Visualizing the impact of COVID-19 on internal and international migration in the Spanish provinces

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Abstract: Drawing on register records from 2019 to 2021, we analyse the impact of COVID-19 on internal and international migration across the 50 Spanish provinces (NUTS 3 regions of Eurostat). Our results show that net international migration declined in all the provinces during the pandemic, particularly in high population density areas. Certain depopulated provinces registered significant positive net internal migration rates, while the most populous areas displayed population losses through internal migration. Generally, the total migration balance (internal + international) decreased in most provinces, primarily driven by the drop in international migration. Changes in internal and international migration persisted over time, while monthly data suggest that patterns tended to converge to pre-pandemic levels in late 2021.

Key words: Internal migration, international migration, COVID-19, provinces, NUTS 3 regions, population density, Spain.
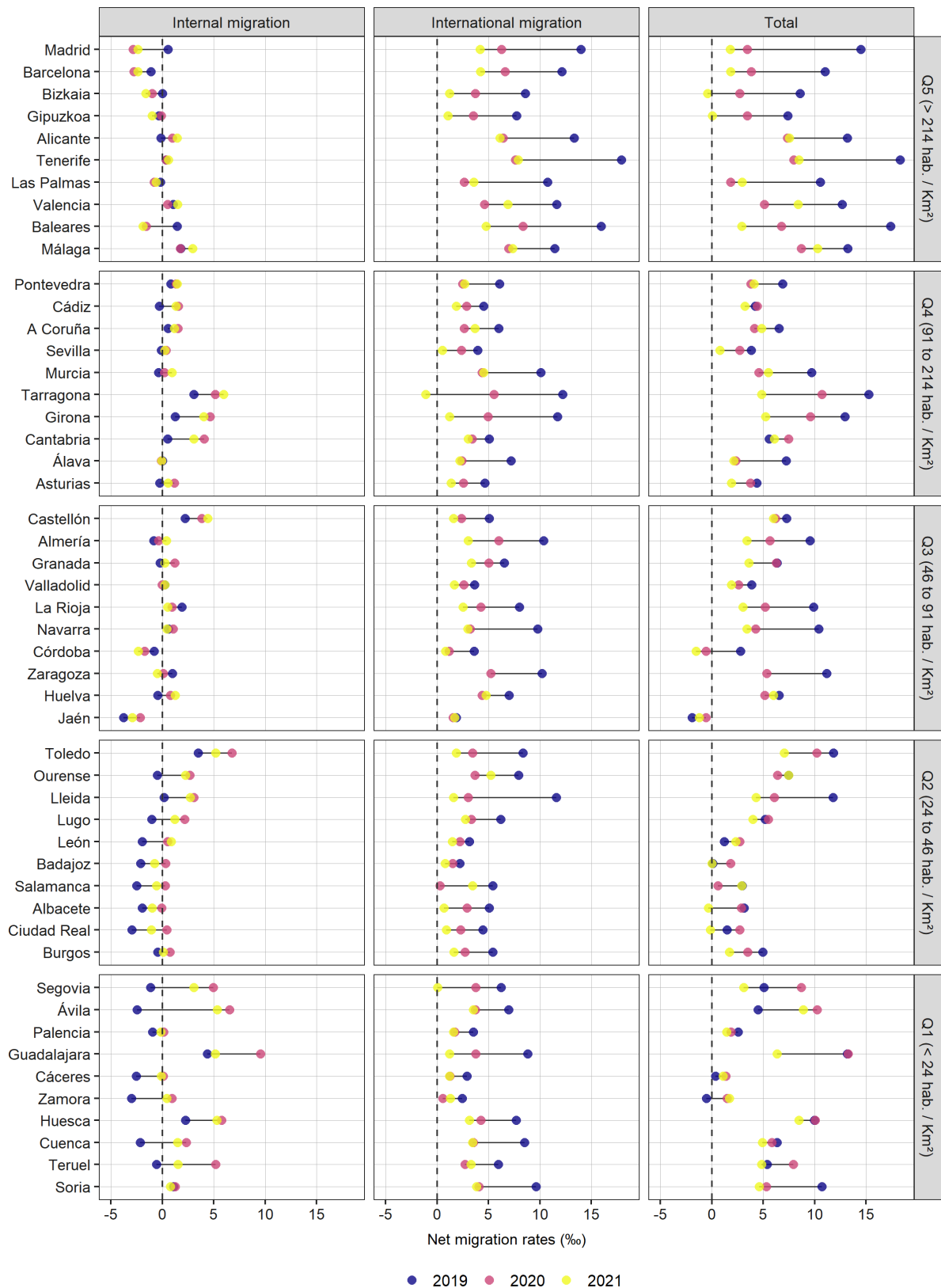
Previous work documented how COVID-19 constrained international migration (UN, 2021; González-Leonardo et al., 2022b) and increased internal migration from large cities into rural areas (González-Leonardo et al., 2022a; Rowe et al., 2019; Stawarz, 2022). However, less is known about the variations in the combined impacts of the COVID-19 pandemic on internal and international migration and the extent to which changes in their patterns have persisted over time. We analyse the effect of the pandemic on internal and international migration in Spain addressing the following research question: How the pandemic has affected both components across provinces with varying population densities? And have changes in migration patterns persisted over time? We used register data from the *Estadística de Migraciones* (EM) of the *Instituto Nacional de Estadística* (INE); and calculated internal, international and total net migration rates (internal + international) for each province in 2019, 2020 and 2021. To facilitate the analysis, we grouped the provinces by quintiles of population density (Figure 1).

