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Exemple d'utilisation des données des Organisations Internationales Estimer les impacts macroéconomiques du vieillissement

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Exemple d'utilisation des données des Organisations Internationales

Estimer les impacts macroéconomiques du vieillissement

Mathilde Esposito

AMSE

Issu de : *Another brick in the Secular Stagnation wall? Demographic aging and Skills mismatch*

Plan de la présentation

1 Introduction

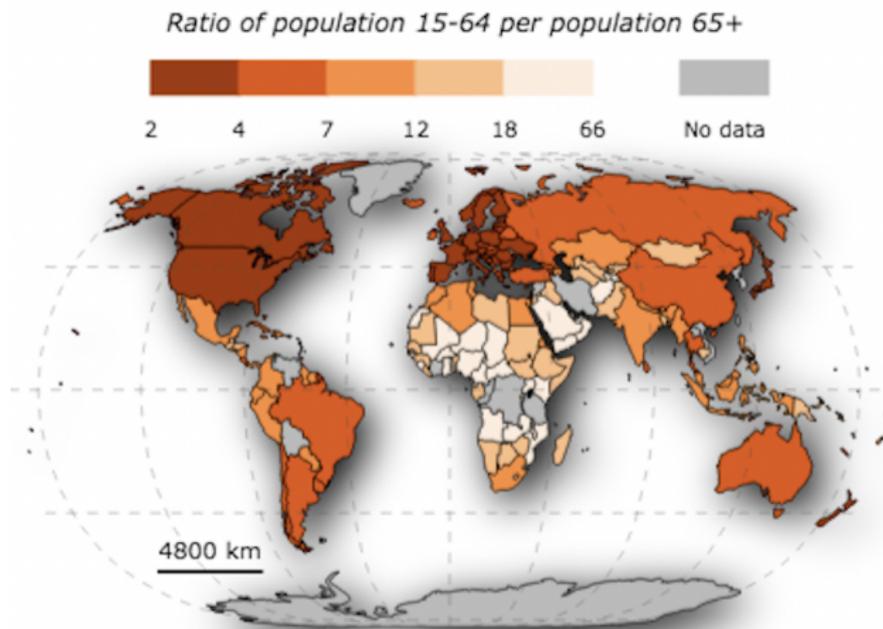
2 Données

3 Faits stylisés

4 Méthodes et résultats

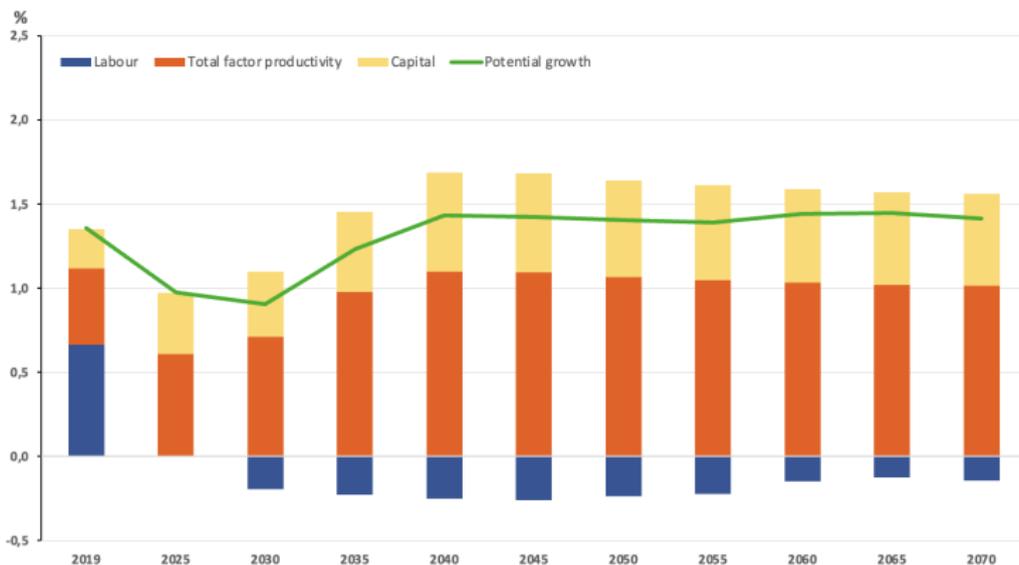
5 Conclusion

Le pays développés vieillissent...



Source : World Population Prospects (UN)
Author : Mathilde Esposito

...et leur croissance potentielle stagne



Computations by the author. Source: 2021 Ageing Report Data, European Commission.

