IHS Markit®

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PMI & Exchange Traded Funds

PMI™ as a tool for equity portfolio adjustment

Following on from our previous work (see here) related to PMI and its application in financial markets settings, this paper provides another fruitful avenue for the applicability of PMI data.

We conduct a simulation exercise whereby we split investment capital of $10,000 into two separate Exchange Traded Funds (ETFs) which respectively provide direct exposure to equities in both developed and emerging markets.

We then use monthly changes in aggregated PMI numbers as a guide to adjust and facilitate changes in exposure to these developed and emerging markets ETFs over a period stretching back over a decade.

Our PMI "growth fund" is found, since its inception (January 2011), to provide a return of 159% to the end of September 2021, compared to a passive benchmark equivalent of 143%. Results are also positive for YTD (2021), one-year, and five-year time horizons, thus providing a compelling case of using PMI data to navigate any difference between equity market trends owing to macroeconomic growth developments.

The paper proceeds as follows.

Sections 1 and 2 provide some background to the PMI datasets and details of our theoretical and methodological approach. Section 3 assesses fund performance over different time horizons, including a short discussion on trends in 2021 to date. Section 4 offers some concluding thoughts.

1. Background

Available for the world's largest developed and emerging economies, *Purchasing Managers' Index*™ (PMI™) surveys for the manufacturing, services and construction sectors are widely viewed by economists, policymakers, and financial market participants as key benchmark indicators of economic conditions.

The data are derived from questionnaires sent to senior company decision-makers, with respondents asked to state whether variables such as output, orders, prices, and inventories have improved, deteriorated, or stayed the same compared with the previous month.

From the aggregate results of these questionnaires, so-called diffusion indexes are then calculated for each variable (the percentage of positive responses plus half the percentage of neutral responses). These indexes vary between 0 and 100 with levels of 50.0 signalling no change on the previous month. Readings above 50.0 signal an improvement or increase on the previous month. Readings below 50.0 signal a deterioration or decrease on the previous month. The greater the divergence from 50.0 the greater the rate of change signalled.

Given the extensive global coverage of our national PMIs – over 28,000 companies are polled each month across more than 40 countries – IHS Markit can also provide various global and regional PMI aggregates.

For this research, we use PMI time series that have been constructed to cover the "developed" and "emerging" markets.

2. Data and Methodological Approach

In this section we outline our datasets alongside the theoretical and analytical frameworks we employ to test the usefulness of PMI data in equity portfolio construction. [1]

(i) PMI Data: DM and EM

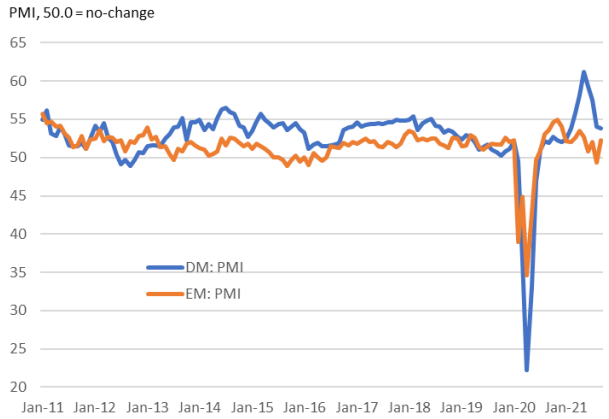
Chart 1 below shows the evolution of our developed and emerging markets PMI headline data since 2011, which covers our period of interest.

Generally speaking, and when interpreting the data from the diffusion index perspective, the developed markets (DM) PMI has "outperformed" that of its emerging markets (EM) equivalent throughout much

[1] The PMIs we use are "composite" series, covering both companies in the manufacturing and service sectors. A full list of the countries included in the DM and EM PMIs can be provided to interested readers.

of the period (for reference, the DM average reading is 52.7 versus 51.5 for EM).

Chart 1: Developed and Emerging Markets PMI



However, as we have argued in previous work, when using PMI data in financial market applications, particularly for equities, momentum can be just as useful as comparisons in absolute readings: where we have come from and we are (potentially) heading tends to be an important consideration.

With that in mind we chose to transform the respective PMI series by subtracting each figure from an average of the previous three months readings.

The rationale for this approach is simply to provide some indication of growth momentum in the respective indices and underpinning an explicit aim of determining which region was, in a purely momentum sense, "outperforming" the other.

For instance, if the DM PMI was found to have a higher reading than the EM PMI, we may wish to use this positive signal of better macroeconomic growth performance for a particular set of countries (in this case DM) and increase exposure to those respective equity markets (and vice versa).

Testing the Theory

To help translate our theory into practice, we downloaded two ETFs from Blackrock's iShares service: one that provided exposure to a group of developed market equities and another that would provide investment exposure to equities from emerging markets.[2]

We then took a hypothetical $10,000 and split this across the two funds at the start of January 2011, with the distribution of our investment capital determined by respective global GDP weights for the DM and EM groupings.[3]

Importantly, regardless whether we take a "passive" or "active" approach to our investments over the subsequent 12 months, we choose to "rebalance" our portfolio at the start of the next calendar year again based on GDP weights for that point in time. This helps us to avoid the theoretical possibility of having funds completely invested in one ETF (if say for instance we had a considerable period of complete outperformance by the DM or EM PMI over the other).

