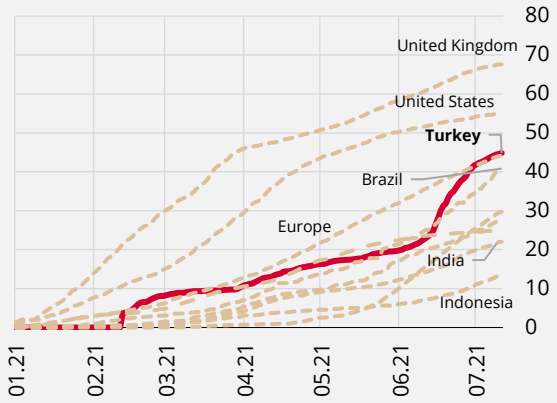
Box 2.2

The Impact of Vaccination Performance on Economic Activity

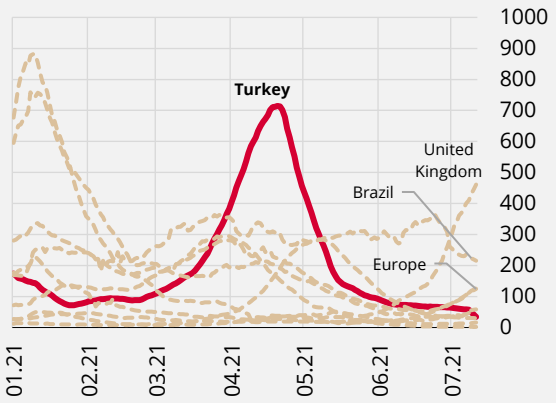
The recent positive developments in vaccine supply have caused vaccination efforts to become a widespread focus of global attention. With the momentum it has gained recently, Turkey has approached the leading countries in terms of vaccination rates and diverged favorably from other emerging economies (Chart 1). Widespread vaccination has also helped keep the number of cases in Turkey relatively low (Chart 2).

Chart 1: Share of People Who Received at Least One Dose of Covid-19 Vaccine* (%)



Source: Our World in Data.
* Emerging economies include Turkey, Brazil, Romania, Mexico, India and Indonesia; advanced economies include Europe, US, Japan and UK.

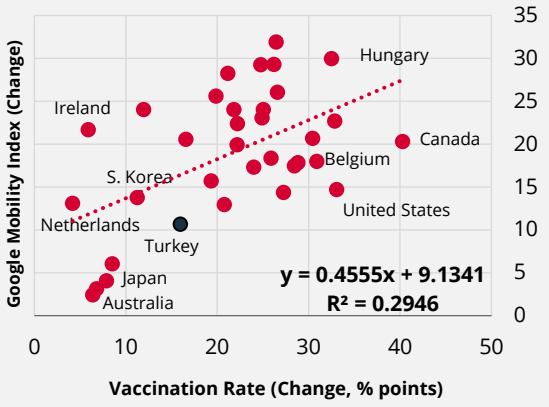
Chart 2: Daily Newly Confirmed Covid-19 Cases* (7-days Rolling Average, Per Million People)



Source: Our World in Data.
* Emerging economies include Turkey, Brazil, Romania, Mexico, India and Indonesia; advanced economies, include Europe, US, Japan and UK.

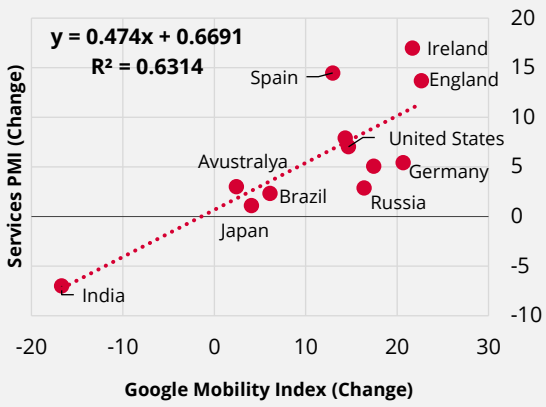
The spread of vaccination contributes to the increase in social mobility along with the decrease in the number of cases. It is apparent that mobility increases more in countries with a high vaccination rate (Chart 3). Again, increases in mobility are considered to have a positive impact on service sectors, which are more affected by the anti-pandemic social restrictions (Chart 4).