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5 Conclusion

Zoom sur la base de l'OCDE

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Zoom sur la base de l'OCDE

Labour force participation rate 15-64 year-olds, % in same age group, 2001 - 2022

Source: Labour Market Statistics: Labour force statistics by sex and age: indicators

Show: [Chart](#) [Map](#) [Table](#) [Fullscreen](#) [Share](#) [Download](#) [My pinboard](#)

Location	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Argentina	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Australia	74.06	74.15	74.49	74.37	75.40	75.80	76.19	76.50	76.39	76.44	76.64	76.43	76.41	76.31
Austria	70.74	71.67	72.04	70.39	71.44	72.39	73.50	73.89	74.34	74.43	74.55	75.11	75.51	75.31
Belgium	64.21	64.78	64.93	65.89	66.75	66.50	67.08	67.11	66.93	67.66	66.72	66.94	67.53	67.71
Brazil	71.10	72.12	72.19	73.12	74.05	73.74	73.51	73.71	73.95	..	71.80	68.85	69.18	68.91
Bulgaria	62.48	61.90	60.91	61.76	62.11	64.46	66.33	67.80	67.19	66.69	65.92	67.10	68.38	69.01
Canada	76.33	77.39	78.16	78.13	77.73	77.93	78.33	78.48	78.19	78.00	78.00	78.17	78.40	78.01
Chile	60.26	59.94	60.65	61.14	61.52	62.49	63.04	64.69	64.82	64.78	66.19	66.27	66.44	66.61
China (People's Republic of)	..	..	..	..	..	..	..	..	..	77.37	..	..	..	..
Colombia	71.31	71.28	72.05	70.55	69.90	..	67.83	68.15	70.89	72.04	72.58	73.24	72.53	72.31
Costa Rica	65.03	64.66	65.26	63.96	66.36	66.04	67.20	66.82	66.51	65.57	64.89	68.90	68.24	68.41
Croatia	..	62.92	62.44	63.69	63.27	62.85	65.65	65.75	65.63	65.12	64.14	63.88	63.69	66.11

Perspectives: 15-64 year-olds Compare variables % in same age group

Countries: Highlighted Countries (11)

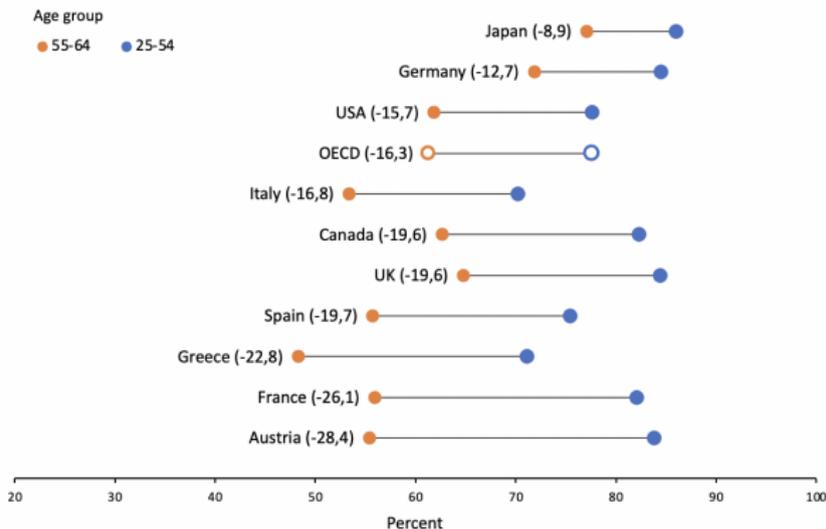
Time: yearly quarterly monthly latest data available