During 2020, the pandemic reshaped the patterns of net population balances through migration. Internal migration recorded significant net gains in low density provinces, especially around Madrid, and it generated net losses in dense agglomerations, notably in Madrid and Barcelona. International migration decreased across all Spanish provinces, especially in high density areas, the main receiving. Total net migration rates declined in most Spanish provinces, mainly driven by the drop in international migration which generally displayed a larger effect than variations on internal migration. Only some low-density areas registered significant increases in total net migration rates in 2020 as a result of the rise in internal migration. Generally, the reversal in spatial patterns of internal migration from high to low density areas persisted during 2021, although net balances were closer to those of

2019. The decline of international migration, however, was exacerbated in 2021, greatly reducing net migration gains in high density provinces.

Our results show the varying impacts of the COVID-19 pandemic on the Spanish migratory system. Generally, drops in net international migration were the main driver of changes in overall net migration rates, especially in high density areas. Though the reversal in internal migration form high to low density provinces raised the migratory balance in less populous areas. Nonetheless, we observed some nuances, as not all provinces with similar populations densities show the same trends. Although the patterns of internal and international migration in 2021 continue to differ from those prior to the pandemic, monthly data from the EM show that levels of both components tended to converge to observed pre-pandemic spatial patterns in the second semester of 2021 (see Supplementary material). Our results suggest that the pandemic, including a range of stringency measures to contain the spread of the virus and teleworking, resulted in significant changes on the Spanish migratory system, but these changes seem to have been temporary. Ageing societies need international migrants to sustain population growth and cover deficits of workers. At the same time, regions with high population densities, where global cities are located, are likely to remain key epicenters of population magnets.

Figure 1. Internal, international and total net-migration rates in the Spanish provinces by quintiles of population density: 2019, 2020 and 2021

Source: Own elaboration using data from the Estadística de Migraciones and Cifras Oficiales de Población (INE). Note: Provinces are grouped and ordered according to population density; International (-14.1‰) and total (-14.6‰) net-migration rates of Zaragoza in 2021 are not shown in the figure, as negative values are exceptionally low because the INE did not include a large proportion of international out-flows in previous years and added 21.000 extra emigrants in the first semester of 2021.

