Foreign market access in government procurement

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Abstract

Governments are known to prefer domestic over foreign suppliers in the award of procurement contracts despite cost and quality considerations. Literature exploring this "home-bias" in public purchases has exclusively focused on the microeconomic interplay between the tendering entity and the bidding firms. There are, however, other factors that influence governments' buying decisions. Using self-assembled and hitherto unexplored data on government procurement submitted by Japan and Switzerland to the WTO, we study the determinants of foreign public procurement over the period 1990-2003. In doing so, we make a threefold contribution to this literature. One, we examine the effect of macroeconomic, political economy, procurement-specific and domestic policy factors that influence governments' sourcing decisions. Two, we provide for an empirical test of Baldwin's (1970, 1984) "neutrality proposition" after controlling for other factors. Three, we test empirically whether the WTO's Agreement on Government Procurement (GPA) has been successful in increasing foreign market access. Our results suggest the importance of the magnitude of procurement demand and of the average contract size awarded to foreign suppliers in these governments' purchases from abroad. While the impacts of domestic firm competitiveness attributes, political budget cycles and Keynesian macroeconomic compulsions depend on the econometric specification used, we find that Baldwin's "neutrality proposition" does not hold for the public purchase pattern of either country. Moreover, membership of the GPA is not found to increase the value of foreign procurement in either country, though it seems to increase the import demand for contracts.

JEL classification: F10, F13, F14, D72, H57

Key words: Government procurement, home-bias, GPA, Japan, Switzerland

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1. Introduction

It is well known that governments prefer domestic over foreign firms in the award of procurement contracts despite cost and quality considerations, giving rise to the so-called "home-bias" in public purchase decisions. Evidence in support of this home-bias has been provided in the literature - Mastanduno (1991), Hoekman and Mavroidis (1997), Trionfetti (2000), the European Commission (1997), Evenett and Shingal (2006), Shingal (2011). Literature has also evolved to explain this home-bias in public procurement - McAfee and McMillan (1989), Laffont and Tirole (1991), Rothenberg (1993), Branco (1994), Breton and Salmon (1995), Chen (1995), Vagstad (1995), Naegelen and Mougeot (1998), Weichenrieder (2001). Another branch of this literature has looked at corruption and bribery as determinants of the home-bias in public procurement - Rose-Ackerman (1975), Rose-Ackerman (1978), Burguet and Perry (2000), Burguet and Che (2004), Compte et.al. (2005). However, almost exclusively, this literature has focused on the interaction between the tendering entity and the bidding firms in a microeconomic setting of asymmetric information and contract theory.

In this paper, we depart from this line of research and consider other factors - procurement-specific, macroeconomic, political economy and domestic policy - that influence a government's propensity to source from foreign suppliers. Review of related literature and anecdotal evidence both suggest the importance of these factors, but to the best of our knowledge, this area remains un-researched in the procurement literature.

The impact of political institutions on economic policy has been extensively studied in the political budget cycles literature[2] – Rogoff and Silbert (1988), Persson and Tabellini (1990), Rogoff (1990), Alesina et.al. (1997), Diermeier and Merlo (1999), Blanchard and Wolfers (2000), Drazen (2000), Persson and Tabellini (2000), Shi and Svensson (2000), Persson (2002). This body of literature explores the implications of electoral cycles on the size and composition of government spending using signalling and moral hazard models to conclude that governments increase spending before elections to enhance their chances of re-election. In this paper, we extend this intuition to government procurement – governments are more likely

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[2] An initial review of the theoretical and empirical literature can be found in Alesina et.al. (1997).

to award contracts to domestic firms in an election period since this would improve their chances of being re-elected. This analysis is also related to recent literature that looks at the effect of political connections on the allocation of procurement contracts (Goldman et.al., 2009; Hyytinen et.al., 2009) and that studying tenure in office and public procurement (Coviello & Gagliarducci, 2010).

Similarly, the impact of macroeconomic variables, especially exchange rate stability, on trade has been studied in the literature (Helpman, 1976; Cushman, 1983; Bacchetta & van Wincoop, 2000), but not on public procurement. In this paper, we bridge this gap in research too. Governments are more likely to award contracts to domestic firms in a recession to stimulate Keynesian multiplier effects in the economy. Similarly, a currency devaluation or depreciation of the exchange rate that makes imports more expensive would also make it more cost-effective for governments to purchase from domestic firms. On the other hand, an increase in government spending at home may result in a depreciation of the real exchange (Ravn et. al., 2008). Thus, causality in this case may work both ways.

Anecdotal evidence cited in Shingal (2009) also suggests that the home-bias in procurement may be driven by a range of procurement-specific and domestic policy factors. These include the nature of the good or service[3] being procured; the value of the procurement contract[4]; the extent of domestic competition[5]; practical considerations of the tender[6]; compliance costs[7]; regulatory burden[8]; and the domestic policy environment[9].

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[3] Some goods and services are easily procurable domestically which renders the entire exercise of initiating a global tender cumbersome. On the other hand, some goods and services are too specialized for them to be available domestically, which mandates their foreign procurement. Moreover, if the structure of production is dominated by intermediate inputs, then demand is more likely to be locally-driven, giving rise to a home-bias in both consumption and trade (Hillberry & Hummels, 2002) and this may well extend to the domain of public procurement (Brenton, 2001).

[4] The contract value may not be large enough to be economically attractive to foreign suppliers or to warrant a global tender, especially in the case of goods procurement.

[5] A competitive domestic market ensures both availability of suppliers and cost minimization through competition. In some cases, however, governments may need to restrict competition to ensure contract performance (Laffont and Tirole, 1991; Rothenberg, 1993; Breton and Salmon, 1995).

[6] Would the tender documentation require translation? Is there enough time to respond to the tender? Such considerations also govern the participation decisions of foreign firms besides inflating their costs.

[7] Breton & Salmon (1995) show that the premium required to ensure contract compliance may increase with the number of potential bidders and in such situations minimizing expected procurement costs may require limiting the number of potential suppliers. Problems of asymmetric information may also induce procuring entities to choose suppliers located within their jurisdictions so as to reduce monitoring costs. Moreover, search costs of

To motivate our analysis, we consider a simple model of government procurement decision-making used in this literature to illustrate how some of these factors work to the detriment of foreign firms. We then empirically examine the importance of these factors using self-assembled and hitherto unexplored data submitted by Japan and Switzerland to the WTO over 1990-2003. In doing so, we also provide an empirical test of Baldwin's (1970, 1984) "neutrality proposition"[10] after controlling for all these other factors and also test empirically whether the WTO's Agreement on Government Procurement (GPA) has been successful in increasing foreign market access in these countries' goods procurement market. To the best of our knowledge, these are all original contributions to this literature.

The choice of countries in this paper is primarily determined by data availability. Both countries have submitted detailed procurement data sufficiently[11] regularly over 1990-2003 and in a form amenable to empirical analysis. But there are other considerations as well: both are large open economies and have large governments, federal as well as sub-federal. The average share of total government expenditure in GDP over 1990-2003 was almost 50% in Japan and 37% in Switzerland, while the average share of trade in GDP in these economies was 19.2 and 74.6%, respectively, over this time period.

Across specifications, our results suggest the importance of the magnitude of procurement demand and average contract size awarded to foreign suppliers in the public purchase patterns

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operating across complex networks of contacts in modern economies are likely to be lower within than between countries (Rauch, 1999) while the element of trust required in lowering transaction costs is likely to be higher (Fukuyama, 1995). All these factors act to the detriment of foreign firms.

[8] Cumbersome regulatory requirements can discourage a foreign firm from participating in a bid. For instance, the firm may need to be pre-registered with the domestic accreditation body before it can submit a bid. A foreign firm may also be faced with more stringent quality requirements compared to domestic firms. A study of such regulatory barriers in the EU's government procurement market can be found in Khorana and Shingal (2008). It would also be useful to remember here that services procurement depends upon the particular sector being first scheduled under the GATS; hence, there may already be a range of market access, national treatment and regulatory barriers confronting foreign suppliers in services procurement.

[9] Purchase and price preferences and product reservations followed by the importing countries systematically discriminate against foreign firms. The absence of a domestic bid challenge procedure in the importing country may also influence a foreign firm's participation decision. On the other hand, economies that are more integrated with the rest of the world are also more likely to be open to foreign procurement.

[10] In a Hecksher-Ohlin model with a home-bias in government procurement, the reduction in imports from the government is compensated by a corresponding increase in the imports of the private sector.

[11] Data is missing for Japan from 1994-1996 and for Switzerland in 1992.

of both countries. Foreign procurement is found to vary inversely with domestic firm competitiveness in Switzerland and Japan, with and without controlling for unobserved industry-specific effects, respectively. Baldwin's "neutrality proposition" does not hold true for the public purchase patterns of these countries in general but Keynesian macroeconomic factors are found to be important in Japanese and Swiss public purchases after controlling for unobserved year effects. Political budget cycles seem more important for services procurement in both countries though this result is counter-intuitive. Membership of the GPA is not found to increase foreign market access in either country, though it does seem to increase the import demand for contracts in both.

The rest of this paper is structured as follows. The next section considers a formal treatment of a government's procurement decision. Section 3 introduces the empirical model and discusses relevant estimation issues. Section 4 discusses the data used in the paper and its limitations for analysis. Section 5 conducts a preliminary analysis of the data while Section 6 describes the results from the empirical analysis. Section 7 concludes.

2. A simple model of procurement decision-making

Government procurement rules at the WTO require that only contracts above a certain threshold[12] value be subject to internationally competitive bidding (ICB). One way of discriminating against foreign firms is by splitting contracts to keep them below such thresholds.

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[12] Thresholds differ depending on the type of procurement and on the level of government making the purchase and are stated in terms of the IMF's accounting unit, the SDR. For central government entities, the threshold values are SDR 130,000 for procurement of goods and services and SDR 5 million for procurement of construction services. For sub-central government entities, the thresholds are SDR 200,000 for goods and services, (except for the United States and Canada which apply a SDR 355,000 threshold) and SDR 5 million for construction services (with the exception of Japan and the South Korea, which apply a SDR 15 million threshold). For utilities, the threshold values are SDR 400,000 for goods and services (with the exception that the United States applies a US$ 250,000 threshold for federally owned utilities) and SDR 5 million for construction services (barring Japan and Korea, which apply a threshold of SDR 15 million). Additionally, Annexes of individual signatories may specify higher thresholds for particular Contracting Parties in a bid to ensure reciprocity.

More formally, consider a government wishing to purchase a good or service whose value is given by $V(q,p)$ where q is the characteristics/quality, p is the expected payment or the price vector. Let the corruption parameter be m and the preferences to the domestic firms be s where $s \in (0,1)$. Denote the costs of the bidding process by k.