2001 - 2022

Construire la base de données

▲	ISO3	Year	Country	capital	labor	TFP	PFA	w50	w60	w65	sexratio	lexpectancy	b_spending	persi
1	AUS	2000	Australia	0.738809168	0.992968798	2.5253353119	4.25711346	28.14043	16.53111	12.36855	100.63186	79.6309	0.925	
2	AUS	2001	Australia	0.841034412	0.999061763	2.2800846100	4.12018061	28.61082	16.70980	12.46894	100.49670	80.0165	0.884	
3	AUS	2002	Australia	1.005710125	1.026236296	2.1969614029	4.22890759	29.03421	16.87885	12.57033	100.44065	80.0639	0.771	
4	AUS	2003	Australia	1.083639622	1.163754344	2.1082372665	4.35563135	29.43387	17.06301	12.67543	100.40464	80.4549	0.698	
5	AUS	2004	Australia	1.096173763	1.232726574	1.9716157913	4.30051613	29.82276	17.28986	12.78846	100.37936	80.7512	0.619	
6	AUS	2005	Australia	1.160820961	1.317174911	1.8761758804	4.35417175	30.19567	17.54428	12.90238	100.37577	81.1126	0.546	
7	AUS	2006	Australia	1.143896222	1.366771579	1.7994804382	4.31014824	30.52870	17.83509	13.01137	100.40885	81.2822	0.484	
8	AUS	2007	Australia	1.224932671	1.407228827	1.4607877731	4.09294939	30.79481	18.15983	13.10974	100.50324	81.2603	0.408	
9	AUS	2008	Australia	1.141021132	1.419597507	1.2067623138	3.76738095	31.00512	18.44071	13.20637	100.63572	81.4589	0.444	
10	AUS	2009	Australia	1.081168771	1.315225124	0.8228988647	3.21929264	31.23749	18.69035	13.34931	100.70346	81.7661	0.541	
11	AUS	2010	Australia	1.068164825	1.218895555	0.5495223999	2.83658266	31.57269	18.98525	13.56621	100.62194	82.0550	0.502	
12	AUS	2011	Australia	1.231130600	1.130730510	0.4055194855	2.76738071	31.94093	19.28573	13.83719	100.46421	82.1336	0.509	
13	AUS	2012	Australia	1.197742224	1.037081838	0.2502708435	2.48509502	32.23240	19.53793	14.12544	100.30321	82.3456	0.566	
14	AUS	2013	Australia	1.066415548	0.822487950	-0.0484256744	1.84047782	32.48136	19.78304	14.40088	100.08307	82.6041	0.642	
15	AUS	2014	Australia	0.914567173	0.757963538	-0.1515560150	1.52097464	32.72188	20.04658	14.66477	99.78071	82.5677	0.672	
16	AUS	2015	Australia	0.786383092	0.712571025	-0.3557586670	1.14319539	32.92000	20.31231	14.92487	99.46432	82.6552	0.684	
17	AUS	2016	Australia	0.746585190	0.664680421	-0.5623092651	0.84895635	33.06990	20.57428	15.17583	99.21147	82.8707	0.643	
18	AUS	2017	Australia	0.803380430	0.618069291	-0.6729602814	0.74848944	33.20173	20.83604	15.41850	99.07406	83.0006	0.606	
19	AUS	2018	Australia	0.731158614	0.591504037	-0.5916271210	0.73103553	33.35607	21.11234	15.66882	99.04550	83.3871	0.553	
20	AUS	2019	Australia	0.639140368	0.532219589	-0.5739755630	0.59738439	33.56199	21.40924	15.93194	99.11361	83.1100	1.033	
21	AUT	2000	Austria	1.084183931	0.453816980	0.7398958206	2.27789664	32.82593	20.60066	15.41303	100.29906	78.2358	0.922	
22	AUT	2001	Austria	0.954674482	0.466325134	0.6404571533	2.06145668	33.09856	21.12085	15.43474	100.34783	78.7192	0.909	
23	AUT	2002	Austria	0.786970019	0.491106570	0.5540943146	1.83217096	33.30363	21.44617	15.43300	100.40334	78.8469	1.069	
24	AUT	2003	Austria	0.824847877	0.677260816	0.5303449631	2.03245354	33.47152	21.63315	15.44697	100.35391	78.8496	1.185	
25	AUT	2004	Austria	0.784996927	0.662462413	0.4937362671	1.94119561	33.65946	21.82244	15.70890	100.30344	79.3632	1.179	
26	AUT	2005	Austria	0.732467771	0.627463043	0.3571605682	1.71709132	33.90108	21.88755	16.18938	100.34578	79.5210	1.106	

Taux d'emploi et groupes d'âge

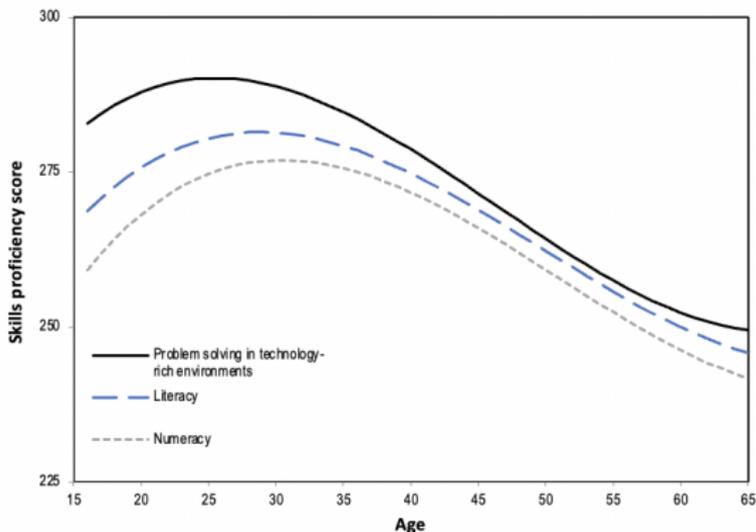


Computations by the author. Source: OECD database for the year 2021.

