Improving Health Resilience Through Better Procurement of Medical Supplies: Lessons from the COVID-19 Pandemic

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Summary

- Bias for procuring domestically ("home bias") stands in the way of an integrated Single Market in procurement and is associated with malpractice that negatively affected the procurement of medical supplies in 2020.
- The first infection wave in early 2020 coincided with an unprecedented surge in cross-border procurement. Most of these were direct awards to firms, not competitive tenders, indicating that home bias is not driven by ignorance of buyers about foreign firms.
- Buyer discretion enables misallocation towards domestic buyers. Policy makers should limit buyer discretion to promote cross-border procurement for medical supplies. This allows the best firms to win contracts internationally, improving health resilience through a stronger industrial base.
- Nonetheless, deregulation and increasing buyer discretion may have been optimal in the emergency as the net effect of the pandemic and deregulation was towards more cross-border procurement, at least temporarily.

1. Introduction

Procurement by the public sector accounts for a large part of the European economy, at 15-20 % of GDP. Economists have long warned of misallocation, especially through favouritism of public buyers towards firms from their own countries. Favouritism can emerge because buyers care not only about the purchase itself, but also about secondary goals, such as boosting local jobs or pursuing political goals, sometimes openly. The resulting home-country bias (or just "home bias") is not only an impediment to the EU policy goal of completing the Single Market. Home bias also prevents European

companies from winning contracts across the continent to achieve greater scale. Therefore, tackling home bias will allow the European public to obtain better products at a lower cost.

Procurement of medical supplies, such as personal protective equipment, disinfectants, or reagents, during the Covid-19 pandemic is now under scrutiny. Public buyers lent their procurement competence to the health sector or took the lead in procuring urgently needed medical supplies. However, the success and efficiency of these measures is questionable. For example, in Germany, Austria and Switzerland, problems range from low-quality products, over failures to organize distribution and payment of deliveries, to even major irregularities in contract awards due to political influence-taking.

This policy paper draws on an empirical analysis of procurement of medical supplies that identifies the effect of emergency and buyer discretion on home bias. Beyond the context of the current pandemic, this analysis uncovers general mechanisms that drive misallocation in procurement. If policymakers address these mechanisms, they can improve European health resilience by reducing misallocation of procurement contracts for the European medical industry.

We present some established facts about misallocation in procurement, analyse our new and original data on procurement of medical supplies in the Covid-19 crisis, and provide descriptive evidence and regression analyses to identify the effect of emergency and buyer discretion on home bias. Our main finding is that buyer discretion is an important contributor to home bias, as measured through deregulation after the start of the pandemic. We suggest policy steps to limit buyer discretion to fight misallocation in procurement.

2. Purpose and background

The purpose of this policy paper is to identify mechanisms that are effective at reducing home bias and improving procurement of medical supplies in Europe. As the initial wave of infections hit, buyers across Europe directly awarded many contracts across borders, suggesting that home bias is not nearly as persistent as the long history of the research discussion suggests. However, buyer discretion is a very important aspect with a potentially large influence on purchasing decisions. We leverage a policy change as a natural experiment to draw conclusions for policies that can improve future procurement of medical supplies.

This policy paper presents preliminary results of ongoing research into home bias as a form of misallocation in procurement. Misallocation takes many forms, including outright corruption, but it can refer to any inefficient allocation of economic resources, for example due to state failure or market failure. Laffont and Tirole (1991) already noticed misallocation as an alarming problem for European

procurement, prompting policy makers to look for ways of fostering fairer competition between domestic and foreign suppliers. Laffont and Tirole suggest examining the share of domestically awarded contracts as a simple screen for the extent of misallocation. Little changed in 30 years and home bias continues to persist in recent studies.

