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# Global Public Procurement Open Competition Index

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## Abstract<sup>1</sup>

This evidence paper seeks to clearly outline the benefits of open competition in public procurement, review the policies fostering it and measuring competitive outcomes in carefully selected comparable markets across a wide array of countries. Our review of evidence regarding benefits of and policies for open competition is based on high-quality academic and policy offering reliable quantitative estimates. Our competition assessment is based on behavioral micro-data rather than expert scores or perceptions and only compares like with like, that is markets for standardized products and services. We find that open competition can contribute both to efficiency and anti-corruption, with many estimates of positive impacts of competition, i.e. a few additional bidders, ranging between 10 and 20% price reduction. Among the reviewed policy interventions fostering open competition in public procurement, we find that introducing e-procurement and widening advertisement of tenders are among the most impactful. While our analysis is preliminary, we find that the narrow comparisons of very carefully defined markets and the use of output and outcome-level indicators of competition yield considerable analytical precision. The measurement framework reveals considerable variation over time and across countries with some surprising good and bad performances.

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## Introduction

Public procurement constitutes a large portion of GDP around the globe with various estimates putting it at about 10-20% of annual GDP in most countries (OECD, 2019). Among other factors, competition, its strength, openness and outcomes are essential on the procurement market for an efficient economy as well as the provision of public services. Unsurprisingly to many, there is a long list of deficiencies of competition in public procurement starting from mere incompetence and high transaction costs until favouritism, corruption and collusion among bidders. The cost of these maladies varies country by country and problem type by problem type, however, most experts would agree that they are substantial in the region of 20-30% even according to lower bound estimates. Deficiencies in public procurement negatively impact the delivery of public services and often hit hardest in contexts where people are at their most vulnerable. For example, the IMF estimates for infrastructure procurement that the combined cost of inefficiencies, including corruption, incompetence, etc, is 15% in advanced economies and 53% in low income developing countries<sup>2</sup>.

Naturally, numerous initiatives aim to address these gaps first by offering a measurement of the scale and nature of problems and pointing at solutions. However, precise measurement which is the precondition of effective policy reform has remained largely elusive due to lack of reliable data and analytical rigour. First, using expert scores (such as the Doing Business Survey - Contracting With The Government<sup>3</sup>) while promising to be simple and immediately applicable on a global scale typically results in biased estimates reflecting perceptions of the day rather than realities on the ground. Second, using large-scale administrative data on public procurement tenders and contracts represents the best evidence-based way forward, these datasets are very diverse, often suffer from data gaps, and require careful standardization before comparisons over time or across countries can be made. Similarly, many initiatives aim to offer sound policy advice, however often these are based on theoretical arguments and anecdotal evidence rather than reliable and high-quality research with the explicit discussion of evidence gaps and uncertainties of our knowledge base.

In contrast, this evidence paper relies on evidence which is high quality and based on behavioral micro-data rather than expert scores or perceptions, while also offering a measurement methodology which is reliable enough for guiding policy and business decisions. In particular we seek to answer the following questions:

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<sup>2</sup>[https://blogs.imf.org/2020/09/03/how-strong-infrastructure-governance-can-end-waste-in-public-investment/?utm\\_medium=email&utm\\_source=govdelivery](https://blogs.imf.org/2020/09/03/how-strong-infrastructure-governance-can-end-waste-in-public-investment/?utm_medium=email&utm_source=govdelivery)

<sup>3</sup> <https://www.doingbusiness.org/en/data/exploretopics/contracting-with-the-government>



- What are the benefits of strong competition in public procurement markets?
- Which policies and practices can improve competition in public procurement? Which ones are most impactful?
- How can we measure strong competition across markets and time in a consistent and reliable way?

We conduct a systematic review of the available academic and policy literature by selecting the high quality studies which offer clear results and typically quantitative estimates on impacts of open competition as well as policies aimed at fostering it. This evidence review is followed by a discussion of measurement, the data to be used, the selection of comparable product markets, and the indicators of open competition. Finally, we show the results of a comparative measurement exercise looking at the degree of open competition in public procurement for selected, comparable products such as office supplies.



## Methods and definitions

### Our systematic review

This evidence paper follows the process of a systematic review. This is guided by the two research questions outlined above on the benefits of strong competition and policies for better competitive environment. In order to answer these questions, we systematically review and assess the available literature on open markets and competition in public procurement. This review involves five methodological steps (Moher, Liberati, Tetzlaff, & Altman, 2009):

1. Screen and collect potentially relevant studies using common search engines such as GoogleScholar and Web of Science.
  - a. apply search term combinations: keywords such as “competition”, “public procurement”, “open markets”.
2. Identify relevant studies for in depth-analysis applying pre-defined criteria:
  - a. Does the study deal with open markets and competition in public procurement?
  - b. Is the study empirical (qualitative or quantitative) and does it have a solid theoretical framework?
3. Extract key characteristics of studies:
  - a. bibliographic data,
  - b. country/region focus,
  - c. research question,
  - d. methodology,
  - e. unit of observation
  - f. data,
  - g. key findings,
  - h. actor highlighted
  - i. policy implications.
4. Assess the quality of evidence presented by each study by looking at aims, appropriateness of methodology, appropriateness of measurements used, causal analysis and consideration of counterfactuals, and robustness of findings. (Filter out apparently low-quality papers at this stage.)
5. In-depth appraisal and synthesis of the selected body of knowledge.

The review would enumerate impacts and solutions with robust evidence on them from the viewpoint of a diverse set of actors influenced by public procurement markets such as



- Public sectors buyers and financiers (contracting bodies, ministries of finance, and international donors);
- Diverse classes of bidding firms (insiders-outsiders, large companies and SMEs, companies owned or managed by excluded groups such as minorities or women); and
- Diverse groups of users (immediate beneficiaries such as patients receiving drugs in a hospital).

The list of impacts would be comprehensive as much as the availability of evidence permits, with arguably most studies focusing on immediate outcomes only. The list of reviewed outcomes would be:

- Immediate outcomes: prices, quality (e.g. timeliness), and quantity; and
- Indirect/dynamic impacts such as employment, productivity, development (e.g. regional growth supported through high quality infrastructure)

## Our measurement for open competition in public procurement globally

Comparing openness and strength of competition using behavioral data, that is data which describes actual market behavior on the level of transactions<sup>4</sup>, is regularly done by international organisations such as the OECD<sup>5</sup>, the EU<sup>6</sup> or the WTO<sup>7</sup> as well as a range of think tanks and NGOs. However, these measurements and benchmarking exercises suffer from a range of weaknesses making them only of limited use when comparing across countries or time. A key concern arises from the fact that countries purchase wildly different goods and services, hence any comparison without harmonising the basket of purchases is more likely to pick up differences in spending structure rather than genuine differences in policy or outcomes. In addition, many internationally used indicators focus on inputs and administrative processes rather than outcomes. This is problematic if the same outcome can be achieved in different ways or the same in input could result in different outcomes which are typically the case in public procurement.

Hence, in order to learn from prior measurement and benchmarking exercises and to offer a more actionable and policy relevant set of indicators, our measurement framework is expected to fulfill the following criteria:

- Based solely on administrative data describing actor behavior;
- Offering intuitive and actionable metrics;
- Focusing on competitive outcomes; and
- Comparing similar markets as defined by product type and location.

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<sup>4</sup> There are also measurements based on expert scoring which we don't consider here given the problems with the validity and reliability of expert assessment in this field. One example of expert scoring is the World Bank's Benchmarking Procurement project: <https://documents.worldbank.org/curated/en/121001523554026106/Benchmarking-Public-Procurement-2017-Assessing-Public-Procurement-Regulatory-Systems-in-180-Economies.pdf>

<sup>5</sup> <https://www.oecd.org/gov/govatag glance.htm>

<sup>6</sup> [https://ec.europa.eu/internal\\_market/scoreboard/performance\\_per\\_policy\\_area/public\\_procurement/index\\_en.htm](https://ec.europa.eu/internal_market/scoreboard/performance_per_policy_area/public_procurement/index_en.htm)

<sup>7</sup> [https://www.wto.org/english/tratop\\_e/gproc\\_e/notnat\\_e.htm#statPro](https://www.wto.org/english/tratop_e/gproc_e/notnat_e.htm#statPro)



## Key concepts and definitions

### Defining public procurement

Public procurement is the process of governments, state owned enterprises and supported bodies<sup>8</sup> purchasing goods or services required for state activities, which generally accounts for a large share of public expenditure and plays an essential role in government spending. In OECD countries, governments spend about 10-20% of GDP on contracts with companies to procure goods and services, while in many non-OECD countries that figure is even higher (OECD 2019).

### Defining open competition in public procurement markets

One of the primary aims of public procurement is to ensure the promotion of value for money in the use of public funds. This means that a public agency doing procurement has to select the company with the lowest price for the highest quality. In order to achieve better value for money, public agencies usually rely upon an open, competitive bidding process taking advantage of competition in the relevant market. Open competition in this broad sense means that all qualified companies are eligible and able to submit bids for a public tender. Consequently, the public procurement process should be designed to foster open competition, maximising the potential participation of genuinely competing bidders. The most important means to ensure that bidders have equal treatment is the use of open and transparent auctions (Spagnolo, 2012).

The level of bidder participation depends on how easy it is for companies to enter into competition - there may be intentional barriers to market entry, e.g. when the procurement process is undermined by corruption; as well as non-intentional barriers to market entry, e.g. when the information on bidding opportunities are hard to find for bidders due to a paper-based procurement system. The goal of open competition policies are therefore to ensure that open auctions are used as much as possible and to reduce the costs of bidding, set up a transparent procurement process, define criteria that do not unreasonably limit potential bidders, allow firms from other regions or countries to participate, or devise ways of incentivising smaller firms to participate even if they cannot bid for the entire contract. Hence, for open competition to function properly, it is a precondition that the public administration develops its regulations and ability to appropriately organise tender procedures in a way that prevents discrimination, corruption, collusion and is managed in a transparent manner (Tas, 2020).

### How to measure open competition in public procurement?

Open competition in the context of public procurement captures the extent to which the procurement process de facto ensures open and fair competition among bidders. Conversely, limiting open competition implies that public procurement contracts are allocated and managed in ways that benefit

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<sup>8</sup> In simple terms, supported bodies are those which receive public funds such as government subsidies, In many countries, this means that when they spend those funds, they have to follow public procurement rules.



some companies while excluding potentially bidding firms. If this is done for corrupt or favouritistic purposes, a closed network of firms with favoured contacts to public officials benefit, to the detriment of those without connections or unable to bribe public officials. Limited competition may also be fostered by colluding firms which prevent non-cartel member firms from submitting bids.

Measuring the openness of competition in public procurement then directly follows from the above definition and our focus on procurement outcomes. In particular, we use:

- Single bidding rate
- Average (trimmed) bidder number
- Market concentration by contract value
- Market entry (share of new firms)

For full methodological details see the appendix.





## Impacts of open competition in public procurement

Open competition is not only seen as an instrument to achieve efficiency and value for taxpayer money, but also to keep public buyers accountable by limiting their discretion in the allocation of public funds (Spagnolo, 2012).

In the narrow sense, open competition has an impact on individual procurement processes as it serves to achieve value for money and to ensure their legitimacy. From this perspective, open competition is seen as a means to allow the public buyer to obtain the benefits of competitive pressure among (participating) bidders, as well as a key instrument to deter favouritism and other corrupt practices and deviations of power. Therefore, the most commonly mentioned benefits of open competition refer to these immediate outcomes in terms of improved efficiency, prices, and quality as well as deterrence of collusion and corruption in the procurement process.

In the broader sense, since public procurement involves the expenditure of large sums of money, it can also impact on the structure and functioning of competition in a market more generally. The public sector as the buyer of a very wide range of goods and services in substantial quantities (for example, consider the demand of national health services' demand for pharmaceuticals and specialist equipment), can influence the structure of supply and encourage changes in the market (Fiorentini, 2006). Open competition policy therefore may be used to shape market structure of the industry, sector, or region in the longer term (OECD 2011). Such dynamic impacts of market structure furthermore also influence a range of broader societal and economic outcomes such as employment, productivity, development. However, these go beyond the scope of this evidence paper.

### Efficiency and value for money

The most straightforward benefit of open competition between bidders is to ensure that public entities, and ultimately society as a whole, obtain the benefit of the best offers in terms of price, quality and innovation of the goods and services purchased. The basic logic behind this principle is that when a sufficient number of relevant bidders are able to respond to the invitation to tender and have an incentive to compete for the contract, government can acquire higher quality goods and services at lower prices than it would if it awarded contracts without competition (Fiorentini, 2006; OECD, 2011, Sanchez Graells, 2016, Spagnolo, 2012). In consequence, citizens receive better public goods and services, e.g. in terms as the public healthcare is better supplied with necessary drugs or public roads are of better quality.

There is clear evidence that open competition has a significant impact on government efficiency and value for money in procurement (Table 1). As one of the most frequently cited authors in this area, Gupta (2002) found that 6-8 bidders are needed to achieve the highest competitiveness and that any further increase in the number of tenderers does not affect the final price (the author analysed the area of highway infrastructure construction in Florida from 1981 to 1986, the total sample consisted of 1937 tenders). Gomez-Lobo and Szymanski (2001) investigated the relationship between costs and numbers of bidders for U.K. local authorities' refuse collection contracts. They found that a higher number of bids



is associated with a lower cost of service. Iimi (2006) focused on procurement in 26 developing countries, with data from 214 cases from 1999 to 2005. The author found that an incrementation in the number of tenderers by an average of 1% brings savings of 0.2% and the state of highest competitiveness was achieved with a participation of eight tenderers. When the number of bidders is more than 8, the cost-cutting effect is largely lost. Gineitiene and Šerpytis (2011) analysed procurement of technically identical and standardised goods. The results were similar to those of the previous authors, they found that with an incrementation from 1 bidder to 2, significant savings were achieved (for some goods even higher than 10 or 20%). Using Brazil's federal government data, De Oliveira, Fabregas & Fazekas (2019), show that if annual winner share in buyer spending declines, in other words if competition intensifies, there are savings of 1.1% compared to the observed unit price.

