

The economic opportunity of generative AI in Croatia

Capturing the next wave of benefits from *generative AI*

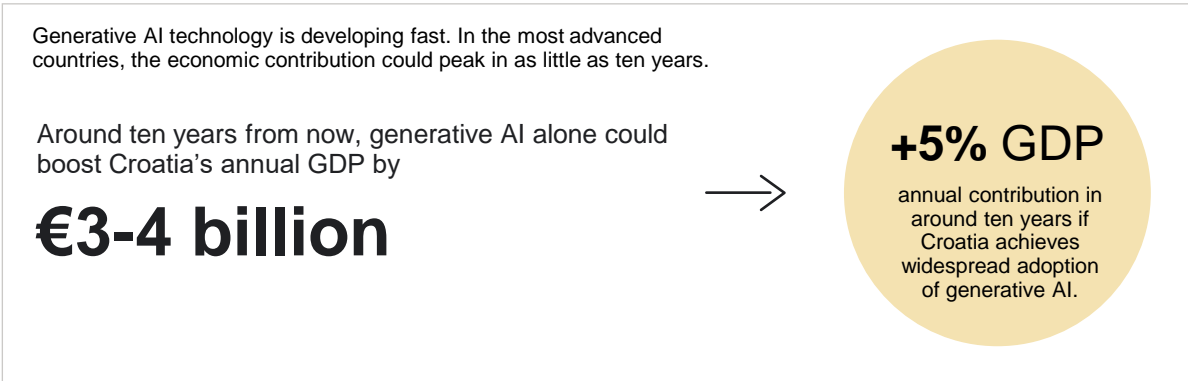
An Implement Consulting Group study commissioned by Google

July 2024

Generative AI has the potential to boost GDP by €3-4 billion in Croatia

The ease of use of generative AI presents Croatia with an opportunity to make a technological leap. It will require more digital skills and investment in innovation.

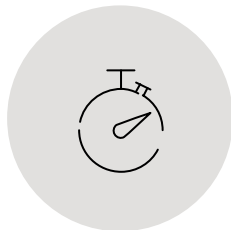
The economic opportunity



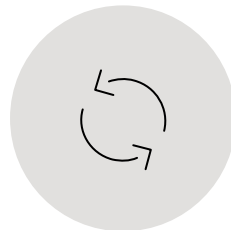
Gains come from three sources ...



Productivity boost from people working with generative AI.



Freed-up time when generative AI helps to automate our work.



Re-prioritised and re-employed time for other value-creating activities.

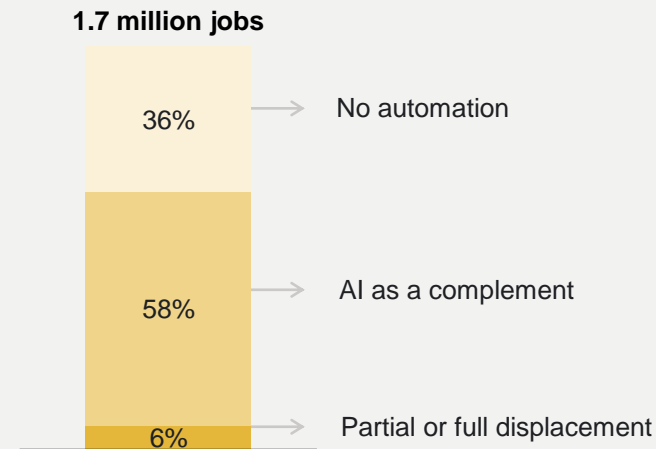
The job implications

58% of jobs in Croatia are estimated to work **together with** generative AI.



Share of jobs exposed to automation by generative AI

% of total employment in Croatia



If Croatia can leverage the potential gains from generative AI, the vast majority of the workforce stands to benefit.

