News Media Coverage

Guglielmo Maria Caporale[a]*, Faek Menla Ali[b],
Fabio Spagnolo[a] and Nicola Spagnolo[a,c]
[a]Department of Economics and Finance, Brunel University London, UK
[b]Business School, University of Sussex, UK
[c]Centre for Applied Macroeconomic Analysis (CAMA), National Australian University, Australia

February 6, 2020

Abstract

This paper investigates the dynamic linkages between portfolio flows and various news indices (based on both "positive" and "negative" news headlines collected from Bloomberg), whilst also controlling for a comprehensive set of push and pull factors. The monthly panel examined comprises 49 developed and developing countries in addition to the US (the "home economy") and covers the period from January 2007 to October 2017; the econometric model includes fixed effects. The empirical results document the important role played by the news variables. More specifically, news pessimism and intensity affect bond flows more than equity flows, and US news appears to play a leading role in these portfolio flow dynamics. By contrast, changes in news pessimism and intensity have a more significant impact on equity flows, and again US news tend to have more sizeable effects. News sentiment is generally found to be an important driver of portfolio flows, whilst only US news disagreement has a significant effect, and only on bond inflows into the US. Most results are robust to the exclusion of the six financial centres from the full sample. As for push and pull factors, most of them (equity return differentials, interest rate spreads, the VIX index, capital controls, exchange rate regimes, CDS spreads, QE episodes, financial development and commodity prices) are significant and with the expected signs.

Keywords: Bloomberg, Bond flows, Equity flows, News.
JEL Classification: F31, F32, G15

# 1 Introduction

Cross-border (equity and bond) portfolio flows have increased sharply in recent years. Whilst they amounted to only 4% of GDP in 1975, they had risen to 100% by the 1990s and reached 245% by the beginning of the current millennium (see Hau and Rey, 2006; IMF, 2012; Sarno et al., 2016). Their decline following the global financial crisis of 2007-08 was only short-lived, and soon they reverted to their upward trend (see Milesi-Ferretti and Tille, 2011), stimulating economic growth in the post-crisis period. However, their increasing volatility with its adverse effects on the world economy has raised concerns that international organisations and central banks have tried to address. In particular, following the global financial crisis, the IMF introduced "capital-flow management" measures to reduce volatility, and more recently the Bank of England has developed a "Capital Flows-at-Risk" framework for capital outflows in the case of a severe, low-probability event with the aim of assessing policy options.

The existing literature has identified a variety of push (global or common) and pull (country-specific) factors as possible determinants of portfolio flows. The former drive capital from the US, the main hub for international portfolio investment, to the rest of the world, and include low US interest rates and industrial growth, low global risk aversion, etc. The latter, on the other hand, pull capital into an economy, and include high domestic interest rates and economic growth, low domestic inflation, better quality of institutions, low political risk, etc. As Mark Carney, the Governor of the Bank of England, puts it, "push factors determine global risk appetite and financial conditions, particularly the level and prospects for US monetary policy and financial stability, whereas pull factors are reflected in domestic conditions and institutions that affect the relative attractiveness of investing in an individual country". [1]

funds is not the same. Following Forbes and Warnock (2012) and other recent related work, our analysis focuses on gross capital flows and outflows, and distinguishes between foreign and domestic investors, since these two categories may react differently to news and other shocks. We obtain news from Bloomberg News, which includes extensive news media coverage of the economic and business outlook, the stock market, corporate bonds, and unemployment for each country in our sample over the period from January 2007 to October 2017 (for a total of 6,165,103 news stories); these are classified as "positive" or "negative" on the basis of an algorithm developed by Bloomberg. Various news media sentiment indicators are then calculated (specifically, news pessimism, news intensity, changes in news pessimism and intensity, news (average) sentiment and news disagreement) and used to analyze the impact of news media coverage on cross-border portfolio flows. Besides, the estimated model includes an extensive set of push (global or common) and pull (country-specific) factors. In brief, the results provide extensive evidence that portfolio flows are driven by news media coverage in addition to other well-known economic factors.