Economists have described how the incentives of the bureaucrats and agencies tasked with procurement may diverge from the public interest and may result in bad purchasing outcomes, inefficient auction design, or both. Empirical researchers have made use of increasing transparency in procurement to support theoretical economists with empirical evidence. Coviello et al. (2017) and Baltrunaite et al. (2020) study the impact of buyer discretion in Italy. The former find positive effects of buyer discretion on allocations in earlier data, while the latter find negative effects using more recent data. Carboni et al. (2018) present evidence for discrimination of foreign firms in procurement due to overt and hidden barriers to trade. Similar to our study, Kutlina-Dimitrova and Lakatos (2016) use data for contract awards in Europe and argue that strong product market regulation may act as a hidden anticompetitive barrier.

Legal scholars Lalliot and Yukins (2020) and Sanchez-Graells (2020) describe how the unique market circumstances in the context of the Covid-19 pandemic impacted procurement. Regulators yielded former red lines, such as no advance payment, and experimented with new policies such as joint procurement and stockpiling. These legal scholars caution that emergency measures must not be abused to pursue unrelated policy goals (such as expanding public spending), and that a return to normal can happen while learning from the crisis. Our paper seeks to draw some of the necessary lessons to move forward.

3. Presentation of the evidence

We begin by describing our data, then describe some aggregate facts, and finally discuss a linear regression model that distinguishes the effects of buyer discretion and emergency.

We create a novel data set of contract awards for medical supplies from "TED Tenders electronic daily - Supplement to the Official Journal of the European Union" combined with data on regional Covid-19 infection rates from the European Centre for Disease Prevention and Control (ECDC). We investigate contract awards published between 2018 and 2020, studying awards (of contracts and contract lots) to firms, observing their value, the locations of the buyer and the seller, and other features. Our outcome of interest is whether a contract award was domestic (i.e., buyer and seller are located in the

same country) or not. Our final data set contains circa 70,000 purchases from over 8000 successful tenders.

3.1. Descriptive evidence

At the start of the pandemic, we observe a sudden and dramatic increase in cross-border awards. Figure 1 describes the average monthly share of domestic procurement. The overall level of domestic procurement before the pandemic[1] is consistent with findings of earlier authors about overall procurement in Europe. Before the pandemic, buyers awarded over 90 % of total contract value (or "volume") domestically. Over 99 % of all contracts are awarded domestically, which immediately implies that cross-border awards tend to be larger, on average. In a sudden reversal, the volume of domestic procurement dips in April 2020 and stays low until June 2020. Country-by-country analyses show that this is not an outlier: purchases in different European countries contribute to this dip. Home bias seems to have diminished promptly.
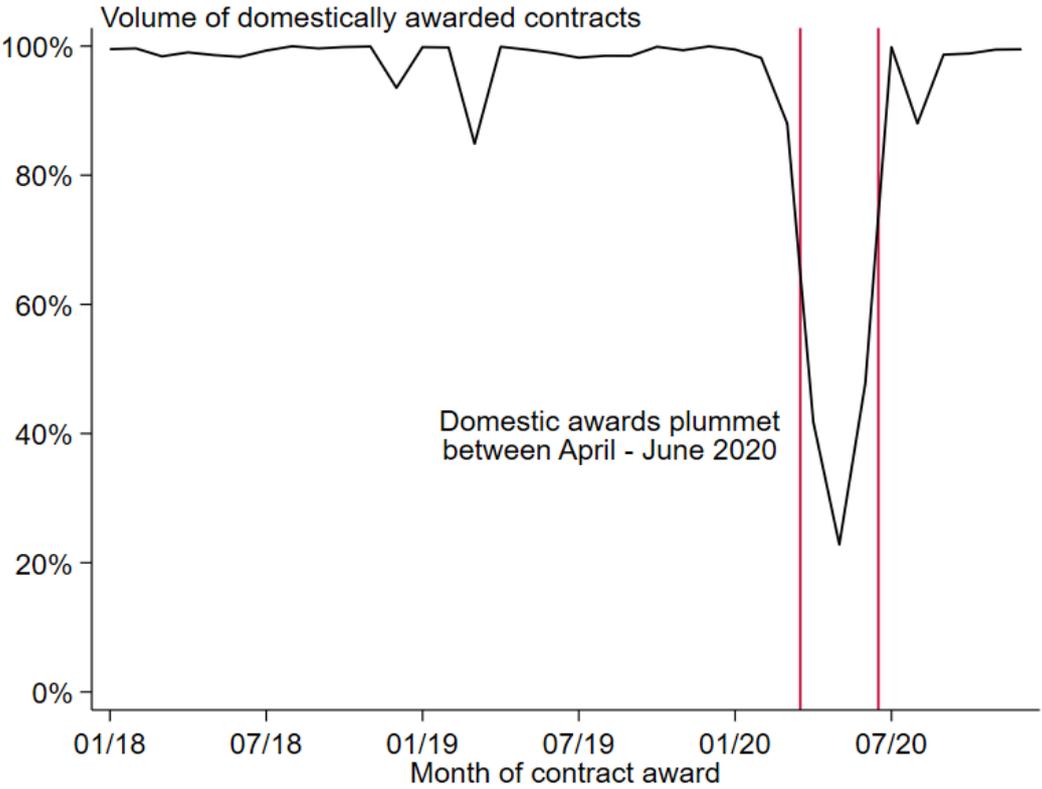