However, open competition can only achieve lower prices or better quality when there are firms that are able and willing to genuinely compete. Evidence from Paraguay raises this fundamental issue, namely that there have to be companies who can potentially enter the market once access is widened (Straub, 2014). When there are not enough firms to sustain competition, e.g. in the procurement of complex or rare works and services (e.g. a submarine) or where special expertise captured by reputation or long-term loyalty is required, more sophisticated arrangements may be necessary to achieve an efficient outcome that ensures value for money (Calzolari & Spagnolo, 2009).

## Anti-corruption & anti-collusion

Public procurement frequently involves large, high value projects, which present attractive opportunities for collusion and corruption (OECD 2011). Most bribery cases prosecuted under the OECD Anti-Bribery Convention involved bribery during the contracting process and according to the UNODC, corruption reduces the value of a public contract by 10 to 25%. In addition, collusion between firms which conspire to rig bids and avoid the pressures of competition is a common phenomenon. As a result, legitimate bidders suffer and public buyers get less value for money with detrimental effects to the services and infrastructure that the public sector provides. Collusion and corruption are distinct problems in public procurement (see Anderson, Kovacic & Muller, 2011), yet they have the same outcome: a public contract is awarded on a basis other than free and fair competition.

Open competition in public procurement can serve to counter these risks of corruption and collusion (Table 1). On the one hand, open competition (together with transparency) rules can bind public officials to choose an open auction design wherever possible. On the other hand, open competition creates an environment where the bidders' ability and incentives to reach corrupt or collusive arrangements are significantly reduced (Anderson, Kovacic & Muller, 2011; Bauhr et al., 2020). For example, some of the EU public procurement rules are clearly oriented towards the promotion of open competition by reducing likelihood of anticompetitive practices, such as the introduction of tools to disqualify offending tenderers and increasing flexibility of contracting authorities. This should foster open competition and therewith value for money and greater societal benefit of public procurement.

A recent study of 3.5 million procurement records across Europe between 2006 and 2015 finds that tender transparency favouring open competition reduces corruption risks, as indicated by single-bid



contracts, substantially (Bauhr et al., 2020). The analysis shows that financial benefits of investing in greater transparency to promote open competition and thus undermine corruption risks could decrease single bidding by 2.5 to 6 percentage points translating into EUR 4.5–10.9 billion savings per year across the EU. This effect is largely driven by ex-ante transparency, in other words allowing other bidding or potentially bidding firms to monitor the process which is key to open competition. Furthermore, Knack, Biletska, & Kacker (2017) used a sample of 34,000 firms in 88 countries to show that in countries with more transparent procurement systems, more firms engage in bidding and pay fewer and smaller kickbacks to officials. Looking at impact on the quality of contract delivery, Lewis-Faupel et al. (2014) show that regions in India and Indonesia implementing more transparent and electronic procurement systems lead allow higher quality contractors to enter the market, which in turn reduces two proxies of corruption, delay in project completion and quality of delivery (roads in this case). The analysis shows that through the improvement in competition, road quality improves by 12% (India) and projects are delivered on time 15% more frequently than conventional, which indicates that corrupt practices are curbed.



**TABLE 1. SUMMARY OF QUANTITATIVE ESTIMATES: IMPACTS OF OPEN COMPETITION ON VALUE FOR MONEY AND ANTI-CORRUPTION**

Source: citation	Country/ countries	Time period	Product market	Change in competition	Impact
Gupta (2002)	USA	1981 – 1986	road infrastructure	from 2 to 8 bidders	12-14% price savings
Gomez-Lobo and Szymanski (2001)	UK	1989-1996	refuse collection	from 1 to 2 bidders	12% to 13% price savings
limi (2006)	26 developing countries	1995-2005	Japanese ODA projects	1% increase in bidders	0.2% price savings
Gineitiene and Šerpytis (2011)	Slovakia		various	from 1 to 2 bidders	10-20% price savings
De Oliveira, Fabregas & Fazekas (2019)	Brazil	2014-2016	Standardised goods	moving 50% of items from 10th to 9th decile of buyer spending concentration	1.1% unit price savings
Bauhr et al. (2020)	Europe	2006-2015	various	decrease in single bidding by 2.5-6%	EUR 2.5-10.9 billion price savings
Lewis-Faupel et al. (2014)	India, Indonesia	2000-2009 2004-2008	works	increase of non-local firms winning contracts	12% improved road quality (India), 15% fewer implement. delays (Indonesia)



## **Policies and practices for improving open competition in public procurement**

We highlight seven selected policy areas that can positively impact the level of open competition in a public procurement market while keeping in mind that legal and policy changes do not automatically translate into a change in practice. Their impact on open competition is either linked to lowering intentional restrictions to competition due to corruption or collusion, or reducing non-intentional barriers to competition due to incompetence or lack of information. We selected the following policy areas based on their potential for achieving a large impact (Table 2):

- e-Procurement,
- Open data portals,
- Civil society monitoring,
- Preferential treatment policies,
- Professionalisation and capacity building,
- Civil service meritocracy and independence, and
- Audits and supervision.

While these are commonly discussed policies in the literature, this list is not exhaustive. Other policy areas that we only touch upon include, for example, the types of procurement procedures that foster competition (assuming the regulatory framework favours competitive tendering as the norm), or the level of discretion that public officials have in the handling of procurement processes.



**TABLE 2. SUMMARY OF QUANTITATIVE ESTIMATES: INTERVENTIONS' IMPACT ON COMPETITION**

Source: citation	Country/countries	Time period	Product market	Intervention	Impact on competition
Blum, Datta, Fazekas, Samaddar & Siddique (2020)	Bangladesh	2011-2018	general procurement	e-Procurement	bidders per tender increase by 1 to 2 bidders, non-local winner probability increase by 9 to 11%
Kovalchuk, Kenny & Synder (2019)	Ukraine	2014-2017	above-threshold procurement	e-Procurement	statistically significant positive effect on number of bids and unique winners (magnitude not specified)
Lewis-Faupel, S., Neggers, Y., Olken, B. A., & Pande, R. (2014).	India, Indonesia	2000-2009 2004-2008	works	e-Procurement	no effect on bidder number, but increase of non-local firms winning contracts
Knack, Biletska, & Kacker (2017)	88 countries	2011-2016	central government procurement	transparency (1-unit improvement on the 7-point PEFA scale)	0.01 increase of firms' likelihood of bidding
Duguai, Rauther & Samuels (2019)	EU	2009-2018	general procurement	open data (introduction of initiative)	12% increase in number of bids
Coviello & Mariniello (2014)	Italy	2000-2005	public works	greater publication requirements	increase of 16 in the number of bidders
Ohashi (2009)	Japan	2001-2004	small-scale public works	transparency in bidder qualification process	increase in number of bidders (not quantified)
Adam, Fazekas, Tóth (2020)	Slovakia	2011-2012	general procurement	open data	number of bidders increase by 1
Marion (2007)	USA (California)	1996-2002	highways	preferential treatment of SMEs (10-percentage point increase in the preference auction prevalence)	participation reduces by 0.064 firms



Krasnokutskaya & Seim (2011)	USA (California)	2002-2005	highways	preferential treatment of SMEs	small-firm participation increases at the expense of large-firm participation
Nakabayashi, 2013	Japan	2005-2009	construction	preferential treatment of SMEs	40% of SMEs would exit the procurement market if preferential treatment were removed
Fazekas & Tóth (2017)	EU	2009-2014	general procurement	audit (and subsequent court decisions)	1.8-3% increase in number of bidders; 3-4% lower single bidding; 3-4% decreases in market share of local winners
Zamboni & Litschig (2018)	Brazil	2009-2010	procurement of municipality governments	audit (increasing annual audit risk by about 20%)	10-15% reduction of procurement processes involving corruption
Gerardino, Litschig & Pomeranz (2020)	Chile	2011-2016	general procurement	audit	deterioration of competition - 5-8% lower use of competitive auction, - 2.4-4.6% lower chance for new suppliers to win, - 3.4-6.5% lower chance of non-local firms winning
Charron et al. (2017)	EU	2009-2013	general procurement	meritocracy	One-unit increase in meritocracy decreases corruption risk measured as single bidding by between 9-14% points

## E-Procurement

E-procurement refers to the use of electronic means by public organizations for procuring public works, goods and services (Buyse et al., 2015). The digitalisation of public procurement can cover some or all phases of the procurement process. Many e-Procurement systems first and foremost move the advertisement and contract award phase to an electronic portal, while other functions related to invoicing and contract management might remain on paper. Therefore, the term or policy “e-procurement” bundles together a variety of small or large changes which can have a range of effects on competition. Not all of them are equally well studied which makes it challenging to draw conclusions about which parts of e-Procurement may be most valuable for competition, however it is well accepted that the



publication of all tender opportunities in one online platform constitutes an important first step to improving competition.

First, it makes it more difficult for corrupt public officials to bend the process in favour of a certain company. As the process is recorded digitally, it becomes more transparent and traceable, thus public officials' discretion over the process reduces while the risk of detection of wrongdoing increases. Hence, it counters intentional restrictions to open competition and aids a free and fair competitive process (Anderson, Kovacic & Muller, 2011; OECD, 2003). Second, it reduces non-intentional restrictions on open competition such as information costs and costs of tender submission. As the digital transfer of information is instantaneous, accessible to everyone and practically free with most e-procurement systems, it becomes drastically easier for firms to find information on public tenders (e.g. obtaining documents) and submit their bids. Hence, it opens up the market for more firms and creates a healthy competition (Croom & Brandon-Jones, 2005). Open competition is expected to intensify as the number of bidders increases, the diversity of bidders improves and because bidders are better informed supporting higher quality bids in terms of lower prices and better specified technical offers (Soudry, 2004).

A recent impact evaluation of introducing a comprehensive e-procurement system in Bangladesh (Blum et al., 2020) and Argentina (de Michele & Pierri, 2020) found an overwhelmingly positive impact of e-procurement on open competition. Open and fair access to public tenders improved in Bangladesh due to the introduction of the e-Procurement system, with the average number of bidders per tender increasing by around 1-2 bidders. In addition, the probability of single bidding decreased by around 10-16%, and the probability of a company based in a different region than the procuring public buyer winning a contract increased by around 9-11%.<sup>9</sup> The study also confirms that such improved competition drives prices down by 7-8%. A study from Ukraine (Kovalchuk, Kenny & Synder, 2019) shows that even among high-value tenders that were already competitive and already fairly transparent, the introduction of e-procurement increased the number of bids, higher savings, and greater participation in provision of contracted goods and services (more unique winners per tender in each entity). Studies from Italy (Coviello & Mariniello, 2014), and India and Indonesia (Lewis-Faupel et al., 2014) provide similar evidence: e-procurement increases the number of bidders and the prevalence of non-local winners, meaning that it improves competition.

However, it must be considered that the shift to e-procurement is not easily done as it requires learning a new system and a certain level of computer literacy among public officials as well as potentially bidding firms. This might not be given in developing countries or some SMEs which would negatively impact competition. In addition, in order for e-procurement to improve open competition there have to be companies who can potentially enter the procurement market once it is opened up. Evidence from Paraguay raises this concern, finding that if there are none to very few such companies, the short to mid-term positive effects of changes to market access would be zero (Straub, 2014).

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<sup>9</sup> The study also found that the adoption of e-procurement was effective in preventing procurement-related violence by preventing armed gangs from physically hindering would-be competitors from submitting paper-based bids.





## Open data portals

Many scholars and policymakers suggest that open competition in public procurement largely depends on the transparency of the procurement process (e.g. Bauhr & Grimes, 2014; Kosack & Fung, 2014). E-procurement and the legal requirements to publish procurement information (usually above certain value thresholds) generate large amounts of data which are sometimes publicly released on open data portals, either run by governments or by watchdog organisations. Such rich datasets can improve open competition by informing bidding decisions, civil society oversight, as well as public management (Bauhr et al., 2020). For example, quantitative analysis of patterns in bidding data can help procurement agencies and competition authorities to identify those sectors where intentional infringements (e.g. collusion of bidding companies) or competition rules are more likely. Transparency portals should ideally provide indicators of spending efficiency and integrity risks which can help different actors to make sense of the often hard-to-interpret data. Examples are the Opentender portal<sup>10</sup>, the Slovakian public procurement portal<sup>11</sup> or its Georgian twin<sup>12</sup>. Such portals can help to shape tender design in those sectors which are at risk and allocating law enforcement resources to the detection of collusion in those sensitive sectors. With increased transparency and better market intelligence to mitigate risks of intentional competition restrictions, open competition is expected to intensify.

There is some evidence of the direct impact of open procurement data on competition. In a global, cross-country analysis, Knack, Biletska, & Kacker (2017) used a sample of 34,000 firms in 88 countries to show that in countries with more transparent procurement systems, firms are more likely to engage in bidding and pay fewer and smaller kickbacks to officials. In an unpublished paper, Duguay, Rauther & Samuels (2019) find that increasing the public accessibility of procurement data raises the likelihood of competitive bidding processes, increases the number of bids per contract, and facilitates market entry by new bidders. However, the increased competition comes at a cost: firms execute government contracts with more delays and ex-post price renegotiations. These effects are stronger for new vendors, complex procurement projects, and contracts awarded solely based on price. Other studies from Italy (Coviello & Mariniello, 2014) and Japan (Ohashi, 2009) also showed that publication requirements, improving the amount of readily available tendering information increase the number of bidders. A study measuring the benefits of transparency interventions finds that the number of bids per contract increased by 1 bid on average in Slovakia after the online publication of tender and contract information became mandatory (Adam, Fazekas, Tóth, 2020).

## Civil society monitoring

Local communities and civil society groups can get involved in monitoring the performance of public procurement, enabled by high-tech solutions such as open data portals on the one hand. On the other hand, in low-tech environments, monitoring often involves documentation of implementation, e.g. local communities taking pictures or writing reports on implementation progress, or interviewing patients on

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<sup>10</sup> <https://opentender.eu>

<sup>11</sup> <https://tender.sme.sk>

<sup>12</sup> <http://tendermonitor.ge/en>



their experiences accessing public health service delivery, for example. Since local communities often directly benefit from public contracts, e.g. in the case of a road construction or a school meal scheme, they are incentivized to monitor contract delivery. By implication, civil society supervision is expected to increase the probability of detecting wrongdoing and errors (Fox, 2015; Olken, 2007).