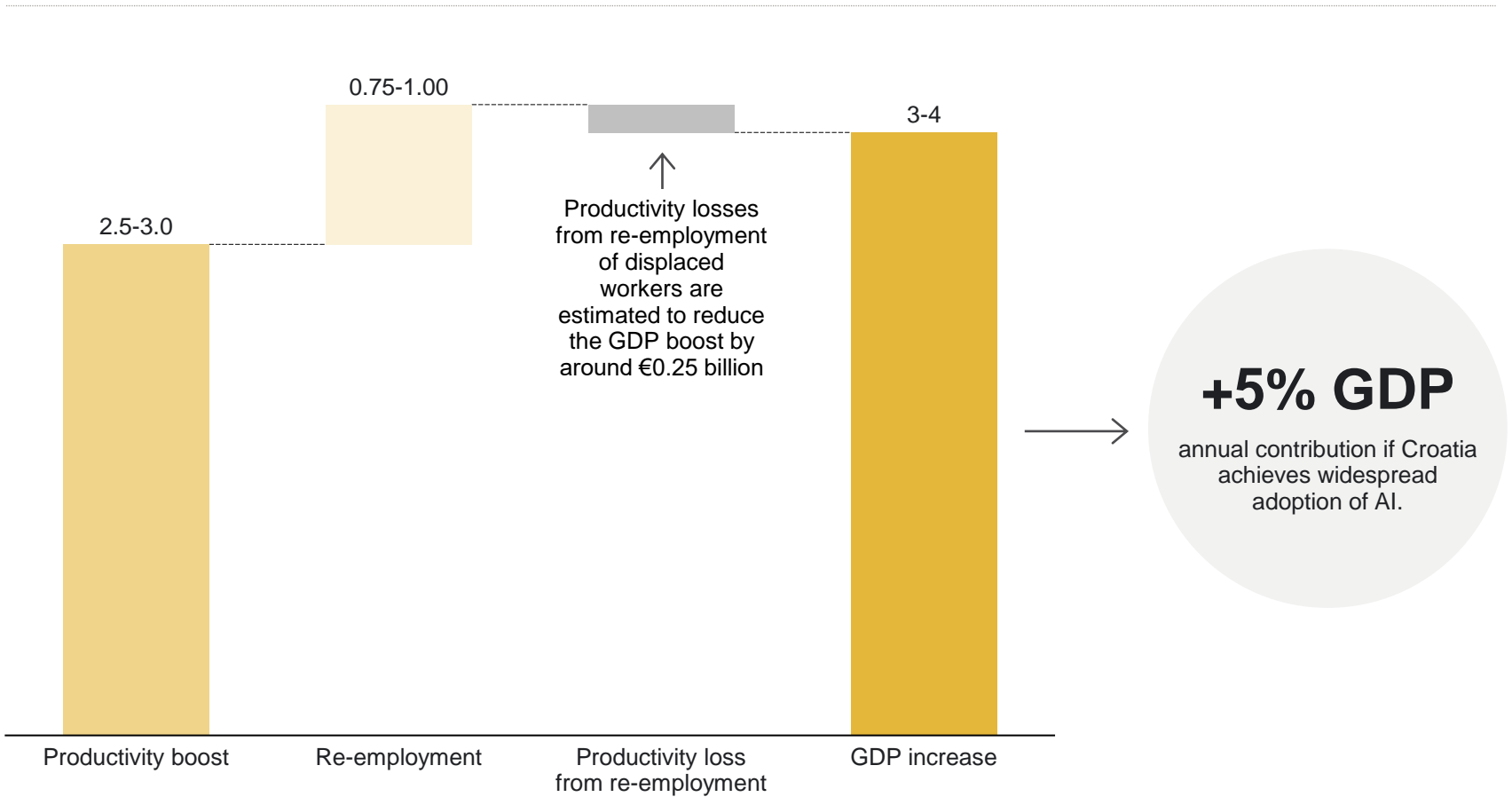
New jobs in the AI-powered economy are expected to replace those lost due to automation, resulting in unchanged employment levels.

The transition is expected to be gradual, allowing workers time to adapt to new tasks and develop new skills.