Figure 1: Volume of domestic contract awards

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[1]   The WHO declared the novel Coronavirus outbreak a public health emergency of international concern (PHEIC), WHO's highest level of alarm, on January 30, 2020.

At the start of the pandemic, competition for contract awards was uniquely low. Figure 2 describes the share of the total value that buyers awarded "competitively" in each month. We define competitive contract awards as having several bidders and not being "Contract awards without prior publication" or "Negotiated without a prior call for competition". Buyers awarded over 90% of contract volume non-competitively in April and May 2020. Direct awards to foreign sellers represent 56.5% and 77.1% of the total observed contract volume in these two months. While the presence of many bidders does not guarantee a competitive auction, it is noteworthy that buyers placed many contracts directly with foreign sellers. This shows that home bias in normal times does not arise from a lack of awareness of foreign sellers.

3.2. Regression analysis

Deregulation that increased buyer discretion is, apart from rising infection rates, the major difference between the situation before and after April 2020. On April 1st, 2020, the European Commission published the "Guidance from the European Commission on using the public procurement framework in the emergency situation related to the COVID-19 crisis" (2020/C 108 I/01) which states, among other things, that

> "[F]or a situation such as the current COVID-19 crisis which presents an extreme and unforeseeable urgency, the EU directives do not contain procedural constraints […] [P]ublic buyers may negotiate directly with potential contractor(s) and **there are no publication requirements, no time limits, no minimum number of candidates to be consulted, or other procedural requirements.** […] [A]**uthorities can act as quickly as is technically/physically feasible** – and **the procedure may constitute a de facto direct award** only subject to physical/technical constraints […]" (emphasis added.)

From April onwards, buyers found themselves in a regulatory regime that set almost no limits to their discretion to award contracts at will, increasing flexibility, but also the possibility for misallocation. This setting provides a natural experiment that affects all buyers and therefore allows us to study the impact of buyer discretion on purchasing decisions. Did buyers award more contracts abroad because of deregulation? Or were buyers pushed by the spread of the virus to make better decisions, which happened to result in more cross-border awards?