There is little systematic evidence on a direct link between civil society monitoring and open competition, but studies have shown that community monitoring can have a positive impact on costs in contract execution (Olken, 2007) especially when working in cooperation with official monitoring bodies such as a national Anti-Corruption agency as was the case in Peru (Lagunes, 2017). In consequence, this suggests that civil society monitoring can help to mitigate intentional restrictions to competition and incentivise authorities to conduct procurement processes that deliver high integrity and value for money.

## Preferential treatment policies

Preferential treatment policies in public procurement typically concern the support of small- and medium-sized enterprises (SMEs), local producers, minorities, and women-owned or run businesses as well as targeting specific products or policies (e.g. focussed on green procurement, sustainability or innovation). The idea behind both policy goals is to use public procurement strategically, not only for improving value for money, but to achieve complementary goals such as sustainability. Nevertheless, governments can still benefit from achieving value for money, and suppliers accessing markets that were previously closed to them, for example due to discriminatory policies, or lack of consideration for strategic goals such as sustainability. Ideally, preferential treatment should lead to both higher participation and a higher success rate of preferred bidder classes and thus foster open competition (Caldwell et al., 2004; Glover, 2008). However, these policies may carry costs in terms of value for money if the positively discriminated bidders are otherwise less productive or preferred products are of a lower value/price ratio (Marion, 2007).

Preferential treatment can take shape in adjusted scoring rules for evaluating bids, reserving some contracts for certain groups, or facilitating access to tenders by increasing the number of lots and reducing their size, or adapting qualification levels and financial requirements. Such preferential policies have become widespread among OECD countries with about 60% of countries having special support for SMEs and green procurement while 40% supporting innovative goods and services (OECD, 2019). One notable example is the US Small Business Act which positively discriminates against SMEs in public procurement or Chile's Women Supplier Certification scheme which aims to recognize women-led businesses.

There is high quality evidence for the effect of SME preferences on competition; less so for other types of preferential treatment. Research on US and Japanese SME schemes (Krasnokutskaya & Seim, 2011; Nakabayashi, 2013) finds that due to SME preferences competition increases and prices go down. For example, in the Japanese construction sector in 2005-2009, the SME preference program decreased overall procurement costs by about 0.10-0.23% thanks to improved competition in addition to giving more opportunity to SMEs to supply the government (Nakabayashi, 2013). Importantly, a comparison of SME schemes in Canada, Hungary and Italy, showed that SME friendly public procurement policies



have to be fine-tuned to the various obstacles to entry that such firms face, as SMEs' involvement is typically affected by a shortage of tangible (human and financial) and intangible resources (experience). It showed that while the three countries had successfully reduced the costs of bidding, the volume of paperwork, and improved the clarity of documentation, SME participation remains hindered by factors like late payments, lack of transparent information about tendering opportunities or the level of resource investment required. (Ancarani, Di Mauro, Hartley & Tátrai, 2019).

## **Professionalisation and capacity development**

Professionalising and improving the capacity of the public procurement workforce has been one of the key reform avenues sought by policy-makers in the last decade to improve, among others, open competition (OECD, 2019; World Bank, 2007). Training for procurement staff advancing their skills and knowledge of procurement systems and management techniques is necessary in order for them to avoid unintentionally limiting competition and effectively manage tenders that create access and open competition and result in value for money (Telgen et al., 2016; UK Office of Government Commerce, 2007).

Only one systematic review of public procurement professionalization (Telgen et al., 2016) examines the existing evidence on the impact of capacity programs. It finds that the development of procurement courses delivered positive results consistently across 20 studies, underlying that sufficiently trained staff at procuring public buyers is one of the most important criteria for successful policy implementation. The review stresses that the provision of appropriate rewards for procurement staff (including an appropriate financial reward system and a career path) can help attract and retain quality staff and make staff less susceptible to bribery. Second, the implementation of a procurement code of conduct or code of ethics can provide much needed guidance in situations of conflicts of interest or corruption. Third, not only the training of government staff, but also of private sector actors is crucial for successful training interventions that deliver better competition (Telgen et al., 2016).

## **Civil service meritocracy and independence**

Implementing open competition in public procurement depends, in part, on the ability of public officials to act independently and free from political interference, favouritism, and corruption, which is better safeguarded when their careers do not depend on political connections but on merit. Merit-based recruitment and promotion of procurement officials can curb corruption as it attracts more capable and competent staff resisting political pressures (Olsen, 2006) and motivates good conduct as a key to a successful, long-term career. Charron et al. (2017) show that where meritocracy, rather than connections, is decisive for bureaucratic careers, corruption risks are significantly lower. Analysing procurement data from 2009-2013, the study finds that meritocratic appointment and promotion of civil servants across the European Union decreases corruption risks as well as contract award prices. This suggests that civil service meritocracy and independence foster open and competitive procurement as corruption poses an inherent barrier to open competition.



A field experiment in Pakistan with frontline procurement officers and their monitors showed that when authority is shifted to procurement officers prices reduce by 9% (indicating better competition) without reducing quality. However, the effect of performance pay is muted, except when agents face a monitor who does not delay approvals. The results illustrate that organizational design and open competition policies must balance agency issues at different levels of the hierarchy (Bandiera, Best, Khan & Prat, 2020). Another study in the context of the US federal procurement of services and works highlights the benefits of competent bureaucrats for procurement outcomes as they tend to cooperate better within the offices. It finds that an increase in procurement officers' competence causes a significant and economically important reduction in time delays, cost overruns, and number of renegotiations with cooperation appearing to be a key driver of the findings (Decarolis, Giuffrida, Iossa, Mollisi & Spagnolo, 2020).

On the other hand, implementing merit-based recruitment requires a strong basis of rule-based governance and norms of integrity which is often lacking in developing countries where those with power over personnel management decisions are likely to abuse their position to hire cronies. Hence, introducing and maintaining civil service meritocracy depends on whether the institutional culture in a country follows rule compliance and norms of integrity in the first place (Schuster, Meyer-Sahling & Mikkelsen, 2020).

## Audits and supervision

Audits and supervision of public procurement by higher-level or independent state organs are expected to increase the risk of detecting misconduct, corruption in particular. The threat of punishment, in turn, contributes to lower corruption and higher levels of compliance with rules of open competition.

There is a growing evidence base about the impact of audits and supervision in public procurement. Analysing the EU's single public procurement market in 2009-2014, a study looked at the impact of procurement investigations and the subsequent European Court of Justice's decisions striking down anti-competitive practices (Fazekas & Tóth, 2017). Investigations and the subsequent court decisions requiring legislative change showed a significant and sizeable positive impact on open competition: they increased the number of bidders, lowered the incidence of single bidding, decreased the market share of local winners, and lowered prices.

In a randomized policy experiment, Zamboni & Litschig (2018) found that an increased risk of being audited deters local government officials in Brazil from interfering with procurement processes for corruption. This holds especially for procurement processes in which competition is restricted. They assign the effectiveness of the risk of audits in this area to the fact that potential sanctions and their likelihood of materializing are comparatively higher in public procurement than other areas of government activity. In other words, they show that corruption in public procurement, which undermines open competition, is responsive to external audit.

Contrarily to this, a recent study from Chile (Gerardino, Litschig & Pomeranz, 2020) finds that public audits can create unintended deterioration of open competition in public procurement. The studied public audits lowered the use of competitive auctions, reduced supplier competition, and increased the



likelihood of incumbent, small, and local firms winning contracts. This is because the existence of standard audit protocols discourages public officials to use open, competitive procedures, because these procedures involve more auditable steps. Hence, the audits create a strong incentive for them to use direct, non-competitive procedures rather than open, competitive ones. In sum, the impact of an audit policy on open competition depends on its design and needs to consider potential unintended negative impacts for competition.



# Measuring open competition in public procurement around the globe

## Data

The Global Public Procurement Openness Index (GGPOI) is a composite indicator constructed from four pillars of market openness in public purchases: a) single bidding, b) average bidder number, c) market concentration, and d) market entry rate. The GPPOI is an annual, localized -- at the Level 2 Nomenclature of Territorial Units for Statistics (NUTS2) or equivalent -- indicator which oscillates between 0 and 1, where a higher score indicates greater openness.

The GPPOI compares only a subset of public procurement markets which are both common and comparable (see Table 1) across different localities. This approach follows a similar logic to that of consumer-price index inflation measurement, where a standard basket of products is taken to make inflation rates comparable even though people buy different things in different places over time.

Only countries with publicly and freely available data which meet the minimum data quality standards set by DIGIWHIST were used to calculate the indicators. The pilot data sample is limited to contracts with value above the threshold of 130,000 EUR. In this paper we consider the EU27 and EFTA countries, the United States, Uganda, Kenya, Colombia, and Paraguay. This gives the indicator a wide geographic range and economic range. The period considered is 2011-2019.

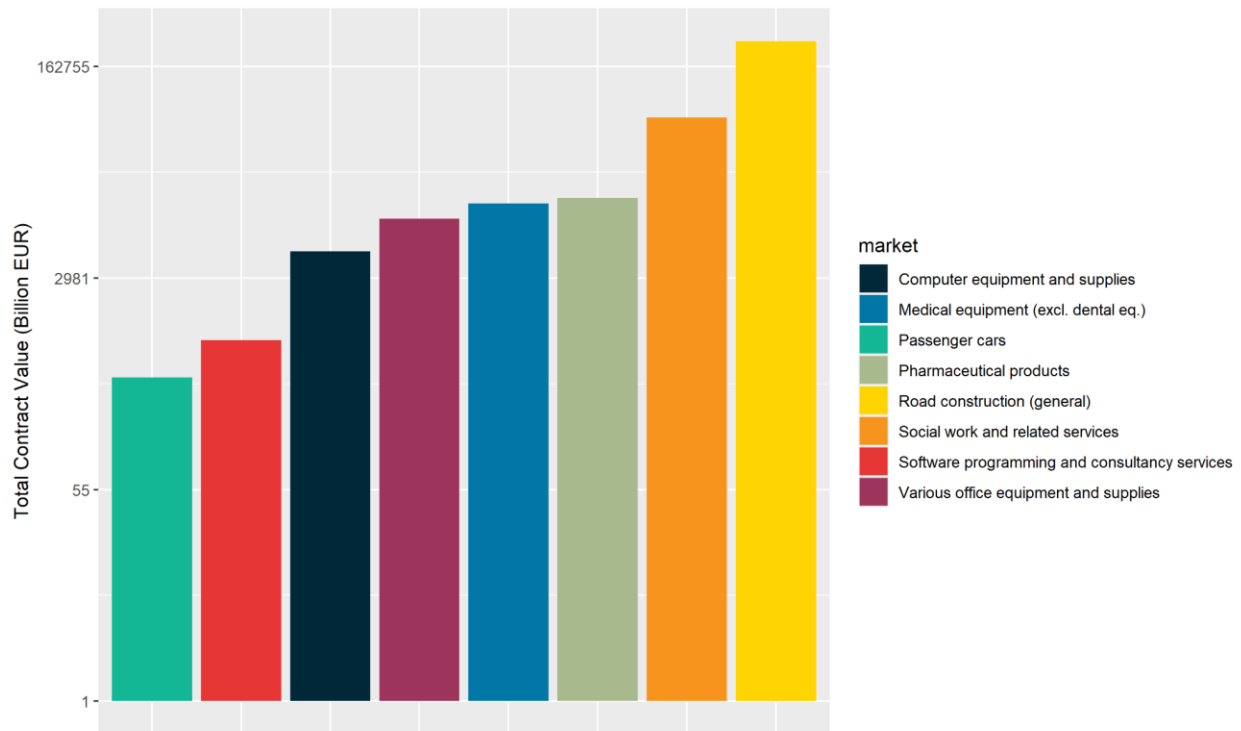
**TABLE 3: NUMBER OF CONTRACTS BY MARKET**

Market	N	%
Computer equipment and supplies	150361	8.8
Medical equipment (excl. dental eq.)	99289	5.81
Passenger cars	23229	1.36
Pharmaceutical products	930514	54.47
Road construction (general)	258113	15.11
Social work and related services	61130	3.58
Software programming and consultancy services	85977	5.03
Various office equipment and supplies	99678	5.83



Table 3 shows the number of contracts available for each of the markets with Pharmaceutical products being the most frequent. This contrasts with the total contract value; as shown in Figure 1, the aggregate value of social work and related services surpasses that of pharmaceutical products despite the relatively low number of contracts (i.e., 20,023 out of a total of 1,036,190).

**FIGURE 1: TOTAL CONTRACT VALUE BY MARKET**



Note: The Y axis is log-scaled

## Results: diversity of rankings

Table 4 shows the five pillars of the GPPOI and the loading that they have on the composite indicator. Each individual pillar runs between 0 and 1, with the latter representing the maximum possible value.<sup>13</sup> A high GPPOI indicates that a) a locality *i* in year *t* has a low number of single-bid contracts, b) it has a high average number of bidders per contract, c) there is a low concentration of total market value (see

<sup>13</sup> For single bidding, a value of 1 means that all contracts in a locality *i* in year *t* had only one bidder. The number of bidders is trimmed to 50, a value approximating 1 in this indicator suggests a high average number of bidders. Market concentration is calculated at the bidder level, per market, per year, per locality; a high market concentration means that a high percentage of total value was awarded to a given bidder. New market entry is calculated as follows: if a given winner was awarded a contract in the previous year (*t*-1) in the same market and locality, its score will be 1 and 0 otherwise.





table 3) around a single winner, d) a high share of contracts was awarded to new bidders (by market), and e) a low share of contracts was awarded to local firms.

**TABLE 4: MISSING VALUES BY PILLAR**

Pillar	Loading	Missing	Mean
Single Bidding	Negative	0.280	0.600
Bidder Number	Positive	0.280	0.060
Market Concentration	Negative		0.400
New Entry	Positive	0.090	0.680

As indicated in Table 5, the individual components of the GPPOI vary greatly by market. General road construction has the highest average openness score, with a particularly low single-bidding ratio and a high ratio of new entrants to the market based on the previous calendar year.