Chart 3: Relationship Between Change in Vaccination Rate and Change in Mobility*



Source: Our World in Data, Google.
* Charts show the change in the second quarter of 2021 data compared to the first quarter data. Data represent quarterly average values.

Chart 4: Relationship Between Change in Mobility Level and Change in Services Sector Activities*



Source: Our World in Data, IHS Markit.
* Charts show the change in the second quarter of 2021 data compared to the first quarter data. Data represent quarterly average values.

Recently, the impact of changes in mobility on economic activity has been frequently discussed both in the academic field and in policy circles. As a matter of fact, the relationship between the decrease in the Google mobility index and the decline in the growth of countries was examined in the OECD Economic Outlook report (OECD, 2020). The IMF, on the other hand, analyzed the economic activities of countries in its World Economic Outlook report using high-frequency mobility indices (IMF, 2020). Similarly, the relationship between the Google mobility index and economic activity for Turkey has been discussed recently (CBRT, 2021).

Although it is expected that the acceleration of vaccination on a global scale will affect mobility and support the recovery in economic activity, the findings regarding the extent of this effect are limited. Sexton and Tito (2021) examined the impact of vaccination on various economic activity indicators for the USA and found that the improvement in mobility was largely due to vaccination. However, this relationship has not been examined for a broader set of countries. In this framework, model (1) is estimated with weekly frequency data for OECD countries to investigate the relationship between vaccination performance and mobility.

$$\boldsymbol{Mobility_{it} = c + \alpha Vaccination_{it} + \beta Stringency_{it} + \sigma_i + \varepsilon_{it}} \qquad \textbf{(1)}$$

In this model, in which the Google mobility index (*Mobility*) is the dependent variable at the country level, the total and two doses of vaccine (*Vaccination*) applied by countries per hundred people and the index (*Stringency*) that measures the strictness of the measures taken by countries against the pandemic are included as explanatory variables.[1] σ_i represents the country-fixed effects, while ε_{it} is the error term.

Table 1: Estimation Results*

	(1a)[1]	(1b)[1]	(2a)[2]	(2b)[2]	(3a)[3]	(3b)[3]
Total Vaccination	0.478***		0.291***		0.432***	
Two Doses of Vaccination		0.670***		0.254**		0.586***
Stringency Index	-0.433***	-0.571***	-0.418***	-0.542***	-0.573***	-0.711***
Number of Observations	908	801	908	801	908	801
Adj-R^2	0.89	0.88	0.84	0.84	0.92	0.92

[1] Mobility is defined as the average of the mobility indices for retail and recreation, groceries and pharmacies, parks, transit stations and workplaces.

[2] Mobility is defined as the average of the mobility indices for retail and recreation, groceries and pharmacies, and workplaces.

[3] Mobility is defined as the mobility index for retail and recreation.

* For the period December 2020-June 2021, the model in which the month-fixed effects are also controlled is estimated using the pooled OLS (ordinary least squares) method. * 0.10, ** 0.05, *** 0.01 represent significance levels. Robustness tests with the first and second lags of the explanatory variables also support the main findings.

The estimation results indicate a positive relationship between vaccination and mobility, when the strictness of the measures taken by the countries within the scope of the pandemic is controlled (Table 1). Accordingly, a 10-point increase in the total vaccination per hundred people leads mobility to increase by 2.9 to 4.8 points on average, although the impact varies with respect to the definition of mobility. Consistent with expectations, the stringency index has a negative effect on mobility. Model results are robust to the use of different definitions of mobility and vaccination variables. In this context, considering the recent positive vaccination performance in Turkey, it is evaluated that mobility will increase in the rest of the year and will support economic activity, especially in the service sectors, which are affected more severely by restrictions. In addition, the rapid convergence to vaccination rates of countries that can be considered as alternative tourism destinations to Turkey and the countries that have an important place in the number of tourists coming to Turkey will stimulate the tourism activity and support the improvement in the current account balance. Despite the increasing trend in the number of cases globally in the recent period, the current pace of vaccination may also contribute to economic activity by limiting the risk of new waves in the pandemic.

[1] Country-level daily vaccination statistics are available at https://ourworldindata.org. As the stringency index, "Oxford COVID-19 Government Response Tracker", developed by Hale et al. (2021), is used.

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