Le difficile retour à l'emploi des seniors

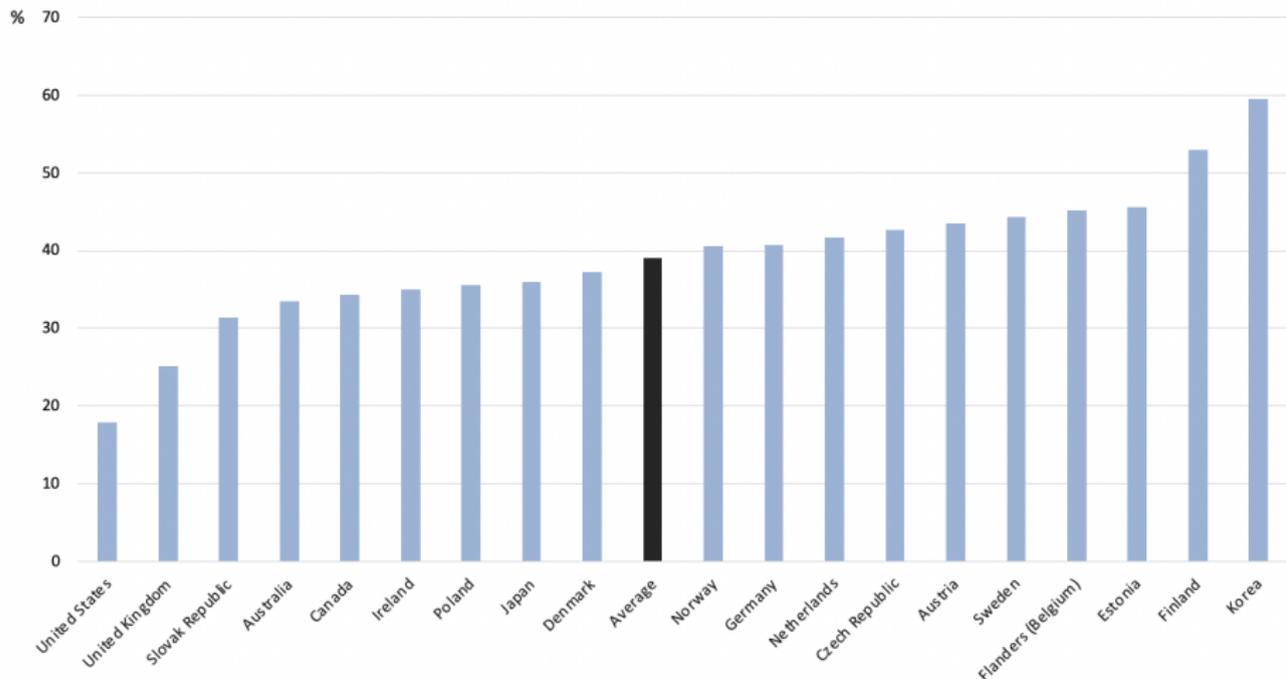
		15-24	25-54	55+
Employment to unemployment	Spain	9%	4%	2%
	France	5%	2%	1%
	Italy	4%	1%	1%
	Sweden	3%	1%	1%
	UK	1%	1%	0%
Unemployment to employment	Spain	22%	22%	12%
	France	26%	22%	13%
	Italy	14%	14%	11%
	Sweden	28%	23%	16%
	UK	16%	18%	14%
Computations by the author. Source: Eurostat estimated probabilities for the latest year available.				

La courbe en U-inversé des compétences



Source: data from additional results of the PIAAC Survey, OECD (2019).