Generative AI could increase Croatia's annual GDP by €3-4 billion in ten years

GDP potential of generative AI in Croatia

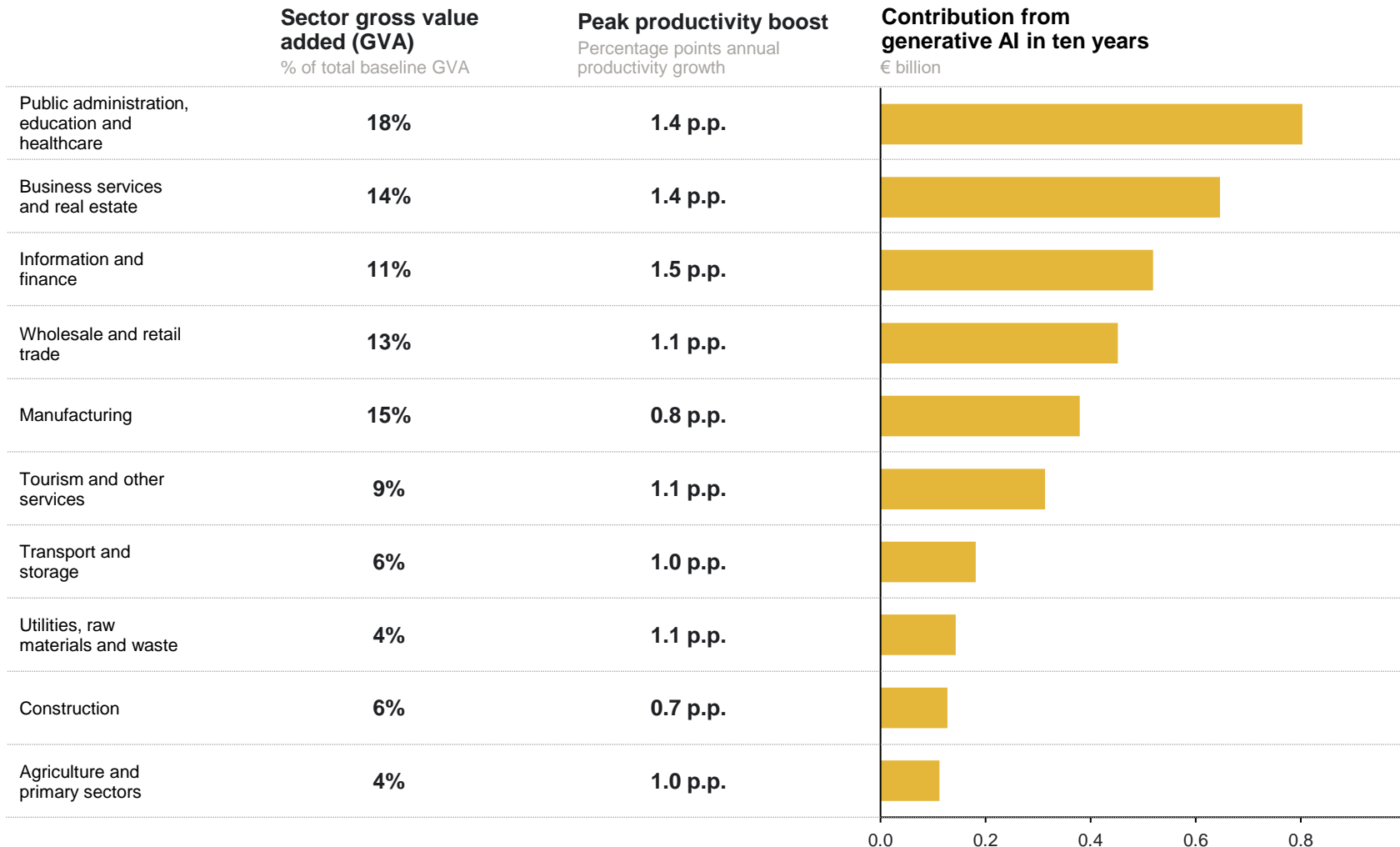
€ billion annual increase from baseline GDP after a ten-year adoption period