Now in the absence of corruption and preferential treatment, a procurement contract is subject to ICB if $V(q,p) > k$; this describes the threshold condition.

Allowing for corruption and preferences the threshold condition becomes
$[1-(m+s)].V(q,p) > k$

Corollary 1: If the preferential treatment is absolute i.e. $s=1$, then the contract is not subject to ICB

Corollary 2: As $m \rightarrow 1$, it is in the government's own interest to keep the contract below threshold

The other way of discriminating against foreign firms is to award fewer of the above-threshold contracts to foreign suppliers. Let the cost of producing the procured good or service for the domestic and foreign firm be $c_d(q)$ and $c_f(q)$, respectively with $c_f(.)<c_d(.)$ by assumption. Let factors increasing the cost of participation for foreign suppliers relative to domestic suppliers be denoted by $z(V(.))$.

Then, expected profit of the domestic firm, $\pi_d = p - [c_d(q) + m(V(.))]$, and expected profit of the foreign firm, $\pi_f = p - [c_f(q) + z(V(.)) + m(V(.))]$. Thus, even if $c_f(.)<c_d(.)$, $\pi_f<\pi_d$ if $z(V(.))>(c_d-c_f)$. The foreign firm may therefore decide not to participate in the bidding process itself, which is an illustration of how the home-bias works.

Similarly, the government's objective is to maximize the expected value of $[V(q,p) - p]$, which is equivalent to minimizing the expected payment as each bidder will choose the cost minimizing quality. Now, $p = f(b_d,b_f)$ where b_d, b_f are the bid prices of the domestic and

foreign firm, respectively, and $b_d = g(c_d(.))$ and $b_f = h[(c_f(.), z(V(.)))]$. Even in the absence of $z(v(.))$, McAfee & McMillan (1989) and Branco (1994) have shown that the optimal procurement policy implies that the contract be awarded to the domestic firm. With $z(V(.))>(c_d-c_f)$, minimizing expected payment would necessarily imply that the government award the contract to the domestic firm.

3. Empirical model and issues in estimation

Ideally, the empirical estimation would entail a two-stage Heckman selection model, where stage one would estimate whether (or not) a procuring entity put a contract above threshold and stage two would estimate the share of the above-threshold contracts that was awarded to foreign suppliers. Unfortunately, available government procurement data meet the requirements of stage two analysis only; data required for stage one analysis are not required by the GPA to be reported at the level of the individual goods and services.

The empirical analysis in this paper therefore models stage two only. The determinants of foreign procurement discussed in the preceding sections are the explanatory variables in this empirical model. The functional form and specification of the model are in the spirit of the standard import demand function of the following form:

$\log MD_{it} = a_0 + a_1 \log (PM_i/PD_i)_t + a_2 \log Y_{it} + U_t$,

where MD_{it} is the value of imports of country "i" at time "t", PM is the unit value of imports, PD is the domestic price level, Y is the real GNP, and U_t is an error term associated with each observation.

In our empirical model, the value of the government's foreign procurement is the dependent variable. In the absence of data on the price of individual government contracts awarded to domestic and foreign firms, competitiveness effects are proxied by domestic industry-specific variables such as output, employment, productivity and tariffs. Economy-wide income and prices effects are represented by macroeconomic variables such as economic growth,

unemployment and exchange rates. In addition, we also control for political economy factors like election cycles. The list of explanatory variables, their description and use in estimation is provided in Table 1.

<Insert Table 1 here>

We set up the data in separate panels for Japan and Switzerland to gain information from both the variation in time and that across categories of goods and services that are procured by the governments of these two countries. The dependent variable is the value of goods and services contracts awarded to foreign suppliers. The empirical model takes the following specification:

$$fpv_{it} = \alpha + \beta_1 RDN^{13}_{it} + \beta_2 y^{14}_{it} + \beta_3 apl_{it} + \beta_4 n^{15}_{it} + \beta_5 m_{it} + \beta_6 TAR^{16}_{it} + \beta_7 rog_t + \beta_8 reer^{17}_t + \beta_9 ELEC_t + \beta_{10} ELEC_{t-1} + \beta_{11} URGPA^{18}_t + \mu_{it}$$

where all lower case variables are in log levels and all economic data are expressed in real USD using the US GDP Implicit Price Deflator. *A priori,* we expect the signs of β_1, β_8 and β_{11} to be positive and β_2 through β_6, β_9 and β_{10} to be negative. Negative sign on the β_7 coefficient would suggest the absence of Keynesian macroeconomics in governments' procurement decisions.

It may be useful to point out that only industry-specific factors such as an increase in the productivity of the domestic firms would be considered as non-discriminatory reasons for governments purchasing fewer goods and services from abroad. Most of the other factors for a decline in foreign procurement would, on the other hand, suggest the presence of a home-bias.

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[13] The relative demand variable takes the value zero for 4.6% of the observations in the case of Japan and 22.8% of the observations in the case of Switzerland. We therefore do not use its log form in the estimation as doing so effectively reduces the sample size given that the log of zero is not defined.

[14] The firm-level output and employment variables are used interchangeably in the estimations.

[15] The number of firms is excluded in the estimation for Switzerland as data on this variable is available only for 20% of the observations.

[16] The simple average applied tariff is effectively zero in the case of Switzerland, so this variable is excluded while estimating the foreign procurement of Swiss goods. In the case of Japan, this variable takes the value zero in 48.4% of the observations, which is why it is not used in its log form.

[17] An increase in REER means currency appreciation and loss in competitiveness.

[18] The URGPA dummy is only used in the goods estimation. Since the coverage of services in the GPA only began with the Uruguay Round, the URGPA dummy is rendered redundant in the services estimation.

Robustness check: Number and average value of procurement contracts - Data are also available on the number of goods and services contracts that these governments purchased from foreign suppliers. The average value of a contract procured domestically and internationally can be further calculated from these data by dividing the total contract value purchased from domestic and foreign firms by the respective number of contracts. As a robustness check, therefore, we further estimate a separate pseudo-import demand function in a secondary estimation. The dependent variable in this secondary estimation is the number of goods and services contracts purchased from abroad (MDD) and in addition to the control variables used in the primary estimation, we include the average value of a contract procured domestically (PD) and internationally (PF).

$$mdd_{it} = \alpha' + \beta_1 RDV_{it} + \beta_2 y_{it} + \beta_3 apl_{it} + \beta_4 n_{it} + \beta_5 m_{it} + \beta_6 TAR_{it} + \beta_7 rog_t + \beta_8 reer_t + \beta_9 ELEC_t + \beta_{10} ELEC_{t-1} + \beta_{11} URGPA_t + \beta_{12} pd_{it} + \beta_{13} pf_{it} + \delta_{it}$$

The domestic and foreign average contract values are expected to impact, negatively and positively, respectively, on the pseudo-import demand for contracts given that a larger value contract is expected to be more attractive to a bidding firm.

The choice of estimation technique is primarily governed by the characteristics of the data at our disposal. Primarily, we found the incidence of zeroes in our dependent variable[19], which meant that using a log-linearized model would effectively truncate the size of the sample[20] and hence, bias the estimates. One way to solve this problem would be by adding a small positive constant to all zero values of the dependent variable[21], but this not only amounts to data manipulation but also biases estimates if the incidence of these zeroes is correlated with other observed or unobserved factors i.e. if there is some economic rationale for the incidence of these zeroes[22]. Another way to account for the "zero problem[23]" is to estimate a logit or probit model. However, these models are based on the dependent variables being discrete choice and

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[19] The foreign procurement value was found to be zero for 29.4% of the observations in the case of Japan and 49.4% of the observations in the case of Switzerland.
[20] This is because log of zero is not defined.
[21] Normally this is done by adding 1 to all zeroes because log(1)=0.
[22] For instance, in the context of gravity model estimations, Baldwin and Harigan (2008) have shown the export zeroes to be strongly correlated with distance and size of the importing country.
[23] Helpman et. al (2008).

not continuous as in our case. Moreover, the explanatory power of the model was found to be reduced considerably in a logit or probit estimation[24]. Additionally, the coefficients from logit and probit estimations cannot be interpreted as elasticities. In view of all these issues, we therefore decided to use the simple Poisson Pseudo-Maximum Likelihood (PPML) (Silva & Tenreyro, 2006; Siliverstovs & Schumacher, 2007), which retains the dependent variable in levels (and hence solves for the log-linearization induced issues with the incidence of zeroes in the dependent variable), with the estimated coefficients still being interpretable as elasticities. Moreover, we also found the data in our sample to be heteroskedastic for both countries, because of which a standard log-linearized model would yield inconsistent estimates.[25] The PPML thus accounts for this as well.

4. Data availability and limitations

Statistics submitted by the GPA signatories to the WTO Secretariat are the primary source of data on government procurement. Article XIX: 5 of the GPA requires that Contracting Parties submit procurement-related data to the Committee on Government Procurement. Unfortunately, only half of the 40 Contracting Parties (Canada, the EC, Hong Kong, Japan, Norway and the United States) have submitted these data regularly since the Uruguay Round, especially over 1997-2007[26]. Moreover, these submissions have been made electronically only since the Uruguay Round, which meant that the database for analysis in this paper before the year 1996 was assembled manually.

Even amongst the countries that have submitted these data, there are significant differences, both in terms of what is included and how it is included[27], and the need for consistency, has

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[24] Across specifications, the coefficient of determination was reduced to 20-49% for Japan and 42-56% for Switzerland, even after controlling for year and category effects.

[25] "This is because the expected value of the logarithm of a random variable depends on higher-order moments of its distribution. Therefore, if the errors are heteroskedastic, the transformed errors will be generally correlated with the covariates." (Silva & Tenreyro, 2006). Note however that this only renders the estimates inconsistent but not biased.

[26] Switzerland has not provided data beyond 2003. A snapshot of country procurement submissions is available in Shingal (2011).

[27] For instance, Norway and the US employ a different classification system compared to the EC, Japan and Switzerland which makes it impossible to analyze data at the level of the disaggregated good or service before the

thus determined the choice of sample countries for the analysis that follows. For both Japan and Switzerland, we consider all goods and services, including construction, included by them in Annexes 1, 4 and 5 of Appendix 1 of the GPA; the list is provided in Annex Tables A1-A3 of this paper.