L'hétérogénéité du niveau de compétences par âge



Computations by the author. Source: Survey of Adult Skills (PIAAC), 2012

Le modèle économétrique

$$Y_t = A_t K_t^\alpha L_t^{1-\alpha} \quad (1)$$

$$\Delta \text{Emploi potentiel}_{it} = \theta \text{vieillesse}_{it} + X_{it} + \epsilon_{it} \quad (2)$$

$$\Delta \text{Taux de participation}_{it} = \theta \text{vieillesse}_{it} + X_{it} + \text{cohorte}_{it} + \epsilon_{it} \quad (3)$$

$$\Delta \text{Emploi sectoriel}_{it} = \theta \text{vieillesse}_{it} + X_{it} + \epsilon_{it} \quad (4)$$

où X_{it} inclut les contrôles démographiques et de marché (taux de fécondité, espérance de vie, législation sur la protection de l'emploi, dépenses de retraite...)

Viellissement, emploi potentiel et croissance potentielle

	<i>First-Differences</i>		<i>Fixed Effects</i>	
	(1)	(2)	(3)	
Share of 50+	-0.068*** (0.026)	-0.044*** (0.012)	-0.045*** (0.017)	
Sex Ratio	0.049* (0.026)	0.110*** (0.017)	0.108*** (0.018)	
Life Expectancy	-0.053** (0.023)	-0.077*** (0.024)	-0.170*** (0.044)	
Unemployment Spending	-0.080*** (0.030)	-0.177*** (0.042)	-0.250*** (0.044)	
Pension Spending	-0.020 (0.017)	-0.021 (0.018)	-0.018 (0.019)	
Tax Wedge	-0.011* (0.006)	-0.033*** (0.010)	-0.022** (0.010)	
EPL	-0.061 (0.061)	-0.206** (0.083)	-0.188** (0.085)	
Training Spending	-0.135 (0.125)	-0.264 (0.177)	-0.248 (0.179)	
Constant	0.011 (0.012)			
Country Fixed Effects		✓		✓
Time Fixed Effects				✓
Observations	370	390	390	
R ²	0.114	0.552	0.378	
Adjusted R ²	0.094	0.519	0.294	
F Statistic	(5.812)*** (df = 8; 361)	55.771*** (df = 8; 362)	26.001*** (df = 8; 343)	

Viellissement et taux de participation

Aggregate Labor Force Participation Rate

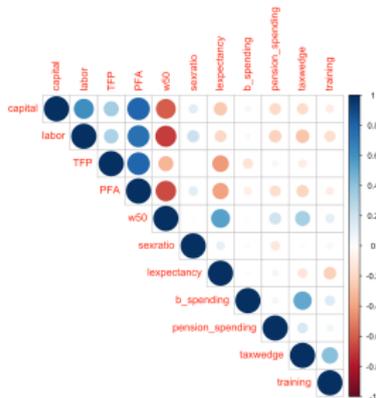
	<i>First-Differences</i>		<i>Fixed Effects</i>	
	(1)	(2)	(3)	
Share of 50+	-0.519*** (0.175)	-0.001 (0.093)		
Share of 60+				-0.493*** (0.119)
Cohort Effect (50+)	0.578** (0.240)	0.177*** (0.066)		
Cohort Effect (60+)				0.330*** (0.059)
Constant	-0.183 (0.210)			
Country Fixed Effects		✓		✓
Time Fixed Effects				
Observations	340	359		359
R ²	0.109	0.521		0.544
Adjusted R ²	0.085	0.482		0.507
F Statistic	4.499*** (df = 9; 330)	39.949*** (df = 9; 331)		43.937*** (df = 9; 331)

Viellissement et obsolescence des compétences : une analyse sectorielle

	<i>Sector Employment:</i>		
	Low technology	Medium technology	High technology
	Random Effects	Fixed Effects	Fixed Effects
Share of 50+	22.319*** (2.137)	0.888 (3.344)	-22.957*** (3.424)
Constant	1,779.967*** (468.325)		
Country Fixed Effects		✓	✓
Time Fixed Effects		✓	
Observations	195	194	195
R ²	0.533	0.276	0.400
Adjusted R ²	0.510	0.080	0.311
F Statistic	211.622***	6.424*** (df = 9; 152)	12.506*** (df = 9; 169)

Les résultats sont notamment robustes à...

- la définition du vieillissement
- la prise en compte de la distribution des autres groupes d'âge
- divers tests économétriques (endogenité, variables instrumentales, corrélation, meilleur modèle...)



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Pour résumer

- le vieillissement **déterioré l'emploi potentiel** et donc la croissance potentielle
- canal: les + de 50 ans ont un **moindre taux de participation**
- **le degré de technologie a un effet d'éviction** sur l'emploi sectoriel des seniors
- ce qui valide l'hypothèse d'obsolescence des compétences technologiques due à l'âge

Les données mises publiquement à disposition par les organisations internationales sont suffisantes pour permettre des estimations précises et robustes de ces phénomènes