Our study contributes [illegible]

Section 3 describes the data and provides some descriptive statistics; Section 4 outlines the empirical

Interest Parity (UIP). The role of liquidity was examined by estimating VAR models by Vagias and van Dijk (2010), who found di erences between regions (America, Europe and Asia/Paci

2018a,b) estimated multivariate GARCH models to investigate the impact of macro news headlines on variables such as stocks, bonds, exchange rates and commodity prices and provided evidence on both mean and volatility spillovers as well as the asymmetric impact of positive and negative headlines. Market-wide attention-grabbing events (such as record levels for stock indices and front-page market news) were shown to be useful predictors of trading behaviour and returns by Yuan (2015).

In recent years, indicators extracted from Internet search data or from content that was posted on social media platforms have also gained popularity.For example, an increase in the search frequency

suggests that both inflows into and outflows from the US vis-a-vis the counterpart countries exhibit significant fluctuations over the sample period. Several recent studies have attributed them to pull and push factors (see, e.g., Fratzscher, 2012; Sarno et al., 2016, among others), as well as to the unconventional monetary policy adopted in the developed world during the post-crisis period (see, e.g., Lim and Mohapatra, 2016; Fratzscher et al., 2018, among others). In this paper, we explore the role of news media coverage as a driver of portfolio flows, while also taking into account the wide range of other factors considered by previous studies.

### 3.2.4 News Sentiment Index

To gain additional insights into the impact of news media coverage on cross-border portfolio flows we also construct an average sentiment measure, as in Antweiler and Frank (2004), by aggregating (positive and negative) news during a given time interval w Specifically, we classify each positive headline as+1 and each negative one as 1 and construct a monthly news Sentiment Index at the country level as follows:

$$V h q w l p h q w_{it} = q g h \{ \frac{Q h Z V^{positive}_{it} \quad Q h Z V^{negative}_{it}}{}$$

### 3.3 Pull and Push Control Variables

We consider the following set of pull and push factors as control variables:

*Return or yield chasing measures*: (i) the stock return di erential, which is the spread between

full sample and that excluding the financial centres, are small for all countries. Their volatilities, on the other hand, are significantly lower in the US than elsewhere.

worldwide news. This is reflected in their having the largest impact on equity and bond flows. Further, US positive and negative news intensity both have a similar effect on portfolio flows.

It also appears that bond inflows are negatively affected by US news pessimism (-1.195), whereas outflows are only driven by worldwide news pessimism (-1.136). As for the news intensity index, US positive intensity affects positively bond inflows whilst worldwide positive intensity has a positive impact on bond outflows. Worldwide negative intensity has a negative impact on bond outflows. When excluding the financial centres, the same pattern emerges although the parameters are even more significant (at the 1% level) and the point estimates are considerably higher (in absolute value), often twice as big compared to those for the whole sample. In addition, an effect of US negative intensity on bond inflows is detected, and with a large point estimate (-1.775). Equity inflows (see Table 7) do not appear to be affected by news pessimism, whereas outflows are affected by worldwide pessimism (-0.661) and US news pessimism (1.445). As for the news intensity index, US negative intensity has a negative effect on inflows. Further, the impact of US positive news on equity outflows is almost three times larger (in absolute value) than that of worldwide positive news; a similar pattern emerges in the subsample without the financial centres.

[Please Insert Table 8-9 about here]

## 4.3 News Sentiment and Disagreement

Tables 10 and 11 present the results concerning the effects of news sentiment on bond and equity flows, respectively; the left (right) panel in both tables refers to the full sample (the sample without the financial centres).

The estimated coefficients suggest that news sentiment in the US and the other countries affect their bond flows (Table 10). Specifically, an increase in the US (other countries') news sentiment index results in an increase in inflows to (outflows from) the US vis-a-vis the counterpart countries.

the impact on inflows is significant only in the full sample. The effect on bond flows, by contrast, is insignificant. The VIX volatility index is considered an important push factor in capital flows dynamics. Overall, this finding is broadly in line with the empirical findings of Fratzscher (2012) and Rey (2015), although the latter also reports a negative association between VIX movements and portfolio debt inflows.

As for the effects of capital controls, they appear to be sensitive to the chosen sample of countries:

## References


[1] Alfaro, L., Kalemli-Ozcan, S., Volosovych, V., 2008. Why doesn't capital flow from rich to poor countries? an empirical investigation. The Review of Economics and Statistics 90(2), 347-368.

[2] Al-Nasseri, A., Menla Ali, F., 2018. What does investors' online divergence of opinion tell us about stock returns and trading volume?. Journal of Business Research 86, 166-178.