Industry-specific data on goods purchased by these two governments are taken from three different sources. Data on goods output, employment and number of firms in Japan are sourced from OECD STAN (various years) and Nicita & Olarreaga (2006) for the period 1990-93 and from UNIDO (2010) 1994 onwards. Data on goods output in Switzerland are taken from Nicita & Olarreaga (2006) for the period 1991-96 and from UNIDO (2010) and OECD STAN (various years) for the period 1997-2003. Data on goods employment in Switzerland are taken from UNIDO (2010) and OECD STAN (various years) and that on the number of firms from UNIDO (2010). The last were available only for the period 1997-2003 and that too were rather scant; the variable was therefore excluded from analysis.

Industry-specific goods trade data on Japan are taken from OECD STAN (various years) and those on tariffs from Nicita & Olarreaga (2006). Swiss trade data are taken from OECD STAN (various years) and Nicita & Olarreaga (2006). Swiss tariffs on the goods included in our analysis are zero. Data on sector-specific services output and employment for the two countries are taken from OECD STAN (various years) and those on trade from OECD Trade in Services by Service Category (various years).

Data availability imposed significant constraints on our analysis, since we needed industry-specific information on output, employment and trade for the two countries for the same categories of goods and services over 1990-2003 and then needed to map this information with that on foreign procurement. To begin with, there were definitional issues for both goods and services, which assumed importance as we needed to achieve consistency across different classification systems used in the data sources[28]. Then in some cases, industry-specific output,

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year 2008. Canada too uses a different classification system for services and provides no information on suppliers, so the amount of foreign procurement in services cannot be calculated. Hong Kong's submissions until the year 2008 can only be accessed via the WTO Members' website.
[28] The concordances used in this paper are provided in Annex Tables A1-A3.

employment and trade data were not available at the level of the individual goods categories that these two governments purchased, which meant that data needed to be aggregated into broader categories to enable meaningful analysis. This was especially true of categories 11-13 and 22-26 for both countries. In some of these cases, however, more disaggregated data were available for exports but not for output or employment (and vice versa); thus, wherever possible, the aggregated data for output and employment were disaggregated using the export data (and vice versa).

Despite all these efforts, a few goods categories in both countries still had industry-specific output, employment, trade and tariff data missing. For instance, there were no data on output, employment, number of firms or trade for categories 2 and 21 amongst the goods that the Japanese procured; tariff data were unavailable for categories 2, 4, 14-15 and 21 over 1990-96 and for categories 2, 4, 14-15 and 21-22, 1997 onwards. In the case of Switzerland, goods-specific data on output and employment were unavailable for categories 2, 4, 10, 14-15 and 17-26 over 1990-96; for categories 2, 4, 10, and 18-21 for the year 1997; and for categories 2-4, 9-10 and 18-21 over 1998-2003. Trade data were missing for categories 2 and 21 across this entire time period.

As in the case of goods, sector-specific data on output, employment and trade were not available for all services categories. In this case too, the individual services categories were aggregated into broader categories[29] to enable meaningful analysis. Even then, the absence of trade data for Swiss construction and computer-related services over the sample period meant that the effective sample size was further truncated in the case of Switzerland. This also led to relatively few services observations in the sample for both countries, due to which results from the empirical analysis that follows for services alone are more suggestive than conclusive.

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[29] This yielded seven broad services sectors for Japan [construction (41), maintenance & repair (51-52), OBS (42, 72-73, 75-77), transportation (53-57), communication (58, 61-65), computer-related (66-67, 71) and sewage & sanitation (78)] and six for Switzerland [construction, OBS (1, 8-18), financial (6), transportation (2-4), communication (5) and computer-related (7)].

5. Data description and preliminary diagnosis

The diversity in the availability of data can be seen in Annex Table A4 that shows the mean value for the sample variables, along with their minimum, maximum and the standard deviation, for both Japan and Switzerland. Procurement data is reported in the country submissions in terms of Special Drawing Rights, which is the IMF's accounting unit. These values have thus first been converted to USD using exchange rates from the IMF's International Financial Statistics (various years). All economic data are reported in real terms using the US GDP implicit price deflator. As this table shows, there is lot of diversity in the availability of data on the variables used in the model, leading to several missing values, especially for industry-specific variables. We are thus left with unbalanced panels for both Japan and Switzerland.

Preceding the empirical analysis, we present a snapshot of the procurement data submitted by Japan and Switzerland in Tables 2 and 3, respectively. Each table shows the value and number of contracts that these governments awarded above threshold (AT) in their "covered" goods and services categories and the share therein that was sourced from foreign suppliers (FP) averaged over 1990-91, 1997-98 and 2002-03. The last row of each table shows the proportion of total procurement by value that was put above-threshold and hence, subject to ICB.

<Insert Tables 2 and 3 here>

Looking first at Japanese public purchases, we see that the value of AT goods procurement almost tripled from USD 3.3 bn in 1990-91 to USD 9.3 bn in 1997-98 before falling sharply to USD 5.4 bn in 2002-03. The share of FP in this was virtually stagnant at 14% in the first two periods before falling by one percentage point in 2002-03. The average number of AT goods contracts over 1990-2003 increased from 7576.5 to 9634 before falling to 7628 but the share of FP in this was higher at 26% in the first two periods before falling to 23.2% in 2002-03. This suggests that more non-large value contracts were awarded to foreign suppliers. Within goods, the majority of Japanese public purchases were concentrated in categories 4, 6, 14-17, 22, 24 and 26; procurement in these accounted for 84.3% of AT goods procurement by value

and 59.7% by number, but fewer of these purchases were made from foreign firms - the average share of FP across these categories was 15% by value and 15.5% by number (averaged over the three time periods).

Japanese AT services procurement was much larger in value, but this too fell sharply from USD 14.8 bn to USD 11.1 bn over 1997-98/2002-03. On the other hand, the number of services contracts awarded AT increased by nearly one-third from 2180.5 to 3007.5, which suggests that the average value of a services contract went up considerably over this period. However, the share of FP in services was very low both in terms of contract value (1.2% on average over 1997-98/2002-03) and number (3.3% on average over the same period). The majority of Japanese public purchases in services were concentrated in construction and computer-related services (categories 41 and 71, respectively); procurement in these accounted for 95% of AT services procurement by value and 62.3% by number but again, the average share of FP across these services was low - 3.7% by value and 3.8% by number (averaged over 1997-98/2002-03).

On the whole, total AT goods and services procurement by the Japanese as well as FP therein declined over 1997-8/2002-3 both in terms of value and number of contracts. Moreover, the share of total procurement that was subject to ICB fell progressively from 42.9% in 1990-91 to 36.2% in 1997-98 and 32.2% in 2002-03. Both these findings, *prima facie,* suggest a decline in foreign access to the Japanese government procurement market.

In the case of Switzerland, the value of AT goods procurement declined progressively from USD 284 mn in 1990-91 to USD 233.2 mn in 1996-97 and USD 212.3 mn in 2002-03. The share of FP in this fell sharply from 70.9% in 1990-91 to 37.5% in 1996-97 before rising to 52.3% in 2002-03. The number of AT goods contracts over 1990-2003 more than doubled from 406 to 940 though there was a dip in this number 1996-97; the share of FP in these was higher at 62.8% (averaged over the three time periods). These results suggest that the average value of a Swiss goods contract fell progressively over time but this average contract size did not seem to influence the government's choice of supplier. Within goods, the majority of the purchases were concentrated in categories 1, 14 and 17; procurement in these accounted for

56.3% of AT goods procurement by value and 38.6% by number and the average share of FP across these categories was also high at 63.2% by value and 62.5% by number (averaged over the three time periods).

Swiss AT services procurement (excluding that in construction) rose by nearly a fourth from USD 204.4 mn to USD 254.5 mn over 1996-7/2002-3 (the corresponding increase in the average number of contracts was from 234 to 321.5), while procurement of construction services witnessed a more than five-fold increase in value from USD 16.5 mn to USD 89 mn (number of construction services contracts increased three-fold). Within non-construction services, the share of FP increased from 5.2 to 27.6% by value and 5.6 to 18.5% by number over this period, while construction services moved from a 23.3% FP share in 1996-97 to 100% domestic sourcing in 2002-03. Technical, scientific and consulting services (category 14), computer-related (category 7), and construction and repair services (category 1) dominated Swiss services procurement during this period, accounting for 69.3% of all services contracts by value and 65.8% by number, but fewer of these services were purchased from foreign firms - the average share of FP across these services was lower at 9.7% by value and 9.2% by number (averaged over 1996-97/2002-03).

Put together, while the number and value of total goods and services contracts awarded by the Swiss AT and the share of FP therein increased over 1996-7/2002-3, the share of total procurement itself that was subject to ICB fell sharply from 41.7% in 1990-91 to 27.7% in 2002-03, which also suggests that more of services were procured below-threshold.

Finally, comparing the evolution of these procurement metrics over 1990-2003 with that of the other sample variables in Table 4, we find that the marginal increase in the share of FP in AT procurement of goods and services by value in both countries was accompanied by a considerable rise in the labour productivity of the domestic firms (from USD 156,000 to USD 197,000 in Japan and from USD 100,000 to USD 224,000 in Switzerland) and a significant fall in the number of domestic firms (20% in Japan and 38% in Switzerland). At the same time, the annual rate of economic growth fell sharply in both countries, the unemployment rate went up considerably and the REER also appreciated by 6% over 1990-2003. This preliminary

diagnosis suggests that these governments' sourcing decisions were driven as much by domestic firm-specific factors as by classic Keynesian macroeconomic compulsions.

<Insert Table 4 here>

6. Results from empirical analysis

The results from the primary estimation carried on Japanese data are reported in Table 5 and those on Swiss data in Table 6. In each of these tables, columns I-IV report results for goods and services together, columns V-VIII report results for only goods and columns IX-X for only services. In each case, we begin by estimating the empirical model without controlling for any effects and then progressively control for year effects, category effects and finally, both year and category effects. By including year effects in the estimation, we control for time-dependent unobservable factors in each procurement year that may have a bearing on foreign procurement but which are not accounted for by the macroeconomic and political economy variables already included in the estimation. Similarly, with category effects, we control for time-invariant industry- and service sector-specific unobservables that may have an impact on foreign procurement but which are not accounted for by the set of industry- and sector-specific variables already included in the estimating equations.

<Insert Tables 5 and 6 here>

Across specifications, our results suggest the importance of the magnitude of procurement demand in explaining foreign public procurement of goods in both countries and of Japanese services procurement. The associated elasticities[30] range from 0.12 in the case of Japanese goods and services procurement to 0.6 for Swiss goods and services procurement. In each case, these elasticities are halved in magnitude (and even more in the case of services alone) when the estimating equations control for category-effects, thereby suggesting that not controlling for sector- and industry-specific unobservables biases these results upwards. Thus,

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[30] These are obtained by multiplying the respective coefficient values by the mean sample value of the relative demand variable.

unobservables such as the price, quality or even the nature of the good/service being procured seem to explain some of the variation in foreign procurement value that was earlier explained by the relative demand variable, which is what anecdotal evidence (Shingal, 2009) suggests. Foreign procurement of Swiss services alone, however, reports a negative impact of relative contract demand, a counter-intuitive result which is also found to be statistically insignificant.