**TABLE 5: GPPOI BY MARKET**

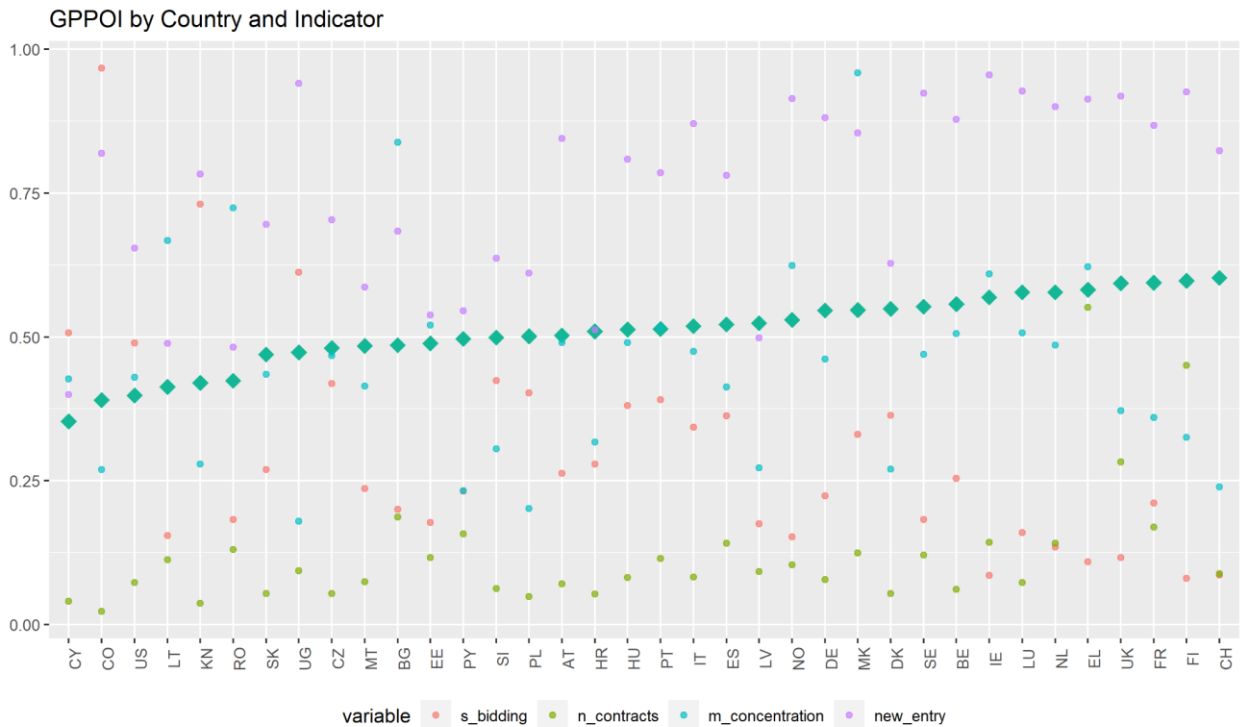
Market	GPPOI	Single_bid (-)	Market_c (-)	N_bids (+)	New_entry (+)
Computer equipment and supplies	0.46	0.64	0.32	0.05	0.73
Medical equipment (excl. dental eq.)	0.45	0.61	0.41	0.09	0.72
Passenger cars	0.48	0.25	0.64	0.09	0.73
Pharmaceutical products	0.46	0.36	0.47	0.08	0.6
Road construction (general)	0.41	0.95	0.24	0.03	0.82
Social work and related services	0.45	0.78	0.34	0.09	0.81
Software programming and consultancy services	0.46	0.58	0.32	0.06	0.68
Various office equipment and supplies	0.41	0.87	0.33	0.03	0.81





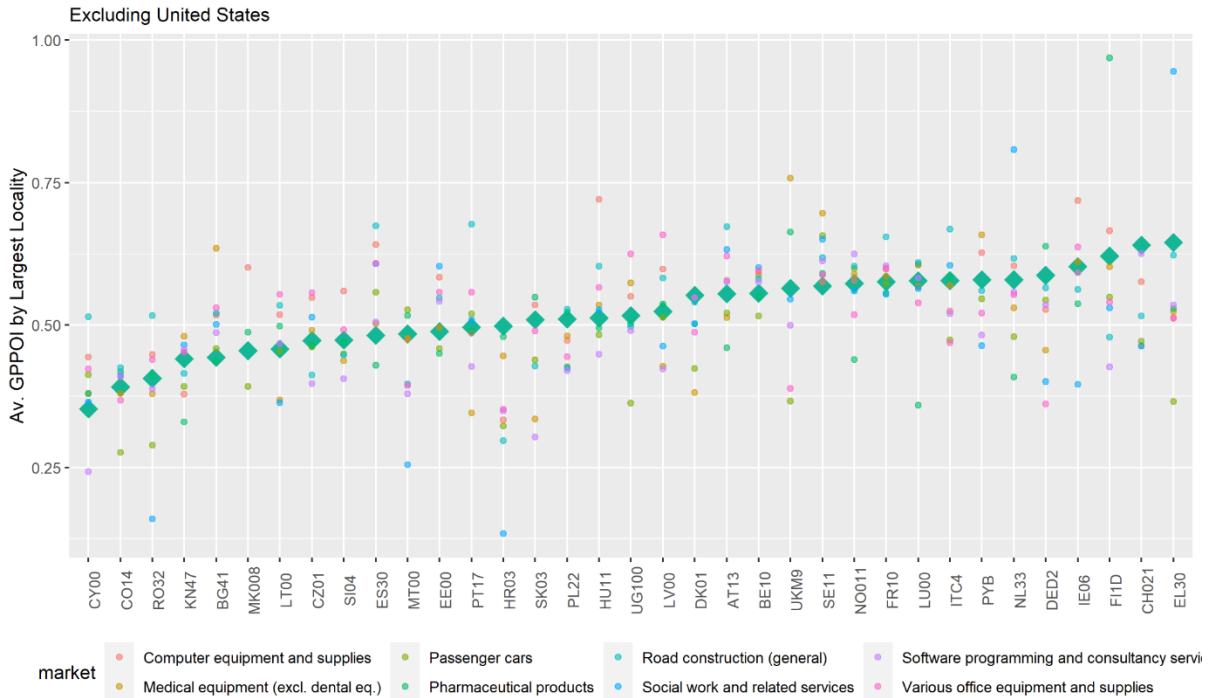
Figure 2 shows the average GPPOI by buyer country disaggregated into the GPPOI scores by each market. Finland, France and the United Kingdom score highest in the index, whereas Cyprus, Colombia and the US score the lowest overall GPPOI. It is important to note, however, that given its large size by number of localities, the US' indicator is slightly skewed. There are significant differences in the average GPPOI by market by country, indicating distinct areas of opportunity across Europe and beyond. This reflects the general patterns seen in Table 5, which shows how medical equipment and pharmaceutical products have the lowest openness scores whereas social work and road construction have the highest. Figure 3 displays the same but for the largest locality (by total contract value in selected markets) in each of the countries considered in this paper.

**FIGURE 2: AVERAGE GPPOI SCORE BY COUNTRY AND INDICATOR**





**FIGURE 3.1: AVERAGE GPPOI SCORE BY LARGEST LOCAL MARKET (EXCLUDING US)**



**FIGURE 3.2: AVERAGE GPPOI SCORE BY LARGEST LOCALITY IN US STATE**

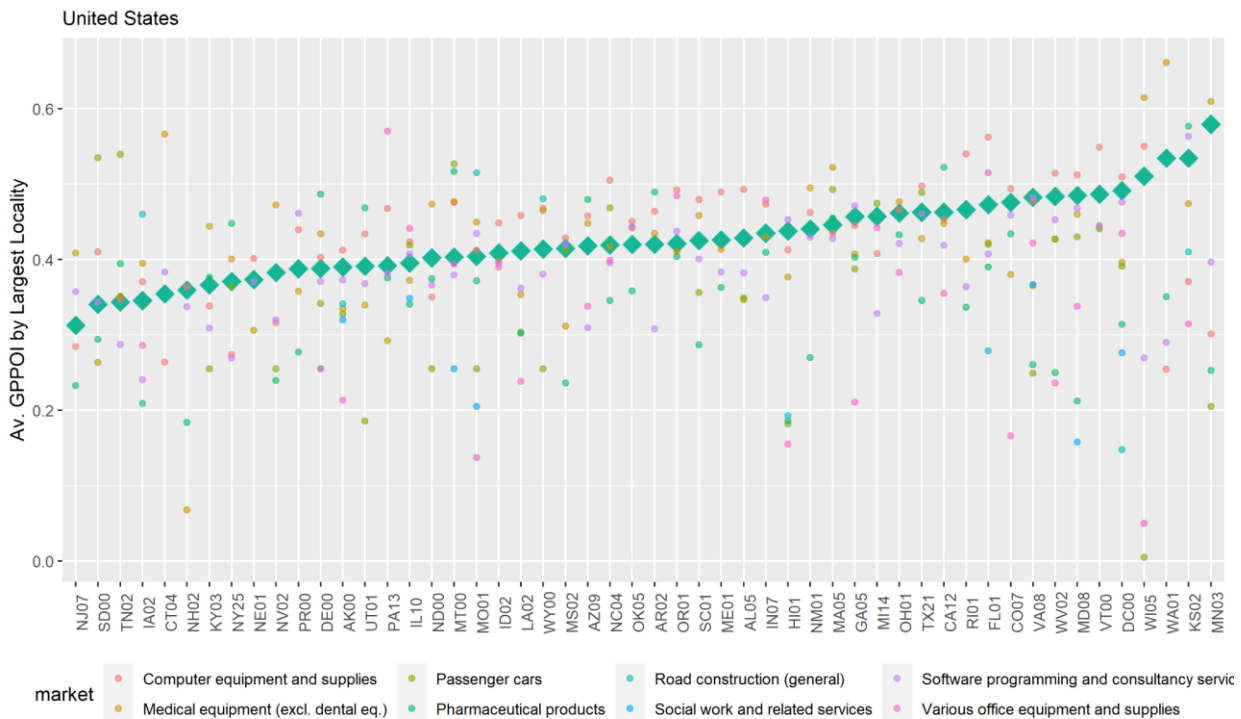
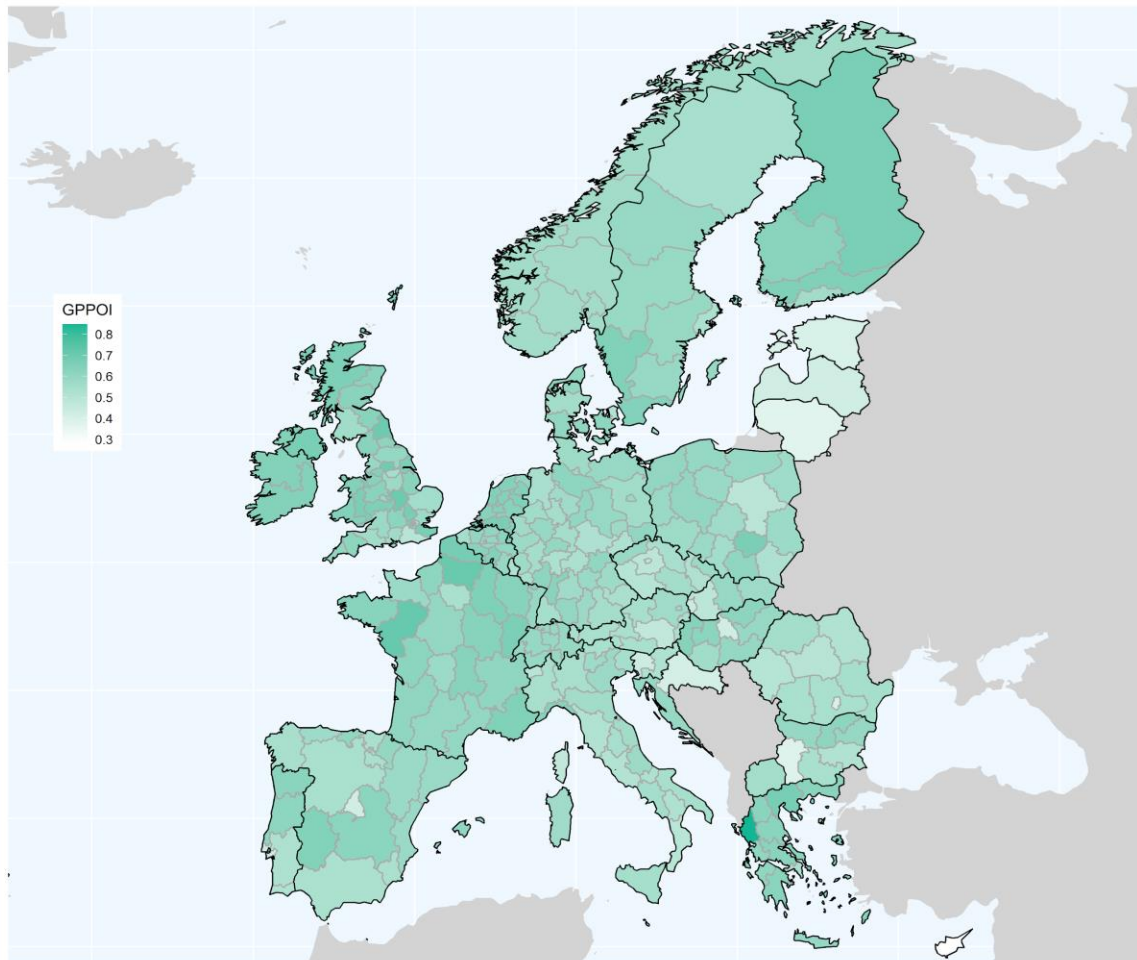




Figure 4 shows a heatmap of the average GPPOI (2012-2018) for European countries at the NUTS-2 level. Though mostly consistent with the country rankings shown in Figure 2, some localities appear to have much lower GPPOI scores than their country averages. Figure 5 shows the GPPOI scores by US congressional districts. Figure 6 shows the time trend of the GPPOI averages by market. Though most markets are consistently ranked over time (high GPPOI for passenger cars and low GPPOI for office supplies), social work also fluctuates between the lowest and the highest positions. This is particularly concerning given the large share of overall contract value absorbed by this market (see Figure 1).