- We estimate a potential increase in GDP of €3-4 billion in around ten years, corresponding to 5% of Croatia's GDP.
- The main impact of generative AI comes from a productivity boost to the majority of workers (58%) by augmenting their capabilities, quality and efficiency, which is estimated at €2.5-3.0 billion for Croatia.
- The estimate includes impacts of re-employment of a small share of workers (6%), where generative AI is freeing up a significant share of work for other tasks. This contribution to GDP is estimated at €0.75-1 billion in Croatia.
- The estimate accounts for the possible productivity loss associated with re-employment to other occupations. This reduces the estimate for Croatia by up to €0.25 billion.
- At its peak, the isolated productivity effect of generative AI in Croatia is estimated to be equivalent to 1.2% annually.

Note: There is much uncertainty around the capability and adoption timeline of generative AI. The size of the productivity boost depends on the difficulty level of tasks that generative AI will be able to complete and the number of jobs it can automate. GDP is in 2022 levels. The average number of work activities that potentially can be performed by generative AI across all types of tasks for both complemented and highly exposed workers corresponds to 20-25%. Our estimate is the isolated potential of generative AI around ten years from now when the impact is assumed to peak in leading countries. The estimated boost from generative AI may not be fully additive to GDP trends, as the GDP forecast already assumes a growth contribution from new technologies and generative AI may substitute some of that. Also, the boost from generative AI may be partially offset by an underlying growth slowdown.
Source: Implement Economics based on Eurostat, O*Net, Briggs and Kodhani (2023a), BNP Paribas (2023), and Dell'Acqua et al. (2023).

Generative AI has large economic potential in public administration and business services – but it also affects the large manufacturing and trade sectors in Croatia