[3] Anderson, C.W., Fedenia, M., Hirschey, M., Skiba, H., 2011. Cultural influences on home bias and international diversification by institutional investors. Journal of Banking and Finance 35, 916-934.

[4] Antweiler, W., Frank, M.Z., 2004. Is all that talk just noise? the information content of Internet stock message boards. The Journal of Finance 59(3), 1259-1294.

[5] Apergis, N., 2015. Forecasting credit default swaps (CDSs) spreads with newswire messages: evidence from European countries under financial distress. Economics Letters 136, 92-94.

[6] Audrino, F., Tetereva, A., 2019. Sentiment spillover effects for US and European companies. Journal of Banking and Finance 106, 542-567.

[7] Beetsma, R., Giuliodori, M., de Jong, F., Widijanto, D., 2013. Spread the news: the impact of news on the European sovereign bond markets during the crisis. Journal of International Money and Finance 34, 83-101.

[8] Beetsma, R., de Jong, F., Giuliodori, M., Widijanto, D., 2017. Realized (co)varianecs of eurozone sovereign yields during the crisis: the impactof news and the Securities Markets Programme. Journal of International Money and Finance 75, 14-31.

[9] Bekaert, G., Harvey, C.R., Lumsdaine, R.L., 2002. The dynamics of emerging market equity flows. Journal of International Money and Finance 21, 295-350.

[10] Birz, G., Lott, J.R., 2011. The effect of macroeconomic news on stock returns: new evidence from newspaper coverage. Journal of Banking and Finance 35, 2791-2800.

[11] Boero, G., Mandalinci, Z., Taylor, M.P., 2019. Modelling portfolio capital flows in a global framework: multilateral implications of capital controls. Journal of International Money and Finance 90, 142-160.

[12] Bohn, H., Tesar, L.L., 1996. U.S. equity investment in foreign markets: portfolio rebalancing or return chasing?. American Economic Review Papers and Proceedings 86, 2, 77-81.

[13] Brennan, M.T., Cao, H.H., 1997. International portfolio investment flows. The Journal of Finance 52(5), 1851-1880.

[14] Bukovina, J., 2016. Social media big data and capital markets-an overview. Journal of Behavioral and Experimental Finance 11, 18—26.

[15] Caporale, G.M., Menla Ali, F., Spagnolo, N., 2015. Exchange rate uncertainty and international portfolio flows: a multivariate GARCH-in-mean approach. Journal of International Money and Finance 54, 70-92.

[16] Caporale, G.M., Spagnolo, F., Spagnolo, N., 2016. Macro news and stock returns in the euro area: a VAR-GARCH-in-mean analysis. International Review of Financial Analysis 45, 180—188,

[35] Fraiberger, P., Lee, D., Puy, D., Ranciere, R., 2018. Media Sentiment and International Asset

[54] Portes, R., Rey, H., 2005. The determinants of cross-border equity flows. Journal of International Economics 65, 269-296.

[55] Reinhardt, D., Ricci, L.A., Tressel, T., 2013. International capital flows and development: financial openness matters. Journal of International Economics 91, 235-251.

[56] Reinhart, C., Rogo , K.S., 2004. Serial default and the "paradox" of rich to poor capital flows. American Economic Review Papers and Proceedings 94(2), 53-59.

[57] Rey, H., 2015. Dilemma not Trilemma: The Global Financial Cycle and Monetary Policy Independence. NBER Working Paper No. 21162.

[58] Sarno, L., Tsiakas, I., Ulloa, B., 2016. What drives international portfolio flows?. Journal of International Money and Finance 60, 53-72.

[59] Saxa, B., 2014. Forecasting Mortgages: Internet Search Data As a Proxy For Mortgage Credit Demand. CNB Working Paper Series 14/2014.

[60] Shiller, R.C., 2000. Irrational exuberance. Philosophy and Public Policy Quarterly 20(1), 18-23.

[61] Sprenger, T.O., Sandner, P.G., Tumasjan, A., Welpe, I.M., 2014a. News or noise? using Twitter to identify and understand company-specific news flow. Journal of Business Finance and Accounting 41(7-8), 791-830.