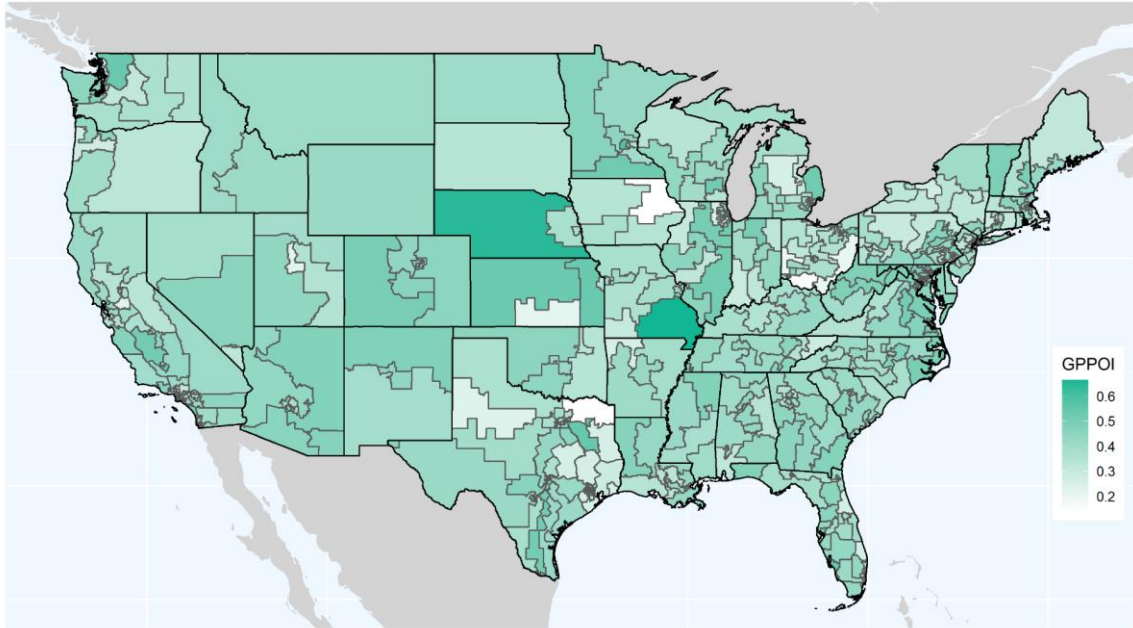
**FIGURE 4: GPPOI HEATMAP, EUROPE**



Note: The map shows the average GPPOI score for the 2009-2019 period. Darker colors represent more open markets. When localities (NUTS2) were unavailable, the national average GPPOI is imputed.



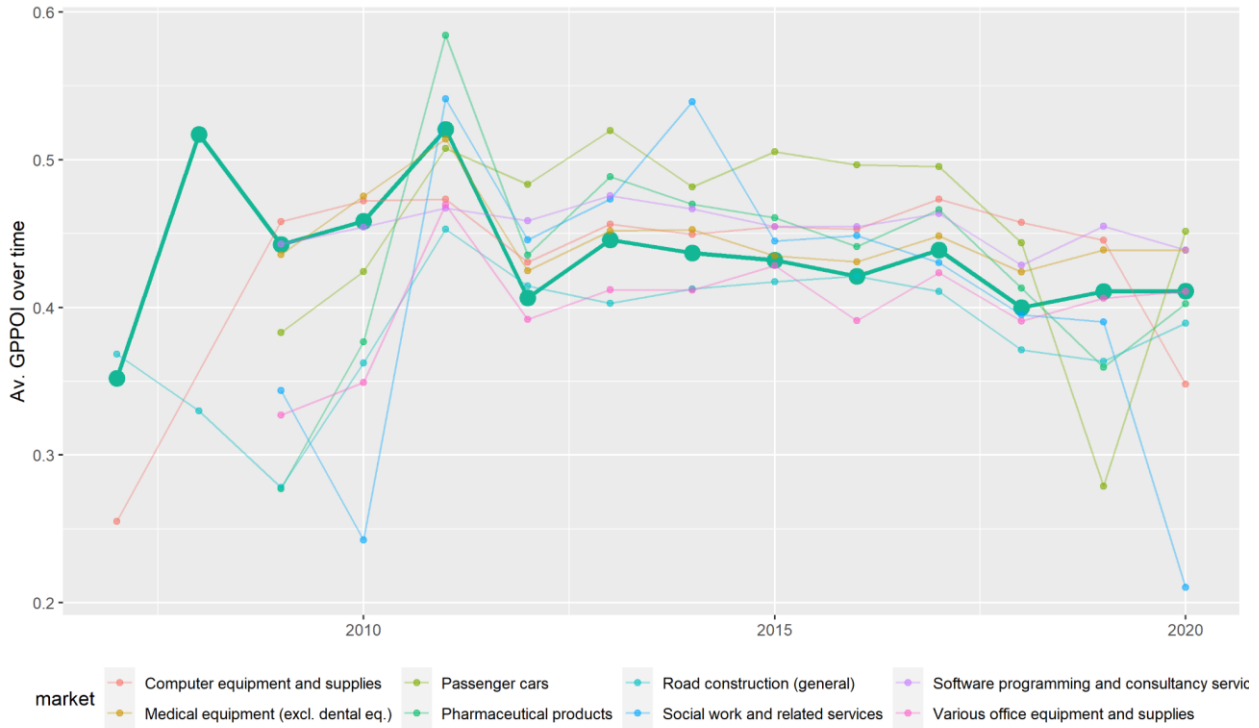
**FIGURE 5: GPPOI HEATMAP, UNITED STATES**



Note: The map shows the average GPPOI score for the 2009-2019 period. Darker colors represent more open markets. When localities (congressional districts) were unavailable, the state-level average GPPOI is imputed.



FIGURE 6: GPPOI TIME SERIES





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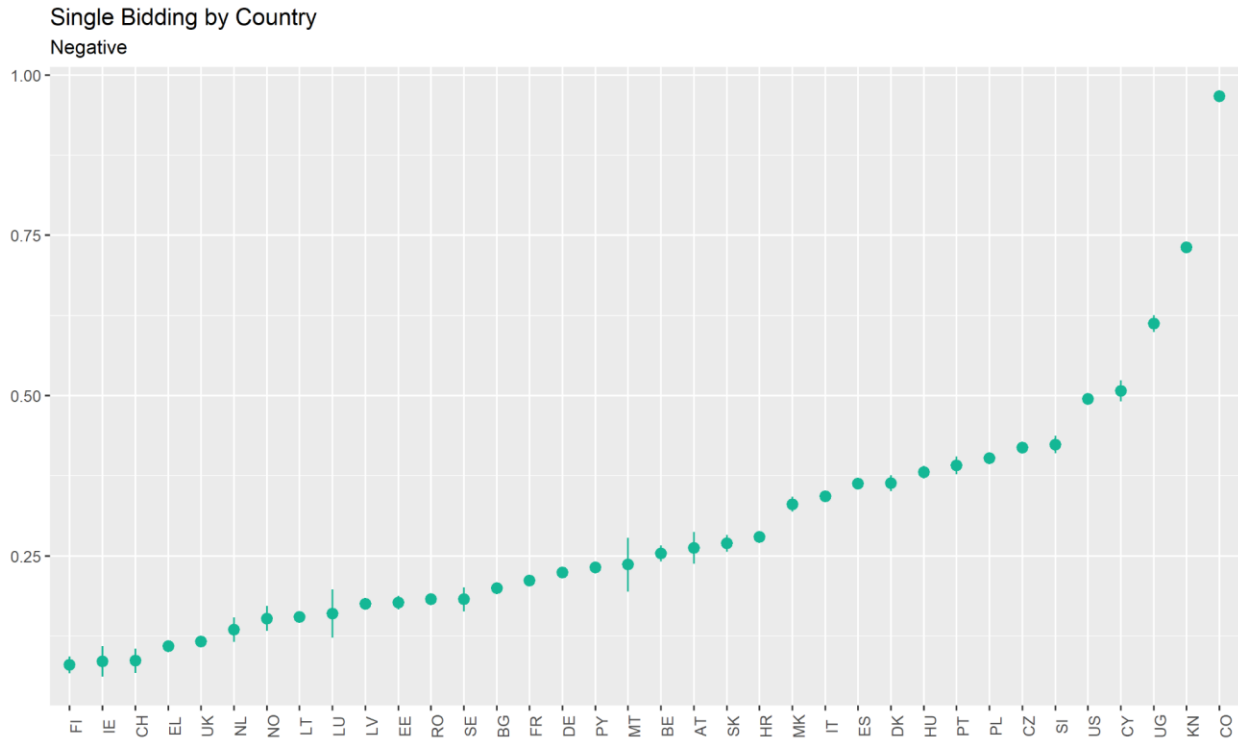


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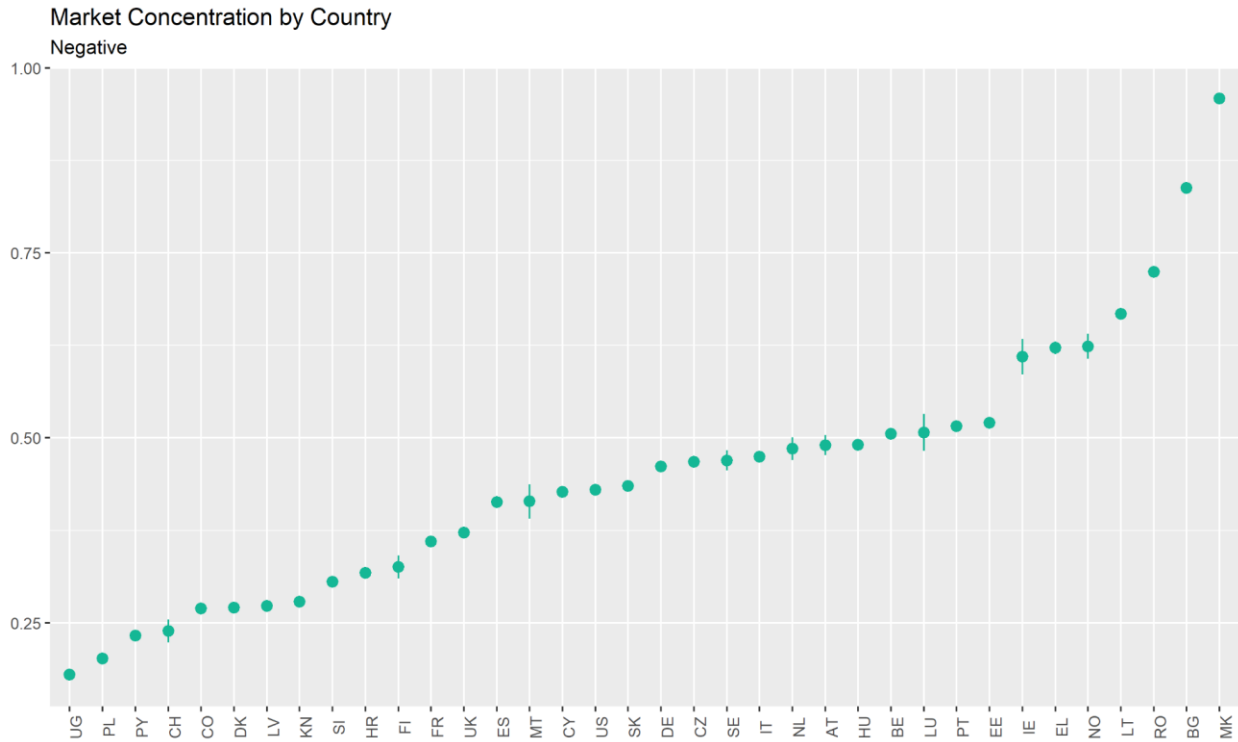