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Supplementary material

Table 1. Immigration and emigration by provinces and semesters: 2019-2021

Province	Immigration						Emigration					
	2019S1	*2019S2*	*2020S1*	*2020S2*	*2021S1*	*2021S2*	*2019S1*	*2019S2*	*2020S1*	*2020S2*	*2021S1*	*2021S2*
Albacete	1,625	1,789	1,303	936	955	1,580	579	854	510	591	1,101	1,173
Alicante	22,738	23,740	14,586	17,428	17,107	22,350	10,289	11,214	8,286	11,629	12,289	15,578
Almería	7,561	8,209	4,951	6,514	5,596	7,299	4,134	4,260	3,862	3,293	6,012	4,719
Álava	1,929	2,118	1,315	1,000	796	1,789	854	827	477	1,044	995	865
Asturias	3,515	4,268	2,631	1,937	1,568	3,333	1,321	1,730	1,267	699	1,441	2,084
Ávila	689	884	500	559	406	682	244	224	226	247	310	215
Badajoz	1,365	1,656	1,209	993	681	1,349	839	709	601	579	932	588
Baleares	12,791	13,305	8,359	8,642	7,149	10,489	3,637	3,320	3,199	3,676	5,093	6,721
Barcelona	61,776	68,579	42,276	34,260	31,682	54,782	24,776	37,588	26,084	13,115	26,970	35,672
Bizkaia	6,612	7,071	4,604	3,328	2,416	4,674	2,214	1,705	1,459	2,241	3,539	2,181
Burgos	1,676	2,073	1,284	925	894	1,623	800	1,030	613	630	654	1,281
Cáceres	763	941	488	551	502	825	279	282	217	335	591	273
Cádiz	3,773	4,577	2,833	3,223	2,958	4,089	1,124	1,546	1,472	981	2,665	2,017
Cantabria	2,489	2,972	1,824	1,558	1,202	2,684	879	1,643	634	764	974	1,146
Castellón	3,582	4,421	2,536	2,637	2,160	4,105	1,954	3,148	1,533	2,278	3,135	2,215
Ciudad Real	1,671	2,184	1,295	1,241	982	1,853	917	737	795	625	1,237	1,156
Córdoba	2,176	1,964	1,365	923	937	1,309	572	756	947	429	702	901
A Coruña	4,468	5,825	3,372	2,511	2,337	4,886	1,865	1,698	1,131	1,781	1,380	1,739
Cuenca	1,030	1,233	823	701	653	1,143	298	269	529	296	434	678
Gipuzkoa	4,237	4,532	3,029	2,327	1,649	3,164	1,665	1,569	1,397	1,432	2,367	1,704
Girona	7,596	8,339	5,067	4,986	4,009	6,780	3,602	3,427	2,921	3,321	4,996	4,863
Granada	4,413	5,268	3,430	4,051	3,406	4,669	1,730	1,922	1,576	1,233	2,510	2,465
Guadalajara	1,837	2,095	1,372	902	807	1,668	806	827	682	609	998	1,159
Huelva	2,987	2,463	1,637	2,188	2,321	2,384	902	869	849	664	912	1,256
Huesca	1,425	1,820	1,096	1,059	838	1,330	741	814	611	600	816	655
Jaén	1,054	1,240	924	897	852	1,267	494	621	503	335	579	463
León	1,253	1,629	937	818	585	1,340	714	721	349	398	664	591
Lleida	3,704	4,484	2,657	2,542	2,255	3,437	1,812	1,353	1,853	2,027	2,889	2,113
Lugo	1,373	1,551	960	794	608	1,237	498	390	333	326	475	470
Madrid	66,761	85,874	49,954	38,656	32,470	66,419	25,686	33,492	23,997	22,160	37,057	33,783
Málaga	15,911	17,139	11,224	13,065	14,283	17,531	7,606	6,340	9,011	3,536	10,958	8,327
Murcia	11,684	12,549	8,170	8,766	8,408	10,749	4,826	4,313	4,342	6,005	6,171	6,097
Navarra	4,450	5,406	3,239	2,623	1,920	4,356	1,800	1,663	1,675	2,076	2,312	2,006
Ourense	1,468	1,877	985	882	734	1,784	547	360	427	312	482	450
Palencia	488	541	382	229	212	501	208	258	168	168	256	208
Las Palmas	9,484	10,170	7,359	5,681	5,757	6,825	3,920	3,427	2,431	7,559	3,647	4,850
Pontevedra	3,768	4,454	2,629	2,371	1,585	3,653	1,048	1,460	1,672	1,003	1,261	1,451
La Rioja	1,762	2,089	1,406	1,186	1,127	1,750	658	678	497	753	1,035	1,049
Salamanca	1,264	1,769	1,061	1,010	916	1,638	554	681	1,167	807	1,060	368
Tenerife	11,921	12,237	7,628	5,477	6,507	8,415	2,316	2,530	2,691	2,109	3,079	3,226
Segovia	858	1,014	629	497	388	856	547	368	226	323	582	654
Sevilla	6,098	6,476	4,874	4,344	3,918	5,461	2,614	2,236	1,765	2,830	4,114	4,234
Soria	544	706	467	348	229	594	250	137	253	198	363	119
Tarragona	6,998	7,858	4,531	4,477	4,020	6,604	2,436	2,562	2,321	2,162	5,294	6,249
Teruel	641	794	405	448	519	608	398	245	208	282	412	275
Toledo	4,048	4,818	3,454	2,077	1,765	3,702	1,423	1,638	1,627	1,494	2,072	2,071
Valencia	19,969	22,857	14,486	11,573	13,258	20,439	6,134	7,022	8,950	5,247	7,916	8,021
Valladolid	1,586	2,023	1,226	1,223	1,040	2,032	883	835	520	570	1,412	789
Zamora	392	454	306	232	240	431	215	211	204	242	279	176
Zaragoza	6,903	7,326	4,450	3,461	3,199	5,173	2,359	1,953	1,193	1,616	19,270	2,620