Regression analysis of the procurement data can answer these questions in a way that graphs of aggregate data cannot. Regression analysis is a tool that measures the correlation between explanatory variables, such as the regulation change, and an outcome of interest, in our case whether

a contract award was domestic. Regression analysis can identify statistically significant predictors of the outcome. In our case, the change in regulation as well as infection rates serve as a natural experiment. These factors affect buyer behaviour without being influenced by buyers' decisions. In technical terms, the regulation change and mounting infection rates represent exogenous changes in the procurement environment. Therefore, we identify a causal effect of these two factors on procurement decisions.
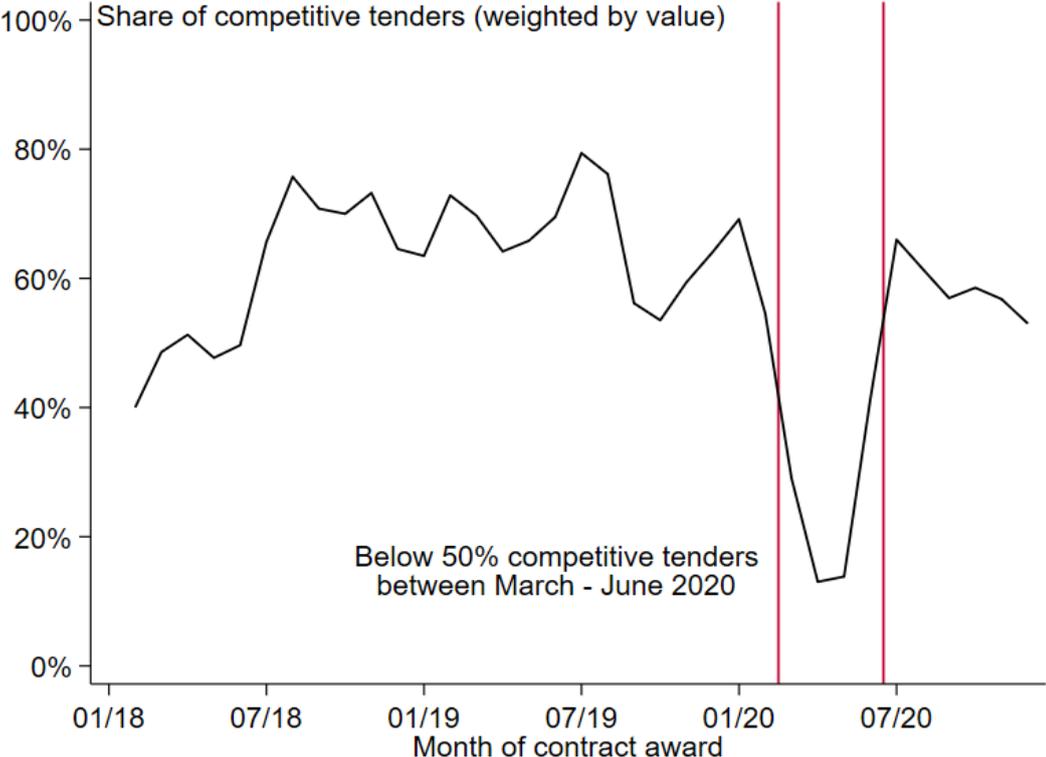

Figure 2: Share of competitive tenders (moving average)

