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When urban density does not bring about productivity: the role of air pollution

Graph illustrating the negative impact of air pollution on the productivity of French cities

75% of the French population live in cities (INSEE, 2020), and we are facing an important challenge: how can these cities be both less polluting and less polluted?





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Compact and dense cities can be viewed as greener, as they have lower CO2 emissions per capita.

A more scattered urban development is also detrimental to the preservation of natural habitats and biodiversity (see, as a consequence, the recent objective of '*zero net artificialisation*').

Consequence : this leads to an increase in densification.





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Compact cities are also uniformly seen as more productive, through agglomeration externalities.

Density allows for:

- > the sharing of infrastructure and inputs,
- > a better match between labour supply and demand,
- > technological spillovers.

Result: firms are more productive.

Hence, the **densification** of existing urban areas could be seen as **an appropriate response to both environmental and economic concerns.**

A win-win situation, really?





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Denser cities would be less polluting and more productive...
but are they less polluted?

Some theoretical analyses suggest that even when it is coupled with improvements in the public transport network, a higher population density leads to a deterioration of air quality.





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What is the practical relationship between density, fine particulate matter (PM2.5*), productivity and wages?



Methodology:

To answer the question, Pascale Champalaune used data on French cities (employment zone scale), covering the period 2006-2017.

* PM2.5: suspended particles shown to be very harmful to health and productivity. Their small size allows them to enter deeply into the respiratory system and to pass through blood and in the brain.

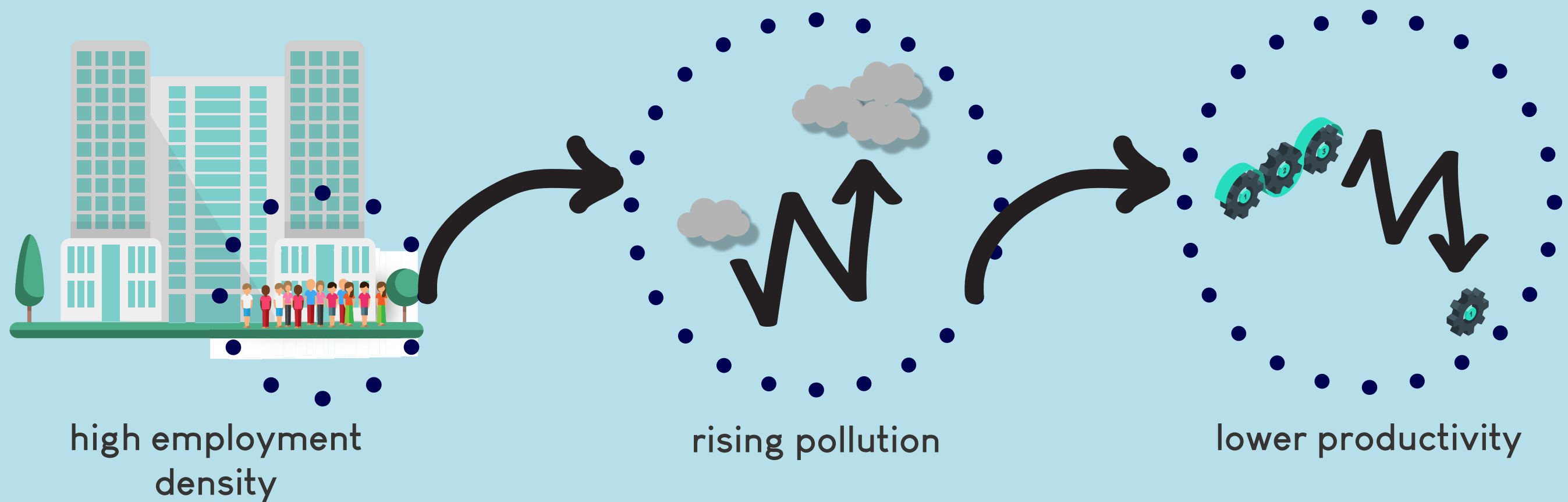




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The results can be summarised in this diagram



- > Without the associated increase in local pollution, agglomeration externalities would be higher, as workers would not suffer from a loss in productivity.





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What to do? One solution:
Promote polycentrism.

What is this about?

Polycentrism is defined by the existence, in addition to the main centre, of several employment centres within the same city.

Why favor this?

A higher degree of polycentrism is associated with lower levels of fine particles and higher productivity, which can be explained by a decrease in home-to-work flows.

What conclusion?

The promotion of secondary employment centers could thus help to reconcile economic and health imperatives.





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From
Pascale Champalaune,
*Agglomeration economies,
city structure
and air pollution.*

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