inclusive, frozen prosperity within our own organization. We want to continue increasing collaboration across our entire enterprise to deliver more through our deep client relationships. To further increase our value proposition as an employer, and to continue to advance our sustainability practices.

Second, we want to advance our client-first approach to serving the financial ecosystem. We will continue to deliver our core marketplace solutions with superior client service, utmost integrity, and technological excellence. We will also continue to listen to our client's need as we expand our offerings in index, investment analytics, Anti Financial Crime and ESG solutions. Third, we are accelerating our technology modernization, our AWS partnership and how our marching forward on the cloud is an incredible example of this. But we have additional opportunities to increasingly leverage machine learning within our offerings, as well as our agile development within more of our innovation areas. We look forward to updating you on our progress on these ambitions, in the quarters to come.

As I wrap up, I will summarize by saying our fourth quarter produced solid results for Nasdaq, completing a very successful 2021 for our company. We remain relentlessly focused on a advancing our strategic position as a technology company that is advancing the financial system as we move forward into 2022 capitalizing on the strong momentum generated last year. With that, I'll now turn the call over to Ann to review our financial details.

Ann Dennison

Thank you Adena and good morning everyone. My commentary will primarily focus on our non-GAAP results and all comparisons will be to the prior year period, unless otherwise noted. Reconciliations of U.S. GAAP to non-GAAP results can be found in our press release as well as in a file located in the financial section of our investor relations website at ir.nasdaq.com.

I will start by reviewing fourth quarter performance beginning on Slide 12 of the presentation. The 12% increase in reported net revenue of $885 million is the net result of organic growth of 10%, including 12% organic increase in the solution segments and a 6% organic increase in market services. And the contribution from Verafin as well as is the impact from divestitures partially offset by the negative impact from changes in FX rates.

Moving to operating profit and margins, non-GAAP operating income increased 18% while the non-GAAP operating margin of 51% increased three percentage points compared to the prior year period. Non-GAAP net income attributable to Nasdaq for the fourth quarter of 2021 was $328 million or $1.93 per diluted share compared to $268 million or $1.60 per diluted share in the prior year period. Turning to Slide 13, as Adena mentioned earlier, annualized recurring revenue or ARR totaled $1.87 billion, an increase of 19% from the prior year period while annualized SaaS revenues totaled $640 million, an increase of 43%. Excluding the impact of Verafin, ARR increased 9% year-over-year.

I will now review quarterly segment results on Slides 14 through 17. Starting with market technology, revenue increased $25 million or 24%. The increase reflects the positive $35 million impact from the acquisition of Verafin and the $3 million increase in our existing Anti Financial Crime Technology business, partially offset by an organic revenue decline of $10 million in our market infrastructure technology business.

Excluding a $4 million purchase price adjustment on deferred revenue associated with the closing of the Verafin transaction, Verafin revenues would have been $39 million in the fourth quarter, an increase of 30% year-over-year; and Anti Financial Crime Technology would have been $76 million with both our existing Surveillance and Verafin's FRAML Solutions continuing to exhibit strong momentum.

On a sequential basis and excluding the impact of the purchase price adjustment on deferred revenue, Verafin revenues of $39 million in the fourth quarter compares to $36 million in the third quarter. As we discussed last quarter, the revenue decline within the Market Infrastructure Technology business was impacted primarily by the successful completion of mid-year of a significant long-term maintenance and support licensing contract with a customer who will continue to use our technology as well as decrease more broadly in change requests and installation revenues mostly due to capacity constraints we are working through as a result of logistical implications of the pandemic.

That said, as Adena discussed a few minutes ago, we see some encouraging signs, including the $142 million of order intake during the quarter. ARR for Market Technology was $428 million in the fourth quarter of 2021, an increase of 51% compared to the prior year. The Market Technology segment operating margin was 15% in the period, an increase compared to the prior year quarter primarily due to a $25 million reserve related to an unexpected loss on an implementation project taken in the fourth quarter of 2020. Excluding the impact of the previously mentioned $4 million purchase price adjustment related to Verafin, the operating margin would have been 18% in the fourth quarter of 2021.

Investment Intelligence revenue increased $43 million or 18%, reflecting organic revenue growth of $44 million. Organic revenue growth during the period reflects very strong growth in our index business as well as a meaningful contribution from analytics. ARR was $567 million, an increase of 10% compared to the prior year period. AUM and ETPs licensed to Nasdaq indices rose 18% compared to the prior year period to $424 billion, including $74 billion from net inflows and an $83 billion net increase from market appreciation, partially offset by $92 billion in net negative impact related to the ETP sponsor switches that we have discussed earlier in 2021. The Investment Intelligence segment operating margin of 64% is down 1 percentage point compared to the prior year period as we continue to make strategic investments in Index and Analytics to support sustained growth.

One note looking forward to the first quarter of 2022. Trading activity of instruments licensed to our Indexes achieved certain annual thresholds mid-year that resulted in an increase in licensing economics in the second half of the year. Similar to what we described in the call one-year ago, as we begin 2022, the economics of certain agreements reset for the New Year. We estimate that this will lead to approximately $7 million of lower revenue in the first quarter of 2022 compared to the fourth quarter of 2021, assuming similar trading activity and product mix in the two periods.