This unique dip in domestic awards coincides with the first "wave" of Covid-19 infections, but not with the larger second "wave". Figure 3 plots the monthly average infection rate that we observe in our data when weighting regions by the total volume procured. This chart broadly tracks official ECDC data for the evolution of infection rates in Europe in 2020 with a noticeable first and second "wave" of infections in spring and fall of 2020.
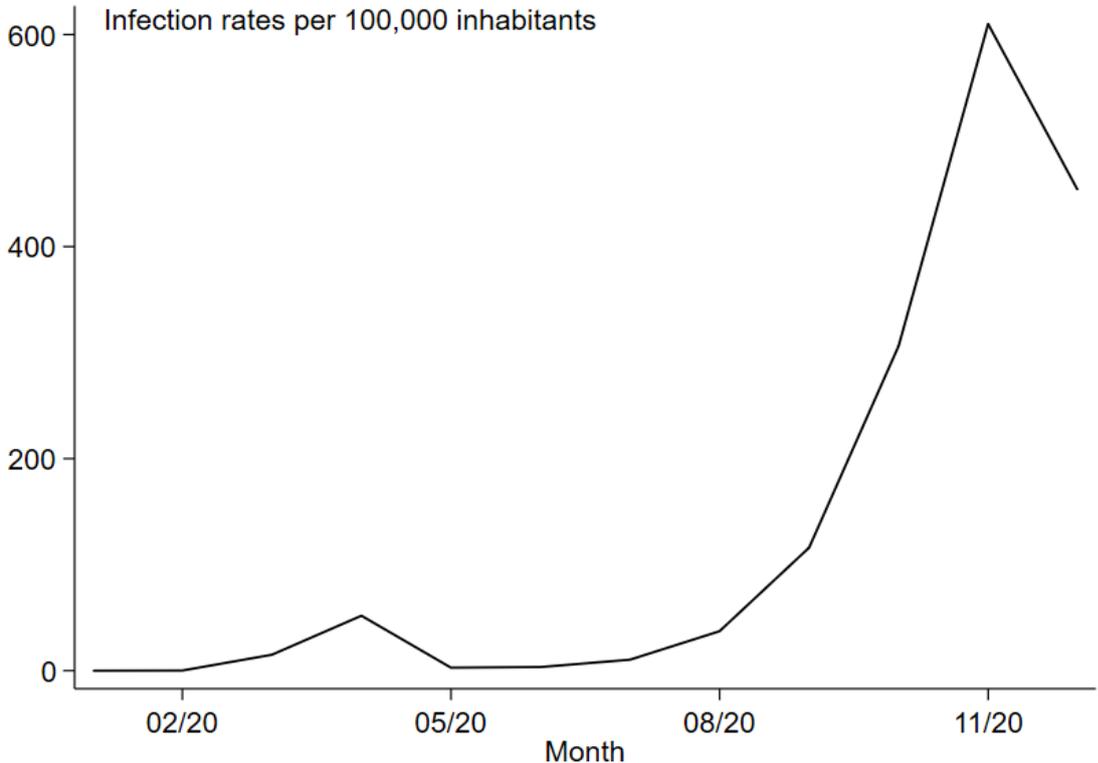
Figure 3: Average monthly Covid-19 infection rates at purchase locations. Weighted by purchase volume

Our main regression equation predicts the likelihood of a domestic contract award with the infection rate at the location of contract performance, an indicator for the regulation regime post April 2020, and control variables, such as the share of foreign bidders or the product group. This way we filter variation, for example, between different countries, to focus on the variation within a specific country, product group, and month, between regions with higher and lower infection rates.

We test different models and specifications, allowing for linear and non-linear effects of the explanatory variables on the outcome. Table 1 summarizes the effect size attributed to infection rates and the regulation change in the simple linear model using all the above-mentioned control variables for three variations of infection rates entering the equation. All regressions give a consistent answer regarding the importance of infection rates and regulation change on home bias.

The likelihood of domestic awards decreases when the infection rate increases. Thus, as the infection rates rise, home bias declines. This effect is economically large and statistically significant, as can be seen by the negative coefficients for "14-day average infection rate per 100" (inhabitants) where stars represent statistical significance at the 5%-level or lower. We interpret this as an emergency effect:

Secondary goals of procurement, such as promoting local jobs, take a backseat in an emergency, leading to more cross-border contract awards. The positive coefficient on "Infection rate squared" in the second column is likely due to the low volume of cross-border awards during the second, larger wave of the pandemic. It seems like this emergency effect motivated cross-border procurement only temporarily. However, the effect was strong and sudden enough to result in an unprecedented amount of cross-border country awards.

Surprisingly, the likelihood of domestic awards increases drastically after deregulation. This is although we see domestic awards plummet after deregulation in April 2020 (see Figure 1). By exploiting all dimensions of the data, our regression model attributes this plummet to infection rates, not deregulation. That is because we observe procurement also in places where infections rates were low, at least at certain times, after deregulation. For low infection rates, holding everything else constant, our models predict a far higher likelihood of domestic awards after deregulation than before. We have seen that deregulation aimed at increasing buyer discretion. We conclude that an increase in buyer discretion, absent emergency, enables buyers towards make more domestic purchases, increasing home bias.