[60]N

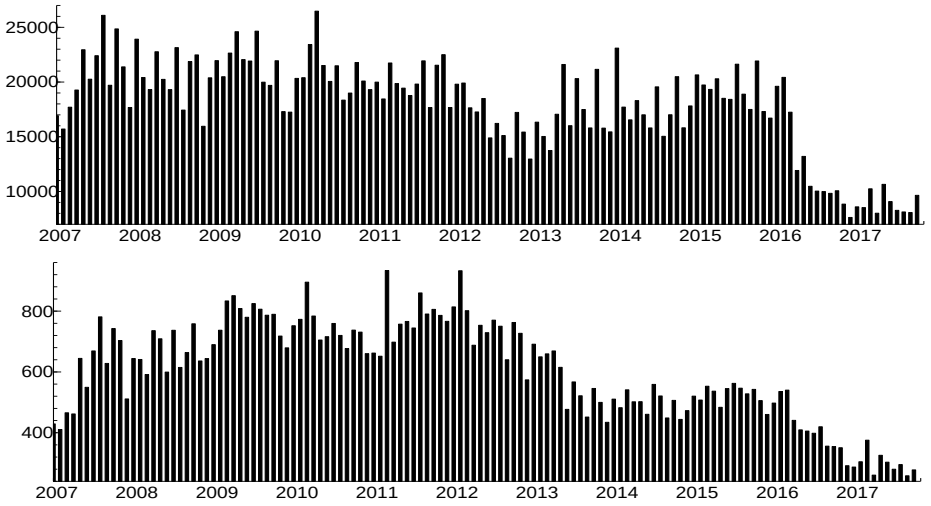
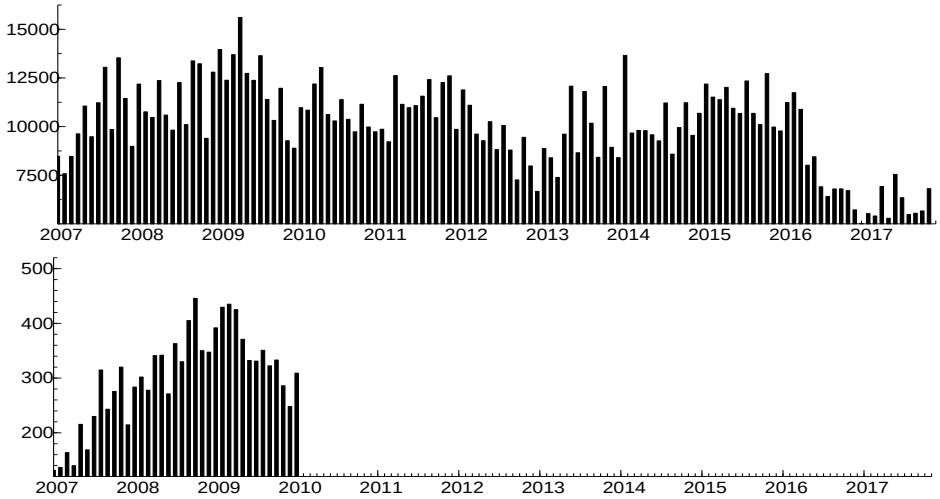
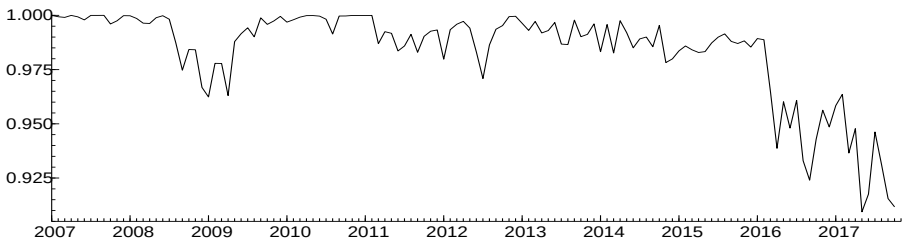



Figure 3. Monthly total number of news headlines for the US (upper panel) and 49 other countries (lower panel, presented as an average).