Japanese foreign procurement of goods and services varies inversely with domestic firm attributes of employment, labour productivity and number of firms in the absence of category effects. However, once these effects are included in estimation[31], foreign procurement of goods moves in the same direction as industry-specific employment and labour productivity, a result that goes against our model's predictions. This seems to suggest a strong correlation between industry-specific unobservables and the employment and labour productivity variables that are explicitly included in our estimation. In the case of Switzerland, on the other hand, foreign procurement of goods alone and goods and services together varies directly with output across specifications and with labour productivity in the absence of category effects, which again is a counter-intuitive result. Thus, despite rising domestic firm productivity, the Swiss government continued to purchase from foreign firms, which either suggests that the rising productivity did not translate into lower procurement costs for the government or that the quality or nature of good/service to be procured determined the choice of the government. As it turns out, the latter does seem to explain this result because once category effects are included in estimation,[32] our labour productivity variable has a negative impact on foreign procurement. Swiss services alone, on the other hand, report a negative relationship between foreign procurement and labour productivity of domestic firms, and a positive relationship between foreign procurement and output across specifications, thereby suggesting that these relationships may be more robust for Swiss services. The elasticities are also much larger in magnitude in this case.

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[31] The category effects themselves turn up to be positive (and statistically significant for 21 goods and services categories) in the case of Japan.
[32] These category effects are negative in the case of Switzerland and statistically significant for 10 goods and services categories.

Public and private sector imports are not found to be substitutes in the case of Japanese and Swiss goods, Swiss services or Japanese and Swiss goods and services in the absence of category effects. In the case of Switzerland, the result becomes statistically insignificant once we control for category-effects. However, Japanese goods (after controlling for year- and category-effects) and Japanese services alone, with and without year-effects, seem to satisfy Baldwin's neutrality proposition.

The annual rate of economic growth is generally statistically insignificant as a determinant of Japanese foreign procurement, except when both year and category effects are included in estimation. In that case, the elasticity of this variable is 0.3 for goods and services and 0.9 for services alone. In the case of Switzerland, the economy's annual growth rate has a positive impact on the foreign procurement of goods and services and goods alone after controlling for year-effects, but this impact becomes negative, once both year- and category-effects are included in estimation. Thus, time-dependent unobservables seem to render the procurement patterns of these countries responsive to Keynesian macroeconomic compulsions. Procurement of Swiss services, on the other hand, seems strongly influenced by Keynesian macroeconomic compulsions across specifications and the elasticities are also larger in magnitude than for Japan.

Foreign procurement of Japanese goods responds positively to an appreciation of the REER; this result becomes counter-intuitive with category- and year-effects included in the estimation. The impact of the REER variable is otherwise statistically insignificant in almost all other specifications, except in the case of Japanese goods and services after controlling for category effects, where the result is as expected. In the case of Swiss goods and goods and services together, the impact of REER on foreign procurement is positive only with year-effects included in estimation; otherwise the impact of this variable is negative. Procurement of Swiss services seems strongly influenced by REER appreciation across specifications. Once again, these elasticities are larger in magnitude for Switzerland than for Japan, which suggests that foreign procurement in Switzerland is more responsive to fluctuations in macroeconomic fundamentals.

The electoral cycle seems to have a negative impact on Japanese foreign procurement patterns, though this result lacks statistical significance in some specifications. Japanese services foreign procurement, however, seems to respond positively to the electoral cycles, with and without year effects, though this result too is weakly significant. In the case of Switzerland, the impact of the political budget cycle on public procurement seems more evident in the year preceding the election year, once year-effects are controlled for. In the absence of these effects, however, the impact is positive. Procurement of Swiss services, on the other hand, seems to respond strongly to electoral cycles; foreign procurement always goes up in an election year irrespective of the econometric specification, which is counter-intuitive. Thus both Japanese and Swiss governments seem to tend to purchase more of their required services from foreign suppliers during elections, which is hard to explain unless we attribute this to the purchase of specialized services from foreign firms for use during elections. Our data show, for instance, that the Japanese government purchased more computer-related services from foreign firms during election periods. However, given the rather small number of services observations in both countries, this result may just need to be discounted.

The coefficient on the URGPA dummy is statistically insignificant across most specifications in the case of Japan, which suggests that the disciplining mechanisms of the GPA may not have led to greater foreign access to the Japanese goods procurement market. In the case of Switzerland, our results suggest that the URGPA may have actually had a negative impact on goods procurement once year-effects were included in estimation. Thus after stripping out the variation created by traditional macroeconomic variables (economic growth, exchange rates, etc.) and by several proxies for the ability of firms to win state contracts at home, we do not find a statistically significant positive estimate of the effect of the URGPA for either country in any specification.

As a robustness check, we also report results from estimating our secondary model which has the number of contracts purchased from foreign firms as the dependent variable. Table 7 reports these results for Japan and Table 8 for Switzerland. The results from this estimation confirm the findings from the primary estimation with respect to the importance of the magnitude of procurement demand, the mixed relationship with domestic firm-level attributes,

the non-applicability of Baldwin's ineffectiveness proposition, the responsiveness to macroeconomic fundamentals and the role of the political budget cycles.

<Insert Tables 7 and 8 here>

The biggest turnaround in these results, however, emerges in the coefficients on the URGPA dummy. Unlike in the primary estimation, the GPA seems to foster import demand for Japanese goods contracts (with and without year effects) and that for Swiss goods contracts in the absence of any effects. This result, coupled with the opposite finding from the primary estimation of foreign procurement value, suggests that the disciplining mechanisms of the GPA may have been more successful in increasing import demand for those goods contracts where the average contract value was not large.

Finally, looking at the impact of average contract value on the import demand for contracts, we find that across specifications, the average value of a contract awarded to a domestic firm has a negative impact on the import demand for Japanese goods and services and Swiss services contracts, which is an expected outcome. The average value of a contract awarded to a foreign firm has a positive impact on Japanese government import demand but a negative impact on government import demand in the case of Switzerland. The latter result is counter-intuitive and seems to suggest that foreign firms may be in the market for Swiss goods and services procurement irrespective of average contract value.

7. Conclusion

In this paper, we bridge a gap in research by analyzing procurement data submitted by Japan and Switzerland to the WTO over the period 1990-2003 for the effect of macroeconomic, political economy, procurement-specific and domestic policy factors that may have influenced these governments' sourcing decisions from abroad. To the best of our knowledge, this is also the first empirical test of the effectiveness of the GPA in increasing market access for foreign suppliers and of Baldwin's (1970, 1984) "neutrality proposition."

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Our first major conclusion is that the most important factors that have a bearing on governments' sourcing decisions are those related to domestic firm attributes and the size of the procurement contract. Thus, rising labour productivity and related domestic firm attributes seem to have made Japanese firms more competitive than their foreign counterparts in that country's procurement market. In the case of Switzerland, on the other hand, this result is specific to the good or service being procured; moreover macroeconomic fundamentals seem more important in determining the choice of suppliers by Swiss governments over time. These results also suggest that Swiss public purchase patterns may have been discriminatory towards foreign suppliers during these years. On the other hand, Japanese governments have tended to award larger-value contracts to foreign suppliers, a result that also supports anecdotal evidence in general.

The finding that public and private sector imports are not substitutes seems to suggest that these governments' domestic procurement requirement exceeds the undistorted free trade level of domestic production, but the impact of time- and industry-specific unobservable factors reverses the result for Japanese public purchases. These unobservables also lead to an increase in foreign procurement of goods and services following appreciations of the REER in both countries. We also find that year effects make Swiss governments purchase less from foreign firms in the year preceding the election year; they also render the procurement patterns of both governments responsive to Keynesian macroeconomic compulsions. Thus, unobserved factors related to the good/ service being procured and/or to time significantly alter our empirical results; this underlines the importance of controlling for these factors in such estimations.

Finally, though the GPA requires that contracts above a certain minimum threshold value be subject to internationally competitive bidding, this does not always ensure that high value contracts are awarded to foreign suppliers, even if the latter were more efficient, which underlines the scope for plugging this loophole in possible reform of this agreement.

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Table 1: Explanatory variables, their description and purpose in estimation

Variable Name	Description	Variable type, control for:	Data Source
RDN_{it}	Number of above-threshold contracts in sector i as a proportion of total above-threshold contracts	Procurement specific, Relative demand in primary estimation	WTO (various years)
RDV_{it}	Value of above-threshold procurement in sector i as a proportion of total above-threshold procurement value	Procurement specific, Relative demand in secondary estimation	WTO (various years)
L_{it}	Number of employees	Industry specific, Competitiveness	Nicita & Olarreaga (2006) and UNIDO (2010) for goods data. OECD STAN (various years) for services data.
Y_{it}	Gross output	Industry specific, Competitiveness	
APL_{it}	Output per employee (average productivity of labour)	Industry specific, Competitiveness	
N_{it}	Number of firms	Industry specific, Competitiveness	Nicita & Olarreaga (2006) and UNIDO (2010) for goods data. Data not available for services.
M_{it}	Private sector imports	Industry specific, Baldwin's (1970, 1984) "neutrality proposition"	Nicita & Olarreaga (2006) and OECD STAN (various years) for goods. OECD Trade in Services (various years) for services.
TAR_{it}	Simple average applied tariffs	Industry specific, Openness	Nicita & Olarreaga (2006)
ROG_t	Annual rate of growth of GDP (%)	Macroeconomic	World Bank, WDI (various years)
$UNEMP_t$	Unemployment as a share of total labour force (%)	Macroeconomic	World Bank, WDI (various years)
$REER_t$	Real Effective Exchange Rate	Macroeconomic	IMF, IFS (various years)
$ELEC_t$ (dummy)	Election year (Japanese House of Representatives & Swiss Parliament)	Political economy	Country websites
$ELEC_{t-1}$ (dummy)	Year preceding the election year as defined above	Political economy	Country websites
$URGPA_t$ (dummy)	Uruguay Round Agreement on Government Procurement	The WTO's GPA	WTO

Table 2: A snapshot of Japanese government procurement (1990-2003)