Source: Own elaboration using data from the Estadística de Migraciones.

Table 2. Internal in- and out-migration by provinces and semesters: 2019-2021

Province	In-migration						Out-migration					
	2019S1	*2019S2*	*2020S1*	*2020S2*	*2021S1*	*2021S2*	*2019S1*	*2019S2*	*2020S1*	*2020S2*	*2021S1*	*2021S2*
Albacete	1,981	2,173	1,429	2,299	2,048	2,248	2,368	2,551	1,492	2,266	2,220	2,468
Alicante	8,623	8,701	5,612	10,228	9,546	9,725	8,625	8,966	5,343	8,676	7,762	8,781
Almería	3,942	4,004	2,481	4,252	3,966	4,373	4,117	4,414	2,637	4,366	3,800	4,254
Álava	1,911	2,011	1,351	2,137	1,894	2,026	1,944	1,974	1,337	2,182	1,925	2,017
Asturias	3,284	3,884	2,299	4,967	3,595	4,017	3,496	3,933	2,236	3,829	3,097	3,962
Ávila	1,448	1,562	1,070	2,779	2,474	1,723	1,663	1,736	1,127	1,687	1,672	1,672
Badajoz	2,596	2,910	1,950	3,346	2,781	2,914	3,330	3,600	2,088	2,998	2,935	3,265
Baleares	8,110	9,133	4,369	7,726	5,347	8,000	7,714	7,814	5,459	8,547	7,910	7,716
Barcelona	19,345	18,277	12,075	17,760	17,451	19,583	20,599	23,192	15,727	29,759	25,084	25,474
Bizkaia	4,206	4,723	2,894	4,557	3,956	4,166	4,338	4,580	3,044	5,529	5,032	4,939
Burgos	2,199	2,290	1,567	2,771	2,241	2,386	2,249	2,403	1,507	2,564	2,181	2,420
Cáceres	2,231	2,385	1,501	2,670	2,419	2,314	2,738	2,875	1,746	2,388	2,216	2,557
Cádiz	5,949	6,687	4,325	7,388	6,580	6,498	6,481	6,532	4,048	5,718	5,189	6,205
Cantabria	2,838	3,347	2,209	4,812	3,694	3,704	2,764	3,130	1,738	2,921	2,635	2,986
Castellón	3,282	3,797	2,409	4,601	3,704	4,238	2,866	2,938	1,926	2,881	2,513	2,890
Ciudad Real	2,370	2,676	1,670	3,338	2,575	2,756	3,022	3,491	2,067	2,720	2,613	3,238
Córdoba	4,209	3,463	2,183	2,834	2,848	3,201	4,020	4,272	2,631	3,740	3,730	4,148
A Coruña	4,256	5,000	3,273	5,654	4,899	5,067	4,154	4,487	2,729	4,499	4,038	4,604
Cuenca	1,515	1,721	1,128	2,245	1,908	1,680	1,707	1,959	1,234	1,678	1,602	1,691
Gipuzkoa	2,443	2,810	1,845	3,010	2,489	2,641	2,646	2,859	1,860	3,063	2,808	3,043
Girona	4,902	5,374	3,938	7,374	6,162	5,951	4,647	4,670	3,126	4,619	4,478	4,532
Granada	5,468	5,731	3,611	6,632	5,519	5,608	5,663	5,726	3,651	5,461	5,046	5,850
Guadalajara	3,334	3,567	2,520	4,916	3,840	3,784	2,801	2,962	1,928	3,000	3,110	3,151