## Appendix: Further details of main results

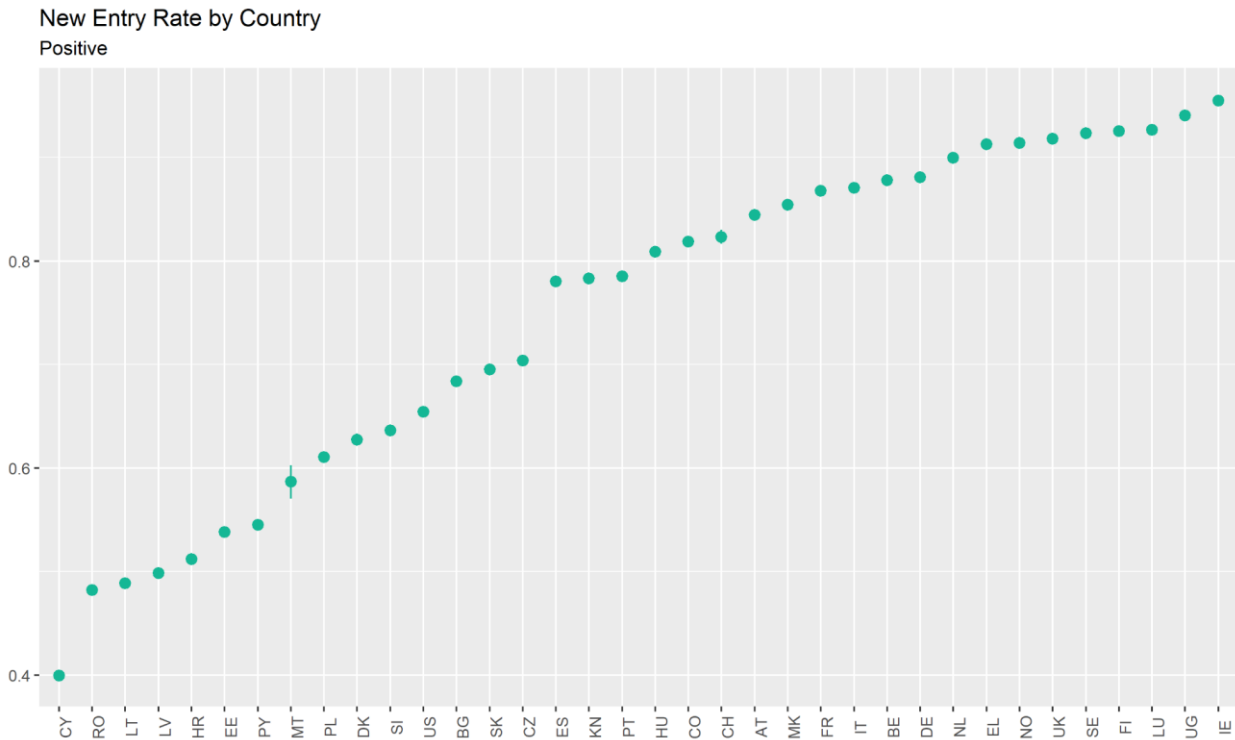
### A1: Indicator Averages by Country



Note: This pillar as a *negative* loading in the GPPOI



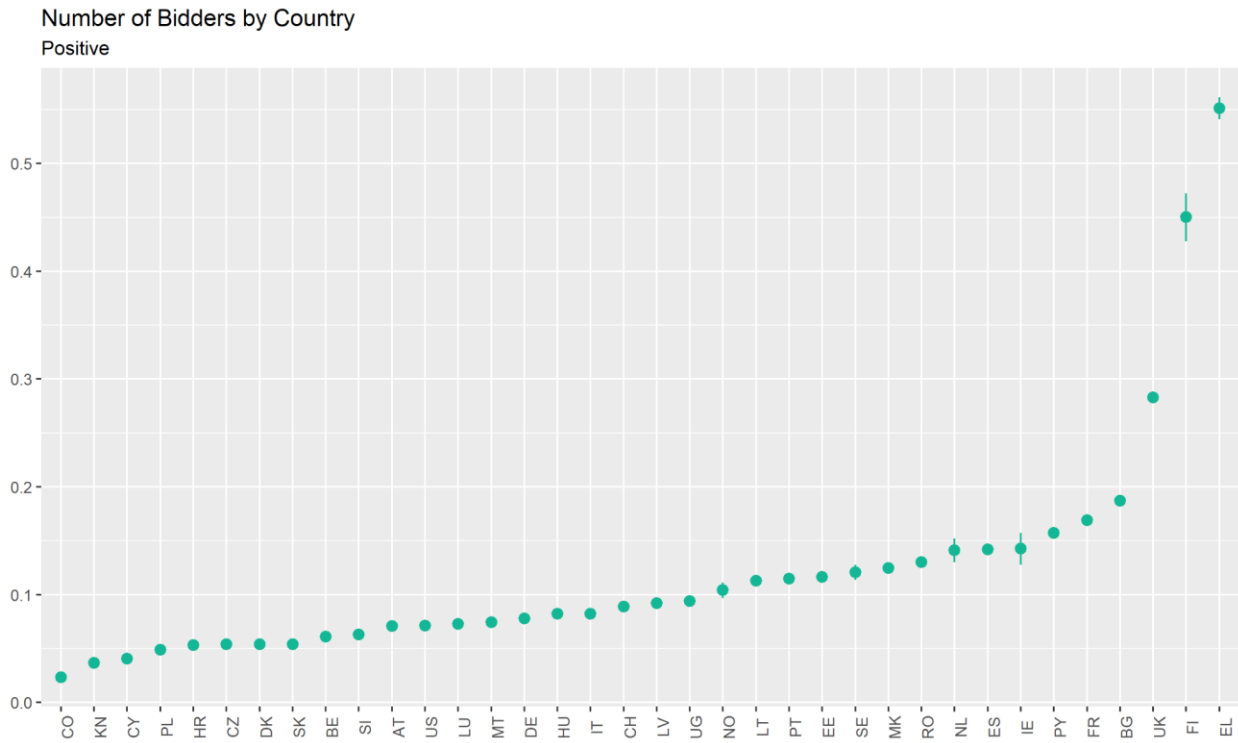
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## Global Public Procurement Open Competition Index

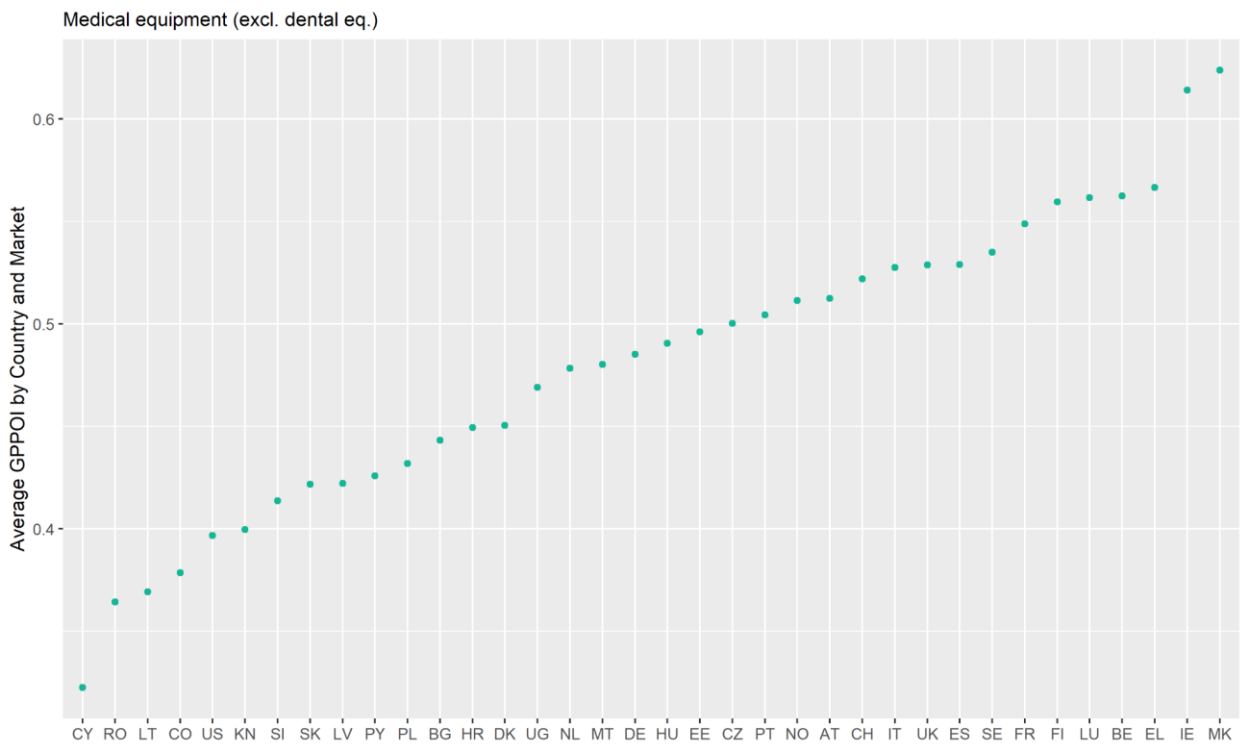
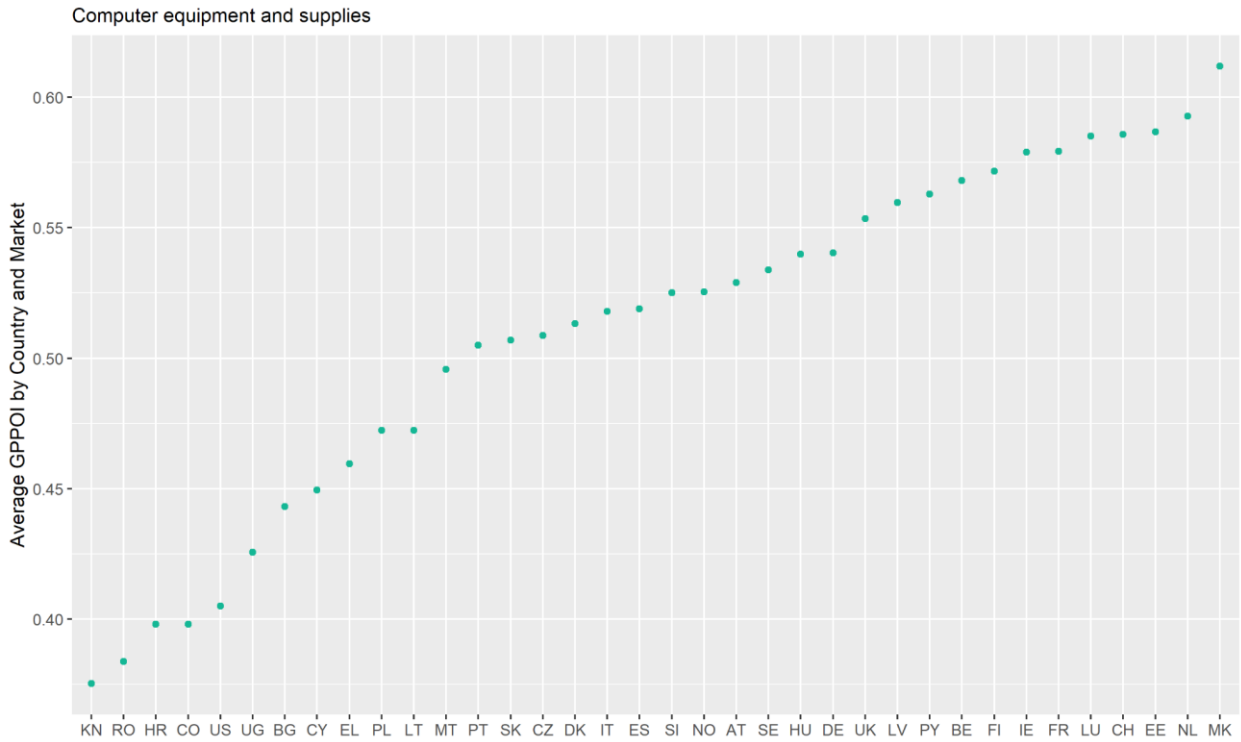
Note: This pillar as a *positive* loading in the GPPOI



Note: This pillar as a *positive* loading in the GPPOI

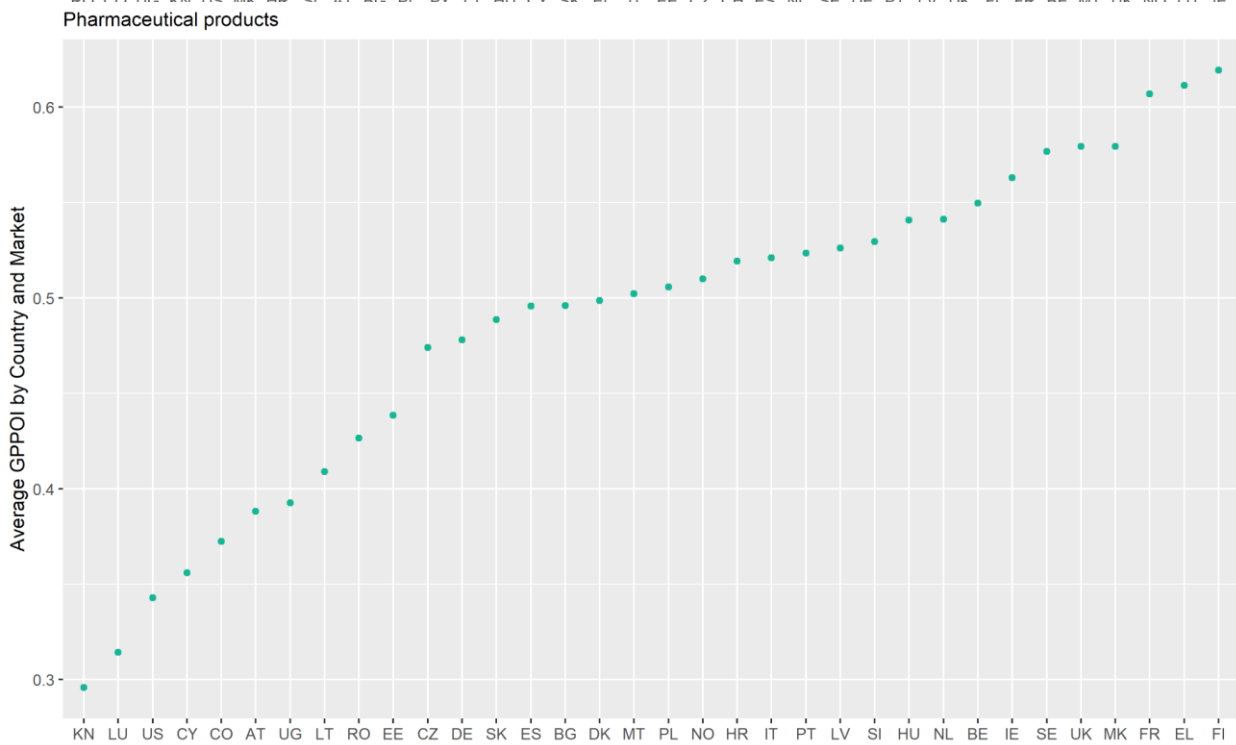
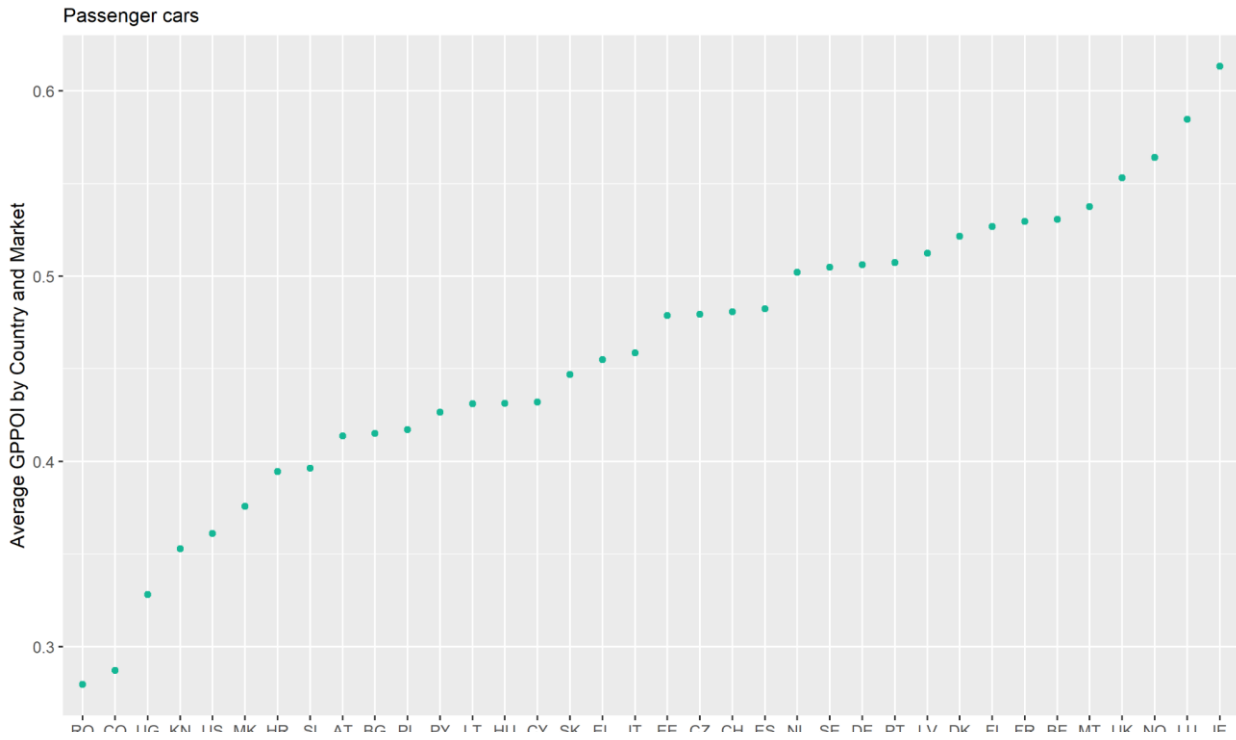