(Value data in real USD mn) Procurement categories	~~~~~~~1990-91~~~~~~~ AT Value	Share of FP(%)	AT Number	Share of FP(%)	~~~~~~~1997-98~~~~~~~ AT Value	Share of FP(%)	AT Number	Share of FP(%)	~~~~~~~2002-03~~~~~~~ AT Value	Share of FP(%)	AT Number	Share of FP(%)
1	0.0	np	0.0	np	2.1	9.4	4.5	33.3	0.8	100.0	0.5	100.0
2	80.8	100.0	607.5	100.0	140.8	95.3	577.5	98.3	82.8	95.1	467.5	98.0
3	10.8	7.6	99.0	5.6	35.1	54.7	55.5	20.7	14.5	4.1	59.5	5.9
4	187.3	39.6	2649.5	27.2	236.6	28.8	1411.0	26.5	207.9	36.9	1255.5	33.7
5	19.8	0.0	40.5	0.0	31.5	0.5	45.5	1.1	12.1	1.1	27.5	1.8
6	246.1	6.7	231.5	11.7	247.4	0.5	290.0	0.9	147.5	0.0	301.5	0.0
7	88.7	1.4	266.0	1.1	131.1	3.1	91.0	3.8	76.2	0.0	98.5	0.0
8	2.0	4.9	22.0	2.3	12.8	0.0	7.5	0.0	1.2	0.0	2.0	0.0
9	115.9	0.2	109.0	1.4	51.3	1.5	64.0	2.3	14.6	0.0	27.5	0.0
10	129.6	7.0	170.0	8.5	109.8	3.5	99.0	5.1	27.6	1.6	52.0	1.9
11	69.9	3.4	141.5	2.1	44.6	4.5	36.0	2.8	70.9	7.7	36.0	8.3
12	41.6	17.2	91.5	4.9	113.9	6.0	85.0	10.0	44.9	4.2	59.0	6.8
13	69.0	16.3	286.0	3.0	136.7	0.7	165.5	1.5	35.4	21.5	131.5	3.4
14	882.4	9.9	394.0	14.2	4324.9	9.0	956.5	11.6	2488.2	5.8	873.0	6.1
15	410.9	1.0	343.5	3.3	1140.9	4.2	514.5	5.6	581.7	4.1	416.0	6.6
16	101.2	7.4	172.0	4.7	261.3	4.5	162.5	9.8	179.3	19.8	203.0	15.8
17	109.4	2.8	251.0	3.6	318.4	1.2	283.0	1.1	235.4	0.6	350.0	1.0
18	52.4	46.5	21.0	21.4	0.1	0.0	0.5	0.0	0.1	0.0	0.5	0.0
19	41.5	23.2	41.0	52.4	75.3	82.2	30.0	86.7	26.3	75.5	24.0	66.7
20	15.1	1.8	22.5	2.2	71.1	0.0	14.0	0.0	65.9	0.7	22.0	2.3
21	0.1	0.0	0.5	0.0	0.9	0.0	4.0	0.0	2.3	0.0	8.5	0.0
22	219.8	34.9	374.0	26.5	712.8	46.1	666.0	38.8	372.0	48.8	447.0	35.7
23	6.5	0.0	33.0	0.0	61.1	0.2	146.0	0.3	39.4	1.6	107.5	0.9
24	237.6	15.2	339.5	24.2	812.8	24.3	770.5	33.0	479.3	26.8	516.0	36.8
25	41.4	19.2	758.0	36.5	123.1	31.5	2960.0	29.1	83.1	8.7	1893.5	18.7
26	95.8	10.4	112.5	15.6	176.0	10.8	194.5	12.1	158.1	4.7	248.5	13.3
All goods	**3275.8**	**14.4**	**7576.5**	**26.2**	**9372.3**	**14.3**	**9634.0**	**26.6**	**5447.4**	**13.3**	**7628.0**	**23.2**
41					12430.3	0.4	552.5	0.5	8638.4	0.0	559.0	0.1
42					106.2	0.0	14.5	0.0	82.0	0.0	53.0	0.0
51					0.2	0.0	0.5	0.0	60.8	0.0	6.0	0.0
52					0.2	0.0	0.5	0.0	0.0	np	0.0	np
53					26.0	0.0	34.0	0.0	37.9	0.0	54.5	0.0
54					19.8	0.0	14.0	0.0	8.9	0.0	7.0	0.0
55					0.0	np	0.0	np	0.0	np	0.0	np
56					1.0	0.0	2.0	0.0	11.4	6.4	14.5	6.9
57					6.2	0.0	8.0	0.0	19.4	0.0	26.5	0.0
58					0.0	np	0.0	np	0.0	np	0.0	np
61					0.0	np	0.0	np	1.7	0.0	3.5	0.0
62					0.0	np	0.0	np	0.4	0.0	1.0	0.0
63					5.8	22.2	10.0	20.0	9.3	10.2	20.0	20.0
64					0.3	0.0	0.5	0.0	0.3	0.0	0.5	0.0
65					0.7	0.0	2.0	0.0	1.3	0.0	5.0	0.0
66					0.0	np	0.0	np	0.0	np	0.0	np
67					8.5	9.8	7.5	6.7	41.6	9.5	33.0	6.1
71					1811.0	8.1	766.0	8.5	1797.7	6.3	1370.5	6.1
72					1.5	0.0	3.5	0.0	9.9	3.5	13.5	7.4
73					135.7	0.3	220.0	1.1	104.5	1.2	136.5	1.1
74					24.3	0.0	29.0	0.0	17.1	0.0	79.0	0.0
75					135.3	0.0	261.0	0.0	108.4	0.0	335.0	0.0
76					26.2	0.0	60.0	0.0	45.4	0.0	108.0	0.0
77					102.6	2.2	148.5	1.3	60.1	4.6	114.0	2.2
78					13.0	0.0	46.5	0.0	20.3	0.0	67.5	0.0
All services					**14854.8**	**1.3**	**2180.5**	**3.4**	**11076.9**	**1.1**	**3007.5**	**3.2**
Total AT procurement	**3275.8**	**14.4**	**7576.5**	**26.2**	**24227.1**	**6.3**	**11814.5**	**22.3**	**16524.3**	**5.2**	**10635.5**	**17.5**
Total procurement	**7644.5**				**66922.5**				**51370.1**			
AT share in total procurement (%)	**42.9**				**36.2**				**32.2**			

Source: WTO (various years); own calculations

Note: (1) "AT" stands for above-threshold procurement; "FP" stands for foreign procurement; "np" denotes no AT procurement (2) Data are averaged over 1990-91, 1997-98 and 2002-03 (3) Contract values in SDR converted to real US dollar using the SDR-USD exchange rate and the US GDP Implicit Price Deflator (4) There are no data on services contracts in 1990-91 as the coverage of services in the GPA only began with the Uruguay Round (5) Categories 4, 6, 14-17, 22, 24 and 26 in goods and categories 41 and 71 in services account for the majority of Japanese public purchases over time.

Table 3: A snapshot of Swiss public purchases (1990-2003)

(Value data in real USD mn)	~~~~~~~1990-91~~~~~~~				~~~~~~~1996-97~~~~~~~				~~~~~~~2002-03~~~~~~~			
Procurement categories	AT Value	Share of FP(%)	AT Number	Share of FP(%)	AT Value	Share of FP(%)	AT Number	Share of FP(%)	AT Value	Share of FP(%)	AT Number	Share of FP(%)
1	11.3	100.0	22.5	100.0	12.8	70.2	13.5	92.6	27.6	54.7	54.5	73.4
2	0.0	np	0	np	4.7	97.3	37.0	98.6	25.7	0.0	72.5	0.0
3	0.1	100.0	0.5	100.0	0.1	0.0	0.5	0.0	0.0	np	0	np
4	0.0	np	0	np	3.1	0.0	4.0	0.0	1.5	27.7	5.5	36.4
5	3.9	19.3	8	6.3	9.4	1.3	12.5	4.0	6.9	88.9	10	40.0
6	2.4	69.2	8	68.8	1.7	85.2	3.5	71.4	6.4	52.2	14	50.0
7	6.7	10.6	30	23.3	7.6	32.7	19.5	35.9	1.8	17.8	2	25.0
8	0.3	0.0	0.5	0.0	1.0	0.0	10.0	0.0	0.0	np	0	np
9	9.8	16.9	17	11.8	9.4	1.3	8.0	6.3	1.2	0.0	8.5	0.0
10	0.0	np	0	np	6.5	18.8	10.0	15.0	1.8	55.6	4	50.0
11	3.2	26.7	4	37.5	0.6	58.5	1.5	66.7	6.2	66.0	6.5	30.8
12	54.5	90.6	38.5	62.3	5.6	9.4	5.5	27.3	4.9	28.9	13.5	25.9
13	5.8	23.6	4	62.5	8.4	53.7	17.5	71.4	3.1	16.4	6	25.0
14	99.7	84.2	137	88.3	38.3	89.8	111.0	95.5	78.1	72.2	108	52.3
15	4.3	75.6	9	88.9	2.0	47.7	5.0	40.0	1.2	0.0	1	0.0
16	3.6	7.6	9.5	10.5	7.6	4.0	18.0	8.3	7.2	79.3	16.5	48.5
17	44.4	63.0	63.5	52.0	91.0	26.0	26.5	3.8	7.1	9.1	10.5	4.8
18	14.5	70.7	15.5	83.9	3.1	0.0	6.5	0.0	1.0	100.0	3	100.0
19	0.0	np	0	np	0.5	0.0	1.5	0.0	0.0	np	0	np
20	0.8	17.6	1.5	33.3	0.0	np	0.0	np	0.0	np	0	np
21	1.4	81.9	1.5	33.3	0.6	0.0	1.0	0.0	0.0	np	0	np
22	1.7	60.9	2	25.0	0.3	0.0	0.5	0.0	1.2	100.0	4	100.0
23	6.3	3.9	11	9.1	6.0	0.0	7.5	0.0	9.7	15.1	9	27.8
24	9.0	54.5	21.5	62.8	6.7	56.6	22.5	62.2	15.5	61.8	40	58.8
25	0.2	100.0	1	100.0	0.2	100.0	1.0	100.0	0.0	np	0	np
26	0.1	0.0	0.5	0.0	5.9	0.0	10.5	0.0	4.1	63.7	551.5	86.6
All goods	**284.0**	**70.9**	**406.5**	**63.7**	**233.2**	**37.5**	**355.0**	**56.8**	**212.3**	**52.3**	**940.5**	**67.8**
1					20.7	0.5	34.0	1.5	17.4	4.4	28.5	3.5
2					9.8	7.8	9.0	27.8	1.5	0.0	1.5	0.0
3					1.5	6.1	1.5	33.3	0.0	np	0.0	np
4					0.0	np	0.0	np	0.0	np	0.0	np
5					0.1	0.0	0.5	0.0	3.0	0.0	3	0.0
6					0.0	np	0.0	np	0.0	np	0.0	np
7					15.2	0.7	33.0	1.5	60.0	3.8	99	2.5
8					0.0	np	0.0	np	0.2	0.0	0.5	0.0
9					3.4	0.0	1.5	0.0	5.9	0.0	7.5	0.0
10					1.4	7.4	5.0	10.0	6.1	24.6	14.5	17.2
11					20.5	19.6	14.5	17.2	0.1	0.0	0.5	0.0
12					1.6	82.6	14.0	7.1	8.5	9.5	22	4.5
13					0.0	np	0.0	np	1.2	0.0	1	0.0
14					129.5	3.1	119.0	4.2	141.1	46.0	124.5	42.2
15					0.4	0.0	1.5	0.0	5.4	0.0	8	0.0
16					0.2	0.0	0.5	0.0	0.5	0.0	1	0.0
17					0.0	np	0.0	np	3.5	0.0	10	0.0
18					0.0	np	0.0	np	0.0	np	0.0	np
All non-construction services					**204.4**	**5.2**	**234.0**	**5.6**	**254.5**	**27.6**	**321.5**	**18.5**
1					0.6	0.0	7.5	0.0	0.1	0.0	3	0
2					3.7	100.0	5.0	100.0	53.3	0.0	28.5	0
3					0.0	np	0.0	np	0.0	np	0	np
4					0.0	np	0.0	np	0.2	0.0	2	0
5					4.3	3.8	2.0	25.0	0.0	np	0	np
6					2.0	0.0	8.0	0.0	16.9	0.0	16	0
7					5.8	0.0	8.0	0.0	4.1	0.0	16.5	0
8					0.0	np	0.0	np	14.3	0.0	24	0
All construction services					**16.5**	**23.3**	**30.5**	**18.0**	**88.9**	**0.0**	**90**	**0**
All services					**220.8**	**6.5**	**264.5**	**7.0**	**343.3**	**20.5**	**411.5**	**14.5**
Total AT procurement	**283.9**	**70.9**	**406.5**	**63.7**	**454.0**	**22.4**	**619.5**	**35.5**	**555.6**	**32.6**	**1352.0**	**51.6**
Total procurement	**681.5**				**1630.4**				**2007.9**			
AT share in total procurement (%)	**41.7**				**27.8**				**27.7**			