Huelva	2,589	2,422	1,632	3,126	2,935	2,642	2,584	2,662	1,759	2,582	2,394	2,528
Huesca	1,764	1,965	1,368	2,709	2,608	2,041	1,498	1,734	1,094	1,712	1,725	1,744
Jaén	2,708	2,772	1,811	2,949	2,890	2,746	3,898	3,961	2,538	3,568	3,472	3,997
León	2,335	2,595	1,598	3,285	2,668	3,012	2,735	3,095	1,796	2,850	2,337	2,953
Lleida	2,812	3,039	2,129	4,061	3,377	3,197	2,830	2,947	1,823	3,038	2,657	2,729
Lugo	1,635	1,720	1,250	2,325	1,878	1,868	1,732	1,957	1,107	1,763	1,627	1,722
Madrid	32,976	37,780	21,401	29,687	28,504	34,274	31,920	35,256	22,821	47,467	39,856	38,899
Málaga	9,110	9,187	6,080	9,423	9,481	10,035	7,539	7,770	4,813	7,771	6,721	7,812
Murcia	6,194	6,254	3,999	7,100	6,837	6,888	6,263	6,743	4,086	6,687	5,511	6,776
Navarra	2,789	3,357	2,162	3,494	2,752	3,226	2,631	3,131	1,929	3,045	2,697	2,990
Ourense	1,516	2,023	1,251	2,399	1,872	2,118	1,736	1,949	1,133	1,696	1,627	1,679
Palencia	979	1,078	641	1,159	893	1,069	1,057	1,151	669	1,111	897	1,087
Las Palmas	4,701	5,828	3,166	5,143	4,401	5,869	4,944	5,798	3,510	5,734	5,303	5,646
Pontevedra	3,616	4,402	2,442	4,750	3,742	4,393	3,523	3,739	2,327	3,608	3,140	3,653
La Rioja	1,812	2,227	1,246	2,078	1,885	1,886	1,568	1,874	1,100	1,927	1,712	1,895
Salamanca	1,762	2,009	1,292	2,268	1,842	2,037	2,170	2,424	1,392	2,073	1,810	2,251
Tenerife	3,948	4,821	2,717	4,659	3,802	5,458	3,907	4,467	2,649	4,352	4,050	4,561
Segovia	1,294	1,286	1,004	2,069	1,721	1,637	1,307	1,447	867	1,446	1,403	1,487
Sevilla	7,638	7,577	5,479	8,040	7,802	7,666	7,585	7,862	4,834	8,020	7,304	7,691
Soria	716	797	468	975	758	801	627	788	527	805	671	820
Tarragona	6,408	6,572	4,319	8,633	7,746	7,731	5,335	5,180	3,346	5,389	5,242	5,331
Teruel	1,076	1,229	893	1,663	1,350	1,260	1,155	1,226	758	1,106	1,238	1,169
Toledo	8,049	8,823	5,781	10,565	8,821	9,187	6,871	7,575	4,458	7,144	6,682	7,686
Valencia	10,149	10,145	6,494	9,899	10,913	10,391	8,515	9,122	5,524	9,584	8,146	9,317
Valladolid	2,735	2,950	1,859	3,013	2,593	2,922	2,639	2,929	1,798	3,080	2,556	2,838
Zamora	1,081	1,088	757	1,370	1,213	1,181	1,302	1,382	790	1,177	1,048	1,273
Zaragoza	4,510	5,256	3,087	5,249	4,503	4,758	3,993	4,824	2,987	5,250	4,751	4,969

Source: Own elaboration using data from the Estadística de Migraciones