For our "active" strategy, which we represent in what we call our *PMI Growth Fund*, we employed a simple approach: based on our transformations of the PMI data for any single month, if the EM or DM PMI was outperforming the other, we would boost our portfolio exposure to that respective market by 2.5 percentage points (and, by definition, reduce exposure to the underperforming region by -2.5 percentage points).

This of course may be an unrealistic proposition – a 5 ppt "swing" feels quite large – but our aim was to "amplify" the signals gleaned from the PMI datasets and therefore give us the best opportunity to fully observe any differences against the benchmark model over a particular time horizon. Where this "sweetspot" of how best to change the balance of the fund requires further empirical research (and may well ultimately be a function of risk appetite).

Finally, a note on our benchmark model that we use to compare PMI Growth Fund performance against.

Apart from rebalancing according to GDP weights at the start of each calendar year, let us be clear that we chose to leave respective fund exposures unchanged (save for any developments that occur due to different fund returns). That is we employ what may be deemed a "passive" investment approach.

[2] Respective products used can be downloaded from the following URLs:
https://www.ishares.com/uk/individual/en/products/251857/
https://www.ishares.com/uk/individual/en/products/243850/

[3] Unfortunately, the data history for our DM ETF officially begins October 2012. To extend back to 2011, we proxied the fund data by taking a market capitalized weighted combination of similar Eurozone, Japan, UK, and US funds.

3. PMI Growth Fund Performance

Table 1 shows the respective returns of PMI Growth Fund against the benchmark model.

Table 1: Fund Performance

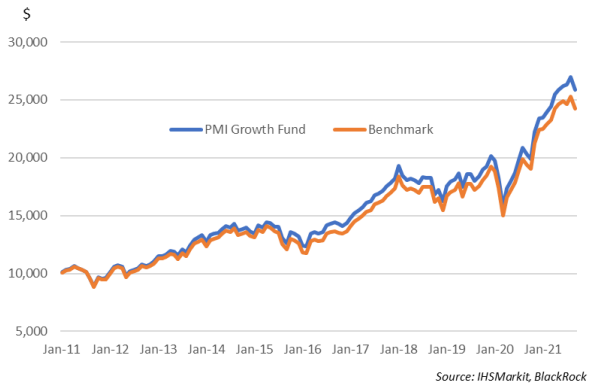
Fund	YTD (2021)	1-year (to Sep-21)	5-year (to Sep-21)	**Since Inception (Jan-11 to Sep-21)**
PMI Growth	10.3%	27.8%	79.2%	**158.9%**
Benchmark	7.9%	25.4%	77.5%	**142.5%**

As we can see, the PMI Growth Fund outperforms the benchmark in terms of cumulative returns across all time horizons. Since inception (January 2011), the benchmark returns a 143% gain against 159% for the PMI Growth Fund. This confirms our prior belief the PMI can provide useful investment signals in determining broad equity market exposure.

Moreover, this generalisation is robust to various time periods. Whether it be over the past year or a five-year time horizon, our simple strategy encapsulated by the PMI Growth Fund always outperforms the benchmark.

Chart 2 below provides an indication of how the respective funds have evolved since inception in 2011.

Chart 2: Growth of Hypothetical $10,000



Perhaps of worthy note has been a notable outperformance of the fund compared to the benchmark over the past 12 months.

Looking closely at trends in equity markets since October 2020, we find that our PMI model indicated that EM growth momentum tended to be better than DM into year end, before we embarked on a noticeable period of stronger DM performance relative to EM since the start of 2021.

However, in the past two months a slowdown in DM growth – reflective of supply-side constraints and inflation concerns in developed markets – has led to EM again performing a little better than DM.

We see similar trends in the equity markets as measured by our ETF data.

Monthly returns in these funds have tended to match our PMI signals i.e., if the PMI data indicate that EM is outperforming DM then this is also replicated in the performance of the ETFs (overall out of the last 12 months, the signals have been "right" on 9 occasions).

4. Summary

This paper provides an initial sketch of how to construct a "PMI Growth Fund" based on the utilisation of signals from two PMI datasets covering broad global regions.

Overall, the approach was relatively simple and binary in nature. By this we mean that regardless of the scale of "outperformance" we automatically changed the balance of the fund in a mechanised and constant way. An obvious improvement therefore would be to employ a scaled change in the fund portfolio linked to the degree of difference between the respective PMI data.

Nonetheless, the exercise shows how the macro growth environment – as measured by timely, unrevised, PMI data – can help investors to strategize and adapt their exposure to equity markets.

For further details on how to subscribe to the PMI datasets email economics@ihsmarkit.com

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