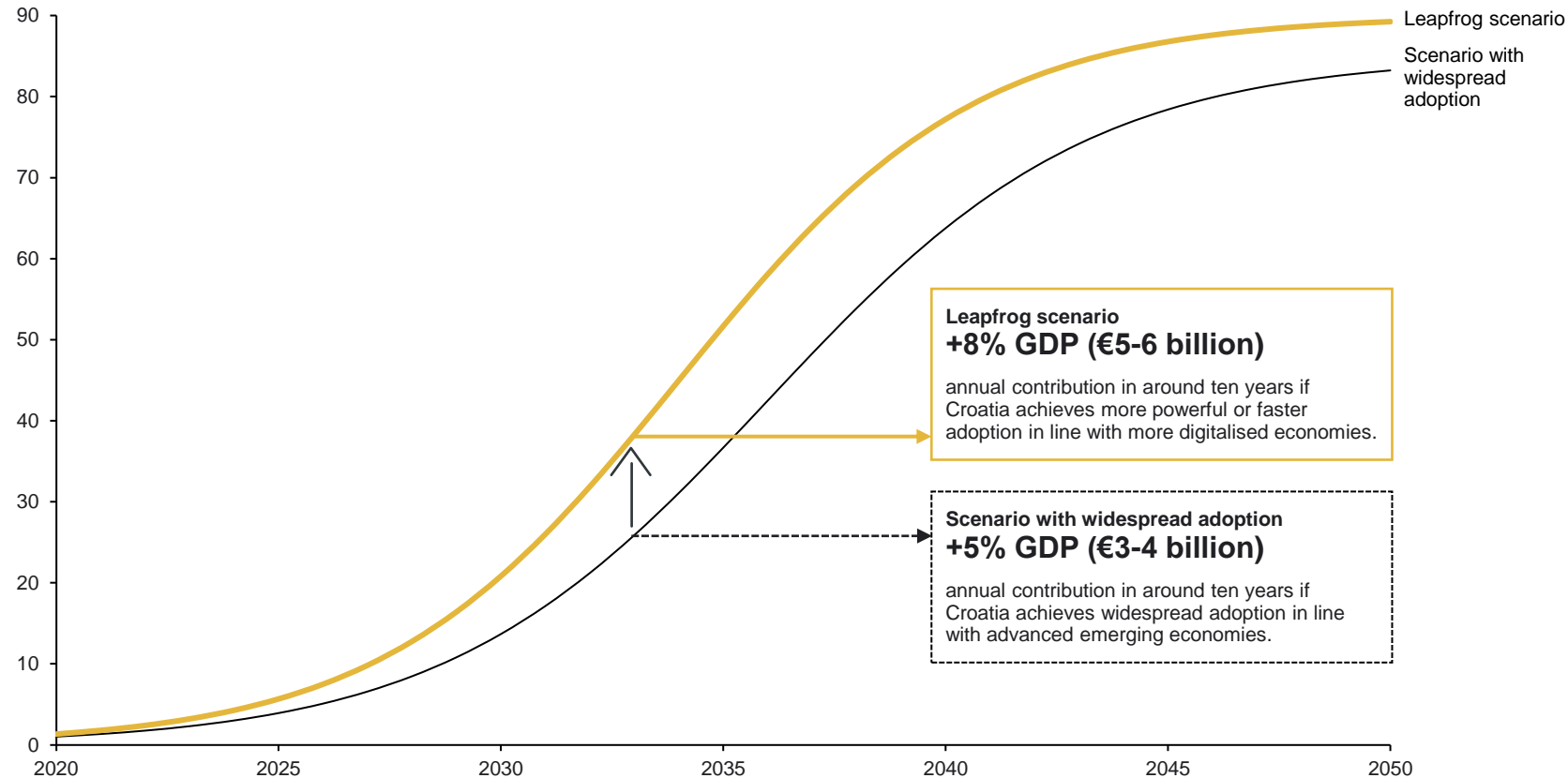
- Generative AI as a tool is most effective in automating knowledge-intensive tasks, such as those carried out in information, finance and business services.
- The largest productivity potentials are found in public administration, business services and information and finance, where the peak productivity increases range from 1.4-1.5% annually. In public administration and business services, generative AI is estimated to increase value added by around €0.6 and €0.8 billion, respectively.
- The economic potential is also large (around €0.4-0.5 billion) in trade and manufacturing despite a low peak annual productivity boost of 1.1% and 0.8%, respectively. This follows in part from the disproportionately large size of wholesale and retail trade (13% of Croatian GVA) and manufacturing (15% of Croatian GVA).
- In contrast to past automation, such as robots, generative AI has the ability to boost productivity in the service sector.
- This is estimated to provide a much-needed boost to service sector productivity, which has historically been difficult to increase.

Note: Sectors are aggregated according to NACE categorisation. "Information and Finance" is a combination of information, communication, financial and insurance activities. Labour productivity gains are mapped one to one to GDP if total employment (as here) is assumed constant and the capital stock increases to match productivity improvements. The estimates take into account that the growth impact of generative AI may not be fully additive to the current GDP trend. First, AI-related gains may substitute for growth that would otherwise occur in a non-AI baseline. Second, underlying productivity growth has slowed over the past decades. The estimated boost from generative AI may be partially offset by an underlying growth slowdown. The contributions from generative AI shown are based on sectoral gross value added and are scaled to reflect the total GDP increase from generative AI.
Source: Implement Economics based on Eurostat, O*Net and Briggs and Kodnani (2023a).

A leapfrog scenario could increase Croatia's annual GDP potential from generative AI from 5% to 8%

Adoption of generative AI

%



Leapfrog scenario
+8% GDP (€5-6 billion)
 annual contribution in around ten years if Croatia achieves more powerful or faster adoption in line with more digitalised economies.

Scenario with widespread adoption
+5% GDP (€3-4 billion)
 annual contribution in around ten years if Croatia achieves widespread adoption in line with advanced emerging economies.