1.000
0.975
0.950
0.925
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017

2010


2007
2008
2009
2010
2011

2010

Table 1: List of Countries

| | Full Sample | Reduced Sample | | Full Sample | Reduced Sample |
|---|---|---|---|---|---|
| Argentina | x | x | Luxemburg | x | |
| Australia | x | x | Malaysia | x | x |
| Austria | x | x | Mexico | x | x |
| Belgium | x | x | Morocco | x | x |
| Brazil | x | x | Netherlands | x | x |
| Canada | x | x | New Zeland | x | x |
| Chile | x | x | Norway | x | x |
| China | x | x | Pakistan | x | x |
| Czech Republic | x | x | Peru | x | x |
| Colombia | x | x | Philippines | x | x |
| Denmark | x | x | Poland | x | x |
| Egypt | x | x | Portugal | x | x |
| Finland | x | x | Russia | x | x |
| France | x | x | Singapore | x | |
| Germany | x | x | South Africa | x | x |
| Greece | x | x | South Korea | x | x |
| Hong Kong | x | | Spain | x | x |
| Hungary | x | x | Sweden | x | x |
| India | x | x | Switzerland | x | |
| Indonesia | x | x | Taiwan | x | x |
| Ireland | x | x | Thailand | x | x |
| Israel | x | x | Turkey | x | x |
| Italy | x | x | UK | x | |
| Japan | x | | Venezuela | x | x |
| Lebanon | x | x | | | |
| | | | Total number of countries | 49 | 43 |

Note: The series used are monthly and span the period 2007:01 - 2017:10 for 49 countries, a total of 6370 observations. The US is considered the domestic or home economy. Full sample refers to all 49 countries considered in our sample. The reduced sample leaves

Table 2: News Stories Counts per Country

| | Total News | Classified as Positive | Classified as Negative | | Total News | Classified as Positive | Classified as Negative |
|---|---|---|---|---|---|---|---|
| Argentina | 16,401 | 7,921 | 8,480 | Luxemburg | 25,397 | 13,080 | 12,317 |
| Australia | 37,578 | 22,922 | 14,656 | Malaysia | 64,223 | 40,288 | 23,935 |
| Austria | 43,550 | 23,853 | 19,697 | Mexico | 40,280 | 17,352 | 22,928 |
| Belgium | 49,446 | 27,477 | 21,969 | Morocco | 2,710 | 1,193 | 1,517 |
| Brazil | 99,166 | 48,462 | 50,704 | Netherlands | 85,533 | 45,792 | 39,741 |
| Canada | 196,237 | 109,976 | 86,261 | New Zealand | 32,491 | 19,360 | 13,131 |
| Chile | 25,161 | 13,594 | 11,567 | Norway | 46,088 | 30,247 | 15,841 |
| China | 340,149 | 177,042 | 163,107 | Pakistan | 29,483 | 6,711 | 22,772 |

Table 3: Variables Definition

| Variables | Definition | Unit | Source |
|---|---|---|---|
| | **Portfolio Flows** | | |
| Bond | | | |
| Inflows | Gross bond inflows towards the US from other countries | Scaled by previous 12 months average | TIC System |
| Outflows | Gross bond outflows from the US towards other countries | Scaled by previous 12 months average | TIC System |
| Equity | | | |
| Inflows | Gross equity inflows towards the US from other countries | Scaled by previous 12 months average | TIC System |
| Outflows | Gross equity outflows from the US towards other countries | Scaled by previous 12 months average | TIC System |
| | **News Media Indices** | | |
| Media Pessimism | | | |
| Pessimism Index | Negative news stories count divided by the total number of news | Percentage (%) | Bloomberg |
| News Media Intensity | | | |
| Intensity Index$^{negative}$ | Natural Log of negative news stories count | Logarithm | Bloomberg |
| Intensity Index$^{positive}$ | Natural Log of positive news stories count | Logarithm | Bloomberg |
| Changes in Media Pessimism | | | |
| Pessimism Changes | Monthly % change in pessimism index | Percentage (%) | Bloomberg |
| Changes in News Intensity | | | |
| Intensity Changes$^{negative}$ | Monthly % change in negative news intensity index | Percentage (%) | Bloomberg |
| Intensity Changes$^{positive}$ | Monthly % change in positive news intensity index | Percentage (%) | Bloomberg |
| Media Sentiment and Disagreement | | | |
| Sentiment Index | Net news signal as % of total news | Percentage (%) | Bloomberg |
| Disagreement Index | Variance of sentiment index | Percentage (%) | Bloomberg |
| | **Control Variables** | | |
| Return/yield chasing measure | | | |
| Stock Returns Di . | Relative returns of stock market indexes, between the US and the other countries | Stock returns differential (%) | Datastream |
| Interest Rate Di . | 3-months interest rate spread, between the US and the other countries | Rates differential (%) | IMF, OECD |
| Macroeconomic Indicators | | | |
| Unemp. Rate Di . | Relative unemployment rates, between the US and the other countries | Unemp. Rates differential (%) | IMF, OECD |
| GDP Growth Di . | Relative industrial production growth rates, between the US and the other countries | GDP Growth differential (%) | IMF, OECD |
| Global Risk Aversion | | | |
| VIX | VIX volatility index | In 1st difference | Datastream |
| Current Account Position | | | |
| Current Account | Current account to GDP ratio for other countries | % of GDP | IMF, OECD |
| FX arrangement | FX regime index, higher index for more flexible FX | Index (1-15) | Ilzetzki et al. |
| Capital Controls | Dummy = 1 for capital account restrictions periods | 0/1 Dummy | Ilzetzki et al. |
| Institutional Quality Measure | | | |
| ICRG | Political risk index, higher number=better institutions | Index (0 - 100) | PRS Gr00al. |