Source: WTO (various years); own calculations

Note: (1) "AT" stands for above-threshold procurement; "FP" stands for foreign procurement; "np" denotes no AT procurement (2) Data are averaged over 1990-91, 1996-97 and 2002-03 (3) Contract values in SDR converted to real US dollar using the SDR-USD exchange rate and the US GDP Implicit Price Deflator (4) There are no data on services contracts in 1990-91 as the coverage of services in the GPA only began with the Uruguay Round (5) Categories 1, 14 and 17 in goods; categories 1, 7 and 14 in services; and categories 2, 6 and 8 within construction services account for the majority of Swiss public purchases over time.

Table 4: Evolution of sample variables over time

						JAPANESE PROCUREMENT OF GOODS & SERVICES									
Year	**TPV**	**ATV**	**FPV(%)**	**ATN**	**FPN(%)**	**Y**	**M_Prop (%)**	**X_Prop (%)**	**N**	**L**	**APL**	**TAR**	**ROG**	**UNEMP**	**REER**
1997	45485	32567.3	3.2	45353	5.8	3974816.0	7.0	10.3	247372	25454726	0.156	1.74	1.6	3.4	83.6
1998	88360	39356.9	5.3	20427	12.8	3978926.7	7.0	11.2	256891	25040011	0.159	1.53	-2	4.1	82.2
1999	49745	22254.2	4.1	26035	7.5	4492294.8	6.8	10.6	237509	24506305	0.183	1.47	-0.1	4.7	93.0
2000	44137	19345.8	5.3	22887	8.9	4550177.1	6.9	10.6	233480	24510280	0.186	1.37	2.9	4.8	100.0
2001	41291	21317.6	3.6	25430	7.1	4007848.5	7.3	10.2	216167	23989704	0.167	1.47	0.2	5	89.5
2002	47749	24267.6	3.8	29698	6.9	4061717.9	7.8	11.7	199669	23432420	0.173	1.47	0.3	5.4	82.9
2003	54991.1	17116.7	4.6	9747	17.3	4599233.1	7.9	12.2	na	23346708	0.197	2.42	1.4	5.2	81.4

						JAPANESE PROCUREMENT OF GOODS									
Year	**TPV**	**ATV**	**FPV(%)**	**ATN**	**FPN(%)**	**Y**	**M_Prop (%)**	**X_Prop (%)**	**N**	**L**	**APL**	**TAR**	**ROG**	**UNEMP**	**REER**
1990	7194	2953.0	13.8	7081	27.8	1575292.7	6.8	13.7	371556	12455507	0.126	2.41	5.2	2.1	75.0
1991	8095	3598.7	14.8	8072	24.7	1849721.4	6.4	13.4	388619	12685728	0.146	2.29	3.4	2	80.8
1992	8143	3713.1	14.9	7424	27.4	2005705.4	5.9	14.0	374488	12709965	0.158	2.24	1	2.2	83.4
1993	8941	4488.7	20.8	9060	28.9	2168915.0	6.3	14.2	372382	12135989	0.179	2.24	0.2	2.5	98.4
1997	45485	6045.6	14.9	9206	28.0	1952595.8	10.6	18.3	247372	7548248	0.259	1.74	1.6	3.4	83.6
1998	88360	12698.9	14.0	10062	25.3	1726083.8	12.5	23.2	256891	7421873	0.233	1.53	-2	4.1	82.2
1999	49745	6257.0	12.7	8396	22.3	1917741.1	12.6	22.5	237509	7098685	0.270	1.47	-0.1	4.7	93.0
2000	44137	5438.6	16.5	8242	23.7	2134796.7	11.6	20.2	233480	6951040	0.307	1.37	2.9	4.8	100.0
2001	41291	5268.6	12.1	7629	22.6	1885233.7	12.1	19.0	216167	6461663	0.292	1.47	0.2	5	89.5
2002	47749	4980.9	15.5	8127	23.8	1738423.3	14.6	24.4	199669	6101126	0.285	1.47	0.3	5.4	82.9
2003	54991.1	5913.8	11.4	7129	22.4	1959497.4	15.3	25.9	na	5973331	0.328	2.42	1.4	5.2	81.4

						SWISS PROCUREMENT OF GOODS & SERVICES									
Year	**TPV**	**ATV**	**FPV(%)**	**ATN**	**FPN(%)**	**Y**	**M_Prop (%)**	**X_Prop (%)**	**N**	**L**	**APL**	**TAR**	**ROG**	**UNEMP**	**REER**
1996	1404.5	395.3	31.1	481	40.3	170542.1	37.3	46.2	na	1705464	0.100	0.0	0.6	3.7	111.3
1997	1856.3	538.7	15.4	744	32.9	309123.1	21.7	27.0	17905	1522327	0.203	0.0	2.1	4.1	102.9
1998	1551.5	717.3	23.5	782	25.4	277298.3	27.6	33.1	17440	1460920	0.190	0.0	2.6	3.6	104.2
1999	1517.7	628.1	24.9	607	29.7	244516.9	29.0	36.2	16975	1547689	0.158	0.0	1.3	3.1	102.3
2000	1744.5	591.3	18.3	763	21.0	254339.4	31.4	38.3	17366	1591581	0.160	0.0	3.6	2.6	100
2001	1898.2	777.3	19.5	744	22.4	255801.8	31.7	38.1	16168	1649461	0.155	0.0	1.2	2.5	103.1
2002	1815.1	516.0	19.2	1224	49.1	320141.4	27.7	35.4	11036	1657331	0.193	0.0	0.4	2.9	106.8
2003	2200.7	773.8	34.0	1473	53.9	364715.7	27.6	35.7	na	1626922	0.224	0.0	-0.2	4.1	106.4

						SWISS PROCUREMENT OF GOODS									
Year	**TPV**	**ATV**	**FPV(%)**	**ATN**	**FPN(%)**	**Y**	**M_Prop (%)**	**X_Prop (%)**	**N**	**L**	**APL**	**TAR**	**ROG**	**UNEMP**	**REER**
1990	642.5	274.5	76.0	368	69.6	130443.9	40.1	39.0	na	1147900	0.114	0.0	3.8	0.5	100.2
1991	720.6	293.5	66.0	428	61.2	131137.5	38.7	38.4	na	716602	0.183	0.0	-0.9	1.7	102.2
1993	652.5	231.7	70.0	486	74.9	130167.8	37.1	41.2	na	645064	0.202	0.0	-0.2	3.7	102.7
1994	690.3	278.6	69.0	368	65.8	147454.7	37.1	40.8	na	636931	0.232	0.0	1.2	3.8	107.4
1995	676.3	222.0	59.3	292	63.0	177647.2	37.3	40.2	na	640642	0.277	0.0	0.4	3.3	114.4
1996	1404.5	184.0	56.0	287	61.7	170542.7	34.8	37.7	na	621350	0.274	0.0	0.6	3.7	111.3
1997	1856.3	283.3	25.5	424	53.3	148625.3	42.6	46.0	17905	439963	0.338	0.0	2.1	4.1	102.9
1998	1551.5	228.8	56.1	327	54.1	97334.7	73.8	76.9	17440	367999	0.264	0.0	2.6	3.6	104.2
1999	1517.7	322.3	44.3	323	48.3	83580.5	78.9	83.5	16975	433966	0.193	0.0	1.3	3.1	102.3
2000	1744.5	272.7	36.1	461	30.8	84574.2	88.2	91.4	17366	445409	0.190	0.0	3.6	2.6	100
2001	1898.2	299.3	42.9	417	35.3	85198.6	89.0	92.8	16168	448889	0.190	0.0	1.2	2.5	103.1
2002	1815.1	168.3	53.6	845	69.7	101399.2	82.9	93.1	11036	435998	0.233	0.0	0.4	2.9	106.8
2003	2200.7	256.3	51.5	1026	67.0	114269.8	83.7	94.0	na	411384	0.278	0.0	-0.2	4.1	106.4

Source: WTO (various years); World Bank, World Development Indicators (various years); Nicita & Olarreaga (2006); OECD STAN (various years); OECD Trade in Services (various years); UNIDO (2010); own calculations

Note: (1) "TPV" stands for total procurement value; "ATV" stands for above-threshold procurement by value of contracts; "FPV" stands for share of foreign procurement in AT procurement by value of contracts; "ATN" stands for above-threshold procurement by number of contracts; "FPN" stands for share of foreign procurement in AT procurement by number of contracts; "M_Prop" denotes the share of private sector imports in output; "X_Prop" denotes the share of private sector exports in output; rest of the variables are as defined in Table 1 (2) TPV, ATV, Y and APL are reported in USD mn (3) There are no data on services procurement before 1996 as the coverage of services in the GPA only began with the Uruguay Round.