Corporate Platforms revenues increased $23 million or 17%, reflecting organic growth. The increase was primarily driven by higher U.S. listings revenues due to the 23% expansion in our listed corporate issuer base, primarily due to a higher number of IPOs as well as higher adoption across the breadth of Investor Relations and newer ESG and reporting offerings. Corporate Platforms ARR was $546 million and increased 16% compared to the prior year period. The Corporate Platform segment operating margin of 37% increased 7 percentage points compared to the prior year period, primarily driven by the continued increase in the listed issuer base.

Market Services net revenues increased $15 million or 5%. The organic revenue increase was $17 million or 6%, and there was a $2 million negative impact from changes in tax rates. The organic increase primarily reflects higher equity derivatives and trade management services revenues. The segment operating margin of 61% was unchanged from the prior year period.

Turning to Page 18 to review both expenses and guidance. Non-GAAP operating expenses increased $28 million to $430 million; the increase reflects a $6 million or 1% organic increase and a $24 million increase from the net impact of the acquisition and divestitures, partially offset by a $2 million decrease from the impact of changes in FX rates due to a stronger U.S. dollar. Excluding the $25 million reserve in the Market Technology segment taken in the fourth quarter of 2020, the organic expense increase totaled 8%. The organic expense increase has two main drivers: first, higher compensation expense, reflecting our continued investment to drive growth as well as an increase in variable performance-linked compensation due to our outstanding results; and second, marketing and advertising expense driven by higher level of new listing activity.

We are initiating our 2022 non-GAAP operating expense guidance to a range of $1.68 billion to $1.76 billion. The expense guidance range at the midpoint has three components. First, a core increase compared to 2021 at approximately the mid-point of our medium-term expense growth objective of 3% to 6%. The majority of which is being allocated to our highest growth product areas: Anti Fin Crime, Index, Analytics and ESG. Second is a roughly 2% additional increase, reflecting certain shorter-term factors including costs related to the heightened competition for talent in today's market, and inflationary pressures as well as some budgeted rebounding costs associated with return to office and travel and entertainment.

Third, there is also the full year impact of the 2021 M&A activity and the impact of changes in foreign exchange rates, which together net to a decrease of under 1%. Our expense philosophy and budget is driven by our strong growth opportunities and our willingness to invest to properly support execution against them. And as Adena went over earlier in her remarks, our positioning versus these large and growing opportunities has never been better. We expect the 2022 non-GAAP tax rate to be in the range of 24% to 26%.

Turning to Slide 19. Debt decreased by $97 million versus 3Q 2021, primarily due to a net payment of $60 million of commercial paper and a $39 million decrease in eurobond book values caused by a weaker euro. Our total debt to trailing 12 months non-GAAP EBITDA ratio ended the period at 3.1 times, down from 3.2 times in the third quarter of 2021. Let me take a moment now to update you on stock repurchases. During the fourth quarter of 2021, in addition to retiring 0.4 million shares of stock representing the final 20% of the $475 million accelerated share repurchase program or ASR agreement, we entered into in July of 2021, the company also repurchased an additional $58 million in shares in 4Q 2021.

Moving to the first quarter of 2022, thus far in January we have repurchased $142 million in stock. And later this week, we plan to execute a second ASR for $325 million, which we expect to fully complete in the first quarter of 2022. These repurchase plans are consistent with our desire as part of our capital plan to maintain a stable share count and with our intention to materially offset the dilutive impacts of the NFI divestiture beyond the first 12 months of that transaction closing.

Turning to Slide 20, I want to touch on Nasdaq's unique set of opportunities in terms of our sustainability and external impact and the strong momentum we have in executing against them. In terms of what makes our ESG opportunities unique, we're committed to the highest level of sustainability in terms of how we run our businesses and serve all of our stakeholders. But we have also positioned ourselves to deliver high impact outside the organization through our Anti Fin Crime Solutions and ESG products and services, our position as a marketplace operator to advance standards and practices and our efforts to further financial inclusion through focused charitable activities and volunteerism.

As we look back at 2021, we have made significant progress across all pillars of ESG. We meaningfully expanded our disclosures and commitments, including our first-ever task force on climate-related financial disclosures report; we enhanced our suppliers' sustainability program, received SEC approval on our Board diversity rule and added Puro Earth, a provider of carbon removal solutions to our growing suite of ESG product offerings. We are pleased to see several third-party ESG research and ratings firms recognize our meaningful progress over the year, including Sustainalytics, ISS, CDP, the Dow Jones Sustainability Index, the Human Rights Equality Index and the just capital ranking of 100 companies to provide critical business – who prioritize critical business behaviors.

We're also moving further in 2022. Earlier this month, Nasdaq announced its partnership with TRIBE Freedom Foundation, a charity focused on fighting human trafficking and modern slavery. Nasdaq will support TRIBE in the creation of a survivor financial