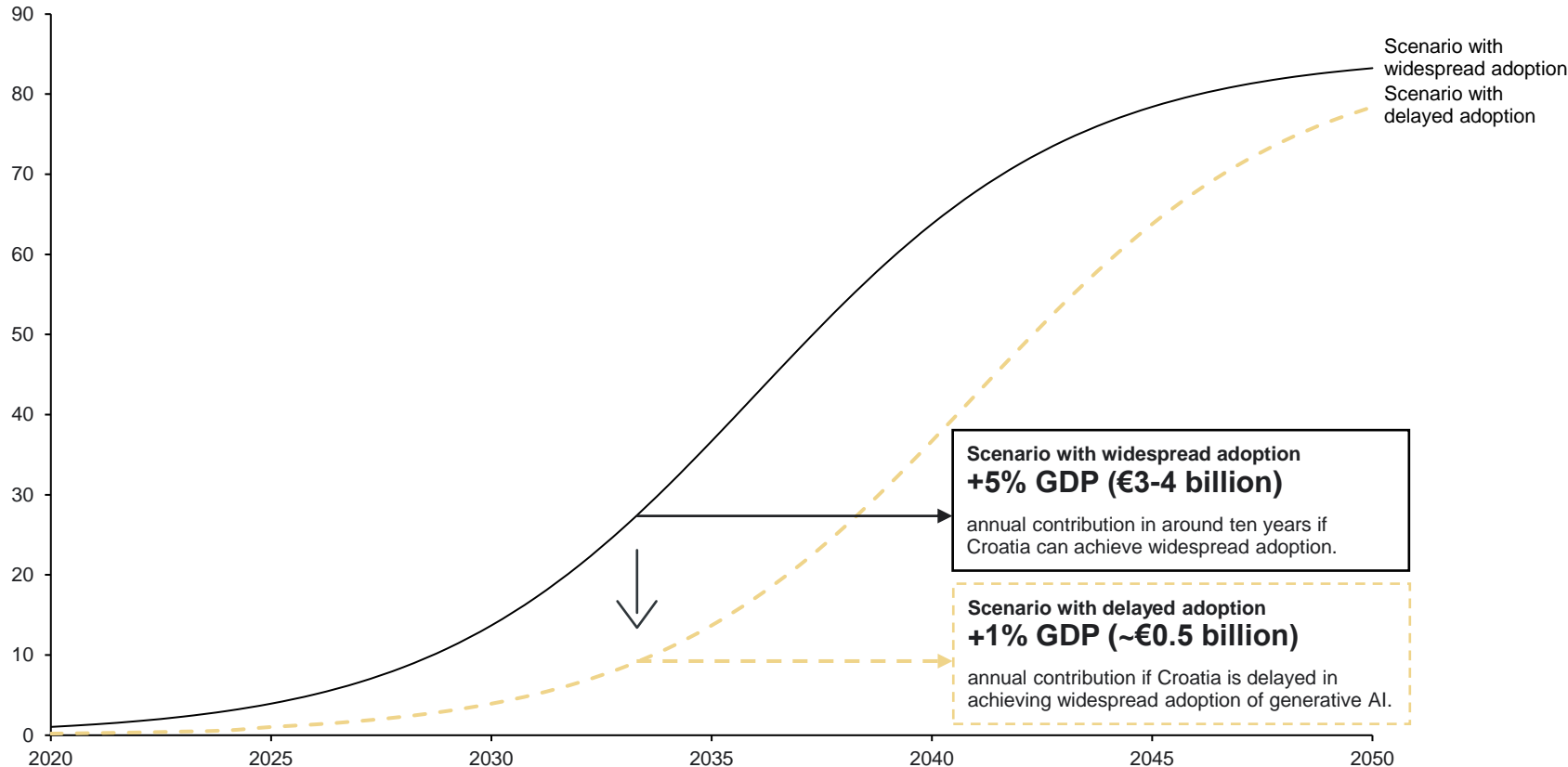
- Compared to other historical technological innovations, generative AI is more powerful, more user-friendly and easier to adopt.
- This presents a significant opportunity for less digitalised countries to leapfrog their digital development by skipping one generation of technology and going straight to the new generation of generative AI tools.
- To gauge the potential, we consider a *leapfrog scenario* where Croatia succeeds in adopting generative AI with the same impact as most digitalised European economies.
- If Croatia can capture the benefits of generative AI in line with frontrunner countries in Europe, the economic potential in ten years is estimated to increase from 5% (€3-4 billion) to 8% (€5-6 billion).
- The leapfrogging scenario may also mean that generative AI could not only be adopted faster but also provide more powerful boosts to productivity in industries in Croatia that are lagging their more digitalised European peers. The boost could potentially be bigger than quantified here.
- Leapfrogging would require a focused effort to significantly elevate key AI drivers in a short timeframe.