## A2: Market Average GPPOI Scores by Country



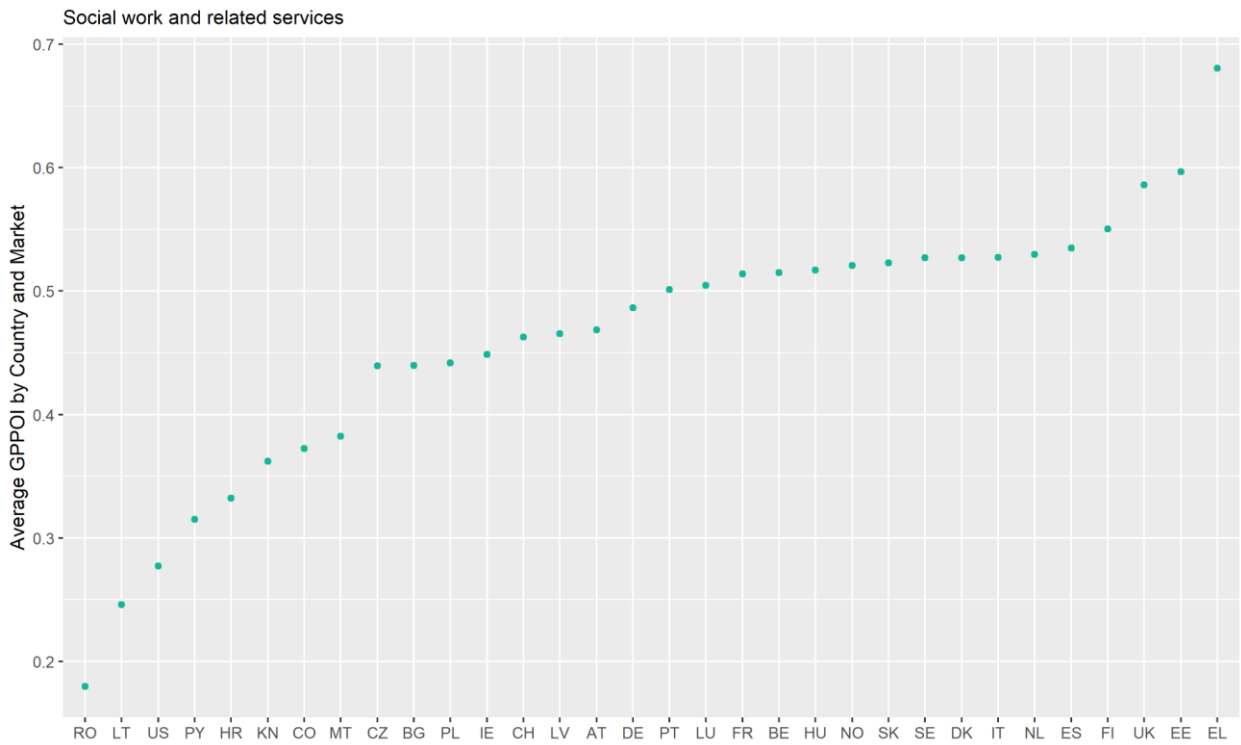
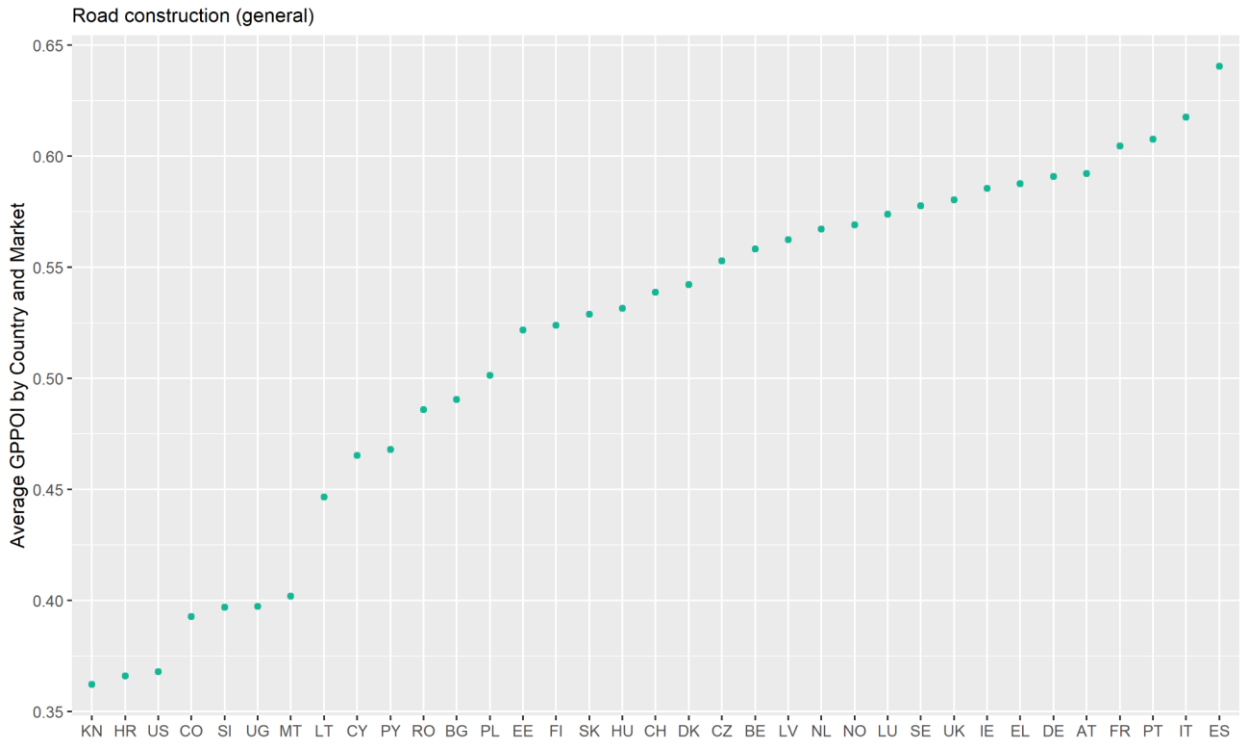


## Global Public Procurement Open Competition Index





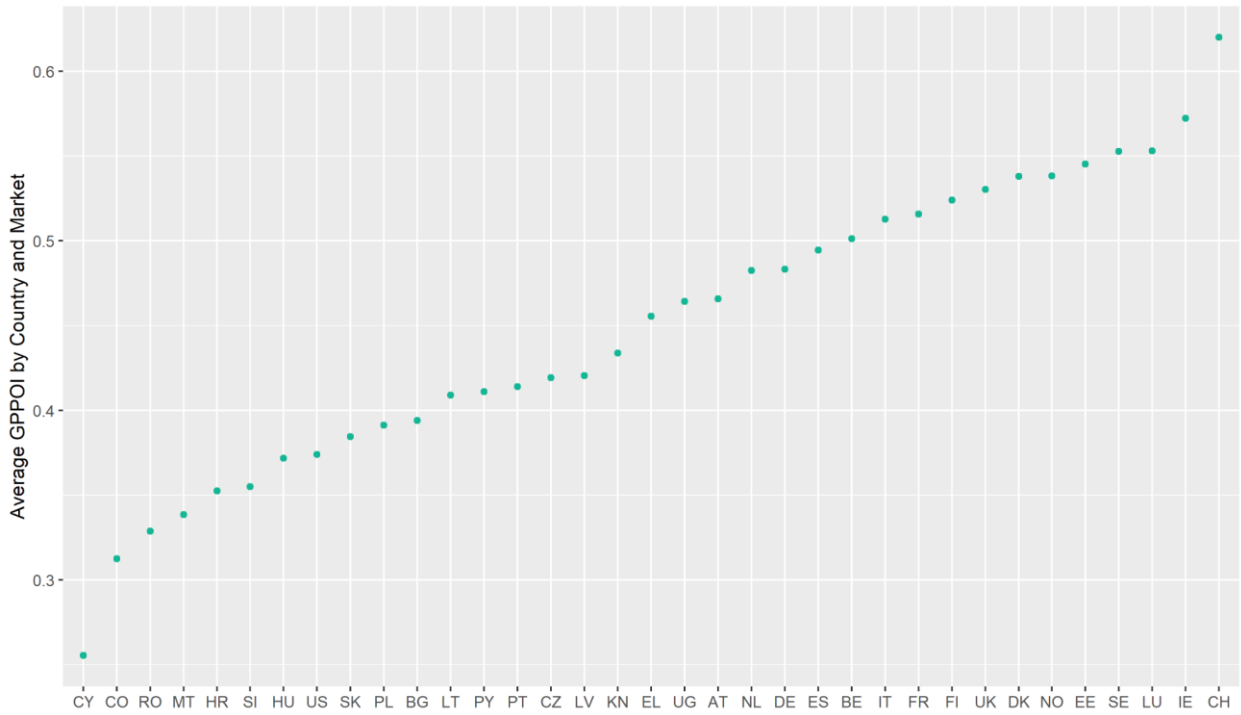
## Global Public Procurement Open Competition Index



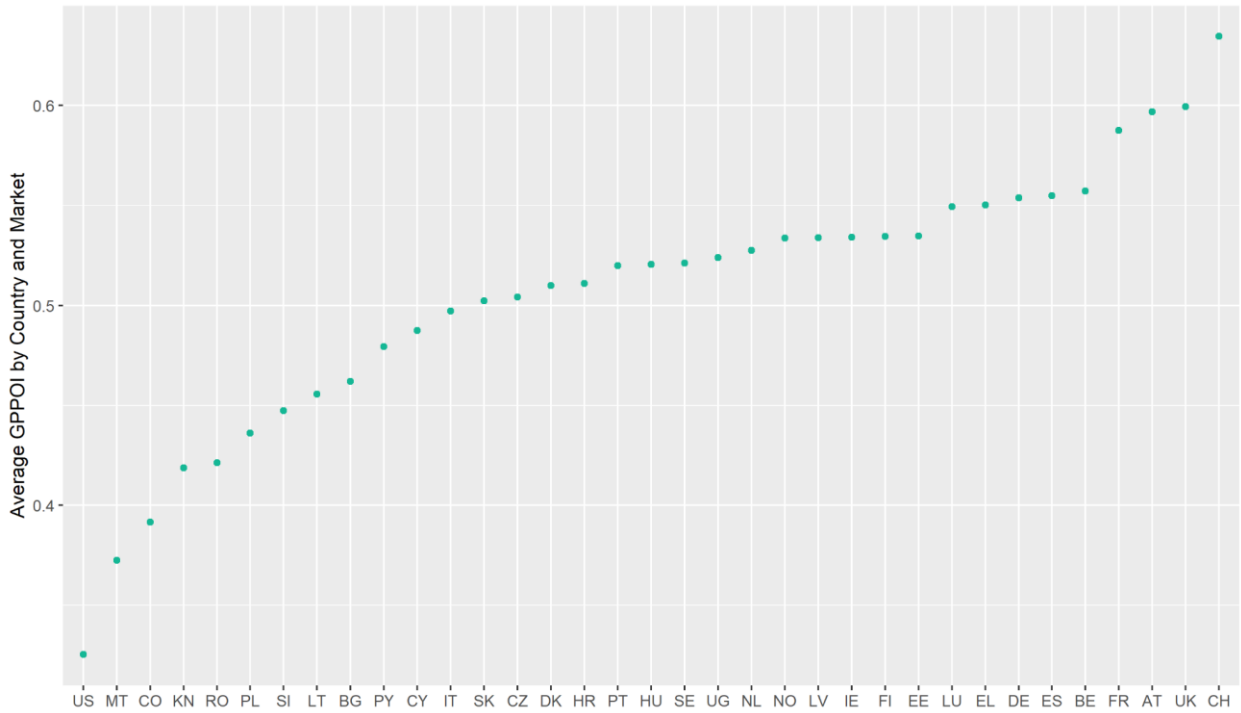


## Global Public Procurement Open Competition Index

Software programming and consultancy services



Various office equipment and supplies







**TABLE A3**

Market	2012	2013	2014	2015	2016	2017	2018
Computer equipment and supplies	0.53	0.6	0.57	0.57	0.57	0.56	0.53
Medical equipment (excl. dental eq.)	0.53	0.54	0.54	0.55	0.54	0.54	0.51
Passenger cars	0.53	0.54	0.53	0.55	0.53	0.53	0.5
Pharmaceutical products	0.51	0.54	0.53	0.53	0.51	0.53	0.49
Road construction (general)	0.61	0.64	0.62	0.63	0.59	0.59	0.55
Social work and related services	0.55	0.55	0.63	0.6	0.56	0.5	0.51
Software programming and consultancy services	0.49	0.55	0.52	0.52	0.53	0.53	0.48
Various office equipment and supplies	0.56	0.61	0.6	0.56	0.56	0.59	0.54