Table 5: Estimating Japanese foreign procurement value

Variable	~~~~Goods and services~~~~				~~~~~~~~~Goods~~~~~~~~~				~~~~~~~~~Services~~~~~~~~~			
	I	II^Y	III^C	IV^{Y,C}	V	VI^Y	VII^C	VIII^{Y,C}	IX	X^Y	XI^C	XII^{Y,C}
RELDD	3.94***	3.86***	1.88*	1.67**	6.60***	5.97***	7.07***	5.87***	12.19*	12.19*	3.68**	3.68**
ln(AP$_l$)	-0.10	-0.08	0.69	1.47**	-2.38***	-2.42***	0.39	2.59**	-7.42***	-7.42***	11.04**	11.04**
ln(L)	-.61***	-.62***	0.33#	0.33#	-0.13	-0.18	1.64***	2.06***	-1.60*	-1.60*	0.33	0.33
ln(N)					-.38*	-.34*	-0.41	-.62**				
ln(M)	.50**	.50**	0.05	0.10	1.12***	1.14***	-0.45	-.72*	-2.14*	-2.14*	0.88	0.88
TAR					-.51***	-.53***	0.71	0.56#				
ln(ROG)	-0.01	0.20	0.00	.30***	0.02	0.71	-0.03	-0.02	-0.32	-0.32	.92***	.92***
ln(REER)	2.41	1.58	1.54**	0.88	3.21#	12.33*	1.06	-19.09***	5.09	5.09	2.04	2.04
ELEC$_t$	-0.11	-0.43	-0.11	-.67***	-0.27	-2.82#	-0.03	2.89***	1.31#	1.31#	-4.07***	-4.07***
ELEC$_{t-1}$	0.00	0.08	-0.02	0.13	-0.01	0.81	0.09	-0.48#	1.10#	1.10#	-1.10**	-1.10**
URGPA	-0.39	-0.05	-0.02	-1.61**	0.98	-1.37	0.99	0.06	(omitted)	(omitted)	(omitted)	(omitted)
Constant	-4.27	-0.68	-12.33***	-7.06	-20.77**	-58.63*	-29.36*	65.43**	4.30	4.30	7.52	7.52
Obs.	223	223	223	223	142	142	142	142	25	25	25	25
df_m	9	12	37	40	11	13	30	32	8	8	12	12
Pseudo-R^2	0.22	0.23	0.85	0.87	0.69	0.7	0.87	0.88	0.71	0.71	0.93	0.93

Note: (1) Levels of significance: ***(.1%), **(1%), *(5%), #(10%)
(2) Y = year effects, C = category effects, effects not reported

Table 6: Estimating Swiss foreign procurement value

Variable	~~~~Goods and services~~~~				~~~~~~~~~Goods~~~~~~~~~				~~~~~~~~~Services~~~~~~~~~			
	I	II^Y	III^C	IV^{Y,C}	V	VI^Y	VII^C	VIII^{Y,C}	IX	X^Y	XI^C	XII^{Y,C}
RELDD	15.21***	16.87***	7.89**	6.98***	16.86***	19.38***	9.19**	9.14***	-8.07	-9.90	-17.31#	-70.46
ln(AP$_l$)	0.42	0.77#	-0.72	-1.02*	0.10	0.35	-0.86#	-1.34**	-19.95***	-19.44***	-25.97***	-9.19#
ln(Y)	0.12	0.17#	0.24	0.79	0.21	.27*	0.33	1.02	9.29***	9.37***	20.04**	29.10#
ln(M)	.79***	.92***	-0.75	-0.82	.49*	.58*	-1.00	-1.66	1.19***	1.11***	-0.644638	-1.57
ln(ROG)	-0.43	1.02*	-0.22	-1.19**	-0.58	0.99#	-0.40#	-1.46***	3.50***	3.70***	5.35**	10.67#
ln(REER)	-13.96*	79.75**	-3.07	-21.97*	-14.87#	88.42**	-5.02	-26.66*	124.09***	134.07**	178.09**	414.08#
ELEC$_t$	0.29	0.34	0.12	-1.12	0.22	0.22	0.02	-0.86	1.30***	1.32***	2.51***	3.68*
ELEC$_{t-1}$	.79*	-1.69*	.43*	-0.61#	0.69#	-2.00*	0.34	-0.62#	-1.28	-1.78	-3.38*	-17.19
URGPA	0.32	-3.10**	-0.01	-1.49**	0.43	-3.19**	0.01	-1.31*	(omitted)	(omitted)	(omitted)	(omitted)
Constant	58.51	-373.40**	18.75	103.33*	63.96	-412.06**	28.79	129.11*	-716.91***	-762.15**	-1067.78**	-2203.17#
Obs.	125	125	125	125	101	101	101	101	24	24	24	24
df_m	9	13	25	29	9	13	21	25	8	9	10	11
Pseudo-R^2	0.594	0.64	0.7492	0.7653	0.5967	0.65	0.7467	0.765	0.8125	0.8127	0.8213	0.8348

Note: (1) Levels of significance: ***(.1%), **(1%), *(5%), #(10%)
(2) Y = year effects, C = category effects, effects not reported

Table 7: Estimating Japanese import demand for contracts

Variable	~~~~Goods and services~~~~				~~~~~~~~~Goods~~~~~~~~~				~~~~~~~~~Services~~~~~~~~~			
	I	II^Y	III^C	IV^{Y,C}	V	VI^Y	VII^C	VIII^{Y,C}	IX	X^Y	XI^C	XII^{Y,C}
RELDD	8.93***	8.88***	3.47*	5.12***	15.85***	15.95***	7.09***	6.68***	10.86***	10.86***	1.86***	1.86**
ln(PD)	-.85***	-.85***	-.57***	-.57***	-0.20	-0.26	-0.16	-0.05	-0.01	-0.01	0.58#	0.58#
ln(PF)	.17**	.17**	0.04	-0.02	.35***	.46***	.21***	.16**	1.37*	1.37*	1.48***	1.48***
ln(AP$_l$)	-0.37	-0.36	-0.73#	0.51	-2.96***	-3.04***	-0.65	-0.08	-0.19	-0.19	2.05	2.05
ln(L)	-.83***	-.84***	-0.05	-0.23	-.95**	-1.07**	-0.16	0.18	-4.76***	-4.76***	-1.88***	-1.88***
ln(N)					0.19	0.26	-0.13	-0.24				
ln(M)	0.03	0.05	.50**	.62***	1.54***	1.51***	-0.27	-0.23	1.51	1.51	-4.24**	-4.24**
TAR					-0.50***	-.48***	.47**	.44*				
ln(ROG)	0.00	0.10	-0.05	.24***	0.14	-0.26	-0.03	-0.03	-.59*	-.59*	.67***	.67***
ln(REER)	1.31	1.57	0.74	1.22**	3.12*	-1.97	2.16***	-3.03	-2.28#	-2.28#	3.37**	3.37**
ELEC$_t$	0.00	-0.29	-0.03	-.82***	-.69***	0.69	-.20***	0.51	1.08	1.08	-2.23***	-2.23***
ELEC$_{t-1}$	0.14	0.12	-0.01	0.01	-0.05	-0.84	-0.04	-0.23	0.55	0.55	-.80***	-.80***
URGPA	-0.13	-0.30	0.24	-1.37***	1.21***	2.51*	.58*	0.35	(omitted)	(omitted)	(omitted)	(omitted)
Constant	6.75	5.88	-3.97	-0.31	-19.39*	2.94	-2.63	18.14	65.20***	65.20***	52.83***	52.83***
Obs.	150	150	150	150	81	81	81	81	21	21	21	21
df_m	11	14	36	39	13	15	28	30	10	10	14	14
Pseudo-R^2	0.66	0.66	0.96	0.96	0.90	0.91	0.97	0.97	0.89	0.89	0.92	0.92

Note: (1) Levels of significance: ***(.1%), **(1%), *(5%), #(10%)
(2) Y = year effects, C = category effects, effects not reported

Table 8: Estimating Swiss import demand for contracts

Variable	~~~~Goods and services~~~~				~~~~~~~~~Goods~~~~~~~~~				~~~~~~~~~Services~~~~~~~~~			
	I	II^Y	III^C	IV^{Y,C}	V	VI^Y	VII^C	VIII^{Y,C}	IX	X^Y	XI^C	XII^{Y,C}
RELDD	6.74***	7.94***	3.86*	3.27#	6.93**	9.23**	5.10**	4.78**	0.50	.03***	-3.09***	.03***
ln(PD)	-0.11	-0.26	0.10	0.12	-0.08	-0.26	0.06	0.08	-.86***	-1.17***	-4.58***	-1.17***
ln(PF)	-.51**	-.56**	-.31*	-.34**	-.51*	-.55*	-.24#	-0.28#	-.54***	-.62***	.028***	-.62***
ln(AP$_l$)	1.72***	2.00***	-0.71#	-1.04#	1.64**	1.80**	-.90**	-1.15*	-18.44***	-15.23***	-51.17***	-15.23***
ln(Y)	-0.17	-0.10	-0.95#	-0.48	-0.17	-0.07	-1.15*	-0.71	6.90***	6.28***	3.91***	6.28***
ln(M)	.46*	.56**	0.19	0.15	0.43#	0.44#	0.00	-0.16	1.31***	1.28***	-2.40***	1.28***
ln(ROG)	-0.02	0.92#	.30*	0.14	-0.05	0.92	.34*	0.17	2.282***	2.63***	2.40***	2.63***
ln(REER)	-14.42#	42.92	12.68*	9.37	-14.19#	46.10	17.03***	12.31	79.79***	99.66***	118.89***	99.66***
ELEC$_t$	0.61#	.65*	0.11	-0.45	0.56	0.55	-0.03	-0.25	.88***	.70***	-.09***	.70***
ELEC$_{t-1}$	.756*	-0.80	0.23	0.03	.81*	-0.83	0.22	0.09	0.03	-.85***	3.60***	-.85***
URGPA	.99*	-1.12	0.22	-0.15	1.05*	-1.03	0.36	0.14	(omitted)	(omitted)	(omitted)	(omitted)
Constant	67.90*	-196.74	-49.30*	-38.19	66.93#	-211.09	-66.36**	-47.50	-484.81***	-563.53***	-674.40***	-563.53***
Obs.	78	78	78	78	66	66	66	66	12	12	12	12
df_m	11	15	24	28	11	15	21	25	10	4	4	4
Pseudo-R^2	0.52	0.55	0.77	0.77	0.51	0.54	0.78	0.78	0.64	0.64	0.64	0.64