Note: GDP figures are expressed in 2022 levels. The figure shows generative AI adoption expressed as a share of economywide companies exposed to AI automation. The estimate is made for a ten-year adoption period to align with the time horizon for widespread adoption by the most advanced emerging markets. Thus, the "widespread adoption" scenario assumes adoption in line with "advanced emerging markets", while the "leapfrog" scenario assumes adoption in line with "other developed markets" in Briggs and Kodnani (2023b). Source: Implement Economics based on Eurostat, O*Net and Briggs and Kodnani (2023a&b).

A five-year delay in the adoption of generative AI could reduce Croatia's annual potential GDP gains from 5% to 1%

Adoption of generative AI

%



- Generative AI is a new general-purpose technology and will take time to adopt.
- Our estimate of Croatia's GDP potential from generative AI is reliant on gradual adoption and development of the new AI technology within the next ten years.
- A five-year delay in capturing the benefits of generative AI is estimated to reduce the annual GDP contribution in ten years from 5% (€3-4 billion) to only 1% (around €0.5 billion).
- Croatia can enhance the welfare and GDP contribution from generative AI by ensuring that policies are in place to capture the benefits as assumed in the widespread adoption scenario.

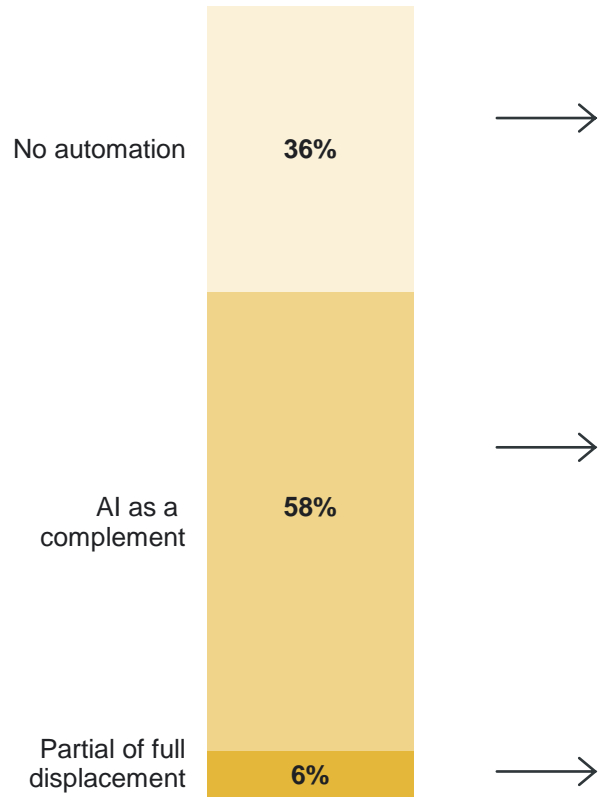
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 Source: Implement Economics based on Eurostat, O*Net and Briggs and Kodnani (2023a&b).

Generative AI augments most jobs in Croatia

Share of jobs exposed to automation by generative AI

% of total employment in Croatia

1.7 million jobs



~ 0.6 million jobs are unlikely to be exposed to automation

An estimated 36% of jobs in Croatia are likely to remain largely unaffected by generative AI. These jobs include manual labour, outdoor tasks, such as construction and cleaning, and human-to-human tasks, such as personal care and food services. The share of unaffected workers is slightly higher in the Croatia region compared to Europe's most digitised economies due to a larger share of employment in agriculture and construction.