**TABLE A4**

Country	2012	2013	2014	2015	2016	2017	2018
AT	0.55	0.51	0.56	0.51	0.49	0.55	0.53
BE	0.56	0.6	0.56	0.55	0.57	0.47	0.56
BG	0.49	0.51	0.47	0.44	0.47	0.46	0.36
CH	0.63	0.62	0.67	0.64	0.71	0.59	0.61
CO	0.4	0.4	0.4	0.41	0.4	0.4	0.36
CY	0.32	0.44	0.36	0.34	0.36	0.29	NaN
CZ	0.45	0.51	0.5	0.49	0.43	0.48	0.42
DE	0.56	0.59	0.55	0.53	0.57	0.58	0.55
DK	0.61	0.58	0.58	0.58	0.54	0.41	0.52
EE	0.55	0.45	0.48	0.45	0.49	0.51	NA
EL	0.68	0.51	0.84	0.73	0.68	0.55	0.5
ES	0.51	0.5	0.57	0.52	0.59	0.51	0.46
FI	0.53	0.87	0.85	0.61	0.65	0.59	0.52
FR	0.62	0.66	0.65	0.67	0.58	0.56	0.53
HR	NA	0.55	0.55	0.51	0.41	0.5	0.51



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HU	0.47	0.55	0.45	0.48	0.55	0.5	0.49
IE	0.6	0.63	0.55	0.62	0.55	0.63	NA
IT	0.54	0.53	0.58	0.49	0.54	0.51	0.49
KN	NaN	NA	NaN	NaN	0.37	0.46	0.49
LT	0.38	0.4	0.4	0.42	0.37	0.53	0.54
LU	0.52	0.65	0.57	0.59	0.62	0.59	0.51
LV	0.53	0.58	0.58	0.54	0.4	0.56	0.46
MK	0.51	NA	0.39	0.56	0.43	0.47	0.53
MT	0.35	0.52	0.56	0.53	0.47	0.53	0.43
NL	0.58	0.64	0.55	0.55	0.69	0.58	0.55
NO	0.57	0.54	0.61	0.57	0.56	0.51	0.48
PL	0.49	0.54	0.52	0.51	0.51	0.53	0.47
PT	0.34	0.49	0.56	0.46	0.51	0.5	0.52
PY	NA	NaN	0.58	0.55	0.56	0.57	0.48
RO	0.42	0.45	0.43	0.43	0.39	0.43	0.38
SE	0.52	0.57	0.59	0.64	0.6	0.65	0.52
SI	0.45	0.55	0.4	0.48	0.46	0.53	0.49
SK	0.46	0.53	0.5	0.47	0.53	0.5	0.53



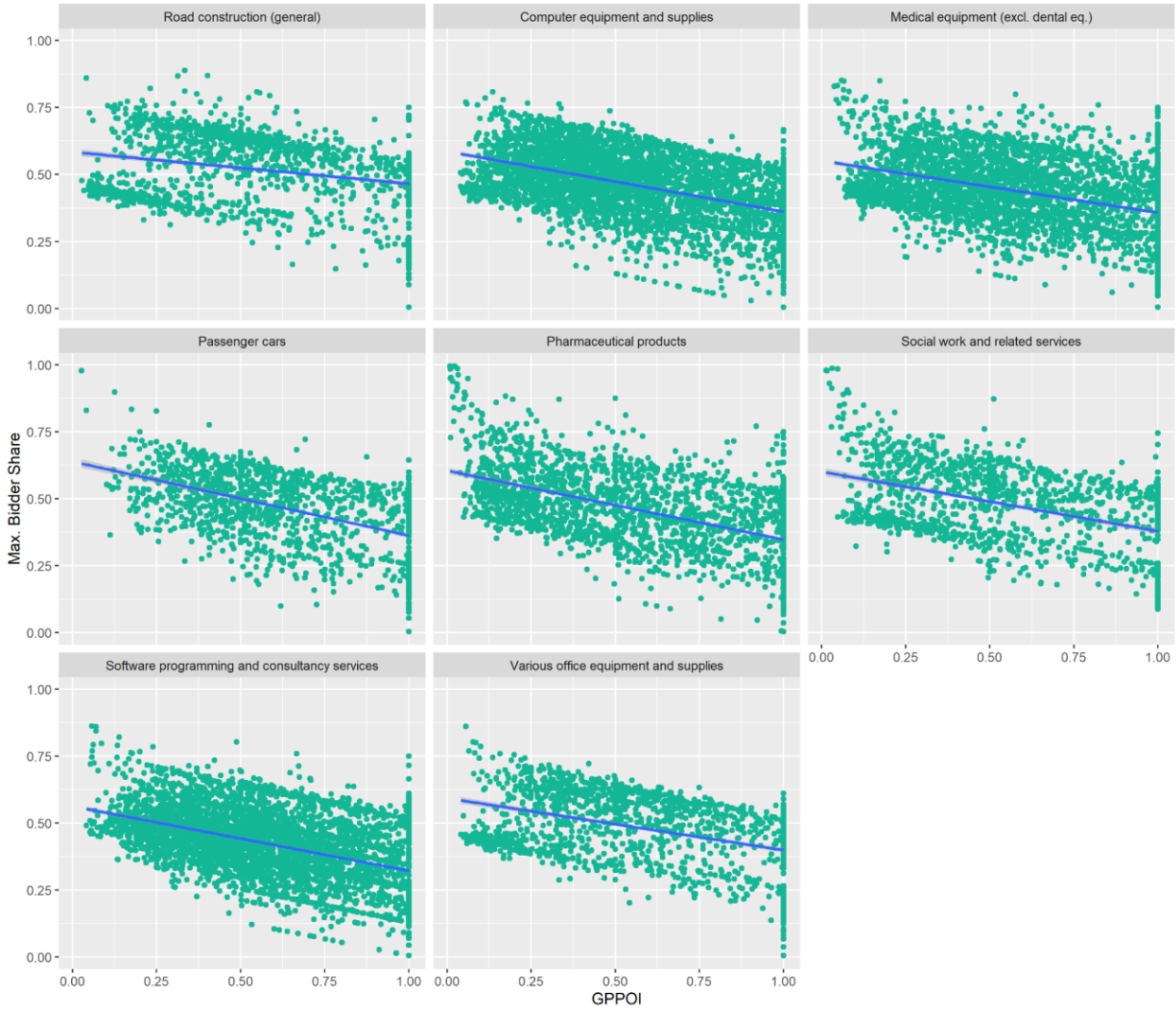
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UG	NA	NaN	NaN	NaN	0.6	0.61	0.46
UK	0.66	0.71	0.64	0.74	0.69	0.59	0.55
US	0.45	0.46	0.45	0.45	0.45	0.45	0.45

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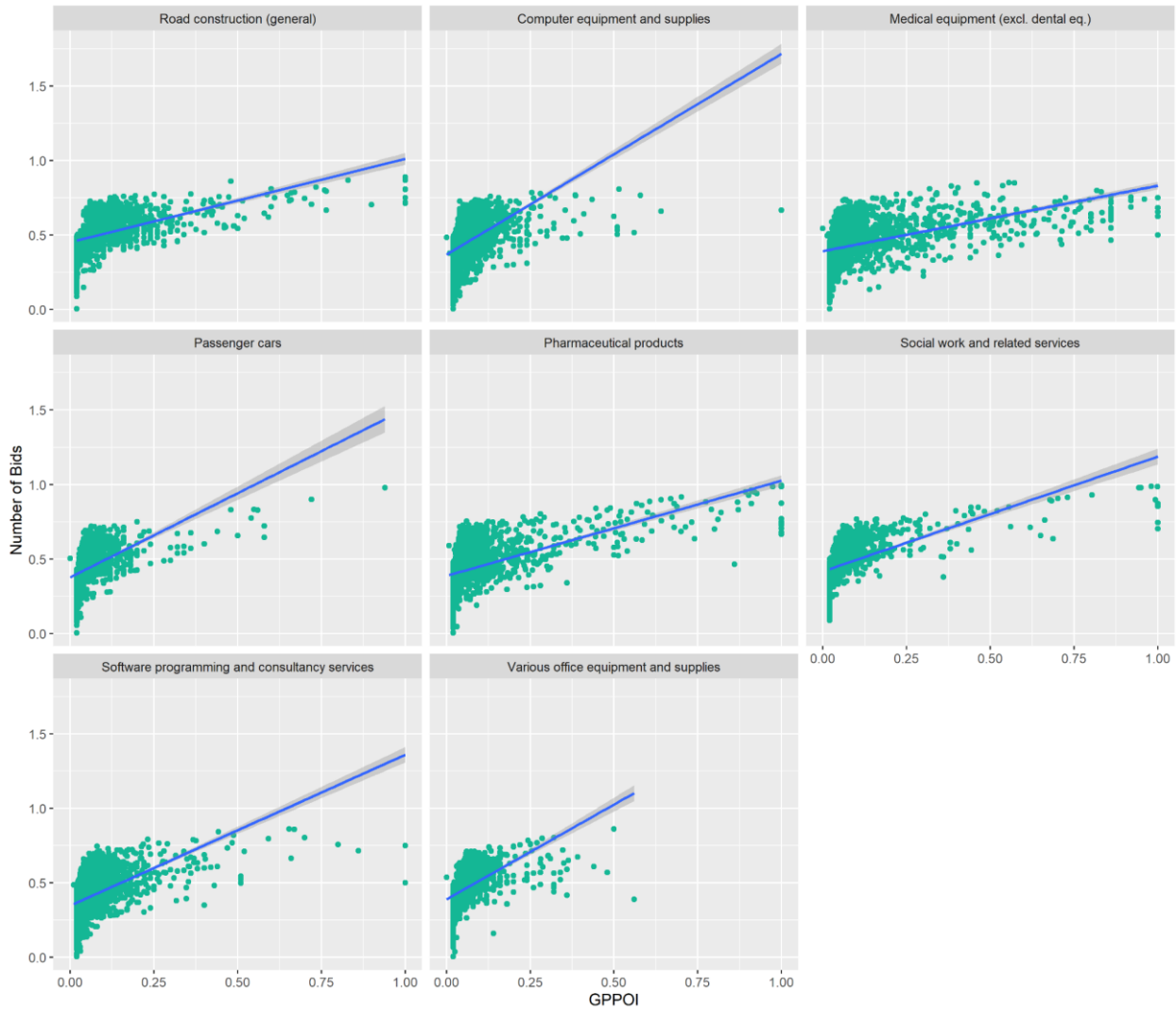


## A5: GPPOI Sub-Indicators



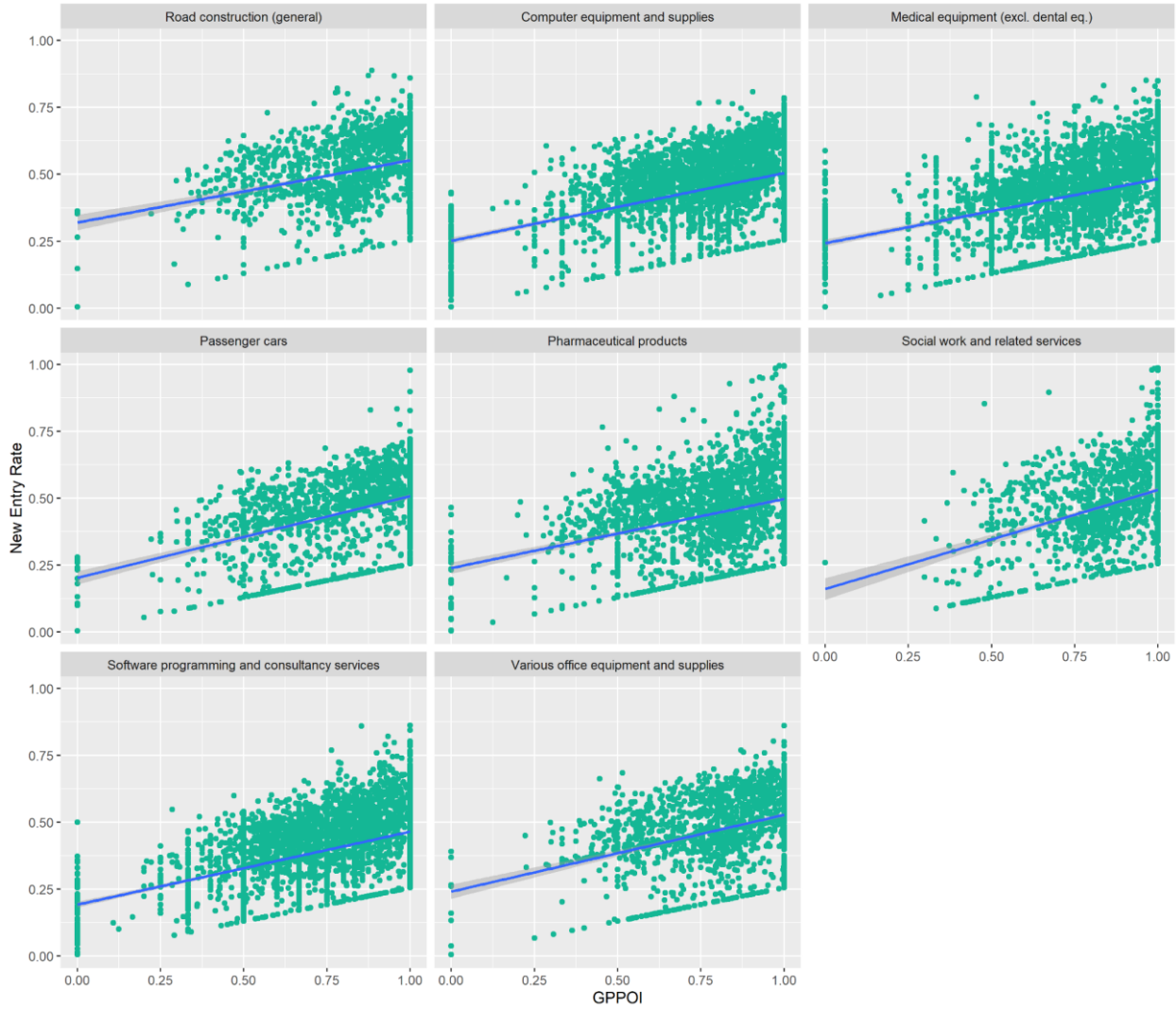


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