Note: (1) Levels of significance: ***(.1%), **(1%), *(5%), #(10%)
(2) Y = year effects, C = category effects, effects not reported

Table A1: Goods procured by the Japanese and Swiss governments

GPA classification	Description	ISIC Rev 2	ISIC Rev 3
1	Products from agriculture, and from agricultural and food processing industries	311,313,314	151-154
2	Mineral products		
3	Products of the chemical and allied industries	351,352	241, 242 less 2423
4	Medicinal and pharmaceutical products	352	2423
5	Artificial resins and plastic materials, cellulose esters and ethers, and articles thereof: rubber, synthetic rubber, factice, and articles thereof; raw hides and skins, leather, fur skins and articles thereof, other than articles of apparel and clothing accessories of leather, saddlery and harness, articles of animal gut	323,355,356	182,25
6	Wood and articles of wood; wood charcoal, cork and articles of cork; paper making material; paper and paperboard and articles thereof; manufactures of straw of esparto and of other planting materials, basketwork and wickerwork	331, 341	202,21
7	Textiles and textile articles, footwear, headgear umbrellas; sunshades; walking sticks, whips, riding crops and parts thereof; travel goods; hand-bags and similar containers; articles of apparel and clothing accessories, of leather or composition leather	321,322, 324	17,181,19
8	Articles of stone, plaster, asbestos, mica and similar materials; ceramic products, other than sanitary fixtures; glass and glassware, other than illuminating and signaling glassware and optical elements of glass, not optically worked nor of optical glass	362, 369	26 less 2696
9	Iron and steel and articles thereof, other than boilers and radiators for central heating, air heaters and hot air distributors not electrically heated	371	271,2731
10	Non-ferrous metals and articles, other than lamp and lighting fittings	372	272,2732
11	Power generating machinery and equipment	382	2911,311
12	Machinery specialized for particular industries	382	292
13	General industrial machinery and equipment, and machine parts	382	291 less 2911
14	Office machines and automatic data processing equipment	382	30
15	Telecommunications and sound recording and reproducing apparatus and equipment	383	32
16	Electrical machinery, apparatus and appliances, and electrical parts thereof	383	31 less 311
17	Road vehicles	384	34,359
18	Railway vehicles and associated equipment	384	352
19	Aircraft and associated equipment	384	353
20	Ships boats and floating structures	384	351
21	Sanitary, plumbing, heating and lighting equipment		
22	Medical, dental, surgical and veterinary equipment	385	3311
23	Furniture and parts thereof	332	361
24	Professional, scientific and controlling instruments and apparatus	385	3312,3313
25	Photographic apparatus, equipment and optical goods; watches and clocks	385	332,333
26	Miscellaneous articles	390	369

Source: WTO (various years); UNSD (http://unstats.un.org/unsd/cr/registry/regso.asp?Ci=1&Lg=1)

Note: The ISIC Rev 2 classification is used in Nicita & Olarreaga (2006) and the ISIC Rev 3 classification is used in UNIDO (2010) and OECD STAN (various years).

Table A2: Services procured by the Japanese government

Japanese Classification	CPC Code	Services Category
41	51	Construction work
42	867	Architectural, engineering & other technical
51	6112	Maintenance & repair (motor vehicles)
52	6122	Maintenance & repair (motorcycles & snowmobiles)
53	712	Other land transport
54	7213	Rental (sea-going vessels)
55	7223	Rental (non-sea-going vessels)
56	73	Air transport
57	748	Freight transport agency
58	7512	Courier
61	7523	Electronic mail
62	7521	Voice mail
63	7523	On-line info & database retrieval
64	7523	Electronic data interchange (EDI)
65	7529	Enhanced fax
66	7523	Code and protocol conversion
67	7523	On-line info &/or data processing
71	84	Computer & related
72	864	Market research & pub opinion polling
73	871	Advertising
74	87304	Armoured car
75	874	Building-cleaning
76	88442	Publishing & printing
77	886	Repair (metal products & machinery)
78	94	Sewage & refuse disposal, sanitation & other EP

Source: WTO (various years); UNSC (2002)

Table A3: Services procured by the Swiss government

Swiss Classification	CPC	Services Descriptions
1	6112, 6122, 633, 886	Discussion to the wide direction (discussion, inspection, repairs)
2	712 (excd. 71235), 7512, 87304	Land transportation, including the transportation of money and the mail services, except the postal traffic and rail transportation
3	73 (excd. 7321)	Air transportation: Transportation of travellers and of merchandise, except the transportation of courier
4	71235, 7321	Transportation of mail by land or by airplane (except rail transportation)
5	752 (excd. 7524, 7525, 7526)	Telecommunications (except the services of vocal telephony, of telex, of radio telephony, of radio-messaging and of telecommunications by satellite)
6	811, 812, 814	Services regarding assurance and bank services, except the financial services relating to the transmission, to the sale, to the purchase or to the transfer of titles or of other financial instruments, as well as services furnished by central banks
7	84	Computer and related services
8	862	Accounting, auditing and book-keeping services
9	864	Market and public-opinion polling services
10	865, 866	Management consulting and related services
11	867	Architecture, urban installation and environmental architecture
12	867	Consulting and technical services, technical integrated services, relevant scientific and technical consulting, technical essays and analyses of construction projects
13	867	Works of study (auction of identical markets to several contractors to obtain different suggestions of solutions)
14	867	Consulting and technical services, technical integrated services, relevant scientific and technical consulting, technical essays and analyses not concerning construction projects
15	871	Advertising, information and public relations services
16	874, 82201-82206	Cleanings of buildings and property management services
17	88442	Edition and impression services
18	94	Sewage and refuse disposal, sanitation and analogous services
Construction services		
1	511	Preparation of the sites and work-sites of construction
2	512	Construction of buildings
3	513	Construction of civil works
4	514	Assembly and construction of prefabricated works
5	515	Works of specialized businesses of construction
6	516	Putting installations
7	517	Secondary work and building finishing
8	518	Housing and credit lease concerning equipments of construction or of demolition, personnel works

Source: WTO (various years); UNSC (2002)

Note: The table has been translated into English from French

Table A4: Data description for the empirical model

| Country | ~~~~~~~~~~Japan~~~~~~~~~~ | | | | | ~~~~~~~~Switzerland~~~~~~~~ | | | | |
Variable description	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
					Procurement-specific variables					
Total procurement (real USD mn)	326	40957.0	23755.9	7194	88360	334	1395.5	541.3	642.5	2200.7
AT procurement (real USD mn)	326	585.8	1913.9	0	16141.9	334	18.7	45.8	0.0	381.2
Foreign procurement (real USD mn)	326	30.5	65.2	0	545.5	334	6.1	16.3	0.0	130.4
Non-LT procurement (real USD mn)	326	441.8	1497.9	0	12574.5	334	9.7	27.7	-4.0	294.5
FP share in AT procurement	312	0.1	0.2	0	1	258	0.3	0.4	0.0	1.0
ICB share in AT procurement	312	0.8	0.3	0	1	258	0.5	0.4	0.0	1.0
Relative demand (value)	326	0.0	0.1	0	0.51	334	0.0	0.1	0.0	0.5
Relative demand (number)	326	0.0	0.1	0	0.76	334	0.0	0.1	0.0	0.5
Number of contracts (total)	326	647.9	2670.4	0	34692	334	26.2	60.0	0.0	612.0
Number of contracts (domestic)	308	609.8	2728.5	1	34688	239	20.6	38.6	1.0	230.0
Number of contracts (foreign)	326	71.8	171.8	0	1202	334	11.5	43.9	0.0	537.0
Average contract size domestic (real USD mn)	308	1.3	2.7	0.032	27.9	239	0.8	0.9	0.0	7.0
Average contract size foreign (real USD mn)	211	1.8	3.2	0.003	20.6	169	4.9	51.2	0.0	665.0
					Industry-specific variables					
Output (real USD mn)	297	125469.2	176321.1	2476.1	1100000	192	15173.6	16234.8	0.0	82000.9
GFKF (real USD mn)	144	4222.8	5393.7	25.6	28499					
Imports (real USD mn)	281	9354.3	9311.2	135.7	37792.9	292	3084.4	2333.0	32.2	12015.8
Exports (real USD mn)	281	15350.0	19552.4	274	121150	292	3655.5	4454.1	7.1	22003.1
Import propensity	281	0.2	0.2	0.004	0.95	175	1	1.7	0.0007	7.6
Export propensity	281	0.3	0.3	0.004	2.6	175	0.45	0.38	0.035	1.9
IIP	201	102.0	14.8	55	149	221	107.1	15.4	64.0	176.0
Number of firms	219	13233.5	15860.9	56.6	70291	65	1490.6	1379.8	93.0	4615.0
Employment	297	741640.9	1307371.0	14231	7000000	198	83580.0	94245.5	2582.0	453900.0
Output per employee (real USD)	297	0.2	0.1	0.05	0.74	175	0.2	0.1	0.0	0.5
Simple Avg. Appd. Tariff	201	1.9	3.6	0	18					
Import-wted. Appd. Tariff	157	2.1	3.4	0	16					
Simple Avg. MFN Tariff	201	2.4	4.0	0	20					
Import-wted. MFN Tariff	169	2.6	4.0	0	18					
No. of tariff lines	197	405.3	572.2	38	2412					
					Macroeconomic variables					
Annual GDP growth rate (%)	326	1.1	1.8	-2	5.2	334	1.3	1.4	-0.9	3.8
Unemployment rate (%)	326	4.0	1.2	2	5.4	334	3.1	1.0	0.5	4.1
Rate of interest (%)	326	3.4	0.8	1.8	4.5	334	3.6	0.9	2.0	5.0
REER	326	86.7	7.3	75.0	100	334	104.9	4.0	100.0	114.4
Trade-weighted exchange rate	292	2.5	1.2	0.96	4.06	334	1549.3	809.1	643.6	2687.5
					Political economy variables					
CPI Index	238	6.6	0.5	5.8	7.1	254	8.4	1.5	0	8.9
CPI Ranking	238	22.3	1.9	20	25	254	9.6	2.3	0	12
Election year dummy	326	0.3	0.5	0	1	334	0.3	0.5	0	1
Year preceding election year dummy	326	0.3	0.4	0	1	334	0.3	0.5	0	1
UR GPA dummy	326	0.7	0.4	0	1	334	0.7	0.5	0	1

Source: WTO (various years); World Bank, World Development Indicators (various years); Nicita & Olarreaga (2006); OECD STAN (various years); OECD Trade in Services (various years); UNIDO (2010); own calculations