~ 1.0 million jobs are likely to be augmented by generative AI

Most jobs (58%) are expected to be assisted by generative AI by automating a limited share of their tasks and helping to create content (text, code and images), collaborating with workers on complex problems and contributing to product design.

Unlike previous waves of automation that mainly impacted manual workers, generative AI is expected to primarily affect office-based professionals. The Croatia region has slightly fewer workers in these types of occupations compared to Europe's most digitised countries.

~ 0.1 million jobs are likely to be fully or partially displaced

A small share of jobs (6%) are expected to have over half of their work activities exposed to automation by generative AI, e.g. in occupations such as clerical support workers, contact centre salespersons and translators. These workers are likely to see their jobs fundamentally change and may need to be re-employed in new occupations. This share is similar in the most digitised EU countries.

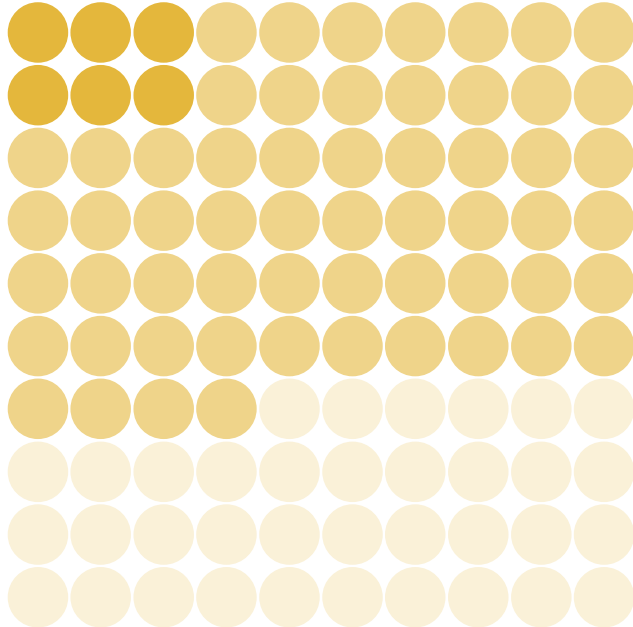
The AI-powered economy is expected to create new jobs in Croatia and ensure full re-employment of potentially displaced workers

Share of jobs exposed to automation by generative AI

% of total employment in Croatia

● Partial or full displacement ● AI as a complement ● No automation

6% of jobs in Croatia are estimated to be highly exposed to generative AI, leading to some job closures.



At the same time, 58% of jobs are expected to see a boost in productivity. This will create new jobs due to:

I

Increase in general demand for goods and services

With higher GDP growth, the AI-powered economy will demand more labour across a wide range of occupations and skill levels.

II

Creation of new AI-related tasks

Widespread use of AI will also create new jobs such as AI prompt engineers, AI content creators and data trainers – and create jobs we cannot preconceive.

III

Demand within occupation

Generative AI will also make highly exposed occupations, such as translators, more efficient and therefore cheaper, which in turn can increase the demand for those occupations.

- The job development in Croatia over the next decades will depend on a range of factors.
- The isolated impact of generative AI depends on the speed of adoption and the size of the productivity boost relative to the size of the displacement effect for the jobs highly exposed to generative AI.
- This report assumes full re-employment of displaced workers. This means no net change in total employment or unemployment.
- This assumption is based on the large productivity boost compared to the relatively small share of displaced jobs. This suggests that the demand for new jobs will be sufficiently strong to create jobs for those exposed.
- Furthermore, economic theory suggests that long-term employment is determined by labour supply and skill mix of the workforce.
- The short-term job impacts will depend, among other things, on the flexibility of the labour market as well as re-training and skilling opportunities for workers.

For more information about the methodology and results, see the report:

[*The economic opportunity of generative AI in CEE*](#)

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