Table 1 Main regression results for domestic contract awards

	Linear model	Squared term	Log-infection rate
Dep. var.: Contract awarded to domestic company			
14-day average infection rate	-0.576***	-1.640***	
per 100 inhabitants	(0.186)	(0.466)	
Infection rate squared		1.015***	
		(0.383)	
Log of infection rate			-1.029***
			(0.293)
Regulation change	0.456***	0.640***	0.559***
	(0.154)	(0.174)	(0.167)
dummies and control variables	yes	yes	yes
adj. R-squared	0.673	0.678	0.675
N	69,857	69,857	69,857

* $p<0.10$, ** $p<0.05$, *** $p<0.01$, robust standard errors in parentheses.

Preliminary robustness checks support our findings. **Our findings are robust to alternative measures of emergency, such as the national death rate and infection rates of other regions of the same country**, mitigating concerns of reverse causality. The possible existence of **domestic capacity constraints does not overturn these findings**: a subsample analysis of contracts with more domestic bidders than domestic winners focuses on cross-border awards that took place while domestic

production was slack. While the regulation effect is less pronounced and noisier to measure, the effect of the infection rate persists.

4. Conclusions and recommendations

We draw two conclusions from our evidence. First, buyers can rapidly adjust their behaviour in emergencies. A period of high cross-border awards of contracts for medical supplies coincides with a low share of competitive tenders. Indeed, we observe a large volume of direct cross-border contract awards between April and June 2020. In an emergency, political factors that contribute to home bias take a backseat to procuring better and more efficiently.

Second, buyer incentives and regulatory constraints are important. Results suggest that buyers are aware of foreign sellers. Ignorance about foreign sellers is therefore likely not an important cause of the low volume of cross-border contracts in normal times. To the contrary, buyers seem capable of selecting foreign sellers if they wish to do so. This suggests that simply making it easier for sellers to enter their bids into foreign procurement tenders, by reducing, for example, language barriers, is unlikely to reduce home bias effectively. Buyers favour domestic firms if they are given the opportunity, for example, after lifting regulations on buyer discretion.

The results do not suggest that lifting the regulations was wrong in 2020. The net effect of the Covid-19 pandemic was an increase in cross-border purchases during the first peak of the emergency. However, as a natural experiment, this policy change helps us to understand the mechanisms that drive home bias. On the one hand, the surge in cross-border awards is a silver lining because it shows that purchasing behaviour can change quickly. On the other hand, purchasing behaviour quickly reverted to the status quo ante after the first wave of infections. By investigating the variation between many contracts, we identify the pure effect of buyer discretion. We find that buyer discretion is conducive to home bias.

Effective policies should therefore aim at reducing buyer discretion. This will allow the most efficient European firms to win contracts across Europe (non-European companies stand to gain as well, but probably to a lesser degree if they face higher access costs due to transportation costs and differences in product market regulation). Policy changes may emphasize scoring rules that favour price, delivery conditions or other easily verifiable aspects of bids. European legislators might standardize the review process for tenders across Europe to make it easier, cheaper, and faster for companies to appeal tender decisions without overburdening the review system. When market forces decide winners, the most

efficient companies will reshape the European medical industry, and its production and distribution network, leaving European countries well prepared for the next medical emergency.

Market integration is a major EU policy goal because it allows the most efficient companies to prevail and grow to a much larger scale than companies in 27 fragmented markets could. In most product markets, we expect lower prices, higher quality, and more innovation as a result of competition. When it comes to medical supplies, the Covid-19 pandemic shows that the stakes may be even higher than that. Reducing home bias to improve market integration for medical supplies can help to improve European health resilience.

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