Table 4: News Indices Summary Statistics

Table 5: Portfolio Flows and Pull - Push Control Variables Summary Statistics

| | Full Sample | | | | Reduced Sample | | | |
|---|---|---|---|---|---|---|---|---|
| Variables | Mean | S.D. | Min | Max | Mean | S.D. | Min | Max |
| | | | | Portfolio Flows | | | | |
| Bond Inflows Outfl | 0.019 | 2.043 | -38.212 | 42.002 | -0.001 | 2.094 | -38.212 | 42.002 |

Table 6: Bond Portfolio Flows and Ne

Table 8: Bond Portfolio Flows and Changes in News Pessimism and Intensity Indices

| | Full Sample | | | | Reduced Sample | | | |
|---|---|---|---|---|---|---|---|---|
| | Inflows | | Outflows | | Inflows | | Outflows | |
| | Model 3 | Model 4 | Model 3 | Model 4 | Model 3 | Model 4 | Model 3 | Model 4 |
| Intercept | −0.081 | −0.083 | −0.266 | −0.271 | −0.014 | −0.012 | −0.446 | −0.455 |
| | (−0.88) | (−0.90) | (−1.49) | (−1.51) | (−0.14) | (−0.12) | (−1.51) | |

Table 9: Equity Portfolio Flows and Changes in News Pessimism and Intensity Indices

| | Full Sample | | Reduced Sample | |
|---|---|---|---|---|
| | Infl | | | |

Table 10: Bond Portfolio Flows and News Sentiment and Disagreement Indices

| | Full Sample | | | | Reduced Sample | | | |
|---|---|---|---|---|---|---|---|---|
| | Inflows | | Outflows | | Inflows | | Outflows | |
| | Model 5 | Model 6 | Model 5 | Model 6 | Model 5 | Model 6 | Model 5 | Model 6 |
| Intercept | 1.122<br>(0.71) | −3.343<br>(−1.52) | 2.829<br>(0.92) | 4.230<br>(0.99) | 2.976<br>(1.69) | −3.783<br>(−1.53) | 2.785<br>(0.57) | 6.161<br>(0.90) |
| Lag($y_{t>w1}$ | | | | | | | | |

Table 11: Equity Portfolio Flows and News Sentiment and Disagreement Indices

| | Full Sample | | | | Reduced Sample | | | |
|---|---|---|---|---|---|---|---|---|
| | Inßows | | Outßows | | Inßows | | Outßows | |
| | Model 5 | Model 6 | Model 5 | Model 6 | Model 5 | Model 6 | Model 5 | Model 6 |
| Intercept | 2 ¾316 | 31 ¼465 | 33 ¼472 WWW | 0 ¾394 | 2 ¾964 | 30 ¾361 | 32 ¾854 W | 0 ¢078 |
| | (1 ¼10) | ( 30 ¾50) | ( 32 ¼44) | (0 ¢20) | (1 ¾33) | ( 30 ¼12) | ( 31 ¾94) | (0 ¢04) |
| Lag( | | | | | | | | |

the decade up to 2008, productivity growth-the most important indicator determining long-term prosperity-was among the lowest in the OECD. This was partly because of high growth in employment, much of it low-skilled

8.

| | |
|---|---|
| Country | India |
| Source | Bloomberg |
| Date | January 13, 2016 |
| News | Business/Economy |
| Title | India economy: Industrial output drops in November |

"According to the Central Statistical O

denotes a contraction) - with demand weakening in the domestic and export markets. A significant worsening